
2014 ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER I

**CLIMATE CHANGE
AND ENERGY**

I. CLIMATE CHANGE AND ENERGY

A. BACKGROUND

Climate change/global warming is the result of world-wide emissions of greenhouse gases, including carbon dioxide. Because the rise in GHG concentrations is attributed to the combustion of fossil fuels, many local governments across the United States are working to improve energy efficiency and reduce GHG emissions¹. This chapter outlines work that is under way in Fairfax County to reduce GHG emissions and improve energy efficiency.

Climate change is already impacting the United States. The governments of many countries and scientists worldwide acknowledge a real concern for the impacts of climate change.

In recent years Fairfax County has seen warmer temperatures and more poison ivy, which has been attributed to slightly warmer temperatures. Floodplain boundaries in the county have been redrawn to meet Federal Emergency Management Agency floodplain designations, resulting in more home structures now being located in floodplains. The Governor's Commission on Climate Change² estimated that there will be a sea level rise between one and 1.6 feet by 2050 and between 2.3 and 5.2 feet by the year 2100. Similar impacts are being predicted elsewhere in the United States and around the world.

Because climate change will have a range of impacts, including rising sea levels and changes in species that can inhabit an area, a number of counties and states have developed and are developing plans to mitigate the impact of climate change. These plans address a variety of issues from health impacts to minimizing property damage due to rising sea levels. While Fairfax County has taken steps to evaluate some impacts such as a rise in sea level, there has not been an effort to identify all impacts of climate change on Fairfax County and outline measures that can or should be taken to mitigate these impacts.

The 2008 National Capital Region Climate Change Report¹ provides some excellent background information on climate change in the metropolitan Washington, D.C. area. The report (<http://www.mwcog.org/uploads/pub-documents/zldXXg20081203113034.pdf>) highlights many important considerations, including:

- Temperatures are rising along with both sea level and atmospheric carbon dioxide levels.
- As population continues to increase in the Washington, D.C. area, emissions of GHG are also projected to increase.

- A variety of actions have been proposed in the report to reduce GHG emissions; these recommendations have formed the basis for bringing together local governments from the Washington, D.C. area to take action to reduce GHG emissions.

According to the Pew Center for Climate Research³, the United States has five percent of the world's population yet we contribute to 17 percent of the world's GHG emissions. Moreover, U.S. emissions account for 30 percent of the world's GHG emissions since 1850. Given the observed increases in GHG concentrations in the atmosphere, the increases in temperature, melting of the glaciers and rises in sea level, the world is moving towards controlling GHG emissions.²

In summer 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 seven percent below their 1990 levels by 2012. Chairman Gerald E. Connolly and other members of the Fairfax County Board of Supervisors decided 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.⁴

Solving climate change is a daunting task by any measure, but Fairfax County continues to play a leadership role in this effort. The county plays an active and significant role in regional cooperation and influence on major environmental policy and operations like air quality, land use planning and zoning, transportation, forest conservation, solid waste management and recycling and water conservation. Fairfax County leads by example by: adjusting Fairfax County operations to understand both GHG emissions and energy use; adopting programs to improve energy efficiency and reduce GHG emissions; and looking at county operations to assess what policy or program changes we have the authority and resources to enact in order to lower the emissions produced by county operations.

To guide efforts to address energy, Chairman Sharon Bulova created the Chairman's Private Sector Energy Task Force to bring together prominent members of the Fairfax County development and business communities as well as academia to create a new energy strategy for the county and lead in the area of energy efficiency, sustainability and "green" technology. The task force brought together

the private sector, utilities, schools, government officials, organizations including the Environmental Quality Advisory Council and county staff. At this point, it appears that the work of the Task Force has come to an end. The work of the Private Sector Energy Task Force was intended to help Fairfax County position itself as a leader in the area of energy efficiency, sustainability and “green” technology. The Private Sector Energy Task Force was a good beginning, but the development of an energy strategy remains important to Fairfax County. As an example, EQAC recommends that Fairfax County place a priority on supporting education and recognition for companies that adopt energy efficient approaches as part of their business practices. By achieving a reduction of energy use for Fairfax County businesses of all sizes, projects that improve energy efficiency and reduce the need for energy will give companies a clear return on their investments, not only through lowered costs but also through enhanced reliability and security and increased competitiveness in the region and in the country.

Fairfax County has undertaken new efforts to make sustainability a core element of county operations. Making decisions that will be sustainable for the county and provide for sound environmental practices is important to the future of Fairfax County. Much of the progress in this area is summarized on the county’s webpage dedicated to the environment and sustainability.⁵

The new energy strategy will also attract green collar jobs to Fairfax County. This will be achieved by fostering a business community that these industries find attractive--one that is committed, across all sectors, to achieving ambitious energy efficiency goals. More information is available in the report of the Task Force.⁶

Climate change is a very active area for the region and it is impressive the way that most local governments are undertaking efforts to address it. This chapter reviews efforts that Fairfax County is taking and provides some information on regional efforts as well as the efforts of nearby counties.

While district energy has proven efficiency and is being used in a variety of areas even around the Washington, D.C. metropolitan area, Virginia laws complicate the question of district energy and whether and how energy can be sold back into the grid. This point can adversely affect the economics of such projects so that they would not be profitable in Virginia when they would be viable in the District of Columbia or Maryland. Fairfax County has been active in working with other Virginia jurisdictions to evaluate district energy. Moreover, the use of district energy is easier to implement when a single owner is responsible for multiple buildings, as is the case in Crystal City (part of Arlington County). Moreover, there are issues with obtaining credit for the return of excess energy back into the grid resulting from the way that Virginia law is written. Fairfax County is an active participant with this and other issues at a regional level and is undertaking efforts to provide answers that will allow Fairfax County and other Northern Virginia jurisdictions to move forward on this and other issues in the future.

Another example involves efforts to obtain a “carbon footprint” (i.e., the GHG emissions associated with the consumption of fossil fuels and other activities that release GHG emissions). Briefings to EQAC from county and Fairfax County Public Schools staffs have reported significant energy savings in a variety of county facilities, including schools that are renovated. While Fairfax County government has undertaken work to characterize the carbon footprint for government buildings, similar building-specific efforts evaluating the performance of individual non-government buildings have not been expanded to the residential and commercial sectors. There are a number of issues associated with such work, some of which might be solved by reporting from utilities. Again, Fairfax County is working with other jurisdictions to explore options for obtaining and managing this information. This chapter focuses on three areas: (1) activities that Fairfax County government is undertaking to reduce GHG emissions associated with county operations; (2) efforts that Fairfax County is taking to network with the greater Washington metropolitan region in these efforts; and (3) Fairfax County’s GHG emissions and activities that the county is taking to reduce such emissions from residences and business operations.

B. FAIRFAX COUNTY GHG EMISSIONS INVENTORY

In April 2013, the county completed its GHG emission inventory. This was the first comprehensive attempt to evaluate the GHG emissions for Fairfax County. While this was the first comprehensive inventory of GHGs for the county, differences in methodologies by the various local governments made it difficult to either compare or combine the inventories from different governments in the Washington D.C. area. As a result, the Metropolitan Washington Council of Governments, with the support of the Northern Virginia Regional Commission, is undertaking an inventory all of GHG emissions in the region using a consistent methodology that is widely used nationwide. The results of that inventory are not yet available but they will serve as a future update to this information.

The 2013 Fairfax County GHG emissions inventory employed the following practices:

- Only property that was under the jurisdiction of Fairfax County was included. Thus, the federal government properties located within the county, including but not limited to Fort Belvoir, Dulles Airport, the Central Intelligence Agency and the National Reconnaissance Organization, were not included. In addition, independent political subdivisions such as the City of Falls Church and the City of Fairfax were excluded from the analysis.
- The analysis includes scope 1 (all direct GHG emissions) and scope 2 (indirect GHG emissions) emissions. Scope 3 emissions associated with the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity related

activities not covered in Scope 2, outsourced activities, waste disposal and other GHG emissions are mentioned but excluded from the analysis.^{7,8}

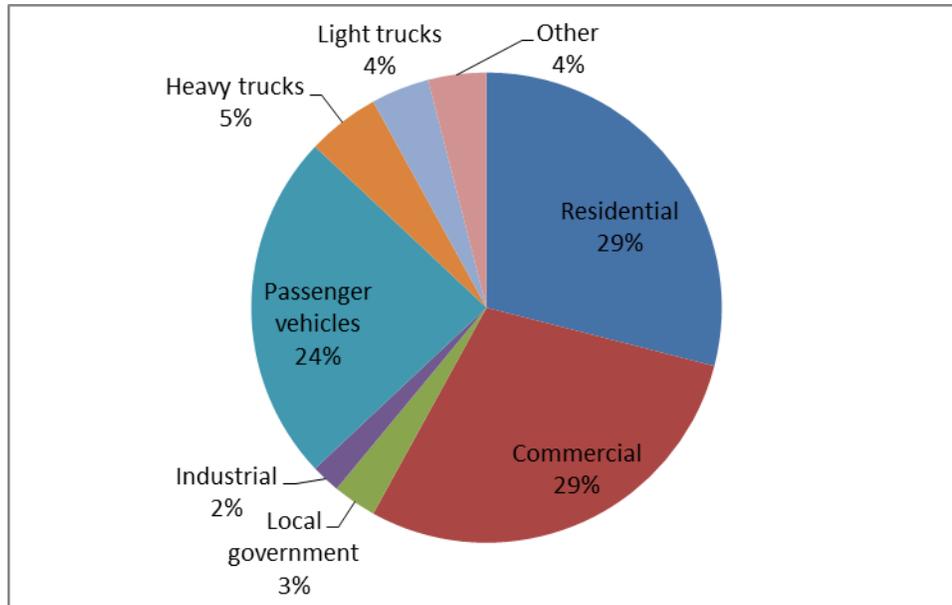
Both of the above assumptions, though reasonable, should be examined when comparing the Fairfax County emissions of 11.4 metric tons CO₂ equivalent (MTCO₂e) per capita across local jurisdictions because of the differences in methodologies for the GHG inventory. For example, Arlington County's estimate of over 13 metric tons per capita includes emissions from National Airport, although Arlington County exerts no control over the airport.

Figure I-1 shows that the main sources of GHG emissions are electricity generation (both residential and commercial) and mobile sources. The annual GHG emission per average Fairfax County resident is about 11.4 MTCO₂e. Information from the county's GHG emissions inventory, which includes a base year of 2006 with four additional years of data, shows that this number has decreased slightly in 2010, which could be attributable to a combination of factors, including education and outreach efforts to reduce energy consumption. According to the Pew Center for Climate Research, the average U.S. citizen has an annual average GHG emission of over 20 MTCO₂e, over twice the world average. However, the lower estimate of GHG emissions per person reported in this inventory has a much sounder basis than this gross estimate from the Pew Center. There are valid reasons that the Fairfax County per capita GHG emissions could be higher or lower. For example, the mix of vehicles in the Washington, D.C. area is newer than in many other areas, the Washington, D.C. area has mass transit to serve the population, and much of the building stock of Fairfax County is newer and more energy efficient than buildings in other areas. However, the Washington metropolitan region does suffer from some of the nation's worst traffic, which would raise GHG emissions. Moreover, the estimate of GHG emissions for Fairfax County does not include scope 3 emissions, which we expect is consistent with the GHG inventories of many, if not most, local governments.

While Figure I-1 groups GHG emissions into a few groups of emission sources, there are many different sources of GHG emissions and many opportunities for reducing GHG emissions. For example, most waste in the Washington, D.C. area is incinerated, which is preferred to landfill disposal of waste because landfills generate methane (which is 20 times more potent than carbon dioxide as a GHG). Recently, however, some property managers of buildings in Arlington County, the District of Columbia and parts of Maryland adopted a more comprehensive recycling program, which is being offered by a private company. One of the reasons that this program for waste management is being selected is that the cost is similar to the cost of incineration and ash disposal. Materials recycled include the materials that most waste companies offer (i.e., glass, aluminum, newspaper) as well as other materials that include batteries, plastic bags and any material that can be composted (i.e., food waste, soiled paper towels, and other materials). In addition to providing for a more comprehensive recycling program, the composting of food waste and other materials decreases waste. Composting of waste is far

more desirable because it reduces the generation of GHG when compared with landfilling waste. Moreover, because composting of waste provides a useful product as opposed to ash from an incinerator that must be managed into the future, composting of food and other materials that can be composted has merits that warrant further consideration, as about 30% of this material will remain as ash after incineration.

Figure I-1. 2006 Countywide GHG Emissions (11.838 mt2e)



Source: *Community Greenhouse Gas Inventory for Fairfax County, Virginia, Report of Findings: 2006-2010*, Fairfax County, Virginia⁷ (advance copy).

C. ACTIVITIES THAT FAIRFAX COUNTY RESIDENTS CAN UNDERTAKE TO REDUCE GHG EMISSIONS

The Fairfax County GHG inventory serves as a guide for both actions that EQAC feels are fundamental to any GHG emissions reduction effort (e.g., monitoring energy use in government buildings and undertaking renovations to be energy efficient) and other actions.. Some efforts, such as saving energy, reducing vehicle miles, carpooling or maybe riding a bike to work will involve changes in lifestyle that can be better for the planet and good exercise. Key opportunities for GHG emissions reductions include:

- Reduce home energy demands. Much of the electrical use shown in Figure I-1 serves to power, heat and cool buildings. Insulation, energy efficient windows, solar panels, geothermal energy and wind power can all help to reduce GHG

emissions from building operations. As the use of renewable energy sources increases, the availability and cost of these sources will hopefully decrease.

- Reduce the use of single occupancy vehicles by carpooling, using mass transit, bicycling, walking or pursuing other alternatives (including work at home opportunities). Vehicle emissions constitute another significant source of GHG emissions, so this is another area that seems to be an appropriate target for reduction.
- Participate in local efforts to plan for improved land use patterns and to encourage energy efficient construction practices. Participating in these local efforts will also help to ensure that energy efficient construction practices will have a better chance of acceptance and success.

D. FAIRFAX COUNTY OPERATIONS GHG EMISSIONS AND ACTIONS TO REDUCE THESE EMISSIONS

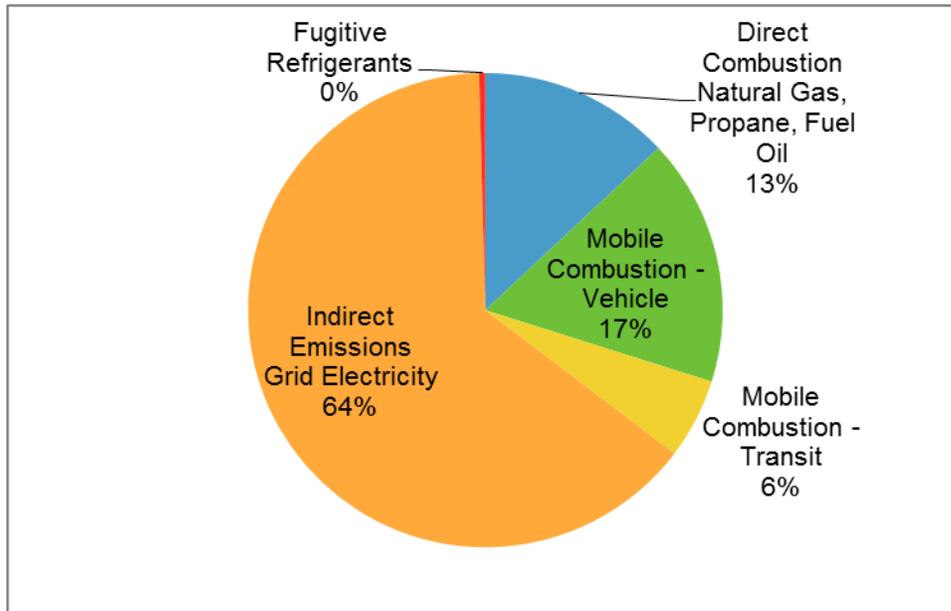
1. Overview

The Fairfax County government has undertaken extensive efforts to both characterize GHG emissions associated with county operations and to target opportunities for increased energy efficiency. While county savings from these efforts are to be commended, the success of Fairfax County government in characterizing emissions and improving the efficiency of operations serves as a model for both businesses and residents in the county.

Fairfax County has already taken a number of significant actions, such as purchasing hybrid vehicles, promoting green energy efficient buildings, promoting renewable sources of energy and teleworking to name just a few.

Fairfax County has had a hybrid vehicle replacement program since 2002 and currently has 112 hybrids in its vehicle fleet. In 2006, the county converted one of its Toyota Priuses to a “plug-in-hybrid-electric” vehicle. This car travels up to 30 miles on electric power from the grid before engine-generated electric power is used; on some trips it has a fuel efficiency over 100 miles per gallon of gas (plus grid electricity). More recently, the county purchased five plug-in hybrid electric Chevrolet Volts.

Figure I-2. 2010 Fairfax County Government Emissions by Source Type (460,695 MTCO₂e)⁴



Source: Fairfax County, Virginia⁷.

Fairfax County is using renewable energy technology to harness energy. This includes landfill-gas-to-energy systems at both closed landfills and solar mixers at the Noman M. Cole Jr. Pollution Control Plant.⁹ In addition, Fairfax County is purchasing energy from renewable energy sources, which both reduces GHG emissions and encourages the further development of these energy sources.

Telework is another effective tool for reducing our GHG emissions by taking cars off our roadways and commuters out of already-crowded trains and buses. Removing just five percent of cars from the road reduces traffic congestion by up to 20 percent. In 2000, the Metropolitan Washington Council of Governments set the goal of having at least 20 percent of all eligible workers in our region telecommuting one day a week by 2005. All 17 jurisdictions in the region endorsed that goal, and Fairfax County was the first to achieve it. Fairfax County has 1,872 employees that routinely telework.

In October 2009, Fairfax County was awarded an Energy Efficiency and Conservation Block Grant of \$9,642,800. The goals of the EECBG program, which was funded by the American Recovery and Reinvestment Act, included improving building and transportation energy efficiency and reducing both total energy use and fossil fuel emissions. To achieve the EECBG program goals, the county developed a pragmatic and results-oriented strategy that builds on its long history of energy improvements. This strategy allocated the county's EECBG funds to projects in areas including information technology, facility improvements and transportation, as well as an education and outreach program targeted to county residents and a community-wide greenhouse gas emissions

inventory. The county's largest EECBG project, which was completed in early 2011, involved the consolidation and virtualization of county computer server equipment. By using enterprise server hardware, virtualization and new data center infrastructure management technology, the project is delivering increases in computing performance while significantly reducing both power consumption and greenhouse gas emissions. These benefits are supplemented by avoided hardware and software costs, which are expected to save millions of dollars. The project is saving an estimated 5,671 megawatts and \$380,000 per year and avoiding the emission of an estimated 3,726 metric tons of carbon dioxide equivalents each year.¹⁰

2. Facilities Management

A decade ago, the county's Facilities Management Department set an internal goal of a one percent annual reduction in energy use per square foot (kBtu/square foot) for the buildings in its inventory. Because annual savings are cumulative, reductions of over 10 percent in energy usage per square foot are expected over a 10-year period. Recent numbers show FMD achieving or exceeding this goal, despite a substantial increase in square footage. During the period Fiscal Year 2001 – FY 2010, FMD's energy reduction efforts resulted in a cost avoidance of more than \$7 million.¹ The magnitude of the energy savings is illustrated by kilowatt hours avoided: in 2005, FMD's actions saved 4,232,639 kWh and saved an additional 2,398,036 kWh in 2006. Additionally, during these same years, natural gas consumption was reduced by 111,440 therms per year. FMD took a wide range of actions to achieve these savings, including: the installation of energy management control systems; right-sizing heating, ventilating and air conditioning equipment; and installing efficient lighting and lighting controls.

3. Vehicle Services

In response to the county's need for cleaner and more energy-efficient vehicles, the Department of Vehicle Services began to include hybrid-electric vehicles in its vehicle replacement program, where appropriate. As a result, a conventional gasoline-fueled county fleet vehicle at the end of its service life may be replaced with a hybrid vehicle, if requested by the agency and conditions warrant. There are over 100 hybrid vehicles in the county's fleet, including five Chevy Volts. The county saves over 60,000 gallons of gas each year from its use of hybrid vehicles. DVS operates a number of other non-conventional vehicles, including a hybrid-electric school bus and a hybrid hydraulic launch assist refuse truck, which can generate up to 25 percent savings in fuel and energy costs depending on duty cycle and driver behavior. DVS has undertaken a diesel exhaust retrofit

¹ The county's fiscal year is June 30 through July 1.

project, in which it retrofitted 1,012 school buses, 167 Connector buses, and 113 heavy duty trucks with exhaust after-treatments that reduce particulate emissions. Other innovative energy-saving DVS activities include programming automatic idle shutdown into all county solid waste trucks and all Fairfax Connector buses and de-rating the engines on 25 Connector buses by 25 horsepower to reduce fuel consumption and corresponding emissions by five percent for affected buses. Using federal stimulus funding, DVS is adding five electric vehicles to the county fleet and anticipates installing the charging stations necessary to support them.

Using federal stimulus funding, in the 2011-2012 period DVS added 16 Ford Fusion Hybrids, five Chevrolet Volts and one plug-in hybrid-electric school bus to the county fleet. The Fairfax County Public Schools are evaluating a hybrid conversion system on one of its school buses; this system, which is offered by ElectroMotive Designs, provides 20 to 100kW of electric power to the conventional drivetrain during acceleration and is designed to pay for itself by reducing operation costs.

DVS continues to seek grant funding for further exploration of hybrid and electric drive vehicles. As other prototype or early production vehicles become available, DVS will consider whether to conduct demonstrations with those vehicles as well.

More information is available at the Fairfax County website on sustainability.⁵

4. Green Buildings

In early 2008, the Board of Supervisors adopted the Sustainable Development Policy for Capital Projects applicable to the construction of new county buildings and renovations or additions to existing buildings. The policy provides a framework for preserving and promoting the natural environment, conserving energy, meeting or exceeding air and water quality standards, creating healthy work environments and establishing a community standard for sustainable practices. Under this policy, county projects greater than 10,000 square feet in size are expected to achieve a minimum LEED[®] Silver certification.⁵ Smaller facilities are expected to achieve LEED certification. As of June 2014, the county had a total of 35 green building projects, 16 of which attained certification (14 under the LEED program and two under the Green Globes program). The other 19 projects, all of which have a goal of LEED Silver, are in design or are under construction. In addition, the county managed the LEED Gold Virginia Department of Transportation Administration Building. The county continues to investigate and implement sustainable practices in both new and renovation projects.¹¹ Green roofs were installed at both the Great Falls Volunteer Fire Station and the Dolley Madison Library. An extensive rainwater collection system and cistern storage was implemented at the Newington Department of Vehicle Services facility for use by the vehicle

bus wash. Lighting controls systems and both interior and exterior LED lighting have been specified on a number of projects. The majority of the projects include construction waste management plans that are executed by the construction contractor. Capital Facilities has also partnered with the Department of Public Works and Environmental Services-Stormwater Planning to implement water quality enhancement measures (e.g., low impact development stormwater management practices) on projects to exceed the regulatory requirements. Practices include porous asphalt, pavers and concrete; bioretention/infiltration facilities; cisterns; gravel galleries; and compost soil amendments.

5. Parks

The Fairfax County Park Authority, which has its own energy management policy, is committed to programmatically addressing energy management and has begun coordinating energy management initiatives and conservation throughout the 417 parks it manages. It has embarked on an energy-saving retrofit replacement program at its RECenters, nature and visitor centers, buildings, tennis courts and athletic fields to reap long-term, system-wide environmental and cost benefits. Key aspects of that program include lighting retrofits (e.g., the installation of T8 Lamps and electronic ballasts, LED exit signs, occupancy sensors, and compact florescent lamps), motor replacements (e.g., replacing 20 horsepower or larger motors with high-efficiency units) and control installations (web-based wireless control of key mechanical systems that allows automatic run-time scheduling, phased start-up to avoid peak demand utility penalty charges, and remote access). The Park Authority's first major energy project was completed at the Providence RECenter in 2008. Energy use declined 60 percent in those areas receiving new lighting, including the pool area, and overall facility electricity costs declined 20 percent, which translates to a three-year payback for the project. As an added bonus, pool customers prefer the new lighting.

Below are some completed energy projects for park facilities:

- Completion of a lighting system project for the Mount Vernon RECenter. This project was completed in three phases, installing building controls for the lighting system, upgrading the building light fixtures and upgrading swimming pool lights. This resulted in improved efficiency and quality of light and reduced energy costs and environmental impacts.
- Completion of athletic fields lighting Web-based control systems for 22 athletic fields at nine sites. All 104 Park Authority fields are now equipped with this control system. This system allows for better field light scheduling and control from a remote location, resulting in improved operational efficiency and reduced energy waste.

- Completion of lighting and Heating/Ventilation/Air Conditioning system improvements for the Area 5 Park Management offices and maintenance shop, including HVAC control, lighting fixtures and lighting control upgrades, resulting in increased efficiency and energy conservation.
- Completion of lighting and HVAC system improvements for the Hidden Oaks Nature Center, including HVAC control, lighting fixtures and lighting control upgrades, resulting in improved energy efficiency and at the same time allowing for the special needs of live animal care.
- Direction of surveys and creation of a chart for temperature set points of the park facilities for efficient use of energy in the facilities, balancing energy conservation with the needs of the customer, including live animal and historic collections.
- Completion of lighting and control system improvements for the Oak Marr RECenter, including pool lighting and control system upgrades and replacement of the pool area skylight, resulting in more natural light, improved energy efficiency and reduced energy costs.
- Completion of lighting and control system improvements for the South Run, Spring Hill, Wakefield and Oak Marr RECenters parking lots, resulting in better energy efficiency, reduced energy waste and better compliance with dark sky needs.

6. Waste Management

The Department of Public Works and Environmental Services has also undertaken innovative energy saving measures to achieve energy savings in many of its industrial plant processes. For example, the Noman M. Cole, Jr. Pollution Control Plant uses methane gas from a county landfill in its sludge-burning process, thereby avoiding the purchase of natural gas and recovering a gas that has a global warming potential that is 21 times that of carbon dioxide. DPWES is using solar energy equipment to power nine remote wastewater flow-monitoring sites and to assist in treating wastewater; its use of solar mixers at the treatment plant is saving about \$40,000 a year in energy costs. DPWES is also undertaking a water reuse project to use 560 million and 24 million gallons of reclaimed water from the plant for process and irrigation purposes, respectively; this project avoids the energy use and costs associated with treating the water. Also underway is a project to provide the Energy/Resource Recovery Facility with approximately two million gallons of potable water for process purposes. This project will reduce consumption of potable water at the E/RRF through the reuse of wastewater treatment plant effluent as a substitute. This action will provide both facilities with cost savings of up to 25 percent per year over the cost of potable water. More information is available at

http://www.fairfaxcounty.gov/dpwes/wastewater/noman_cole.htm and http://www.fairfaxcounty.gov/dpwes/construction/water_reuse/.

7. Transportation

The county contributes funding for the operations of the Washington Metropolitan Area Transit Authority. In addition, the county's Department of Transportation has a number of initiatives supporting transit use in Fairfax County. The Employer Services Program provides outreach to employers on transportation demand management strategies, including rideshare incentives and promotions, computerized ride matching, carpool incentives such as preferred parking, subsidies and telework programs. Other DOT efforts include the Connector Bus system, the "RideSources" program, which provides ridesharing information and ride matching assistance to commuters (part of the regional Commuter Connections system), the Community Residential Program, which assists residential communities with the assessment and promotion of alternatives to single occupant vehicle trips and the provision of park-and-ride lots. Employees are eligible to receive a subsidy for transit use of up to \$120 per county employee. Also, in 2012, DOT initiated efforts for the conversion of the maintenance and service buildings at West Ox Road for their use of landfill gas for heating. More information is available at <http://www.fairfaxcounty.gov/fcdot/>.

E. EDUCATION AND OUTREACH

Climate change is a phenomenon that can have real impacts on our lives, and yet the effects of local actions are more limited than those associated with other environmental problems. Counties across the U.S. are taking steps to reduce GHG emissions and inform people who live and work in these counties. To address this challenge, Fairfax County is exploring the use of social media to facilitate communications and education on climate change. One of the most significant actions that Fairfax County has taken is the establishment of an outreach program to assist Fairfax County residents in understanding the benefits of efforts to improve home energy efficiency, which also reduces GHG emissions.

In late 2011, following an open bidding process, the county selected a vendor to assist in the development and branding of a federally-funded residential energy education and outreach program and to work closely with the county's Project Management Team overseeing the effort. EQAC supported this outreach effort through participation on the PMT.

Working collaboratively throughout the first three quarters of 2012, the vendor and PMT developed the Energy Action Fairfax pilot program¹¹ to provide ways for

residents to learn about their energy consumption and how to reduce it through improved energy efficiency. Given the limited time horizon, the program was narrowly focused and aimed at homeowners in Fairfax County, particularly those occupying single-family homes and townhouses. The program's direct outreach included presentations at homeowner association meetings, small energy-audit gatherings within selected communities and the distribution of informative brochures at events and fairs. The program also generated stories for local media and created a multi-faceted presence on the county website (www.fairfaxcounty.gov/energyactionfairfax/) that includes tips sheets, checklists and short how-to videos.

In its 2012 and 2013 Annual Reports, EQAC commended this effort and recommended the continuation of energy education and outreach through a follow-on program. Staff is building on the pilot Energy Action Fairfax with a second phase that both retains a residential component and also develops and implements a green business recognition program. The residential component includes a restructured and revised Web presence and continuing free presentations to homeowner associations and community groups. The green business recognition program will be a free program open to businesses of all types and sizes that are integrating sustainability principles like energy conservation, waste reduction, and water conservation into their day-to-day operations. Participating businesses will be listed in a green business directory on a "green business" Web page on the county's website and will receive window decals or other means of advertising their designation as a Fairfax County green business designation. Both the residential and business efforts anticipate direct outreach, community events and continuing updates to their respective webpages.

F. REGIONAL COORDINATION

1. Climate, Energy and Environment Policy Committee

Fairfax County is well-recognized for its participation in regional environmental and energy initiatives. One such initiative is the Climate, Energy and Environment Policy Committee. CEEPC was created in 2009 by the Metropolitan Washington Council of Governments' Board of Directors to provide leadership on climate change, energy, green building, alternative fuels, solid waste and recycling issues and to help support area governments as they work together to meet the goals outlined in the National Capital Region Climate Change Report.¹

CEEPC includes representatives from COG's 22 member governments, state environmental, energy and transportation agencies, state legislatures, the Air and Climate Public Advisory Committee, federal and regional agencies, electric and gas utilities, environmental organizations, business organizations and members of the academic community.

a. Climate and Energy Action Plan

In May 2013, CEEPC adopted its 2013-2016 Climate and Energy Action Plan.¹² The new plan places a greater emphasis on energy efficiency and climate resiliency, and includes recommendations for local governments on: greenhouse gas inventories and reduction plans; built environment and infrastructure; renewable energy; transportation and land use; sustainability and resiliency; and public outreach.

Figure I-3 summarizes recent local government efforts to address the local measures included as key priorities in the 2013-2016 Action Plan. This figure helps to illustrate the breadth of activities local jurisdictions in the Washington, D.C. area are undertaking to address climate change and the progress the region has already made. As one of the largest local governments, Fairfax County is not only active but plays a leadership role in many activities related to climate change.

To track the region's progress toward the CEEPC Action Plan goals, COG Department of Environmental Programs staff performs an annual Climate and Energy survey of local member governments and water utilities and evaluates the results in the annual Progress Report.¹³

In 2013, CEEPC, working with the members of the Air and Climate Public Advisory Committee, created a Climate and Energy Awards Program. The awards program will recognize projects, programs or policy initiatives that help achieve the regional goals identified in the Climate, Energy and Environment Policy Committee's 2013-2016 Climate and Energy Action Plan. Awards will be given in each of the following categories: small communities (population under 50K), medium communities (population 50K- 200K), large communities (population over 200K) and nongovernmental organizations. Awards will be given based on results achieved, creativity, stakeholder engagement and transferability to other jurisdictions. Recipients were to have been announced in fall 2014.

b. ENERGY STAR® Portfolio Manager Regional Data Sharing

In May 2014, COG held an ENERGY STAR Portfolio Manager regional data sharing training for staffs of local governments and schools in the region who wish to connect and share their building data with COG and each other. Sharing these data will allow COG to better track regional Climate, Energy and Environment Policy Action Plan goals, such as energy and water use and GHG emission reductions. It will also allow local governments to compare their facilities' energy performance with similar property types on a region-wide basis.

Figure I-3. Select Local Measure Highlights (At least 50 percent of local governments are implementing or in progress on each measure listed in the following chart.)

| Local Government | 2010 Census Population ¹ | Govt GHG Inventory | Community GHG Inventory | Govt GHG Reduction Plan | Comprehensive Energy Strategy | Green Building Policy | Efficient Street Light Program | Govt Energy Benchmark | Green Purchasing Policies | Green Fleet Policy | Commuter Options Program | Tree Canopy Plan |
|-----------------------------------|-------------------------------------|--------------------|-------------------------|-------------------------|-------------------------------|-----------------------|--------------------------------|-----------------------|---------------------------|--------------------|--------------------------|------------------|
| District of Columbia | 601,723 | ■ | ■ | □ | □ | ■ | □ | ■ | □ | □ | ■ | □ |
| Suburban Maryland | | | | | | | | | | | | |
| Fredrick County | 233,385 | ■ | ■ | ■ | ■ | □ | | | ○ | □ | ■ | □ |
| City of Frederick ² | 65,239 | ○ | ○ | ○ | ○ | ○ | NR | NR | ■ | ○ | ○ | □ |
| Montgomery County | 971,777 | ■ | ■ | ■ | □ | ■ | □ | ■ | ■ | N/A | ■ | N/A |
| City of Gaithersburg ² | 59,333 | □ | ○ | ○ | ■ | ■ | □ | ○ | ○ | ○ | ○ | □ |
| City of Rockville ² | 61,209 | □ | □ | ■ | | ■ | ■ | ■ | □ | □ | ■ | ■ |
| City of Takoma Park ² | 16,715 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Prince George's County | 863,420 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| City of Bowie ² | 54,727 | ■ | ○ | ○ | ■ | ■ | □ | □ | ○ | □ | ○ | □ |
| City of College Park ² | 30,413 | ■ | □ | ○ | ○ | N/A | ■ | ○ | □ | N/A | ■ | □ |
| City of Greenbelt ² | 23,068 | □ | □ | □ | □ | | N/A | □ | ○ | ■ | ○ | □ |

| | | | | | | | | | | | | |
|----------------------------------|-----------|----|----|----|----|----|----|----|-----|----|-----|----|
| Town of Bladensburg ² | 9,148 | ○ | ○ | ○ | ○ | ○ | ○ | □ | □ | □ | □ | □ |
| Northern Virginia | | | | | | | | | | | | |
| Arlington County | 207,627 | ■ | ■ | □ | □ | ■ | □ | ■ | ■ | ■ | ■ | ■ |
| Fairfax County | 1,081,726 | ■ | □ | ■ | □ | ■ | □ | □ | ■ | ■ | ■ | ■ |
| Loudon County | 312,311 | ■ | ■ | ■ | ■ | ■ | ○ | ■ | ■ | ■ | ■ | □ |
| Prince William County | 402,002 | □ | ○ | □ | □ | □ | ○ | ■ | □ | □ | ■ | □ |
| City of Alexandria | 139,966 | ■ | ■ | ■ | ■ | ■ | □ | □ | □ | □ | ■ | ■ |
| City of Fairfax | 22,565 | ○ | ○ | □ | □ | ■ | □ | □ | ○ | □ | ○ | □ |
| City of Falls Church | 12,332 | ■ | ■ | □ | □ | ○ | □ | □ | ■ | ■ | □ | □ |
| City of Manassas | 37,821 | ○ | ○ | ○ | □ | ○ | □ | □ | N/A | ■ | N/A | ■ |
| City of Manassas Park | 14,273 | NR | NR | NR | NR |

■-Implemented response

□-In progress

○-Not Started

N/A-Not Applicable

NR-No

¹ Source: COG tabulation of Census 2010 PL 94-171 Redistricting Data

² Population in Maryland cities is included in appropriate county totals.

Source: Metropolitan Washington Council of Governments, 2011, *Climate, Energy and Environment Policy Committee Regional Climate and Energy Action Workplan 2010 Progress Report*, with an update from Amanda Campbell, June 27, 2014¹⁴

c. Advocacy

In 2013, CEEPC advocated for improved federal financing for local energy efficiency and renewable energy and resiliency infrastructure, greater federal investments in energy efficiency, improved building energy codes nationally and energy efficiency requirements for the industrial sector. Additionally, CEEPC advocated for a number of state legislative issues, including state renewable energy portfolio standards, energy security and resilience, electric and alternative fueled vehicles, community net metering for renewables and expanded financing options for energy efficiency and renewable energy.

d. Energy and Greenhouse Gas Reporting

COG Climate and Energy staff collected and analyzed annual energy consumption data from regional utilities, which will be used to measure progress on reducing greenhouse gas emissions from the 2005 baseline. The data are also used to inform COG's progress report on regional air, climate and energy initiatives and to assist local governments in their own energy and climate programs and reporting, such as grant and award applications. In 2013 staff collected electricity and natural gas data for the 2012 calendar year. Since 2005, the region's overall electricity consumption has grown 0.5 percent and natural gas consumption has fallen nine percent. Fairfax County's electricity consumption has grown seven percent and natural gas consumption has fallen 12 percent.

e. Built Environment and Energy Advisory Committee

The Built Environment and Energy Advisory Committee was established in 2013 and serves as a technical advisory committee to Climate, Energy and Environment Policy Committee. Membership includes local government energy managers, government staff supporting green building initiatives and interested stakeholders. The group serves as a forum for discussion and monitoring of energy and green building issues in the National Capital region.

The group was formed as a merger of two previous COG committees, the Energy Advisory Committee and the Intergovernmental Green Building Group. Members of both groups recognized that there was an increasing overlap between their core issues, particularly as green building practices are placing a stronger emphasis on alternative energy and energy efficiency.

BEEAC's monthly meetings have focused on updating regional stakeholders on the status of local green building policies throughout the region. Noel Kaplan, Senior Environmental Planner in Fairfax County Department of Planning and Zoning, presented the county's green building policy to the

group and discussed lessons learned to assist other localities in developing and refining green building programs.

During 2013, BEEAC discussed: federal and local climate and energy planning efforts; greenhouse gas inventory methodologies; financing tools for increasing renewable and energy efficiency penetration in low-income communities; energy efficiency rating systems for buildings and communities; and local government efforts on energy benchmarking, high efficiency street lights and solar photovoltaic systems, among other initiatives.

BEEAC sponsored a group of members, including a Fairfax County representative, to attend the International Energy Conservation Code Public Comment Hearings in Atlantic City in October. These members represented the region's interest in energy efficiency and helped to preserve building energy conservation standards to be included in the 2015 IECC.

f. Electric Vehicle Working Group

COG's electric vehicle initiatives began with a workshop in early 2011 to examine successful local and regional EV readiness strategies and to begin the conversation on a regional level on how to effectively and collectively deploy electric vehicle transportation technology.

This led to the creation of a stakeholder-driven task force tasked with making recommendations for the region and local jurisdictions to consider in designing and implementing programs to facilitate adoption of electric vehicles. Kambiz Agazi, Fairfax County Environmental Coordinator, served as the task force's co-chair, and subgroups were formed to address: comprehensive planning, zoning, building codes and permitting/inspection; infrastructure siting; energy utility policy; and outreach and education.

Task force stakeholders contributing to the process included: electric vehicle owners; state and local government staff (transportation and energy planners); electric vehicles original equipment manufacturers; electric vehicle supply equipment suppliers; non-profit organizations (e.g., Georgetown Climate Center, Electric Drive Transportation Association, Electric Vehicle Association of Greater Washington DC); the Greater Washington Regional Clean Cities Coalition; and electric utility representatives from the three states.

In 2012, the task force recommendations led to the publication of the report, "Electric Vehicles in Metropolitan Washington."¹⁵ The COG Board of Directors endorsed the report in November 2012. The report provides a comprehensive look at current regional EV readiness and offers recommendations to address barriers to EV use. The report also stresses the

benefits of EVs, including reducing greenhouse gases, improving air quality and dramatic fuel costs savings.

Although metropolitan Washington still has a relatively small electric vehicle market, consumer interest in EVs is growing and more models are becoming available. However, the region's charging infrastructure and EV policy frameworks are not yet sufficient to accommodate more widespread adoption of these vehicles. COG's inventory of EV charging stations in the region identified 332 chargers in 133 publicly available charging station locations. In terms of infrastructure, metropolitan Washington lags behind other regions, such as San Francisco and San Diego, in the number of EV charging stations, though this figure is increasing due to stimulus funding and private investment. Furthermore, the absence of a clear policy framework for EV infrastructure planning – which considers permitting, citing, zoning, utility policy and other issues – exacerbates existing market barriers. The report notes that a streamlined regional strategy would help overcome these obstacles and encourage wider EV adoption.

The top five recommendations from the task force's report, aimed at encouraging greater EV use in metropolitan Washington, were:

1. **Regional EV Partnership:** A Washington Regional Electric Vehicle Partnership should be formed to develop a business case for EVs and to assess the potential for community return on investment.
2. **Incentives:** Stakeholders should consider offering incentives such as preferred parking, HOV occupancy exceptions and tax credits to promote EV adoption.
3. **Utility Planning and Policy:** Electric permitting procedures should identify EV charging station installations and notify electric utilities of their locations.
4. **Outreach and Education** is needed to promote EV adoption and inform the public of its benefits.
5. **Local Government Policy:** Comprehensive plans and zoning regulations should guide EV infrastructure development and ensure that the built environment can accommodate future EV charging station installations.

During 2013, the Electric Vehicle Working Group focused on assisting government and business stakeholders in removing barriers to EV deployment in the Washington region. In January 2013, COG partnered with the Washington Auto Show to conduct a business case forum on how electric vehicles make good business sense. Presenters included MOM's Organic Market, Capital One, FedEx, Eaton Corporation and SemaConnect.

The working group also explored the potential for developing a cooperative purchase of EVs and charging stations for COG member governments. Based on the interest received, COG will pursue the cooperative purchase of EVs as well as other alternative fuel types and infrastructure as part of its green purchasing initiative.

g. Climate Adaptation

In October 2010, EPA awarded the Washington Metropolitan Council of Governments technical assistance through the Smart Growth Implementation Assistance Program. Through the program, EPA developed a guidebook for adapting to risks from climate change in four sectors: land use, transportation, buildings, and water¹⁶ (<http://www.epa.gov/dced/pdf/mwcog-guidebook-final-508-111313.pdf>).

During the process to develop the guidebook, stakeholders identified the need for more specific information about climate trends and anticipated impacts in the National Capital region and planning implications. To address this need, COG developed a Summary of Potential Climate Change Impacts, Vulnerabilities, and Adaptation Strategies in the Metropolitan Washington Region.¹⁷ This summary is a synopsis of lessons learned from MWCOG's climate adaptation planning initiatives from 2010 to 2012.

In order to aid decision makers, COG continues to monitor and present the latest findings from sources such as the International Panel on Climate Change and the National Climate Assessment. See COG's Climate Impacts and Adaptation website for additional resources and activities¹, including a handout on climate projections for the region developed by NASA.¹⁸

h. Sustainable Purchasing

On February 20, 2013 COG hosted a webinar on the U.S. General Services Agency Sustainable Procurement Initiatives and Resources. Executive Order 13514 requires 95 percent of new contract actions for products and services to be environmentally preferable. GSA is working on greening federal contracts to meet those goals. GSA also developed the Sustainable Facilities Tool at <https://sftool.gov>, which offers sustainable guidance and tools for planning projects and product procurement. This resource can be beneficial to local jurisdiction procurers interested in greening public contracts.

National Capital Region jurisdictions, drinking water and waste water entities and school systems were surveyed earlier this year and asked to identify all current contracts that, at least in part, include environmentally preferable products and services and whether the COG Rider Clause – which allows other jurisdictions to use the contract – is included. The

results are compiled into a Green Contracts Database to assist with local green purchasing efforts by:

- (1) Identifying contracts that COG Cooperative Purchasing Program Members can "ride" to acquire the same product or service.
- (2) Enabling members to connect to share specifications and experience with the product or service.

COG shared the database with survey respondents and local government procurement and environmental staff.

i. Rooftop Solar Challenge

In August 2013, COG joined two teams under the U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge. The Rooftop Solar Challenge incentivizes regional awardee teams to make it easier and more affordable to go solar. By streamlining permit processes, updating planning and zoning codes, improving standards for connecting solar power to the electric grid and increasing access to financing, teams will clear a path for rapid expansion of solar energy and serve as models for other communities across the nation. The Rooftop Solar Challenge is part of the SunShot Initiative, which strives to make solar energy fully cost-competitive with other forms of energy by the end of the decade.

Through CEEPC, COG is partnering with eight other regional councils and the National Association of Regional Councils on the Solar Ready II program, which applies a collaborative approach and proven best practices to help local governments around the country reduce solar market barriers and lower soft costs. COG is also working with Optony, Inc. on the Solar Roadmap initiative, which assesses solar market readiness and soft costs and which tracks progress of participating jurisdictions nationwide.

There are ten local jurisdictions participating in the Rooftop Solar Challenge, including Fairfax County. Starting in fall 2013, county staff worked with COG and Optony on a baseline assessment of solar permitting, inspections and zoning practices in the county. The county's Solar Roadmap page (<http://my.solarroadmap.com/ahj/fairfax-county-va/view>)¹⁹ shows how Fairfax County's policies, as well as the utility policy and available financing options, compare to national best practices. Over the course of the grant, Fairfax County staff will continue to work with Optony and COG staff to determine areas for improvement and begin to implement those improvements. Fairfax County will have access to the expertise and resources of two national teams, as well as dedicated technical assistance to help the county reach its solar soft-cost and market development goals.

2. Northern Virginia Regional Commission

The nonprofit organization Local Energy Alliance Program, in partnership with the Northern Virginia Regional Commission, operates the Home Performance with ENERGY STAR program to help improve the energy efficiency of existing homes in northern and central Virginia. LEAP educates communities on energy efficiency and facilitates and tracks energy improvement work done by a network of vetted local contractors. Homeowners can have their homes certified HPwES if they make efficiency improvements measuring 20% or more. LEAP is headquartered in Charlottesville, VA and expanded to Northern VA in 2012.

In October 2013, LEAP introduced the Home Energy Check-Up as an entry service offering to the HPwES program; this has proven to be a very effective way to get the energy conversation started with homeowners and to get energy plans for their houses. The Home Energy Check-Up is a one hour visual inspection done by a LEAP professional building analyst who provides an evaluation of the homes' efficiency potential, advice on cost effective improvements and a few immediate installed saving measures based on the home's needs such as energy efficient light bulbs and smart power strips. The value of the check-up is estimated at over \$250 in goods, savings and professional advice. LEAP is able to offer the low price of \$45 to the homeowners as a participating contractor in the Dominion Virginia Power Home Energy Check-Up Program. For those homeowners interested in making improvements through the HPwES program after the check-up, LEAP is then available to assist with technical advice throughout the improvement process, whether that is all at once or staged over time.

As of June 30, LEAP has performed 723 Home Energy Check-Ups in northern Virginia, of which 392 were in Fairfax County. 137 homes in northern Virginia have been certified in the Home Performance with ENERGY STAR program to date. of which 20 were in Fairfax County.

Re-Energize Reston Community Challenge

LEAP engages local communities with outreach; this is done in partnership with local municipalities, civic associations, congregations and other community groups. Campaigns in Fairfax County have ranged from neighborhood efforts in Wilton Woods in Alexandria and Long Branch in Annandale to a broader community effort in Reston. In partnership with Reston Association and in celebration of Reston's 50th anniversary of its founding year (1964), LEAP launched the Re-Energize Reston Community Challenge with the goal of helping 1,964 homeowners get a Home Energy Check-Up. To engage the community, the effort is also serving as a fundraiser for Friends of Reston, which will earn \$10 for each Home Energy Check-Up done in the challenge.

Friends of Reston is a nonprofit organization that provides environmental education programs at its flagship Walker Nature Center in Reston.

3. NOVA Parks (Northern Virginia Regional Park Authority)

Three Northern Virginia counties (Fairfax, Loudoun and Arlington) and three cities (Alexandria, Fairfax and Falls Church) participate in NOVA Parks (the Northern Virginia Regional Park Authority). NVRPA was founded in 1959 and currently operates 25 regional parks on 11,156 acres of land that it owns and leases throughout the region. It also holds conservation easements on 115 parcels covering more than 652 acres. The following information highlights efforts of NOVA Parks/NVRPA:

- Bull Run Shooting Center is using solar panels to charge the batteries that operate the trap machines on the sporting clays field.
- NOVA Parks updated the inefficient lighting in the shooting center pro shop to new, more energy efficient light fixtures.
- NOVA Parks also continues to add alternative fuel vehicles to its fleet, and a 2012 Toyota plug-in hybrid Prius was arranged for display and test-drive at Potomac Overlook Regional Park. It served as a great education and outreach tool and provided a sense of how the park's electric charging station will be used.
- Pohick Bay's camping cabins now have ceiling fans and energy efficient lighting.
- New efficient lighting has been installed in the restrooms at Pirate's Cove Waterpark and at the Pohick maintenance shop.
- Meadowlark Gardens prepared plans to install a walking holiday light show that will use all LED lights, which use only a 10th of the electricity that normal incandescent bulbs use.

G. SMART GROWTH (see also the Land Use and Transportation chapter of this report)

1. Transit-Oriented Mixed-Use Development

Key planning concepts in Fairfax County include the protection of stable, residential neighborhoods from incompatible development and the concentration of new growth in mixed-use growth centers, largely focused around transit opportunities and revitalization areas. Transit-oriented development should serve to reduce, in aggregate, the number of motor vehicle trips and vehicle miles traveled and the associated emissions that would otherwise occur through more traditional suburban development patterns in the region. An increasing focus on TOD over the last 20 years led to the 2007 adoption of a Comprehensive Plan definition for TOD and development guidelines, with a strong emphasis on vehicle trip reduction and pedestrian and non-motorized transportation. Major recent initiatives include: adoption of the Plan for Tysons Corner; adoption of Plan Amendments supporting TOD in the Franconia-Springfield Area, Baileys Crossroads, Annandale, Seven Corners, Lake Anne Village Center, the Fairfax Center Area, areas near Fort Belvoir and areas near future rail stations in the Reston and Herndon areas; and the adoption of new zoning districts to facilitate the establishment of mixed use, transit-oriented development in growth centers.²⁰

2. Transforming Tysons

On June 22, 2010, the Board of Supervisors adopted a Comprehensive Plan amendment for Tysons Corner that will turn the area into the county's "downtown." The plan focuses future growth within an easy walking distance of transit. Fairfax County expects that 75 percent of future growth will be within a half mile of the four Metrorail stations. Many offices and homes will be a three to six minute walk from these stations, allowing people to get around on foot, bicycle, bus or subway. The plan, which was created based on [economic, transportation and fiscal analyses](#),²¹ guides growth during the next 20 years while creating a framework for redevelopment beyond 2030. It sets an initial development level of 45 million square feet for office space, which is the highest market forecast for the year 2030. Once this amount of office development is reached, the plan would be updated to allow for additional growth. The plan also encourages mixed use development by allowing residential, hotel and ground floor retail at levels above the 2030 forecast. The plan also provides for the use of district energy--allowing use of energy near the point of generation, which provides opportunities for much greater efficiencies in the use of energy generated.

The Comprehensive Plan amendment establishes the expectation of substantial commitments to energy and water conservation measures for development

proposals, especially where rezonings are being sought. As substantial redevelopment is expected in the Tysons area, the plan for Tysons Corner should lead to redevelopment that is more energy and water efficient. More information is available at <http://www.fairfaxcounty.gov/dpz/tysonscorner/>.

3. Green Building Policy and the County's Comprehensive Plan

In December 2007, the Board of Supervisors adopted an amendment to the Policy Plan volume of the county's Comprehensive Plan that established a green building policy. The policy included broad support for green building practices and established linkages between the incorporation of green building/energy conservation practices and the attainment of certain Comprehensive Plan options, planned uses and densities/intensities of development. In the county's growth centers, commitments for green building practices sufficient to attain certification through the LEED[®] program or its equivalent were recommended for certain nonresidential and multi-story multifamily residential proposals (e.g., proposals seeking development at the high end of the planned density/intensity range; development seeking a Comprehensive Plan Option; development involving a change in use from what would be allowed as a permitted use under existing zoning; development at a planned Overlay Level). ENERGY STAR[®] Qualified Homes designations were recommended for any other residential development proposed at the high end of the Plan density range.

The aforementioned Policy Plan amendment was adopted with the expectation that it would be reviewed in two years. The Planning Commission's Environment Committee began its review of this policy in November 2009; this review resulted in the completion, in July 2011, of a "strawman" draft Plan amendment that was released for public review and comment. The committee's review of all comments received on this draft was completed in fall 2012, and a Planning Commission recommendation for a Policy Plan amendment was transmitted to the Board of Supervisors in December 2012 in the form of a second "strawman" draft. In July 2013, the board authorized, through the Fairfax Forward program, a Plan amendment consistent with this second strawman draft.

The Planning Commission held a public hearing on May 7, 2014 and recommended approval of a proposed Plan amendment on June 12, 2014. The Planning Commission recommended several changes to the policy, including:

- Clarifying that the emphasis of the policy has always been on individual buildings, not site/neighborhood design.
- Adding support for reuse of and for greening/retrofitting existing buildings.
- Adding language to encourage energy and water usage data collection and performance monitoring, as well as participation in regional and local evaluations of outcomes.
- Adding language to encourage the use of natural lighting.

- Adding support for solid waste and recycling management practices.
- Defining “equivalent” in reference to green building rating systems.
- Removing a limitation on a green building expectation for multifamily residential proposals relating to number of stories, as rating system eligibility requirements have changed.
- Adding support for higher levels of green building performance when proposed developments have relatively high levels of intensity or density (both residential and non-residential).
- Updating the range of residential green building rating systems available for use, recognizing the more comprehensive systems now available, and revising the related policy to focus more holistically on green building design and not just ENERGY STAR Qualification.
- Adding Industrial Areas to the areas of the county with an expectation for a green building commitment.
- Clarifying expectations for public-private partnerships.
- Adding support for infrastructure for electric vehicle charging.

On July 1, 2014, the Board of Supervisors adopted the Plan amendment as recommended by the Planning Commission.

While a green building policy is expected to encourage more energy efficient practices, it is important to recognize that there are a number of companies that already seek to adopt energy efficient policies. For example, a Costco that was recently built is applying for LEED certification. This Costco, like others, incorporates many energy efficient features in its construction and operations. Other chains, like Whole Foods, are also sensitive to energy efficiency and recycling.

4. MITRE Studies

Electric Vehicle Charging Infrastructure

In August 2011, the MITRE Corporation, per a proffered commitment to sustainability-related work for the benefit of Fairfax County, completed a report titled “Electric Vehicle Charging Infrastructure Recommendations to Fairfax County.” The report included several recommendations, with a particular focus on electric vehicle charging-related opportunities associated with redevelopment in Tysons Corner. The MITRE report was transmitted to the Board of Supervisors, which, in turn, referred the report to the Planning Commission for its review and recommendation.

The Planning Commission’s Environment Committee has been reviewing the MITRE report and its recommendations. During the several meetings that the committee has held on this issue, the committee has received presentations from: the MITRE Corporation; the Fairfax County Environmental Coordinator (regarding related efforts at the regional level); and three private sector

providers of electric vehicle supply equipment. The committee developed a series of policy questions for consideration based on these discussions. The list of policy questions was circulated to stakeholders for comment, and the revised policy questions were then considered by the committee. A draft white paper was prepared that provided: an overview of the review process; background information regarding electric vehicle charging; comprehensive plan guidance as it relates to this issue; guidelines and requirements of other jurisdictions; and draft recommendations on each of the policy questions. The draft white paper was circulated to stakeholders in April 2014 and was discussed at a workshop in May 2014. The Environment Committee is continuing to consider electric vehicle charging issues, and it is anticipated that committee recommendations will be finalized later in 2014 or in 2015.

Building Energy Technology

Also per MITRE's proffer commitment, MITRE conducted research for the county focusing on flexible building design to accommodate energy efficiency innovations – that is, ways to design buildings now to allow for the future implementation of innovative energy systems that may not be cost effective or otherwise feasible at the present time. The report also provided guidance regarding renewable energy supplies and their potential applicability for new buildings and building retrofits. MITRE's report was transmitted to the Board of Supervisors in May 2013 and has been referred to the Planning Commission for review and recommendation. The Planning Commission's Environment Committee began its review of this report in February 2014.

5. Lorton Green Energy Triangle

The Lorton area is also undergoing significant growth and development. In 2011, a white paper was developed by an energy industry engineer serving on the board of the Lorton Arts Foundation; the paper describes efforts that could be explored beyond the efforts that are already being pursued (see the next section of this chapter and the Solid Waste chapter) in conjunction with waste management facilities in the Lorton area. For example, landfill gas could be used in the Lorton Workhouse Art Center, waste heat from the waste to energy facility in Lorton could be used to power major commercial activities and landfills could house a variety of renewable energy technologies (e.g., wind, solar). The planning for the Lorton Green Energy Triangle has involved a number of parties, including the Department of Public Works and Environmental Services. This effort has been recognized by the Chairman's Private Energy Sector Task Force.

These cooperative planning efforts, and efforts to make more efficient use of existing energy sources and to create renewable energy within the county, are commendable.

H. WASTE MANAGEMENT AND ENERGY EFFICIENCY

1. Waste-to-Energy

The county's Energy/Resource Recovery Facility recovers methane, controls nitrous oxide and generates about 80 megawatts of electricity from solid waste – enough energy to power about 75,000 homes and the facility itself. The sale of this electricity to the local utility generates revenues that partially offset the facility's operational cost. Converting waste to energy at the E/RRF provides a number of benefits in addition to these revenues. Incineration avoids the need to landfill garbage and the resulting production of methane, which traps 21 times more heat per molecule than CO₂, and nitrous oxide, which absorbs 310 times more heat. In addition, waste-to-energy avoids the combustion of coal, oil or gas to produce electricity. The county's Department of Public Works and Environmental Services estimates that the waste-to-energy plant avoids the equivalent of approximately one million tons of greenhouse gas emissions each year.²²

2. Landfill Gas Recovery and Utilization

There are both closed and open portions of the I-95 landfill, with the open portion collecting ash generated by the Energy/Resource Recovery Facility. The county collects landfill gas generated by the closed portion of the I-95 Landfill (which collected solid waste) and the closed I-66 landfill as a substitute for fossil fuel to heat on-site buildings. It has installed a system to use landfill gas from the closed I-66 landfill as a fuel source to heat vehicle maintenance facilities at its West Ox campus, at an initial project cost of approximately \$300,000. With annual natural gas savings of between \$40,000 and \$50,000, the estimated payback for the West Ox LFG project is less than eight years. A second system at the Bus Operations Garage has been installed and is now operational. At the I-95 landfill, LFG recovered from a well field is delivered to a series of power stations that produce up to six megawatts of electricity, which is sold to the local utility and is then distributed to homes. This can power supports about 75,000 homes and saves approximately two million barrels of oil a year. The county's LFG projects reduce its carbon dioxide emissions by more than 300,000 tons each year.⁵

I. AWARDS AND RECOGNITION

In 2011, the county received the American Planning Association's Daniel Burnham Award for its Comprehensive Plan for the Tysons Corner Urban Center. Its energy-specific awards include designation by the U.S. Environmental Protection Agency as an *ENERGY STAR Partner*, a *Green Power Partner* for its green purchasing and a *Landfill Methane Outreach Program Community Partner of the Year*; it also has

received the Public Technology Institute's *Solutions Award* in the Sustainability category for its plug-in hybrid vehicle fleet trial.

J. COMMENTS

1. The Facilities Management Department cost avoidance from fiscal year 2001 to fiscal year 2010 is in excess of \$7 million, or an average annual energy reduction of one percent. For example, one energy project performed by part-time efforts of one staff member resulted in a cost avoidance of approximately \$83,000 annually at the Government Center complex (variable frequency drives, lighting retrofits and lighting software upgrades). More could be accomplished with dedicated staffing. EQAC commends the county for its past efforts and looks forward to working with the county in the future on its climate change program.
2. EQAC commends the county for assembling an inventory of greenhouse gas emissions for Fairfax County facilities and for designing a GHG reporting program for county that allows for GHG emissions to be easily combined with reporting of other jurisdictions.
3. EQAC commends the county for participation in regional efforts to reduce GHG emissions and improve energy efficiency. Certain GHG programs, such as transportation related programs, district energy and reporting of carbon footprints require intergovernmental cooperation.
4. EQAC commends the county for the work the county has undertaken to evaluate the energy consumption of buildings and achieve greater energy efficiency in operations. This work compliments the efforts to require the incorporation of energy efficient certification, such as LEED at the Silver level or higher.
5. EQAC commends Fairfax County for the work that has taken place to support residential education and outreach. This is a good beginning but it will need continued support. The residential sector is a big part of Fairfax County and there are potential significant efficiencies to be realized by the County. This should continue to be an area of emphasis.

K. RECOMMENDATIONS

1. While EQAC is very encouraged to hear that a process has been established through which funding can be provided for a variety of environmental initiatives through the county's Environmental Improvement Program, including education programs (including social media) and other programs to promote energy efficiency, EQAC is concerned that the EIP activities were eliminated as part of budget negotiations for the FY 2015 budget. EQAC appreciates the Board of Supervisors' restoration of

funding for EIP projects through the FY 2014 carryover process, but the FY 2015 budget decision suggests that future funding of EIP projects may be uncertain. EQAC recognizes that these programs hold promise for efficiencies that might not be identified by other means. It is EQAC's view that, if Fairfax County is going to continue to compete with neighboring jurisdictions for progressive companies to enhance our workforce, Fairfax County must be a leader in energy efficiency, outreach and education and environmental stewardship in general. EQAC recommends that the county executive and the Board of Supervisors support and fund those projects that are recommended by staff. Moreover, EQAC recommends that funding for the EIP be structured so that it is not as vulnerable to future actions like the one that would have eliminated it for FY 2015.

2. EQAC recommends that the Board of Supervisors direct county staff to evaluate alternatives for the county to further reduce greenhouse gas emissions from either incineration of waste or placement of waste in landfills. The long-term goal should provide for expanding the recycling of all waste streams, including composting of compostable waste. The expansion of waste streams recycled should be considered as the county develops a strategic plan for the management of county waste. Specific recommendations related to the support of recycling are included in the Solid Waste chapter.
3. The work of the Private Sector Energy Task Force was intended to help Fairfax County position itself as a leader in the area of energy efficiency, sustainability and "green" technology. The Private Sector Energy Task Force was a good beginning, but the work recommended by the task force is languishing and needs to be reinvigorated. As an example, EQAC recommends that Fairfax County place a priority on supporting education and recognition for companies that adopt energy efficient approaches as part of their business practices.
4. Fairfax County should undertake an effort to identify all the impacts of climate change that might reasonably be expected to impact the county. This information will help to: 1) better plan for potential impacts; and 2) initiate mitigation or adaptation efforts where appropriate.
5. Fairfax County has made significant strides in monitoring energy use, identifying opportunities for reducing energy use, and reporting this information to the County Government. Just as this information has been useful to the County, it would also be helpful for businesses and residents to see the benefits of monitoring energy use. EQAC recommends that monitoring information that shows the benefits of monitoring be made available to the public and private sectors.

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