DECEMBER 2012

Reducing Greenhouse Gases … Growing Our Economy

The 2011 District of Columbia Greenhouse Gas Emissions Inventory

A critical first step in solving any problem is to understand where to begin - the baseline against which one measures success or failure. In 2006, the District of Columbia established a baseline against which future greenhouse gas (GHG) emissions would be measured. The 2006 inventory quantifies the total amount of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) released into the atmosphere to meet the District's needs for power and water, transportation, and waste management.

The 2006 inventory was calculated in two parts — **community wide** and **government operations**. The community wide inventory includes GHG emissions from all building and transportation energy use and emissions from solid waste. The government operations inventory, a subset of the community inventory, includes impacts from government-operated facilities and streetlights, vehicle fleets, and waste operations.[1]

Annual Emissions from Government Operations and Community Wide (metric tons of CO_2e)

	2006	2007	2008	2009	2010	2011
Government Operations	686,091	*650,295**	*618,377**	576,396	554,396	527,811
Community Wide	10,211,045	*9,714,454**	*9,454,646**	8,504,145	9,132,503	8,931,663

* Italics indicate extrapolated annual estimates; detailed inventories were not completed for 2007 or 2008.

Community Wide Inventory: 2006 to 2011

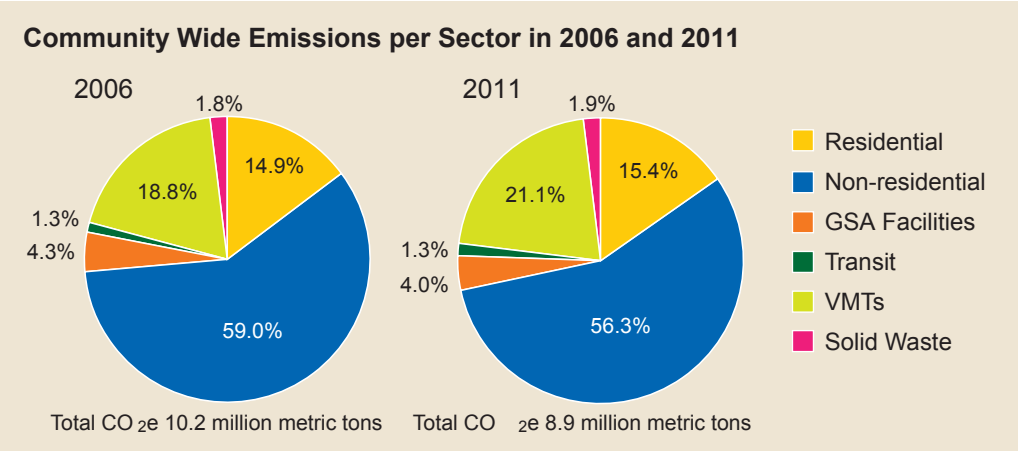
In 2006, the District produced community wide GHG emissions of 10.2 million metric tons of carbon dioxide equivalents (CO_2e).[2] By far the largest share of emissions (74%) is attributed to building energy use. The next largest source of emissions was vehicle use (calculated as vehicle miles traveled, or VMT), contributing 22% of the District's emissions total.

The 2011 community wide emissions inventory totaled 8.9 million metric tons of CO_2e — a reduction of 12.5% from the 2006 baseline. The most significant GHG reductions were in building energy use, including residential (9.1%), nonresidential (16.5%), and federal facilities managed by the US General Services Administration (18.2%). Since emissions from buildings are the biggest portion of the District's total emissions, reductions from the building sector translate into significant reductions in total GHG emissions.

Emissions reductions in the building and transit sectors also illustrate that regional electricity became cleaner as the regional power grid reduced the use of coal generated power in favor cleaner natural gas. The cleaner power grid accounted for 16.8% of the total greenhouse gas emissions reductions in the last five years.

[1] Both the 2006 and 2011 inventories used the ICLEI Local Government Operations Protocol (LGOP) v1.1 (May 2010) to calculate and compare GHG emissions.

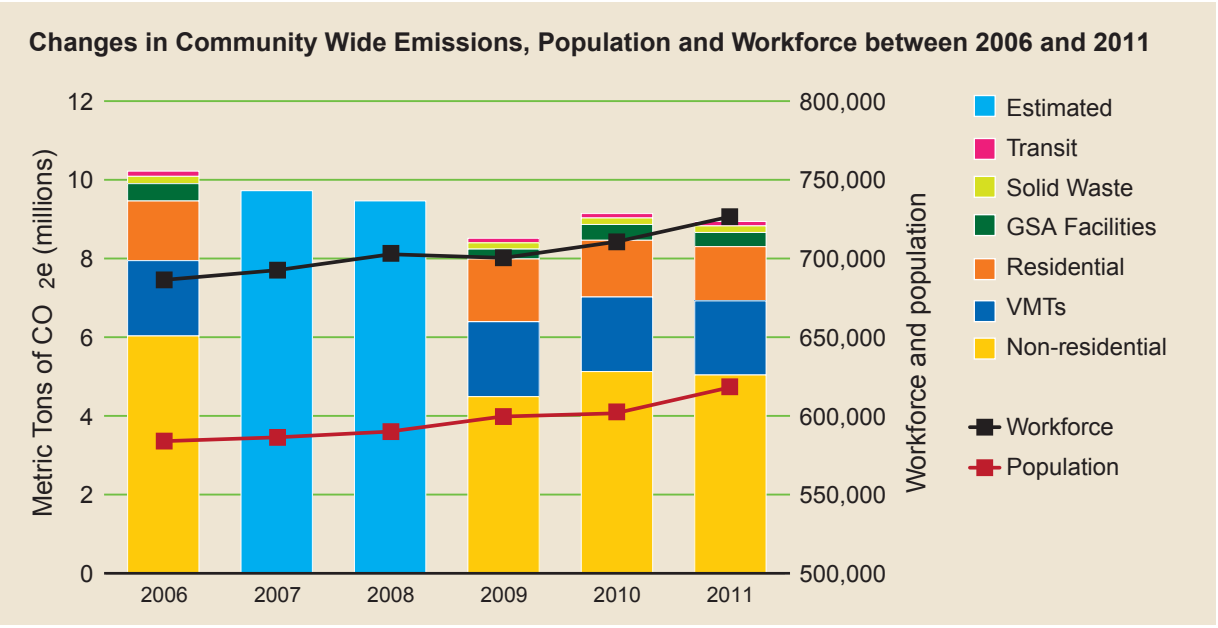
[2] This total was adjusted in 2012 due to the availability of better information and corrections to calculations. The 2006 inventory reported 10,505,945 metric tons CO_2e.



Reducing Greenhouse Gas Emissions while Growing the City

In 2006, the District's population was 583,978. In 2011, the population increased to 617,996, a 6% increase. Based on decreasing GHG emissions and a growing population, per capita emissions dropped significantly, from 18 to 14.5 metric tons of CO_2e per resident, or 20%.

Despite the global economic downturn within that time period, the District's workforce rose from 687,600 to 727,800 employees, a 6% increase.[3] Housing construction rose steadily, keeping up with population growth, while employment growth was reflected in an increase of commercial and office space in the District. The District continues to have the lowest commercial/office vacancy rates in the country.



Public and Private Efforts to Reduce GHG Emissions

Many initiatives across District government and the private sector are improving efficiency and reducing our GHG emissions. In the past five years, the city has expanded its stock of LEED and ENERGY STAR rated buildings, promoted the production and use of renewable energy, reduced vehicle usage, and expanded transit options. In addition to climate benefits, these initiatives are improving our quality of life and local environment.

[3] Department of Employment Services and US Department of Labor, District of Columbia Wage and Salary Employment by Industry and Place of Work: http://does.dc.gov/sites/default/files/dc/sites/does/publication/attachments/DC%202001-2011%20AA.pdf

Changes in Community Wide Emissions, Population and Work Force between 2006 and 2011

	Sectors	2006	2011	% Change	% of Total Reductions
metric tons of CO_2e	Residential	1,517,010	1,379,313	-9.08%	10.8%
	Non-Residential	6,020,070	5,027,438	-16.49%	77.6%
	GSA Facilities	441,167	360,776	-18.22%	6.3%
	Transit	131,275	112,236	-14.50%	1.5%
	VMTs	1,915,532	1,884,803	-1.60%	2.4%
	Solid Waste	185,991	167,097	-10.16%	1.5%
	Totals	**10,211,045**	**8,931,663**	**-12.53%**	**100%**
	Population	583,978	617,996	5.83%	
	Work Force	687,600	727,800	5.85%	

LEED and ENERGY STAR Buildings

Thanks to broad public and private sector leadership, the District is home to 240 LEED certified projects totaling more than 46 million square feet of space, and more than 760 other District projects are LEED registered.[4] According to the US EPA, in 2011 the Washington, DC, area ranked #2 in the nation for number of certified buildings. In 2011, the District had 211 ENERGY STAR rated buildings comprising 74.7 million square feet, up from 27 buildings comprising 12.9 million square feet in 2006. The US EPA estimates these building help eliminate 156,000 tons of GHG emissions through energy use reductions.

Clean and Renewable Energy

Government and private customers in the District have made a significant commitment to renewable production and purchasing of clean electricity. The District was recognized in 2011 (and again in 2012) as the #1 US EPA Green Power Community. In 2012, electric customers in the District will purchase more than a billion kilowatt hours of renewable power, or 11.4% of all the electricity consumed in the District. These purchases result in an annual savings of 451,000 metric tons of CO_2e. However, because most purchases of green power are made from national markets, they do not reduce local emissions or factor into GHG inventories. While very important to the growth of a national renewable industry, many of the reductions occur far away and are purchased as renewable energy credits.[5]

Local renewable production that does directly reduce reliance on fossil fuels and cut GHG emissions is growing rapidly. Thanks to an increasingly active solar energy industry, the District's Renewable Energy Incentive Program has supported 392 solar installations in the District that produce 1,263 kW of local, green electricity between 2005 and 2011.[6] Solar power from these projects prevented local emissions of 5,500 metric tons of CO_2e.[7]

[4] US Green Building Council. Green Building Information Gateway (September, 2012).
[5] The US Environmental Protection Agency: Green Power Communities Challenge. (September, 2012). Source: http://www.epa.gov/greenpower/communities/gpcrankings.htm
[6] This includes solar installations funded through the District Department of the Environment's Renewable Energy Demonstration Project and the Renewable Energy Incentive Program.
[7] Energy Administration, District Department of the Environment. (August, 2012). Renewable Energy Generation Presentation.

Green Roofs and Tree Canopy

The District will surpass 1.5 million square feet of green roofs in 2012 as requirements and incentives encourage installation of green roofs. The tree canopy in the District grew by 818 acres between 2006 and 2011, a 2.1% increase. Cooler roofs and thousands of newly planted trees help provide shade and reduce energy use.[8]

Transit Options, Active Transportation, and Hybrid Vehicles

The District continues to expand transit services and options that help reduce auto traffic and cut vehicle miles travelled (VMTs). Expanded DC Circulator service, the Capital Bikeshare system, and implementation of the bike and pedestrian master plans contribute to reductions in VMTs and tailpipe emissions in the District. As hybrid and other green vehicles have become more affordable, the number of hybrid vehicles registered in the District has gone from 923 in 2005 to 8,280 in 2011, a 9-fold increase. Between 2006 and 2011, DDOT added 48.6 miles of bike lanes in the District, as well as thousands of bike racks. As the city built out the bike master plan and provided more biking infrastructure, the rate of bicycle commuting rose by 50% between 2006 and 2010. The District's bikeshare program features 1,670 bikes at 175 stations across the city and in neighboring jurisdictions. Capital Bikeshare has grown to 19,200 annual and 130,000 casual members and users who have ridden more than 2 million miles by bike since September 2010.

Government Operations Inventory: 2006 to 2011

In 2006, the District government produced 686,000 metric tons of CO_2e across all sectors, including facilities, wastewater treatment, streetlighting, vehicle emissions from fleets, solid waste disposal, employee commuting, and fugitive emissions from refrigerants and fire suppressants. In 2011, the District government generated 528,000 metric tons of CO_2e, a 23.1% reduction in emissions from the baseline.

Expressed in CO_2e per capita, District government operations emitted 1.2 tons of GHG per resident in 2006, and only 0.85 of a ton per resident in 2011. The decrease in emissions, paired with the increase in population, means that government operations GHG emissions per resident fell by 30% between 2006 and 2011. District owned and operated buildings represent the largest share of emissions — 295,000 metric tons of CO_2e accounting for 56% of total emissions in 2011 (down from 58% of total emissions in 2006). Emissions from the government building sector were reduced by 26% between 2006 and 2011.

Emissions Reduction Measures between 2006 and 2011

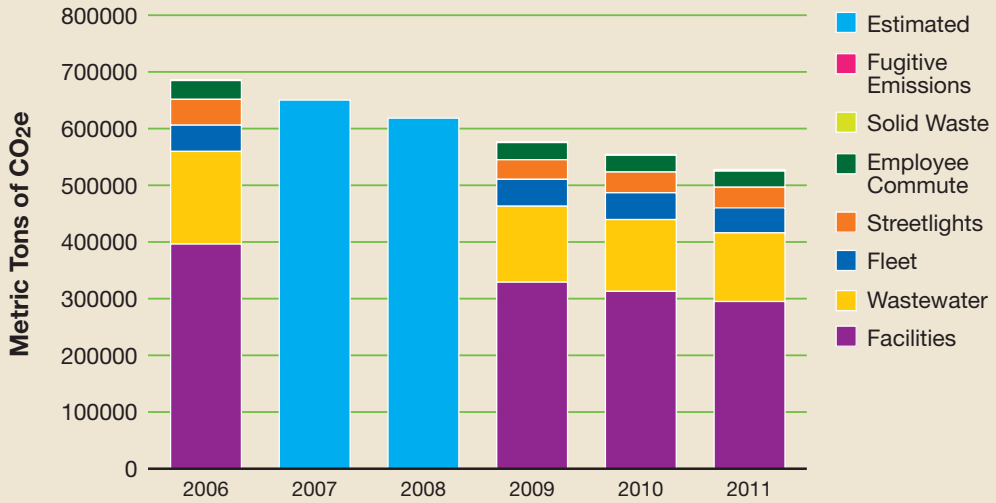
	2006	2011
Government Green Power Purchases (%)	5%	50%
Community Green Power Purchases	0.7%	8.5%
Installed Solar Systems	21*	439
Installed Solar Capacity (mW)	55*	3,475
LEED Certified Buildings	6	240
ENERGY STAR Buildings	27	211
Bikeshare Members	0	19,200
Hybrid Cars	923	8,280
Tree Canopy (acres)	13,791	14,608
Green Roofs (square feet)	194,592	1,333,490

* These solar projects refer to projects funded through DDOE's Renewable Energy Incentive Program.

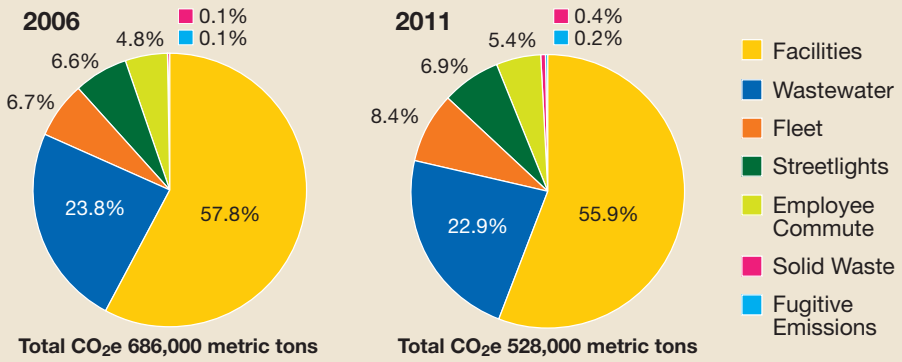
More information can be found at www.greendashboard.dc.gov

[8] Urban Forestry Administration, District Department of Transportation. (January, 2012). Source: http://ddot.dc.gov/DC/DDOT/Publication%20Files/On%20Your%20Street/Urban%20Forestry/TreeCanopy_DC_Factsheet_2006-2011.pdf

Government Operations Emissions per Sector between 2006 and 2011



Government Operations Emissions per Sector in 2006 and 2011



Changes in Government Operation Emissions between 2006 and 2011

metric tons of CO_2e

Sectors	2006	2011	% Change	% of Toal Reductions
Facilities	396,299	294,997	-25.6%	64.0%
Wastewater	163,454	121,077	-25.9%	26.8%
Fleet	46,289	44,147	-4.6%	1.4%
Streetlights	45,586	36,375	-20.2%	5.8%
Employee Commute	33,101	28,385	-14.2%	3.0%
Solid Waste	625	2,022	223.5%	-0.9%
Fugitive Emissions	770	807	4.8%	0.0%
Totals	**686,091**	**527,811**	**-23.1%**	**100%**

The next largest sources of emissions come from the District's wastewater treatment facilities and treatment processes. In 2006, wastewater treatment facilities produced 152,000 metric tons of CO_2e. In 2011, wastewater treatment facilities consumed more natural gas but less electricity and produced 113,000 metric tons of CO_2e, reducing emissions from energy consumption by 32%. Tailpipe emissions from the District's fleet are the third largest source of emissions, at 8.4% of the District's total emissions. Between 2006 and 2011, emissions from the District fleet decreased slightly by 4.6%, which is largely due to more efficient vehicles, cleaner fuels powering the District fleet, and more efficient use of vehicles.

District Government Efforts to Reduce GHG Emissions

The largest reductions in District government GHG emissions are from buildings, wastewater treatment facilities, and streetlights. Each sector reduced emissions by more than 20%, largely by using fuel and energy more efficiently.

District Buildings

District government buildings and facilities are continuously being improved and modernized. Extensive improvements have been made to District public schools since 2006, and emissions have dropped 8% in five years. The DC Housing Authority has been retrofitting its portfolio with modernized HVAC systems, lighting, water heaters and ENERGY STAR rated appliances, reducing electricity consumption by 10%, natural gas consumption by 20%, water usage by 30%, and GHG emissions by 11%.

District Vehicles and Fleets

The Department of Public Work's Fleet Management Administration has reduced emissions from the District's vehicle fleet and saved money by reducing fuel consumption. Use of more fuel efficient vehicles, including hybrids, compressed natural gas cars, and electric vehicles, and cleaner fuels, including biodiesel and ethanol, reduced emissions from 8.4 metric tons of CO2e per vehicle in 2006 to 6.7 metric tons of CO_2e in 2011 even as the fleet grew from 5,540 to 6,587 vehicles. The Metropolitan Police Department, which manages the city's largest fleet, has purchased more efficient patrol vehicles, saving roughly 600 gallons per vehicle and cutting 7,600 metric tons of CO_2e fleet-wide.

Wastewater Facilities

DC Water operates the Blue Plains Advanced Wastewater Treatment Plant, which has undergone substantial improvements over the last few years and reduced energy consumption at treatment facilities and administrative buildings. Total energy consumed at the DC Water Blue Plains plant was reduced by 21%, and greenhouse gas emissions dropped by 32% between 2006 and 2011.

Clean and Renewable Energy

The District government is continuing to expand solar installations in public facilities, including schools, offices, and even pools. In addition, the District has made a significant commitment to the production and purchasing of clean electricity. The District government purchased 50% green power in 2011, making it the US EPA's #1 local government purchaser of green power (the District increased green power purchases to 100% in 2012, again #1 on the US EPA list with 534,084,977 kWh).