

Annual Energy Sustainability Report

Department of General Services Office of Energy and Sustainability



February 1, 2016



Background and Introduction

A. Scope

The Office of Energy and Sustainability (OES) was established within the Department of General Services (DGS) to implement comprehensive and crosscutting initiatives to reduce the environmental footprint of County operations.

Montgomery County Government's environmental footprint is extensive and includes:

- Over 9,000,000 square feet of office space in over 370 owned and leased buildings
- 460 heavy duty, 330 transit and 2,430 light duty vehicles

This report documents activities by the County Government to reduce the environmental footprint of its operations. As part of its ongoing mission, OES works with County Departments and other stakeholders to reduce the environmental impacts of delivering County services to the community.

B. Office of Energy and Sustainability Responsibilities:

Montgomery County Council Bill 6-14 defines the Office of Energy and Sustainability's responsibilities as:

- Develop an energy baseline, energy unit savings plan, and energy cost savings plan for the County's building portfolio;
- Develop a comprehensive plan to reduce the energy consumption and impact of fleet operations, which may include the use of alternative fuels, reductions in vehicle miles traveled, improvements in vehicle efficiency, or vehicle electrification;
- Execute plans to use Energy Performance Contracting to improve the efficiency of County buildings;
- Develop and execute the County's renewable energy plans, including the purchase of renewable energy and deployment of solar and other clean energy sources across County facilities;
- Coordinate with the Office of Procurement to develop green and environmentally preferable purchasing plans;
- Develop initiatives, plans and projects to reduce the environmental impact of County operations and foster a culture of sustainability within the County Government; and
- Prepare and submit data summarizing efforts to reduce the environmental impact of County operations to any annual Sustainability report prepared by the County.

This is accomplished by fostering cross-departmental initiatives, initiating innovative and high-value projects, focusing on actions and results, and reporting on the County's progress on green initiatives.

I. Sustainability Goals and Targets

A key component of achieving and sustaining sustainability outcomes is the development of a comprehensive sustainability plan for County operations. The plan, to be completed in 2016,

includes achievable targets for reducing energy consumption, greenhouse gas emissions, water consumption, fleet fuel use and other aspects of sustainability. This government-wide plan will involve engaging all County departments and employees to ensure its success.

II. Sustainability Achievements and Efforts

A. Green Building and the Built Environment

Building Green – Building Better

Montgomery County is committed to building, better, greener facilities that reduce energy costs, heat islands, and provide a healthier environment for visitors and employees. Since 2012, Montgomery County has constructed 8 facilities that meet or exceed the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Silver rating, with 5 additional buildings achieving LEED Gold. Common features in County facilities include:

- Environmental Site Design such as cisterns, vegetated and white “green” roofs, and pervious pavement, all of which reduce and slow run-off from buildings and sites, thereby improving local water quality;
- High efficiency lighting, heating and cooling, including two buildings with geothermal systems and another in design;
- Renewable building materials such as cabinets made from compressed wheat board, flooring made from bamboo, and peanut oil-based linoleum tiles;
- Extensive construction waste recycling, diverting waste that ultimately would end up in landfills;
- Water efficiency through recapture and reuse of rainwater in several facilities;
- High levels of daylighting “harvesting” to minimize heating and lighting demand;
- Improved ventilation controls and indoor air quality measures, and;
- Installing bike racks at all existing and planned buildings.



Silver Spring Library

Opened in 2015, the Silver Spring Library provides services to greater Silver Spring. The facility, designed to be LEED Silver certified, incorporates a vegetative roof, and was designed to accommodate a future Metro Purple Line station.

Energy Efficiency and Smart Buildings

The majority of Montgomery County's buildings are over 30 years old and in need of substantial improvements to operate efficiently. DGS is taking action to identify the most inefficient buildings and improve their energy performance while reducing maintenance costs. Specific actions include leveraging energy data and controls to provide immediate savings.

- *Enhanced Energy Monitoring* - DGS is implementing comprehensive software to track energy consumption, allowing County energy managers to identify problems and implement solutions. Starting May 2016, EnergyCAP, will process the majority of utility bills in an electronic file, reducing paper consumption. The utility cost and consumption will be populated on an electronic dashboard available on desktops and digital devices.
- *Energy Performance Benchmarking* – Montgomery County Government was the first organization in compliance with the County’s Energy Performance Benchmarking Requirements (Council Bill 2-14). Using EPA’s *Portfolio Manager* Software, the County benchmarked all facilities over 50,000 square feet, which are listed in the chart below. This was an extensive effort to search and import data from various sources. The EnergyCAP system will enable staff to automatically benchmark and report on all eligible facilities. The County anticipates that once final utility data is received, the JC Annex and 401 Hungerford will be eligible for an ENERGY STAR label. All buildings scoring below the ENERGY STAR Score of 75 are targeted for energy efficiency retrofit.

Montgomery County Energy Performance Benchmarking

Property Name	Year Ending	ENERGY STAR Score	National Median Site Energy Use (kBtu)	Difference from National Median Site EUI	Site Energy Use (kBtu)	Site EUI (kBtu/ft²)	Property GFA - Self-Reported (ft²)
Public Safety Headquarters	12/31/2014	15	45,485,750	51.3	68,806,295	196.5	350,092
Council Office Building	12/31/2014	8	13,623,071	71.8	23,398,222	178.3	131,203
Up County Service Center	12/31/2014	13	6,986,630	56.9	10,960,167	170.9	64,120
Strathmore Music Center	12/31/2014	Not Applicable	7,923,243	294.5	31,257,752	160.6	194,659
Executive Office Bldg	12/31/2014	27	24,903,047	27.7	31,803,998	136.2	556,580
Germantown Library	12/31/2014	Not Applicable	4,626,233	27.9	5,916,295	120.3	49,183
J C Annex	12/31/2014	70	21,175,378	-21.2	16,679,416	95.3	175,000
1301 Piccard	12/31/2014	61	8,863,191	-11.9	7,804,540	93.6	99,915
Rockville Library	12/31/2014	Not Applicable	11,151,219	-15.6	9,413,411	91.2	103,163
HHS Administrative Offices (401 Hungerford)	12/31/2014	86	10,794,505	-39.6	6,524,447	78.7	82,888

- *Automated Energy Management and Demand Response* - The County’s newest, and most of the older large buildings are controlled by building management systems that help manage energy by allowing DGS Facilities Management technicians to adjust temperature set points, reduce run-time and take other actions. These controls also allow the County to participate in demand response programs, voluntarily reducing energy use during periods of peak energy demand. The County has received rebates exceeding \$100,000 over the last 4 years due to unnoticeable operational changes.

In addition to leveraging data, the DGS is also making physical improvements to County facilities. Specific initiatives include:

- *Energy Performance Contracting* – DGS is in the middle of a six-year plan to invest \$81 million dollars of alternative financing in County facilities via energy performance contracting. Under this initiative, the County has contracted with three vendors (Energy Solutions Group, NORESKO and AMERESCO) to audit, design, and implement energy efficiency improvements. The County finances the improvements and repays the principal and debt service with energy savings.

Scheduled ESCO Projects	
Project	Anticipated Completion
1301 Piccard	FY16
Pre-Release Center	FY17
Council Office Building	FY17
Longwood Community Recreation Center	FY17
8818 Georgia	FY17
Kensington Park Library	FY17
Aspen Hill Library	FY17
UpCounty Regional Services Center	FY17

**HHS Headquarters
401 Hungerford**

The County has completed the first of these projects, a \$4.1 million dollar retrofit of HHS Headquarters, to reduce energy costs by over \$159,000 annually and reducing the County’s greenhouse gas footprint over 650 metric tons carbon dioxide equivalent (MTCO₂E).

- *Qualified Energy Conservation Bonds and Green Master Lease Program*: The Departments of Finance and General Services collaborated to leverage energy conservation bonds, enabled by the American Resource Recovery Act, to reduce the costs of financing energy efficiency projects. The County anticipates using its full allocation of QECB’s by the end of FY17. The departments are currently identifying options to secure faster and timely financing for energy conservation projects, helping move from design to implementation quickly.
- *Energy Conservation and Level of Effort Projects* – In addition to comprehensive retrofits under its energy performance contracting initiative, DGS implements a variety of improvements such as light emitting diodes, heating and cooling, and other improvements using capital improvement budgets. The County has completed over 8 of these projects in FY15.
- *Green and Energy Aligned Leasing*: Developed in partnership with the Institute for Market Transformation (IMT), a green leasing tool to assist in negotiating future leases that include utility data transparency, energy efficient building systems (e.g., lighting, heating and cooling) and other green features.

B. Clean and Advanced Energy Initiatives:

Montgomery County is leading the clean energy revolution by fostering the carbon free and low carbon sources of energy through the following programs.



Solar Photovoltaic Projects on County Facilities

DGS is leveraging public private partnerships to install renewable energy across the County’s portfolio of facilities where technically and economically feasible. Under a White House initiative the County has committed to installing a minimum of 6 megawatts of solar, enough to power 550 to 600 homes, saving an estimated \$550,000 annually in utility costs. Once all project are completed the County anticipates having installed over 10 megawatts of solar.



Scheduled Solar Projects	
Project	Status
New Liquor Warehouse	Complete- Awaiting Interconnection
Rockville Library	Complete Awaiting Interconnection
Silver Spring Civic Building	Complete – Awaiting Interconnection
Jane Lawton Community Center	Complete – Awaiting Interconnection
UpCounty Regional Services Center	Complete – Awaiting Interconnection
Potomac Community Recreation Center	Under Construction
Gaithersburg Library	Under Construction
Fire Station 31	Under Construction
County Correctional Facility – Roof Mounts	Under Construction
Council Office Building	FY16
Holiday Park Senior Center	FY16
KidStop Childcare Center	FY17
Country Correctional Facility – Ground Mounts	FY17
Dickerson Compost Facility	FY17
Oaks Landfill	FY17

Resilient and Efficient Facilities

Microgrids are local electrical generation systems that allow a building or campus to operate independently from the utility grid for a prolonged period of time. Microgrids combine advanced technologies to improve facility resistance to prolonged power outages, operating independently from the power grid for a majority of the year, and ensuring power availability during an emergency. Microgrids include technologies such as solar, combined heat and power systems that produce heat and electricity, energy storage, controls and energy conservation measures into a seamless interconnected system. Microgrids are efficient and clean technologies, reducing the environmental footprint of the host facilities.

- A contractor was selected in 2015 to develop a microgrid under a public-private partnership.

- Implementation of a microgrid at Public Safety Headquarters (PSHQ) and the Montgomery County Correctional Facility in Clarksburg (MCCF) will take place in FY17.

Clean Energy Purchase

Since 2004 Montgomery County has led a coalition of county agencies and municipalities to purchase electricity supply generated from wind energy. The County, and the majority of its purchasing partners, have consistently increased their purchases of clean energy. All agencies are purchasing greater than 20% of electricity consumption with the majority graduating to a 100% commitment. Current participants include Montgomery County Government, Montgomery County Public Schools, Montgomery College, the Maryland National Capital Park and Planning Commission, Chevy Chase Village Section 5, City of Takoma Park, Town of Kensington and the Town of Somerset. The County also facilitates purchases for the Cities of Rockville and Gaithersburg who report separately.



The County led purchase current ranks 4th amongst local governments and 15th amongst all national purchasers tracked by the EPA's Green Power Partnership, competing against Fortune 500 companies.

Montgomery County Government purchases 100% of its annual electricity consumption from clean sources, specifically energy generated by wind turbines. The County also purchases credits to offset greenhouse gas and fossil fuel emissions from its facilities.

C. Fleet and Mobility

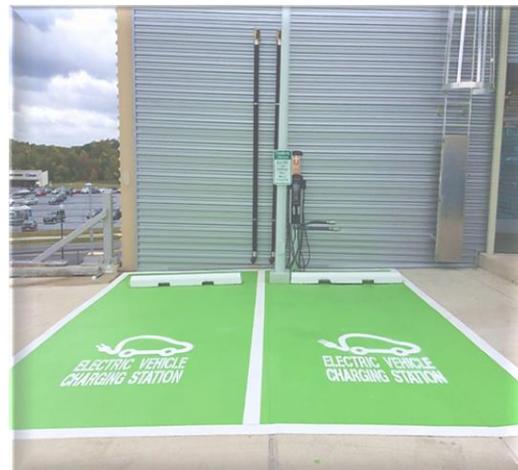
Approximately 40% of Countywide Greenhouse Gas emissions originate from transportation sources. Responsible for a fleet of over 3,000 vehicles, DGS has reduced fleet emissions 10% over 3 years. The County Department of Transportation (DOT) also conducts several programs to encourage use of public transportation by County employees.

Green Fleet Strategy

DGS' Division of Fleet Management Services has developed a comprehensive Green Fleet Strategy. This strategy combines sound management practices, fleet rightsizing, alternative fuels to drive emissions reductions and better service. Core objectives to the mission are a 20% reduction in petroleum consumption over 5 years and a 30% reduction in emissions by 2030 (2% per annum).

Electric Vehicles and Infrastructure:

DGS has installed 16 charging stations for fleet use and currently operates 15 electric or plug hybrid vehicles. Using the DGS contract, DOT has also initiated a program to install charging stations at public parking facilities.



The County anticipates federal grant funding for the purchase of up to 10 electric transit buses. If all 10 buses are purchased the resulting fuel savings will exceed \$6.4M over the lifecycle of the buses.

Fleet “Right Sizing”

The County is rightsizing its fleet by replacing vehicles with more efficient alternatively fueled vehicles (AFVs), sizing the vehicle class (e.g., sedan, SUV) to the job function. Fleet has specifically:

- Eliminated over 165 vehicles from the fleet in the last 3 years.
- Increased fuel economy for the administrative fleet from 14.5 miles per gallon (MPG) in FY12 to 25.5 MPG in FY15
- Increased the fuel economy of the public safety fleet from 12.3 MPG in FY12 to 15.6 MPG in FY15

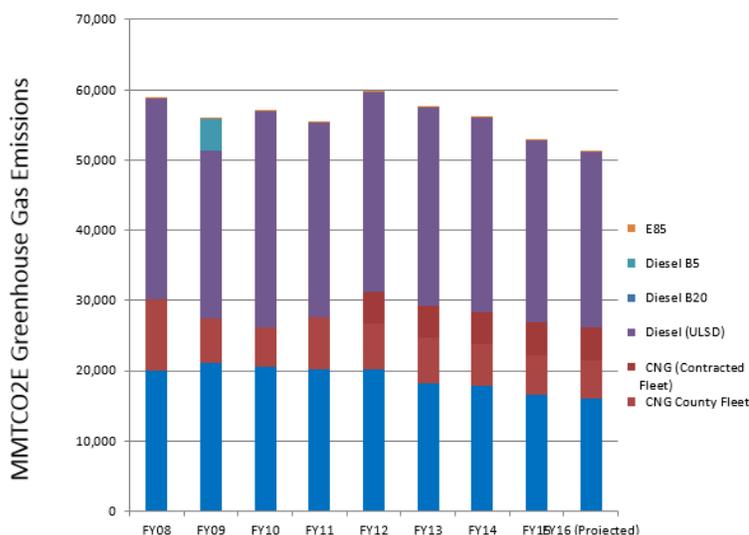
Alternative Fuels:

The County maintains a fuel neutral approach by selecting fuels to achieve desired emissions reductions. The County has made extensive use of alternative fuels, in addition to vehicle electrification.

The County is not currently using biodiesel due to performance issues discovered in pilots. The County’s primary focus is a fleet that is fuel neutral, fuel efficient, and environmentally sensitive.

The County has embraced compressed natural gas as a cost-effective, lower emissions alternative to diesel for heavy duty vehicles. Over 75% of the County’s bus fleet is fueled by CNG and the County operates two new CNG fueling stations.

Fleet GHG Emissions by Source MTCO2E (Fuel)



Anti-Idling and Telematics:

Follow a successful pilot program, DGS’ Fleet Management Services division launched a telematics initiative that will allow the County to leverage vehicle operating data to improve performance. This includes smart routing to reduce miles traveled, idling control, and employee/driver education to improve performance. The initiative is expected to be fully implemented by FY17.

Telework and Employee Engagement:

Reducing the miles traveled by employees to their place of work is essential to the County’s efforts to reduce greenhouse gas emissions. Efforts include:

- Providing commuter benefits to employees.
- Providing free RideOn Bus use to employees.
- Partnering with Capital Bikeshare to install bike stations near major facilities.

The County’s Office of Human Resources has also initiated a telework pilot, with 7 Departments committing a total of over 230 eligible employees.



D. Environmentally Preferable Products

Green Standards and Education:

The Office of Procurement and the Montgomery County Interagency Purchasing Committee – Green Initiative developed a comprehensive web tool to help County purchasing staff and project managers select green products or services.

In addition, the Office of Procurement has added a field in its database search, allowing County buyers to search for businesses certified by the Montgomery County Green Business Program.

The Office routinely conducts education for employees and staff on green options available through office supply and other contracts.

Eliminating Styrofoam Food Service Products

County Council Bill 41-14 requires that all County government food service contractors not use expanded or rigid polystyrene. This practice was implemented by contract change order prior to the passing of the legislation.

Recycled Paper:

The County currently purchases 35% post-consumer recycled content paper.

E. Waste Reduction on County Properties

Paper Reduction

DGS Central Duplicating has implemented the new copier contract that includes a wide variety of energy and cost saving features. Through a networked

	Savings
Sheets not Printed	452,202
Water Savings (Gallons at Factory)	1,193,813
Carbon Dioxide	12 metric tons

copier system users must swipe their identification badge to operate the copier. In addition, copiers default to black & white and double sided printing, and allow users to delete unwanted files. The printer controls allow private receipt of documents, enabling personal printers to be phased out.

Additional actions to reduce paper consumption include:

- DGS Central Duplicating initiated a digital storefront, enabling browser based ordering of services, eliminating paper requisitions.
- The Department of Finance is directly importing scanned images into Zyimage, which would eliminate duplication and excessive scanning, eliminating over 130,000 pages of paper documents per month. The department has also limited the amount of paper MPA's reducing another 1,500 pages of printing.

Toner Cartridge Recycling

DGS currently collects toner cartridges for recycling. In addition, DGS has placed recycling receptacles to facilitate easy turn-in of printer cartridges for recycling.

III. Partnerships and Resources

Grants and Partnerships:

- Montgomery County was designated a *Maryland Smart Energy Community (MSEC)*, receiving a total of \$1,300,000 of grant funds over the last three years.
- The County has partnered with the Institute for Market Transformation (IMT) to develop tools to negotiate greener and more energy aligned lease terms.

Awards and Recognitions

- Received five FY14 National Association of Counties awards for sustainability focused initiatives to reduce energy consumption, enable smarter growth, and cutting edge green facilities and campuses
- The County's Fleet was featured as a "Clean Cities Fleet" on *Motor Week*
- Received two FY15 National Association of Counties Awards for sustainability initiatives, Awards recognized the major improvement to the energy performance of the Strathmore Music Hall and a growing partnership between the County and the Maryland Energy Administration through the Maryland Smart Energy Communities Program
- Montgomery County was recognized by the White House for its aggressive commitment to develop 6 MW of renewable energy across the County portfolio.



IV. Status of Implementation of Council Legislation

Council Bill`	Status of Implementation	Notes
2-14 Energy Performance Benchmarking	Implemented	<ul style="list-style-type: none"> DGS has implemented performance benchmarking on all applicable facilities over 50,000 square feet. DEP has certified compliance.
41-14 Ban on Expanded Polystyrene Food Service Ware and Loose Fill Packaging	Implemented	<ul style="list-style-type: none"> County contractors no longer using expanded or extruded polystyrene.
9-14 County Council Renewable Energy Purchase	Implemented	<ul style="list-style-type: none"> Montgomery County purchased 50% of its electricity needs from clean sources in FY15 and over 100% in FY16. The County was able to negotiate additional clean energy to offset building natural gas and fuel oil consumption.
8-14 County Buildings – Clean Energy Technology	Underway	<ul style="list-style-type: none"> Montgomery County is currently piloting a “solar ready” in the Wheaton Recreation Center. The National Renewable Energy Laboratory assisted the County by providing a report on solar potential and other design guidance. A draft regulation proposing goals and standards will be published in FY17.
6-14 Environmental Sustainability – Office of Sustainability Established	Implemented	<ul style="list-style-type: none"> DGS established the Office of Energy and Sustainability (OES) OES has published its 2nd annual report An energy master plan outlining measures across the County’s portfolio and a comprehensive sustainability plan are expected in FY17.
5-14 Social Cost of Carbon	Underway	<ul style="list-style-type: none"> Montgomery County is implementing a new data system, ENERGY Cap which will allow us to extract key metrics to calculate the social cost of carbon for County operations.
2-14 Energy Performance Benchmarking	Implemented	<ul style="list-style-type: none"> DGS has implemented performance benchmarking on all applicable facilities over 50,000 square feet. DEP has certified compliance.