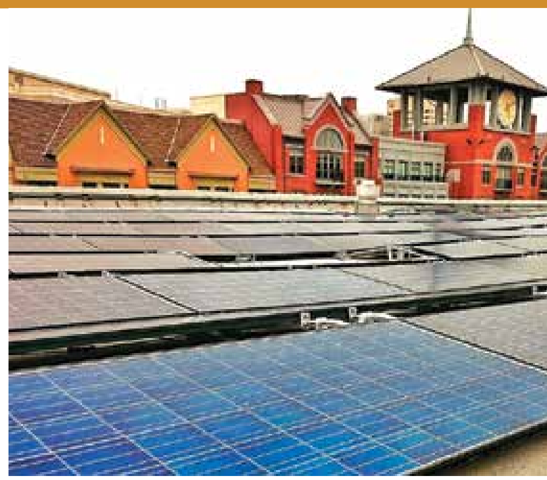
Montgomery County
FY2016 Sustainable Government Operations Report



presented by the Department of General Services
Office of Energy and Sustainability

superior government service with the smallest possible environmental footprint

March 1, 2017

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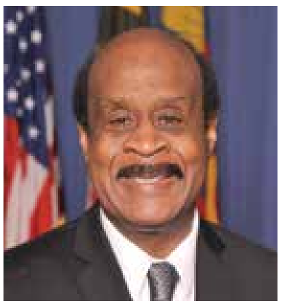
ACKNOWLEDGEMENTS

The County's environmental success is due to the ongoing engagement of staff across the County. Many thanks to the Departments who execute innovative efforts to help the County reduce the environmental impacts of its operations and assisted the Department of General Services, Office of Energy and Sustainability in compiling this report.

- Department of Corrections
- Department of Environmental Protection
- Department of General Services
- Department of Health and Human Services
- Department of Finance
- Department of Liquor Control
- Department of Permitting Services
- Department of Police
- Department of Public Libraries
- Department of Recreation
- Department of Technology Services
- Department of Transportation
- Office of Human Resources
- Office of Procurement

MESSAGE FROM MONTGOMERY COUNTY EXECUTIVE ISIAH LEGGETT



Isiah Leggett, County Executive

Healthy and sustainable communities are vital to making an already great Montgomery County even better. Our policies, budgets, and initiatives must be sustainable from both an environmental and fiscal perspective for decades to come. We also must evaluate all decisions in light of the urgent need to address global climate change. And that starts with a sustainable and accountable County government leading the way with eco-friendly facilities and operations that protect our land, air, and water.

I am proud in this annual report to present the accomplishments of Montgomery County's green and sustainable government operations. This report demonstrates that our sustainable operations are strong across County Departments, with impressive leadership from the Department of General Services and its Office of Energy and Sustainability.

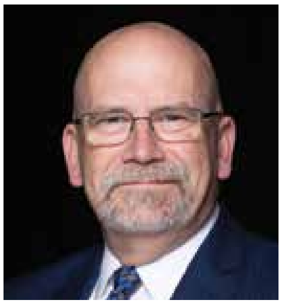
In our 2009 Climate Protection Plan, Montgomery County announced our goal to reduce greenhouse gas emissions by 80% of the 2005 baseline by 2050. By the end of fiscal year 2016, Montgomery County is ahead of schedule, having already reduced greenhouse gas emissions by 67%.

The improvements we've made to our facilities and operations to achieve such impressive pollution reductions also saved taxpayer dollars. We've saved more than $1 million in FY2016 through energy efficiency improvements in buildings, negotiations with energy suppliers, and installation of solar energy systems on County facilities. New projects are expected to save $30 million over the next 20 years.

Montgomery County's commitment to clean energy has positioned our community as a long-term leader in Maryland and across the country. In 2016, we nearly doubled our commitment to install solar panels on County facilities. When completed, solar energy systems on County facilities will reduce greenhouse gas emissions by 9,000 metric tons each year, which according to the U.S. EPA, is the equivalent of taking 1,900 cars off the road.

I'm proud of our government employees who worked hard all year to use less paper, reduce driving, purchase environmentally friendly products, save energy and water, recycle more, and educate each other and the public about how, together, we can make Montgomery County an even cleaner and healthier place to work and live. I look forward to working with you to make our local government operations even more sustainable in the coming years.

MESSAGE FROM DEPARTMENT OF GENERAL SERVICES DIRECTOR DAVID E. DISE



David E. Dise, Director

The Department of General Services (DGS) proactively serves the diverse business and service requirements of all County departments, delivering great service to the departments and agencies we support and the public we serve. With a portfolio that includes more than 9 million square feet of real estate, 3,000 vehicles, and 9,000 employees, the County government has tremendous opportunity to lead by example in practices leading to cleaner air, land, and water. DGS maintains vehicles, designs and constructs buildings, performs interior and exterior maintenance, manages copier services, and more. We apply stringent standards to ensure we meet sustainability goals across DGS's operations and support our partners in improving the sustainability of their work.

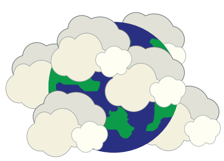
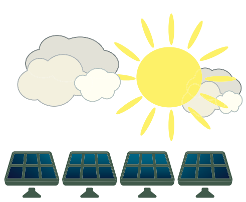
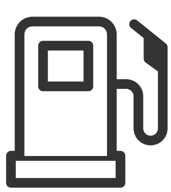
Three years ago we created the Office of Energy and Sustainability (OES) within DGS to enhance the County's capacity to implement green programs, improve cost effectiveness and resiliency of County operations, and provide measurable results. OES was specifically created to provide services to our departmental partners as well as coordinate initiatives across all DGS divisions to further enhance their efforts to green the County's buildings and fleets.

OES provides planning, performance measurement, innovation, and specialized resources to help County departments deliver initiatives that produce measurable environmental and financial benefits. We have been able to invest some of the savings realized to increase the resources available for new initiatives resulting in additional savings. This investment in people and projects such as the County's growing solar energy initiative has provided incredible results in a short amount of time. Our OES team looks forward to helping our partners across the County government expand upon these achievements in the coming year.

The Office of Energy and Sustainability Team. From left to right: Cindy Myers, Leah Miller, Valerie Myers, Eric Coffman (Chief), Chris Weatherly, and Michael Yambrach. Not pictured: Odohi Ettah, Madeleine Yambrach.

THE YEAR IN REVIEW

This report highlights the progress and accomplishments of Montgomery County's green government initiatives through FY2016. For more details, as well as our latest green government news, please visit the newly revised website at www.montgomerycountymd.gov/dgs-oes.

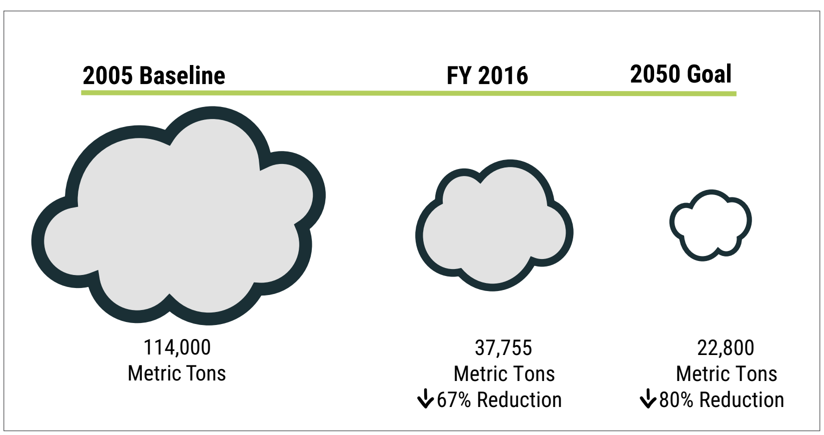
	The Challenge	Our Targets	Our Accomplishments
	Greenhouse gas levels are 400 parts per million (ppm). 350 ppm or less could avoid negative impacts of climate change. (Source: United Nations Intergovernmental Panel on Climate Change)	Reduce greenhouse gas emissions 80% below FY2005 levels.	**Reduced 67%** of greenhouse gas emissions from government operations.
	Electricity generation is the largest source of greenhouse gas emissions in the U.S. (Source: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions)	Generate emissions-free electricity by installing 6 megawatts of solar on County facilities by the end of FY2017.	**Installed 2.4 megawatts** of solar on County facilities. Additional 8.1 megawatts of solar is underway.
	Buildings account for 40% of U.S. energy consumption and 39% of $C0_2$ emissions. (Source: USGBC)	Improve energy efficiency of buildings to maximize savings and greenhouse gas emissions reductions.	**Saved $294,876** on utilities and reduced greenhouse gas emissions by 1,635 metric tons.
	In 2015, the United States used 385 million gallons of petroleum a day for vehicles. (Source: https://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11)	Reduce petroleum consumption of vehicles in the County's fleet 20% over FY2014 levels by 2020	**Saved 206,676 gallons** of fuel over 2014 levels, representing a 3.8% reduction in petroleum use in just two years.
	Marylanders sent 6.11 lbs of waste to landfills each day – 2.8 lbs more than the average person in the U.S. (Source: Maryland Dept. of the Environment Zero Waste Plan)	Divert 70% of waste from landfills.	**~60% waste diverted** through recycling.

ENERGY AND CLIMATE

In FY2016, Montgomery County has already reduced greenhouse gas emissions by 67% over the 2005 baseline — the equivalent of taking 13,500 cars off the road.

ENERGY AND CLIMATE

In the 2009 Climate Protection Plan, Montgomery County set a goal to reduce greenhouse gas emissions to 80% below the baseline FY2005 levels across the community. In addition, the County set interim goals to stop increasing greenhouse gas emissions by 2010 and to achieve a 10% reduction every 5 years through 2050.



All references to the number of cars off the road, trees planted, and homes powered are according to the U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalecies-caluculator.

SOCIAL COST OF CARBON

The social cost of carbon is a measurement, in dollars, of the global environmental, health and economic impact of emitting a ton of carbon dioxide into the atmosphere. Montgomery County is one of the first communities to incorporate the social cost of carbon into government decision-making and accountability. Between FY2011 and FY2016, the social cost of carbon emitted each year from Montgomery County government operations has **decreased from $2,940,000 to $1,044,708.**

Social cost of carbon assessment is required by Bill 5-14. Detailed assessment is shown in Table IV on page 32.

ENERGY EFFICIENCY

Montgomery County uses the latest technology, innovative financing, and data analysis to maximize energy efficiency of its buildings. County staff closely monitor utility bill data across the County's entire portfolio of more than 400 buildings to identify opportunities to improve energy efficiency through cost efficient upgrades of lighting fixtures, heating and cooling systems, and plumbing fixtures. In addition, Department of General Services (DGS) staff use building controls to make rapid adjustments in response to changing weather conditions and customer needs, saving energy and increasing building occupant comfort.

$295,000 **amount Montgomery County has saved on utilities from FY2013–FY2016 by improving the energy-efficiency of its existing facilities.**

>$15 million **amount the County expects to save over the next two decades as a result of energy efficiency projects.**

Energy Performance Analysis and Monitoring

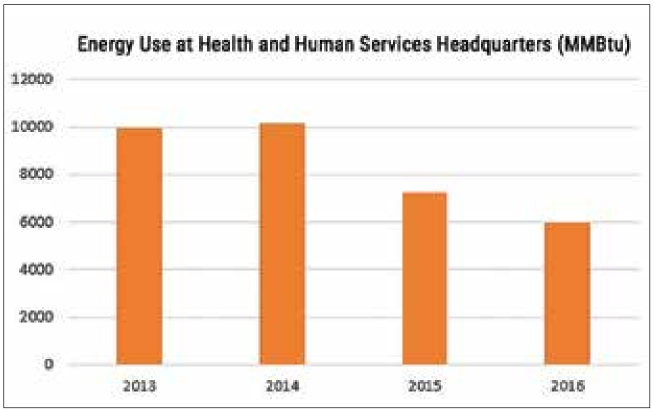
In late FY2016, the Office of Energy and Sustainability transitioned utility billing and analysis to EnergyCAP software that pulls data directly from the utilities, eliminating the need for paper billing. This reduces opportunities for data input error and reduces time needed to process and resolve billing errors, enabling staff to focus on identifying cost savings opportunities. The software includes powerful data analysis tools and automated reporting, providing stakeholders across the County with timely and accurate energy data.

Energy Performance Benchmarking

Energy benchmarking tracks building annual energy consumption and compares performance to similar buildings nationwide. As part of the County's benchmarking law, Montgomery County Government benchmarked 14 buildings in its portfolio that are more than 50,000 square feet and released benchmarking data to the public through the Department of Environmental Protection's MyGreenMontgomery.org website. The County anticipates pursuing an ENERGY STAR label on at least one facility in FY2017 based on this analysis.

Energy Performance Contracting

Montgomery County is implementing a six-year plan to invest more than $100 million in facilities through energy performance contracting. The County is working with several energy services companies (ESCO) that recommend upgrades and guarantee cost savings on utilities. Energy performance contracting enables the county to redirect electricity, heating, and cooling expenses to paying for projects without impacting the County's overall budget. The first project, the Health and Human Services Headquarters renovation completed in 2013, shows a 40% reduction in energy consumption between FY2013 and FY2016.

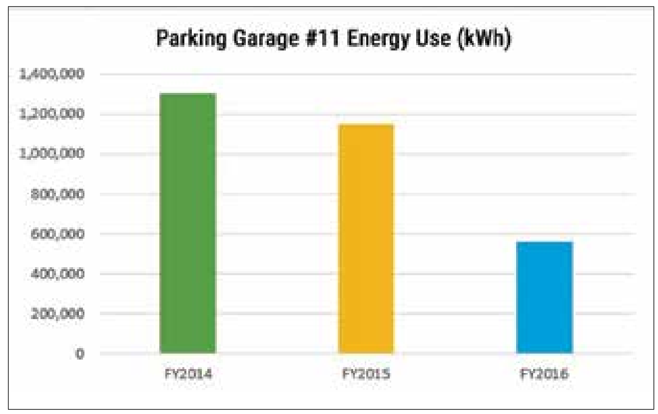


MMBtu stands for one million British thermal units. A British thermal unit is the amount of energy needed to raise the temperature of one pound of water by one degree Fahrenheit at sea level. Using MMBtu allows us to convert electricity, natural gas, and other fuels into one unit of measurement so we can include all of them when tracking building energy use. Building space data is subject to change as Montgomery County builds and acquires new properties and/or divests of current properties and leased spaces.

In FY2016, Department of General Services staff conducted extensive planning and preparation for future energy saving projects. More than 20 facilities, including libraries, recreation and swim centers, are scheduled for energy efficiency upgrades financed by energy performance contracting over the next three years. The County is currently implementing several projects that are expected to be complete between FY2017 and FY2019. These energy use reduction projects are expected to save more than $765,000 each year, most of which will be reinvested in facility improvements, and to reduce greenhouse gas emissions by more than 2,650 metric tons per year.

Other Energy Efficiency Projects

The County has a number of other projects underway on an ongoing basis, either improving the efficiency of building equipment through planned replacements or other projects that provide an extremely fast payback on investment. Many of these projects involve replacing compact florescent and halogen lights with highly efficient LED lights.



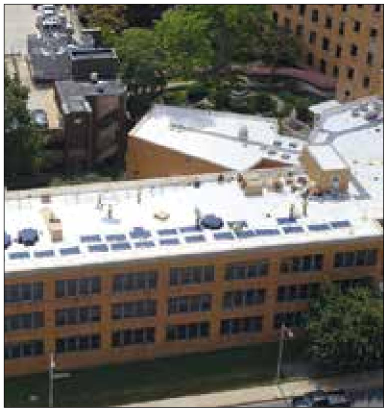
Installing LED lights at Parking Garage #11 (7730 Woodmont Avenue, Bethesda) showed a 57% decrease in energy use after the project was implemented.

SUSTAINABILITY AND THE ARTS

Montgomery County installed highly efficient, low maintenance LED lights at Strathmore Concert Hall, AFI Silver Theater, and Blackbox Theater. Montgomery County's theaters provide opportunities to experience films, plays, concerts, and art installations that are integral to our vibrant community. The use of LED lights minimizes the environmental impact of these venues that often require a large amount of energy because they often operate at night and on the weekends. The LED lights are expected to save more than $140,000 in utility costs each year and provide the same greenhouse gas reductions as planting 20,000 trees or taking 170 cars off the road.

SOLAR

Montgomery County started the year with a goal to generate 6 megawatts of solar power through projects installed on County facilities. Based on projects underway or under contract the County will greatly exceed that goal, installing an anticipated 11 megawatts across our portfolio. Through grants and power purchase agreements, Montgomery County benefits from low-cost energy with no upfront costs or responsibilities to maintain the solar energy generation systems.

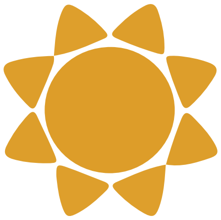


Council Office Building, Rockville.

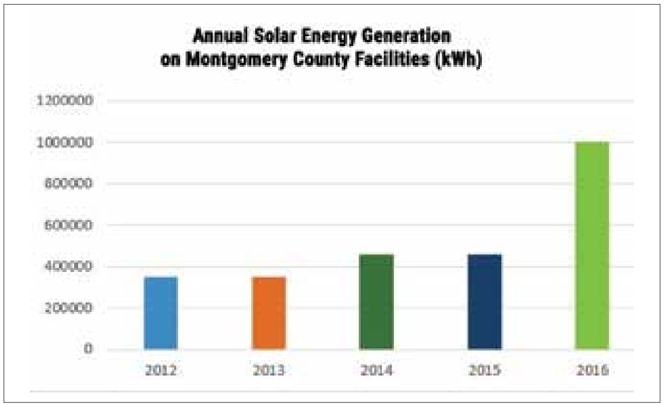
Installed by **November 2016**

2.4 Megawatts

Anticipated **FY2018**



11 Megawatts



FY 2016 Energy Saved = 1,003,570 Kilowatt hours

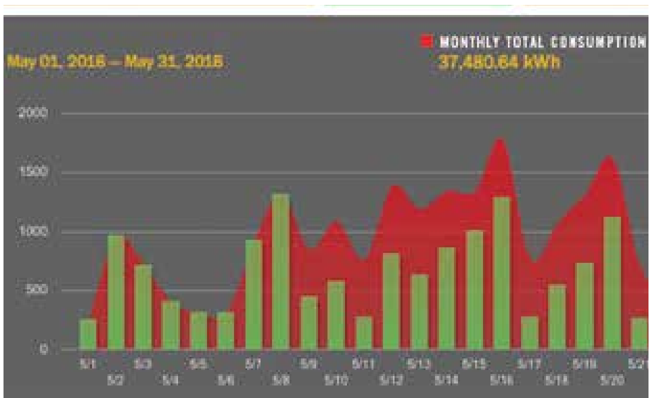
Equivalent of:

705 metric tons of GHG | 149 cars off the road | 104 homes powered | 18,278 trees planted

FY 2016 Saved $96,922

Amount expected to save annually once all are on-line:

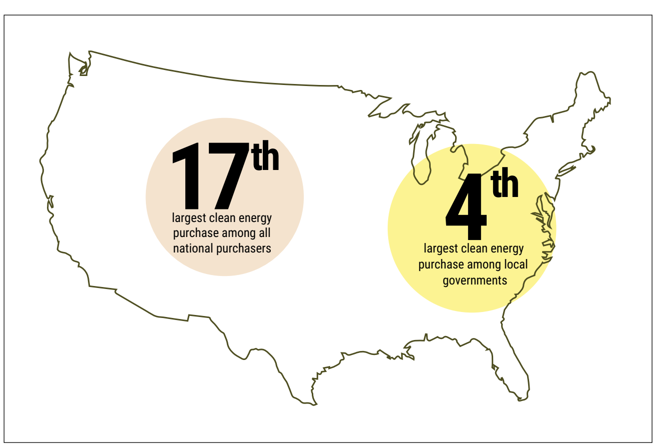
$785,000

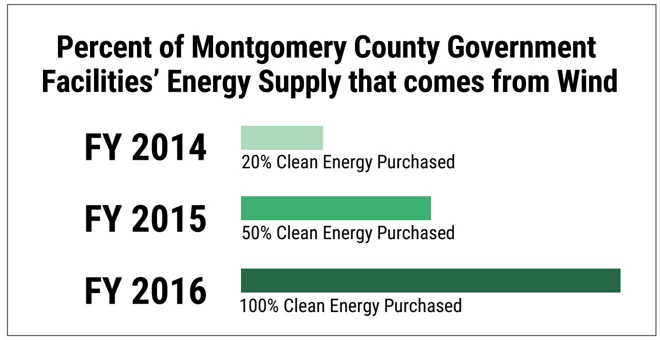


REAL TIME SOLAR ENERGY GENERATION

Visit the Office of Energy and Sustainability website at http://www.montgomerycountymd.gov/dgs-oes/SolarProjects.html to see how much energy solar panels are generating in real time.

Montgomery County's solar initiative is innovative because it fosters educational opportunities. The initiative includes projects in neighborhoods across the County and across a wide range of facilities to demonstrate the use of solar in a variety of settings, including libraries, recreation centers, child care centers, correctional facilities, and offices. The solar energy system at Fire Station 31 includes a demonstration section for fire fighters to train on how to put out fires on PV systems. We also designed the contract to be ideal as a model for other government agencies to easily initiate their own solar energy projects.





Disclosure required by Bill 9-14.

Once all 11 megawatts of solar are installed by the end of 2017, they will generate enough electricity each year to power 1,100 single family homes. The solar energy systems will reduce greenhouse gas emissions by 9,000 metric tons each year — the equivalent of planting 236,000 trees.

CLEAN ENERGY PURCHASE

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.

In addition, since 2004, Montgomery County has led a coalition of county agencies and municipalities to purchase electricity supply generated from wind energy. 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 currently ranks 4th among local governments and 17th among all national purchasers (including Fortune 500 companies) tracked by the U.S. Environmental Protection Agency's Green Power Partnership.

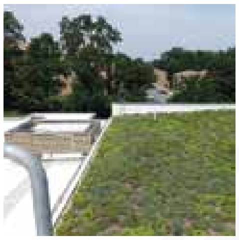
GREEN BUILDINGS

Vegetated roofs slow and filter storm water, provide habitat for birds and butterflies, and insulate buildings. 9 out of 14 Montgomery County LEED buildings have a vegetated roof, including a 4-acre vegetated roof at the Equipment Maintenance and Transit Operations Center in Gaithersburg.

GREEN BUILDINGS

Buildings provide an enormous opportunity to conserve resources and protect our environment. They account for 40 percent of greenhouse gas emissions because we need a lot of energy to heat, cool, and light them. The County's Department of General Services, builds or retrofits approximately a dozen buildings each year. All new County government buildings over 10,000 square feet are designed and constructed to achieve a minimum Leadership in Energy and Environmental Design (LEED) certification of Silver. As of October 2016, Montgomery County has built 4 LEED Silver and 10 LEED Gold buildings.

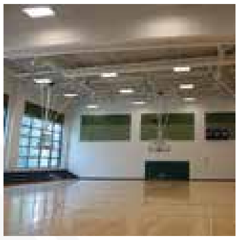
Green Building Elements



Vegetated Roofs

Renewable Energy

Energy Efficient Heating and Cooling



Energy Efficient Lighting

10 Gold
4 Silver

14 Montgomery County Buildings LEED Certified as of October 2016

Water Conservation

Rain Gardens & Stormwater Ponds

Transportation Alternatives

Green Building Materials

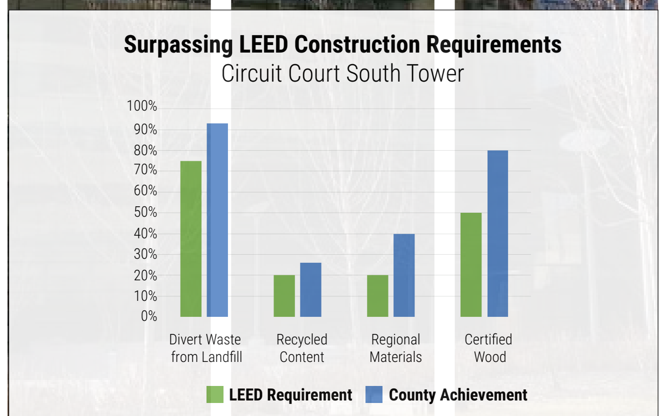
MONTGOMERY COUNTY GREEN BUILDING ACCOMPLISHMENTS

83%	**Construction waste kept out of landfills.**
21%	**Recycled materials used in construction.**
53%	**Sustainably harvested wood (FSC certified) used during construction, on average. Some buildings, such as Gaithersburg Library, have nearly all FSC certified wood.**
30%	**Locally manufactured and/or extracted materials used in construction.**
40%	**Reduction in water use over baseline levels.**
15%	**Reduction in energy use over baseline levels.**

Percentages are based on averages across all LEED buildings certified through October 2016.

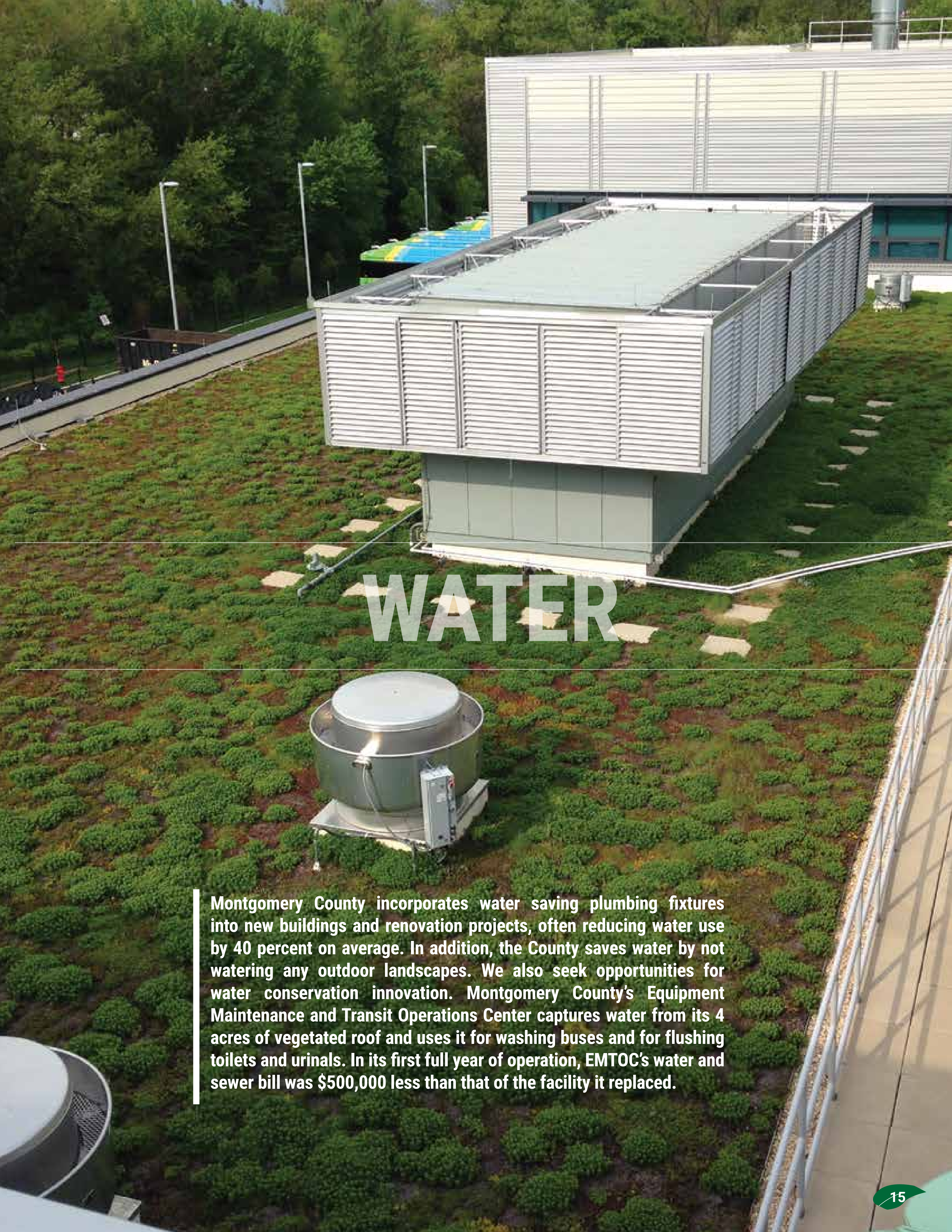
NANCY H. DACEK NORTH POTOMAC RECREATION CENTER

Opened in October 2016, this facility makes fantastic use of natural light with windows and skylights throughout all of the meeting rooms, social halls, hallways, gyms, and art studios. Highly efficient LED fixtures provide additional lighting when needed. The building also features extensive vegetated roofs and rain gardens, a highly efficient heating, air conditioning, and ventilation system and the use of state-of-the-art healthy and safe materials for playgrounds and fields.



CIRCUIT COURT SOUTH TOWER

The Circuit Court South Tower is a six story building that provides ten additional courtrooms and administrative space for the judicial center in Rockville. The building features a wall of windows to maximize natural light, a vegetated roof, and rooftop solar panels. The building achieved a LEED Gold certification, surpassing LEED construction requirements in many categories.



WATER

Montgomery County incorporates water saving plumbing fixtures into new buildings and renovation projects, often reducing water use by 40 percent on average. In addition, the County saves water by not watering any outdoor landscapes. We also seek opportunities for water conservation innovation. Montgomery County's Equipment Maintenance and Transit Operations Center captures water from its 4 acres of vegetated roof and uses it for washing buses and for flushing toilets and urinals. In its first full year of operation, EMTOC's water and sewer bill was $500,000 less than that of the facility it replaced.

WATER

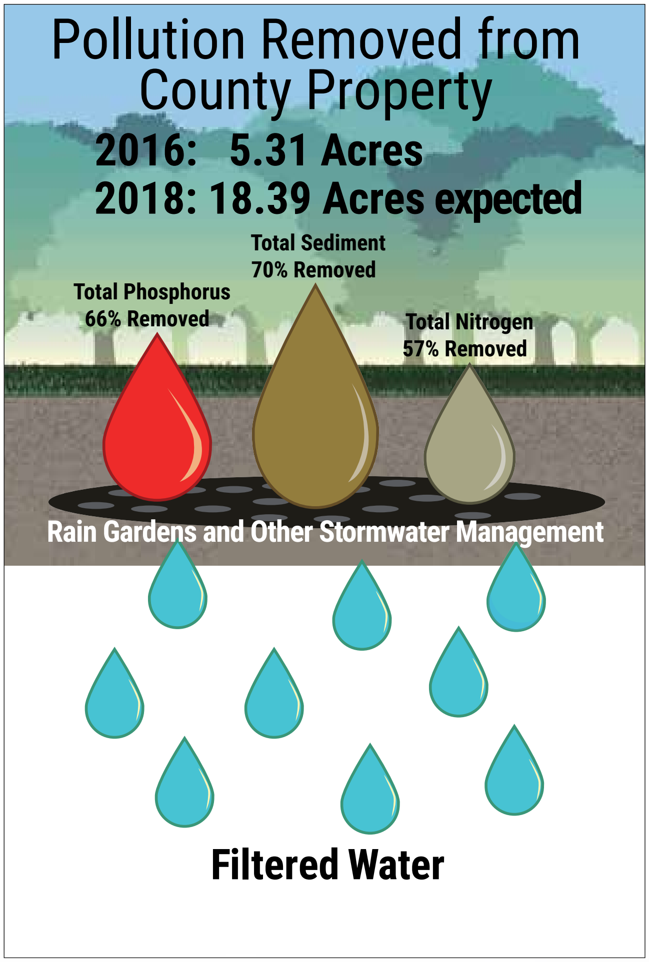
REWARDING EXCELLENCE TEAM PILOTS WATER SAVINGS

A team from the Department of General Services, Division of Facilities Management that participated in the Rewarding Excellence (employee gain sharing) program recognized a potential for significant savings through installing sub-meters for cooling towers. As water runs through the cooling system for buildings, some water evaporates. Sub-meters show the water loss and allow the water utility to credit the County for sewer services not used. From FY2013-FY2016, Montgomery County has saved $177,974 at Strathmore Concert Hall and $43,942 at Montgomery County Correctional Facility. Lessons learned by the team are being applied in other buildings as the County pilots additional water conservation projects.

In 2016, the Office of Energy and Sustainability initiated a pilot project including water use audits and data analysis to identify and prioritize water saving measures at its facilities. Water saving measures may include installation of low-flow showerheads, sinks, and toilets, as well as smart metering. In addition, measures may include educational signage at high public use facilities, such as pools, libraries, and theaters. The County is conducting this project with AQUEES, a local green business start-up that is part of the Bethesda Green Incubator.

STORMWATER MANAGEMENT

Stormwater is rain and snow melt that runs over roofs, parking lots, streets and other hard surfaces, picking up pollutants along the way before ending up in our streams and rivers. Stormwater treatment involves slowing and filtering the water to prevent flooding and water pollution. Montgomery County treats all stormwater in new construction according state and County regulations, in which stormwater from 90% of the average annual rainfall is captured and treated to remove 80% of pollutants. In addition, through the Capital Improvements Program and the RainScapes Program, the County installs new stormwater treatment structures on older facilities that were not previously being treated, improving water quality in the process. Total acreage of hard (impervious) surfaces treated by stormwater projects, including both Capital Improvements Program and RainScapes Program projects through 2016 is 5.31 acres. Based on projects currently under construction or in design, an additional 13.08 acres will be treated within the next two years bringing the total area treated to 18.39 acres. These best management practices remove sediment, phosphorus, and nitrogen, the top three pollutants threatening local streams and the Chesapeake Bay.



WASTE REDUCTION

The Department of Environmental Protection has operated a food composting pilot project at the Executive Office Building cafeteria since November 2011. Scraps generated from food preparation are separated for recycling collection, diverting a total of 87 tons of food scraps for composting from November 2011 through June 30, 2016. In FY2016, DEP expanded the food scrap recycling collection project to include pre-consumer food scraps generated in the cafeterias located at the Council Office Building and at the Public Safety Headquarters Building.

WASTE REDUCTION

FY 2016

5.6 million sheets of paper saved in FY 2016

Equivalent of:

931 trees saved

Reduced GHG by **156** metric tons

14.8 million gallons of water saved during the paper production process

OR 371,141 bathtubs full of water saved in the paper production process

PAPER USE REDUCTION

The County is implementing innovations to reduce paper waste from government operations, achieving a reduction of more than 5.6 million sheets of paper in FY2016. The County's state-of-the-art print management system defaults to double-sided and makes deleting unwanted print jobs easy. Departments across the county continue to embrace paperless processing:

- Department of Finance converted several processes from paper to digital, including directly importing scanned images into an electronic filing system.
- Department of General Service's print shop now uses digital ordering for in-house print services.
- The Department of Permitting Services has converted a significant portion of the permit application process to an electronic system.
- Over the next two years, Montgomery County Public Libraries plans to provide phone or text notifications to notify customers when hold materials are available, rather than printed mailers. This change is anticipated to save $13,000 each year.

Switching to *e*Plans has saved

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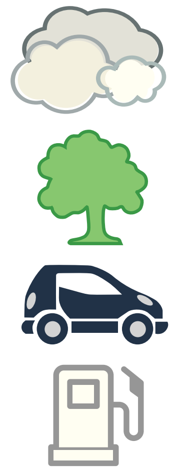


118 metric tons in greenhouse gas emissions

787 trees

41,155 hours of drive time

$188,626 in fuel

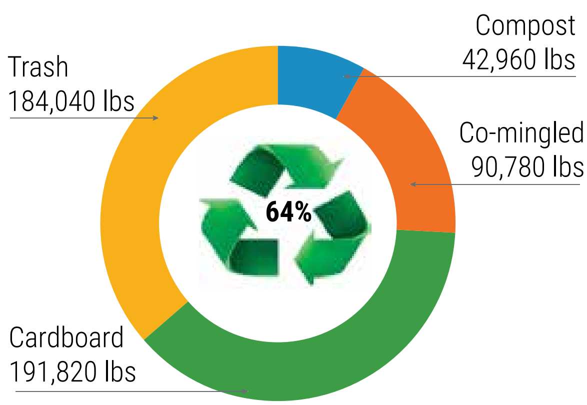
ePLANS

Department of Permitting Services handles thousands of permit requests each year. Traditionally, the process required applicants to deliver multiple copies of poster size plans to different agencies by courier or in person. In FY2014, the department began phasing in an electronic system for the permitting process, called ePlans. The system is a virtual workplace that not only eliminates the need for paper copies, but also eliminates the need for in person meetings.

FURNITURE AND OFFICE SUPPLIES

Montgomery County stores surplus furniture and supplies in a warehouse for reuse by employees, saving money and resources. In addition, employees routinely reuse office supplies like binders, clips, and folders.

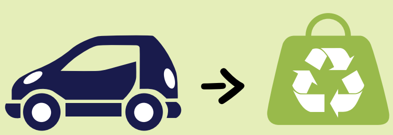
Executive Office Building Waste and Recycling in FY2015



*The Executive Office Building has a base recycling rate of 64%. Montgomery County's overall recycling rate across all sectors, public and private, commercial and residential, is 56%. The County also receives an additional 5% credit from the state of Maryland for our educational efforts and policies that lead to waste reduction.

RECYCLING

Montgomery County Department of Environmental Protection provides recycling containers and educational signage, materials, and training at our County government facilities. We are currently tracking recycling rates at each facility to best target education and outreach efforts for employees and the public in order further reduce waste and maximize our recycling rates.



2,640 tons recycled metal from cars

The County's Vehicle Recovery Section within the Police Department removes 136 abandoned, unregistered, and junk vehicles per month on average. Vehicles are sold at auction and the majority (65%) are recycled for metal and parts. This equals 2,640 tons of recycled metal each year — enough to make more than 1,900 new cars — based on 2,727 pound of steel and aluminum in the average car (according to ETF.com). That would make 2,640 tons of metal into about 1,936 cars worth.

BIODIVERSITY AND GREEN PURCHASING

Montgomery County requires landscaping contractors to use integrated pest management on County facilities – an eco-friendly and common sense strategy that focuses on long-term prevention of pest damage through biological control, habitat adjustments, and other minimally toxic techniques .

RECYCLED MATERIALS

Montgomery County purchased $4.3 million of products containing recycled materials in FY2016.

- **Increased recycled content of plastic recycling bins from 25% to 50%.**
- **Copier and printer paper throughout the County is 100% recycled, with 30% post-consumer content.**
- **65% of all paper products the County purchased in FY2016 contained some recycled content with 91% containing 25-50% recycled content.**
- **Used an average of 21% recycled materials in new construction between FY2012 and FY2016.**

BIODIVERSITY AND GREEN PURCHASING

BIODIVERSITY

Montgomery County government improves biodiversity through conserving forests, planting native vegetation, implementing pollution prevention measures, and using eco-friendly landscaping on County-owned property.

In FY2016, the County helped protect the roots of mature trees on County property with eye-catching no parking signs. We also worked with community experts to educate County staff in strategies to protect biodiversity. Training in FY2016 focused on honey bee conservation.

ELECTRONICS

Printers and copiers in County government facilities, including libraries, are independently verified as energy efficient, including ENERGY STAR qualification and Electronic Product Environmental Assessment Tool (EPEAT) certification. Toner cartridges and end-of-life equipment are recycled.

In FY2016, the County purchased 2,533 Energy Star computers (PCs and laptops). All County laptops and desktops (including those for employees and those at public libraries) have earned ENERGY STAR qualification, which means they are among the most energy efficient equipment available. They also are EPEAT Gold certified (the highest certification), which addresses environmental sustainability throughout a product's life cycle. From FY2013-FY2016, there were 8,035 PC purchases and 1,392 laptop purchases. Out of those, 2,420 PCs and 113 laptops were purchased in FY2016.

ENVIRONMENTALLY PREFERABLE CLEANING PRODUCTS

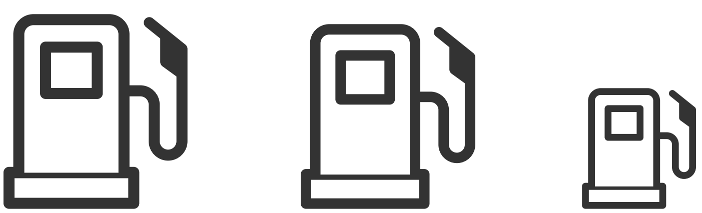
Montgomery County is committed to green cleaning. This includes purchasing green soaps and cleansers, training cleaning staff in environmentally friendly cleaning techniques, using green cleaning equipment, and properly storing and managing hazardous materials. At maintenance facilities for buses and other County vehicles, we use eco-friendly auto parts washers. These washers use natural enzymes and bacteria to convert oil and other harmful materials into safe substances, like carbon dioxide and water.

TRANSPORTATION

County employees are encouraged to participate in Bike to Work Day and MCDOT displays flyers and posters in the EOB and COB advertising the event, particularly the Bike to Work Day "Pit Stop" in Rockville Town Center. Montgomery County also provides infrastructure to make bike commuting easy. 100% of Ride On buses and 83% of County parking garages now have bike racks.

TRANSPORTATION

2014 Baseline	2016	2020 Goal
5,437,571 Gallons	↓ 3.8% Reduction 5,230,895 Gallons	↓ 20% Reduction 4,350,057 Gallons



FLEET FUEL CONSUMPTION

Montgomery County's comprehensive Green Fleet Strategy combines sound management, fleet rightsizing, alternative fuels, and innovative technology to achieve a 20% reduction in petroleum consumption by 2020. In FY2016, Green Fleet efforts saved 206,676 gallons of fuel over FY2014 levels, representing a **3.8% reduction in petroleum use in just two years.**

ELECTRIC VEHICLES AND INFRASTRUCTURE

Montgomery County has installed 15 charging stations (most capable of charging two vehicles at a time) for fleet use and currently operates 23 electric or plug-in hybrid vehicles. The County has also installed 14 charging stations (capable of charging two vehicles at a time) for public use at the County's public parking garages and other facilities.

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 electric vehicles. The County uses Ultra Low Sulfur Diesel instead of biodiesel due to performance issues discovered in biodiesel 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 (CNG) as a cost-effective, lower emissions alternative to diesel for heavy duty vehicles. 32% of the County's bus fleet is fueled by CNG and the County operates two CNG fueling stations.

FLEET COMPOSITION

The County is right-sizing its fleet by replacing vehicles with more efficient vehicles and better sizing the vehicle class (e.g., sedan, SUV) to the job function. Montgomery County eliminated 147 vehicles from its fleet between FY2014 and FY2016.

TELEMATICS PILOT

Combining technology and training, the Department of General Services conducted a pilot to improve fuel economy, lower costs, and reduce greenhouse gas emissions. This pilot used telematics – a combination of GPS devices, mapping software, real-time vehicle data, and connected mobile devices to optimize routes in response to road conditions, minimize idling, and empower drivers to see important connections between driving choices and environmental impact. 68 vehicles were included in the pilot, including 62 administrative vehicles and 6 delivery trucks.

EMPLOYEE TRANSIT

Montgomery County offers employees a number of benefits to reduce the environmental impact of employee commutes to work. Employees have access to free Ride On bus service, discounted membership in Capital Bikeshare, access to the Commuter Connections regional ridesharing program, and reimbursement for regular public transit use through the County's Get-In program.

TELEWORK AND ON-LINE TRAINING

Routine, scheduled telework reduces greenhouse gas emissions associated with employee commutes. In February 2016, Montgomery County launched a year-long telework pilot program. The Office of Human Resources and the Department of Transportation developed a telework policy and guidelines for implementation with employees. More than 200 employees from seven departments are participating.

In addition, Montgomery County is using technology to reduce employee drive time for meetings and trainings. Montgomery County Public Libraries offers several employee trainings on-line to eliminate travel to Rockville. In addition, required information technology safety training is available to all County employees on-line.

SMART PARKING

Montgomery County is using new technology at our most popular public parking garages that can guide drivers to available spaces, saving driving time and reducing greenhouse gas emissions. In FY2016, Montgomery County's Department of Transportation installed 1,182 smart parking meters in Silver Spring, adding to the 820 smart meters already installed in Bethesda. The parking meters use solar power and rechargeable batteries, saving energy and reducing waste. The new meters accept credit cards, coins, and pay-by-cell phone.

COMMUNITY ENGAGEMENT AND RESILIENCY

COMMUNITY ENGAGEMENT AND RESILIENCY

GET THE LATEST GREEN GOVERNMENT NEWS

Follow the Office of Energy and Sustainability for the latest Montgomery County green government news. You'll see photos and video of green buildings and solar energy systems under construction, behind-the-scenes images and stories of Montgomery County employees reducing waste and saving energy, live tweeting of events, information that can help you green your home and workplace, and more.

https://www.facebook.com/MocoGreenDGS/

https://twitter.com/MoCoOES.

RESILIENCY

Montgomery County is improving its ability to anticipate and quickly adapt to extreme weather, economic downturns, and natural and man-made disasters. Reducing energy use and increasing on-site power generation at critical facilities ensures that Montgomery County can keep residents safe and provide needed services in spite of power outages. Resilient County facilities also relieve pressure on the power grid, reducing blackouts and brownouts during times of peak electricity use.

COMBINED HEAT AND POWER

In FY2016, Montgomery County increased resiliency by piloting a combined heat and power system at the Pre-Release Center in Rockville. Combined Heat and Power, also known as co-generation, saves energy by using waste heat from on-site power generation to heat buildings. The combined heat and power system will serve as the main source of electricity and heat for the building.

Montgomery County is an inaugural participant in the U.S. Department of Energy's Combined Heat and Power for Resiliency Accelerator Program. The Accelerator supports combined heat and power solutions to keep critical infrastructure operational every day and night regardless of external events. Montgomery County is one of 23 local partners participating in the program across the United States.

WINTER STORM JONAS

An important aspect of resiliency is the County's ability to clear roads and restore services during extreme weather events. Winter Storm Jonas, a major blizzard that produced more than three feet of snow in Montgomery County in one weekend in January 2016, demonstrated that the County is able to bounce back quickly from major storms. Within two days of the end of the storm, 86% of County facilities were ready to resume operations. All facilities were accessible and ready to resume operations by the third day after the storm.

COMMUNITY ENGAGEMENT

Montgomery County government employees, nearly 10,000 strong, can have an enormous impact on cleaning up pollution and reducing waste through everyday actions at work. In FY2016, employees engaged in recycling, purchasing environmentally preferable goods and services, and donating food, money, and surplus office supplies to community members in need. The Department of Environmental Protection also provided training for Department of General Services staff in materials that can and cannot be recycled.

In addition to engaging employees, the Office of Energy and Sustainability increased public engagement over the past year with increased social media presence, partnering with the Department of Environmental Protection on educational events for the public for Energy Action Month, and unveiling a new user-friendly website in December 2016.

AWARDS AND RECOGNITIONS

NATIONAL ASSOCIATION of COUNTIES NACo

- **FY16 National Association of Counties (NACo) Award for Installation of Solar and Advanced Energy at County Facilities.**
- **Two FY15 National Association of Counties Awards for sustainability initiatives, recognizing 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.**
- **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.**
- **Montgomery County was recognized by the White House for its aggressive commitment to develop 6 megawatts of renewable energy across the County portfolio.**
- **Smart Energy Community Designation from the Maryland Energy Administration.**
- **The County's Fleet was featured as a "Clean Cities Fleet" on Motor Week.**

FINANCIAL STEWARDSHIP

Not only has Montgomery County shown leadership in environmental sustainability, we also strive for excellence in stewardship of financial resources. The Department of General Services, including staff from the Office of Energy and Sustainability, the Division of Building Design and Construction, and the Division of Facilities Management, have cumulatively saved more than $3.5 million from FY2013-FY2016. With the addition of solar energy systems and energy saving projects planned through FY2019, we expect to save more than $30 million over the next 20 years.

Billing Recovery	**FY2016 Savings $86,816** **Cumulative Savings $610,000** Analyzed utility bill information and recovered funds from billing mistakes and contractor use during building construction.	**Sub-Meter Installation**	**FY2016 Savings $73,547** **Cumulative Savings $267,132** Installed water sub-meters on the cooling towers of several County facilities.
Grants & Incentives	**FY2016 Grants $598,156** **Cumulative Grants $2,084,128** Secured grants and incentives for energy saving projects in County facilities.	**Solar**	**Anticipated Savings** **$15 million+ over 20 years** Secured solar power purchase agreements from solar panels installed on County facilities in 2016-2017.
Energy Efficiency	**Cumulative Savings $294,876** **Anticipated Savings $765,000** *(annually from projects that will be completed over the next three years).* Saved on utility costs from energy savings projects in County facilities.	**Demand Response**	**FY2016 Savings $82,260** Participated in demand response, where the County takes action to reduce energy demand in select buildings during periods of peak energy demand, usually on the hottest summer days.
Energy Purchasing	**FY2016 Savings ~$225,000** **Anticipated Savings $550,000 per year in FY2017-FY2018** *Negotiated electricity supply contract to save costs on electricity in County facilities from mid-FY16 through FY2018.*		

* Cumulative savings includes FY2013 through FY2016

REINVESTING ENERGY SAVINGS

The County funds many energy efficiency projects by leveraging future savings. Funds that previously would have been used to pay for utilities such as electricity and natural gas are invested into projects that improve the health and comfort of our buildings with no negative impact on the County's overall budget. In FY2016 the Department of Finance issued a proposal for a financier to provide a master lease to enable the efficient and quick financing of energy performance contracting and similar projects. The master lease was closed in FY2017 with an overall $40 million line of credit.

NEW INITIATIVES INCLUDE...

- A County government operations sustainability plan that will identify goals, targets, and actions for each topic area identified in this report.
- A strategic energy management plan that will outline goals, targets, actions, timelines, and staff roles and responsibilities toward maximizing energy efficiency of the County's portfolio of buildings.
- A comprehensive plan for installation and management of solar energy systems at County facilities. The plan will include a target for the total clean energy to be installed on County facilities and a process to vet new facilities for potential renewable energy.
- Pilot employee education and behavior change campaigns to maximize the sustainability of County operations. Pilots may include campaigns to save energy, increase recycling rates, and establish green teams.
- Continued installation of solar energy systems on County facilities. Completion of projects at three facilities will add an additional 8.1 megawatts to our current solar capacity for a total of 11 megawatts by the end of 2017.

Montgomery County

will expand its work

in 2017

and beyond.

- Installation of microgrid systems at Public Safety Headquarters and Montgomery County Correctional Facility to save energy and improve the County's resiliency to natural and man-made disasters. Microgrids incorporate technologies such as microturbines, solar, and advanced building controls to allow facilities to operate independently from the utility grid during power outages.
- Additional tree planting on County properties to increase biodiversity and reduce stormwater pollution.
- New green buildings, including Wheaton Library and Community Recreation Center and Good Hope Community Recreation Center.
- Retrofit of County owned street lights to highly energy efficient lighting, saving energy and reducing costs.

DATA TABLES

I. Greenhouse Gas (GHG) Emissions in Metric Tons from Montgomery County government operations (facilities and fleet) from FY2011-FY016.

Fiscal Year	GHG from Facilities (metric tons)	GHG from Fleet (metric tons)	Total GHG from Facilities and Fleet without Offsets (metric tons)	GHG Reductions from Renewable Energy Certificates (metric tons)	Total GHG from Facilities and Fleet with Offsets (metric tons)
2011	84,354	55,335	139,689	(33,174)	106,515
2012	92,008	59,607	151,615	(32,903)	118,712
2013	92,615	60,916	153,531	(35,324)	118,207
2014	102,408	59,770	162,178	(35,261)	126,917
2015	104,281	59,749	164,029	(60,116)	103,913
2016	104,226	59,627	163,853	(126,098)	37,755

Facilities data are based on electricity, natural gas, and building fuel consumption based on utility bill data for all County-owned facilities as well as leased spaces that house County staff and operations. Fleet data are based on petroleum, natural gas, and electricity consumption for all County vehicles, including cars, trucks, buses, and off-road and industrial equipment. Renewable energy certificates are purchased to ensure renewable energy from wind, solar, and other renewable sources are added to the grid and used by another party to offset the greenhouse gas emissions from fossil fuels.

II. Percent Reduction in Greenhouse Gas Emissions and Social Cost of Carbon from Montgomery County government operations (facilities and fleet) from FY2011-FY016.

Fiscal Year	Greenhouse Gas Emissions (metric tons)	Percent Reduction (from 2005 baseline)*	Social Cost of Carbon
2011	106,515	7%	$ 2,940,000
2012	118,712	-4%	$ 3,150,000
2013	118,207	-4%	$ 3,240,762
2014	126,917	-11%	$ 3,462,774
2015	103,913	9%	$ 2,702,994
2016	37,755	67%	$ 1,044,708

*The 2005 baseline of 114,000 metric tons of greenhouse gas emissions was calculated using a subset of Montgomery County government facilities and fleet operations for which data are available.

III. Energy Use Intensity Across County Buildings (Non-Departmental Accounts).

Fiscal Year	MMBtu	Sq Ft	KBtu/Sq Ft
FY13	485,813	5,355,978	91
FY14	538,350	5,671,068	95
FY15	553,144	5,511,438	100
FY16	554,086	5,586,418	99

IV. Energy Efficiency Projects Summary

Project Type	Year Completed	Estimated Annual Utility Savings	Grants and Incentives	Annual GHG Emissions Reductions (metric tons)	Social Cost of Carbon Avoided Annually
Parking Garage LED Lighting	FY2014	$92,415	$229,155	541	$11,366
Building LED Lighting	FY2015	$35,078	$278,979	205	$4,314
ESCO Building Upgrades	FY2015	$74,968	$107,056	348	$7,317
Building LED Lighting	FY2016	$6,706	$18,535	39	$825
ESCO Building Upgrades	FY2017 (expected)	$475,986	$633,752	1,279	$26,869
Building LED Lighting	FY2017 (expected)	$180,492	$149,622	1,015	$21,317
ESCO Building Upgrades	FY2019 (expected)	$214,072	$305,859	1035	$21,730
TOTAL		**$1,079,717**	**$1,722,958**	**4,462**	**$93,738**

Disclosure required by Bill 5-14.

V. Energy Performance Benchmarking

County Building	ENERGY STAR Score
Health and Human Services Administrative Offices	94
Montgomery County Circuit Court North Tower	75
Montgomery County Circuit Court South Tower	61
Mid-County Health and Human Services Building (1301 Piccard Drive)	51
Executive Office Building	33
Up County Regional Service Center	18
Council Office Building	14
Public Safety Headquarters	12
White Oak Recreation Center	N/A*
Holiday Park Senior Center	N/A*
Gaithersburg Library	N/A*
Germantown Library	N/A*
Strathmore Music Center	N/A*
Rockville Library	N/A*

*Building type cannot earn an ENERGY STAR score.
Disclosure required by Bill 2-14.

VI. Scheduled Energy Efficiency Projects funded by ESCOs (subject to revision)

Project	Anticipated Completion
1301 Piccard Drive	FY17
Silver Spring Health Center at 8818 Georgia Avenue	FY18
Twinbrook Library	FY18
Kensington Park Library	FY18
Pre-Release Center	FY18
Longwood Community Recreation Center	FY18
Upcounty Regional Services Center	FY18
Aspen Hill Library	FY18
Davis Library	FY18
Little Falls Library	FY18
White Oak Library	FY18
Bethesda Library	FY18
Quince Orchard Library	FY18
Olney Swim Center	FY19
County Owned Street Lights	FY19
Council Office Building	FY19
Long Branch Library	FY19
Marilyn Praisner Library	FY19
Poolesville Library	FY19

VII. Scheduled Energy Efficiency Projects funded by Capital Improvements Program (subject to revision)

Project	Anticipated Completion
Brookeville Maintenance Facility	FY17
Strathmore Concert Hall	FY17
AFI Silver Theater	FY17
Black Box Theater	FY17
Bauer Drive Recreation Center	FY17

IX. Fuel Economy Standards

Average Fuel Economy	FY2012	FY2015	FY2016
Administrative Fleet	14.5 mpg	25.5 mpg	TBD
Public Safety Fleet	12.3 mg	15.6 mpg	TBD

* Data currently under analysis.
Disclosure required by Bill 6-14.

VIII. Solar Project Summary

Facility	Type	Power (kilowatts)	Expected Annual Energy Generation (kilowatt hours)
Completed Before 2016 (self-funded by Montgomery County)			
Shady Grove Transfer station	Rooftop	280	350,000
Equipment Maintenance and Transit Operations Center	Rooftop	74	93,758
Circuit Court South Tower	Rooftop	12 (estimated)	15,144
Completed in 2016 (Power purchase agreement through public-private partnership)			
Montgomery County Department of Liquor Control	Rooftop	1,120	1,462,362
Holiday Park Senior Center	Canopy over parking	351	440,520
Gaithersburg Library	Rooftop	220	271,234
Rockville Library	Rooftop	88	104,291
Potomac Community Center	Rooftop	55	64,249
Up-County Regional Services Center	Rooftop	54	66,905
Jane Lawton Recreation Center	Rooftop	41	42,919
Silver Spring Civic Building at Veterans Plaza	Rooftop	39	45,529
Fire Station 31	Rooftop	37	40,554
Council Office Building	Rooftop	32	38,413
Completion Expected in 2017 (Power purchase agreement through public-private partnership)			
Oaks Landfill	Ground mount	5,338	3,417,330
Montgomery County Correctional Facility	Ground mount and rooftop	2,803	3,551,401
Kidstop Childcare Center	Rooftop	31	39,277
TOTAL		**10,575**	**10,048,083**

Disclosure required by Bill 8-14.

X. County Employee Participation in Commuter Services Programs.

Program	Description	Participation in FY2016
Ride On C-Pass	County employees can take Ride On buses for free using their employee id badge.	81,455 rides (approximately 9 rides per employee)
Capital Bikeshare	Employees receive discounted annual membership for the bikesharing program.	75 employees (since 2014)
Commuter Connections	Connects commuters with vanpool and carpool opportunities and provides guaranteed ride home service.	31 employees are actively registered.
Get In Program	Partial reimbursement of public transit costs for employees who use public transportation five days a week.	93 employees participate.

XI. Recycled Materials Purchased in FY2016

Recycled Product	Cost
Asphalt and bituminous concrete (bituminous concrete may consist of 25% recycled material)	$3,268,000
Recycled paper	$367,669
Recycled office supplies purchased through the County's LSBRP contract with Benjamin Office Supplies	$411,063
Plastic recycling bins (increased recycled content from 25% to 50%)	$220,872
Record storage boxes (with recycled content from 10-26%)	$7,837
TOTAL	**$4,275,441**

XII. Stormwater Management Facilities on County Property

Facility	Stormwater Management Practice(s)	Status	Impervious Area Treated (acres)
Ken Gar Recreation Center	Rain Garden	Completed	0.05
Wheaton Veterans Park	Conservation Landscaping	Completed	0.11
Glen Echo Heights Right-of-Way	Conservation Landscaping	Completed	0.05
Aspen Hill Library	Bioretention; Curb Extension	Completed	0.71
Kensington Library	Rain Gardens; Bioretention; Bioswale	Completed	0.76
Upper County Community Recreation Center	Dry Pond Retrofit	Completed	3.63
Colesville Park & Ride	Bioretention; Water Quality Inlets	Completion Expected May 2017	1.28
Greencastle Park & Ride	Bioretention; Water Quality Inlets	Completion Expected May 2017	1.77
Little Falls Library	Bioretention	Construction Expected August 2017	0.68
Germantown MARC Park & Ride	Water Quality Inlets; Underground Water Quality Filters	Construction Expected August 2017	6.35
Longwood Recreation Center	Bioretention; Sand Filter	Construction Expected August 2017	0.6
Potomac Recreation Center	Bioretention; Permeable Paver; Underground Sand Filter; Water Quality Inlets	Construction Expected August 2017	2.4
		TOTAL	**18.39**

XIII. County LEED Certified Building Statistics

Facility	LEED Certification	Construction Waste Diverted from Landfill	Building Materials with Recycled Content	FSC Certified Wood used in Construction	Building Materials Harvested or Manufactured Locally	Water Use Reduction	Energy Use Reduction
MCPS Food Distribution Center	Silver	77%	20%	97%	33%	36%	19%
Mid County Community Recreation Center	Silver	87%	n/a	n/a	100%	43%	35%
Plum Gar Recreation Center	Silver	50%	n/a	n/a	n/a	n/a	n/a
Travillah Fire Station	Silver	82%	25%	n/a	22%	33%	21%
Animal Services and Adoption Center	Gold	96%	15%	n/a	24%	40%	14%
Circuit Court South Tower	Gold	93%	26%	80%	40%	35%	24%
Coleville Depot	Gold	98%	14%	n/a	43%	41%	18%
EMTOC	Gold	75%*	20%	50%	20%	40%	n/a
Gaithersburg Library	Gold	79%	33%	97%	35%	30%	n/a
3rd District Police Station	Gold	94%	24%	51%	24%	37%	17%
Olney Library	Gold	83%	20%	76%	22%	38%	20%
Scotland Neighborhood Recreation Center	Gold	75%*	22%	50%*	28%	44%	n/a
Silver Spring Library	Gold	85%	20%	76%	27%	43%	28%
White Oak Recreation Center	Gold	85%	20%	50%*	40%	50%	32%

*Montgomery County achieved LEED points for this category that require at least the minimum threshold listed to be met. In cases where a more precise number was not available, we substituted the minimum needed to achieve the points. Actual percentages for some of these categories may be even higher.

Montgomery County DEPARTMENT OF GENERAL SERVICES
DGS
Delivering Great Service!

Office of Energy and Sustainability
Department of General Services
Montgomery County Government
101 Monroe Street, 9th Floor
Rockville, Maryland 20850
dgs.green@montgomerycountymd.gov
www.montgomerycountymd.gov/dgs-oes

MONTGOMERY COUNTY
17 76
GARDEZ BIEN
MARYLAND