

Montgomery County Public Schools Environmental Sustainability



Sustainable Programs, Initiatives, and Strategies

November 9, 2015



Some things about me

Sean Gallagher, Assistant Director
Dept. of Facilities Management

- Facilities Mgt - 15 years
- Energy and Utilities Mgt - 30 years
- Mechanical Engineer, JD

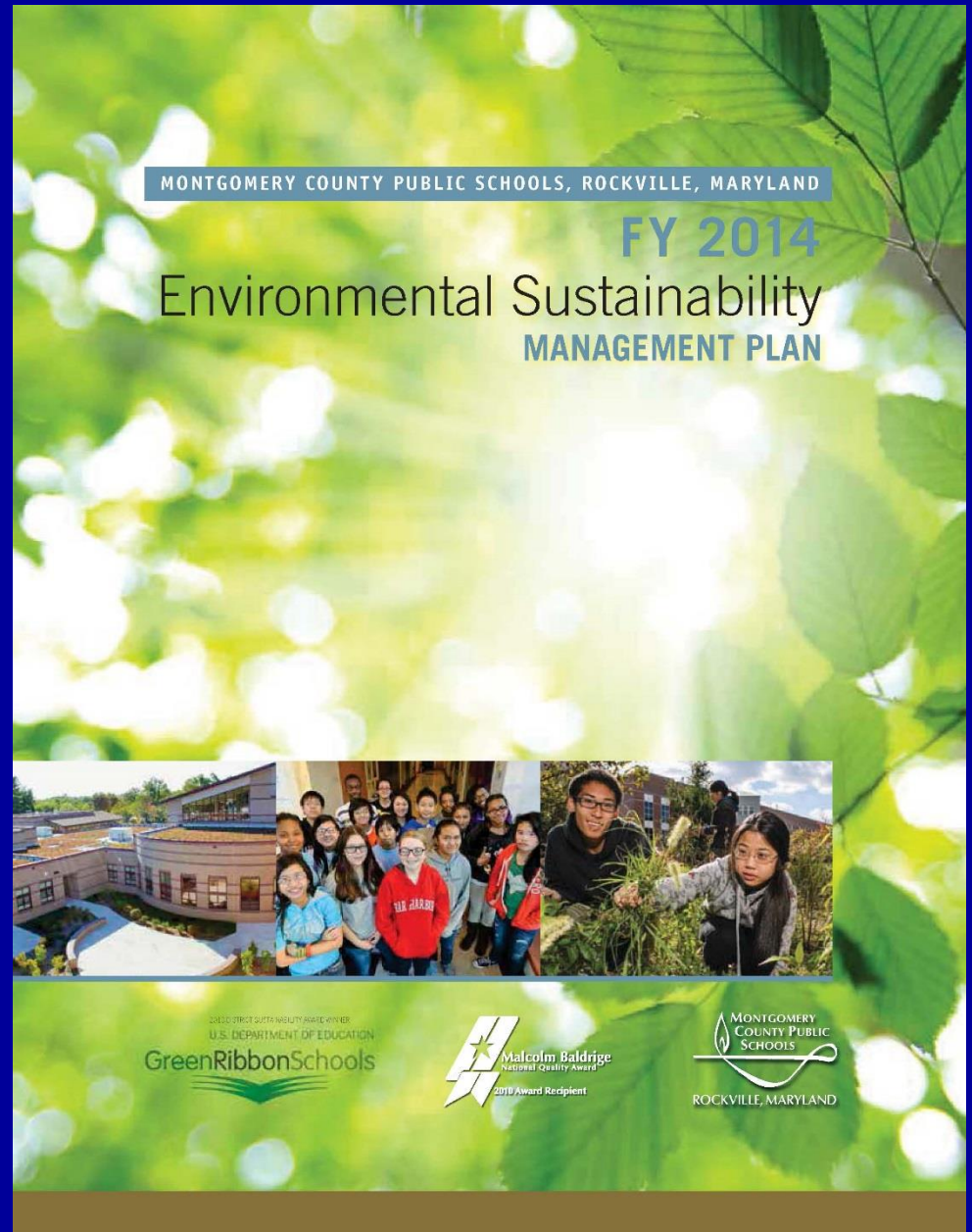
And about MCPS

- 156,455 students & growing at ~ 2,500/yr
- 202 schools
- Primarily suburban
- Utility cost ~ \$38M/yr
- Energy use index – 57 kBTU/yr



Major Sustainability Areas

- Education and Awareness
- Resource Conservation/Utilities
- Solid Waste and Recycling
- Construction and Land Use
- Transportation
- Technology



U.S. Department of Education Green Ribbon Program



Northwest High School
2015 US ED - Green Ribbon School Awardee

Travilah Elementary School
2014 US ED - Green Ribbon School Awardee

Cedar Grove Elementary School
Summit Hall Elementary School
2013 US ED - Green Ribbon School Awardees

Montgomery County Public Schools
2013 US ED - Sustainability District Award

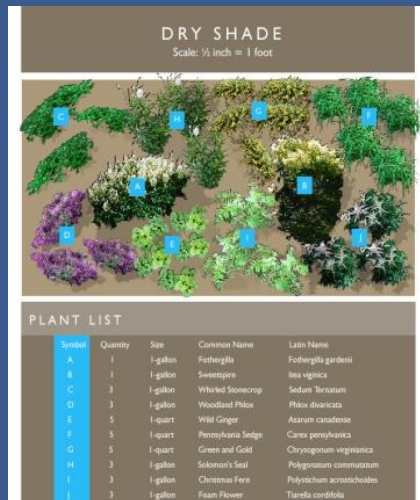
Francis Scott Key Middle School
2012 US ED - Green Ribbon School Awardee



Education and Awareness

Outdoor Environmental Education Programs (OEEP)

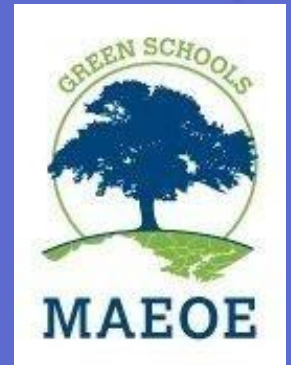
- Collaboration on edible and perennial garden initiations
- Small scale reforestation projects
- Student service learning
- MCPS Environmental Literacy Plan



Maryland Association of Environmental and Outdoor Education (MAEOE)

The MCPS SERT and OEEP are both certified Green Centers

- provide support to schools applying for Green School Certification
- Professional development
- Community partnerships
- Best management practices
- Conservation classroom activities, lessons, and outreach



School Energy and Recycling Team Program (SERT)

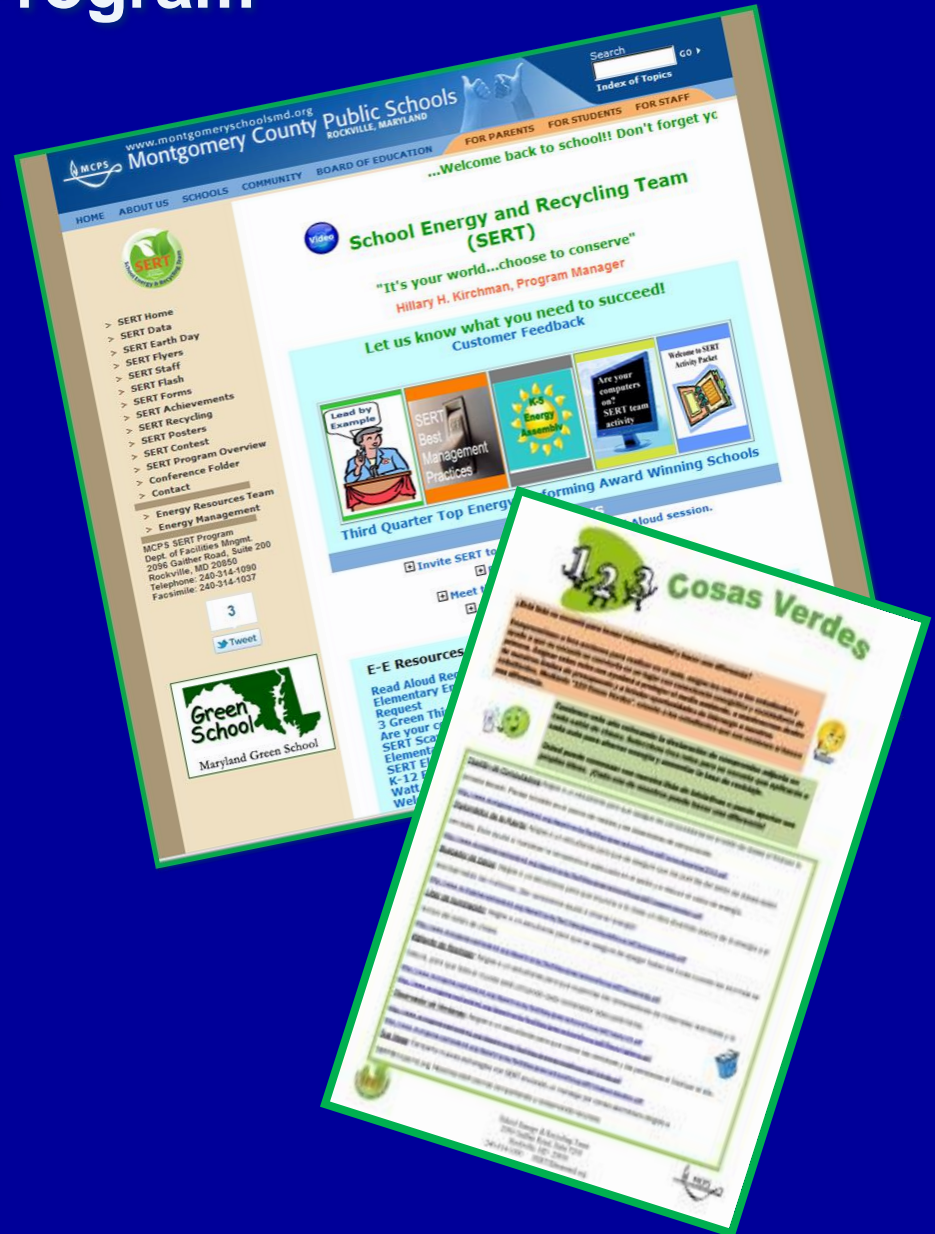
SERT is a school-based resource conservation and recycling program that comprises teams of staff and students who take responsibility to foster a culture of conservation and **green** their schools.



Earth Day Celebration—Solar Water Fountain
Francis Scott Key Middle School

SERT Program

- Activity Packets – classrooms
- Classroom presentations/activities tied to curriculum
- Read alouds, assemblies, videos, activities, and games
- Contests all inclusive K-12
- Energy and recycling kits w/tools and manipulatives
- Interactive web site
- Twitter, drop box, conference folder, newsletters, activities, data, special events and news box
- Upcoming: videos and teachers resources



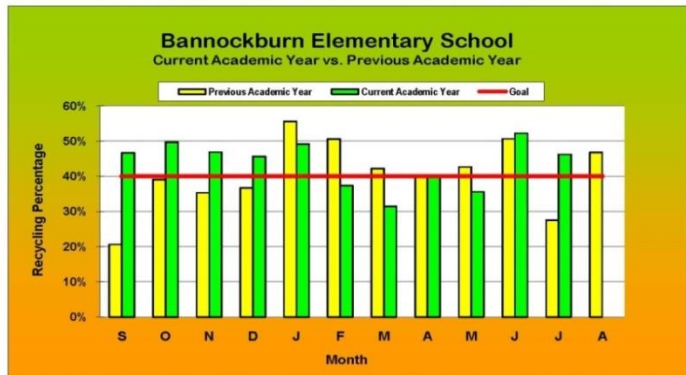
Recycling Data



Bannockburn Elementary School

Recycling Chart 2010-11 VS. 2011-12

Month	Previous Academic Year Monthly Recycling Rates	Current Academic Year Monthly Recycling Rates	% Change 2010-11 vs. 2011-12
September (S)	20.6%	46.6%	126.2%
October (O)	39.1%	49.7%	27.2%
November (N)	35.3%	46.8%	32.6%
December (D)	36.7%	45.6%	24.3%
January (J)	55.6%	49.2%	-11.5%
February (F)	50.6%	37.3%	-26.2%
March (M)	42.2%	31.4%	-25.6%
April (A)	40.2%	40.4%	0.6%
May (M)	42.7%	35.6%	-16.6%
June (J)	50.7%	52.2%	3.1%
July (J)	27.5%	46.2%	68.1%
August (A)	46.8%	0.0%	
YTD %	44.0%	44.2%	18.4%



It's your world... choose to conserve.

As of: 8/29/2012

Energy Data

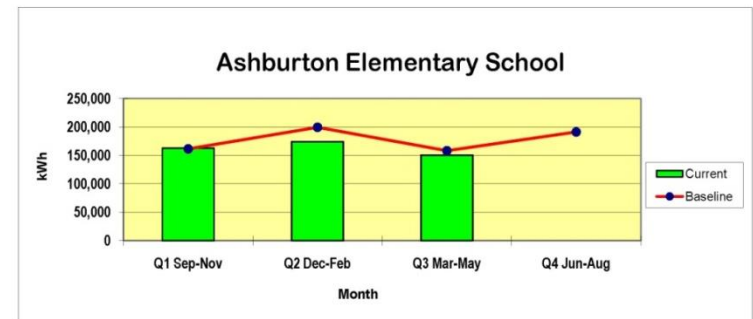


Ashburton Elementary School

Electrical Consumption (kWh)
School Year (2011-12) vs. Baseline Year (2009-10)

Energy Chart

Month	kWh Current	kWh Baseline	%Change Quarter	kWh Current YTD	% Change YTD	Actual kWh/Sq.Ft. Current Quarter
Q1 Sep-Nov	162,741	161,576	1%	162,741	1% (Q1)	2.00 (kWh/SqFt)
Q2 Dec-Feb	174,191	199,636	-13%	336,932	-7% (Q1-Q2)	2.14 (kWh/SqFt)
Q3 Mar-May	150,681	158,371	-5%	487,613	-6% (Q1-Q3)	1.85 (kWh/SqFt)
Q4 Jun-Aug	0	191,260				



Baseline adjusted for portables (+3)

It's your world... choose to conserve.

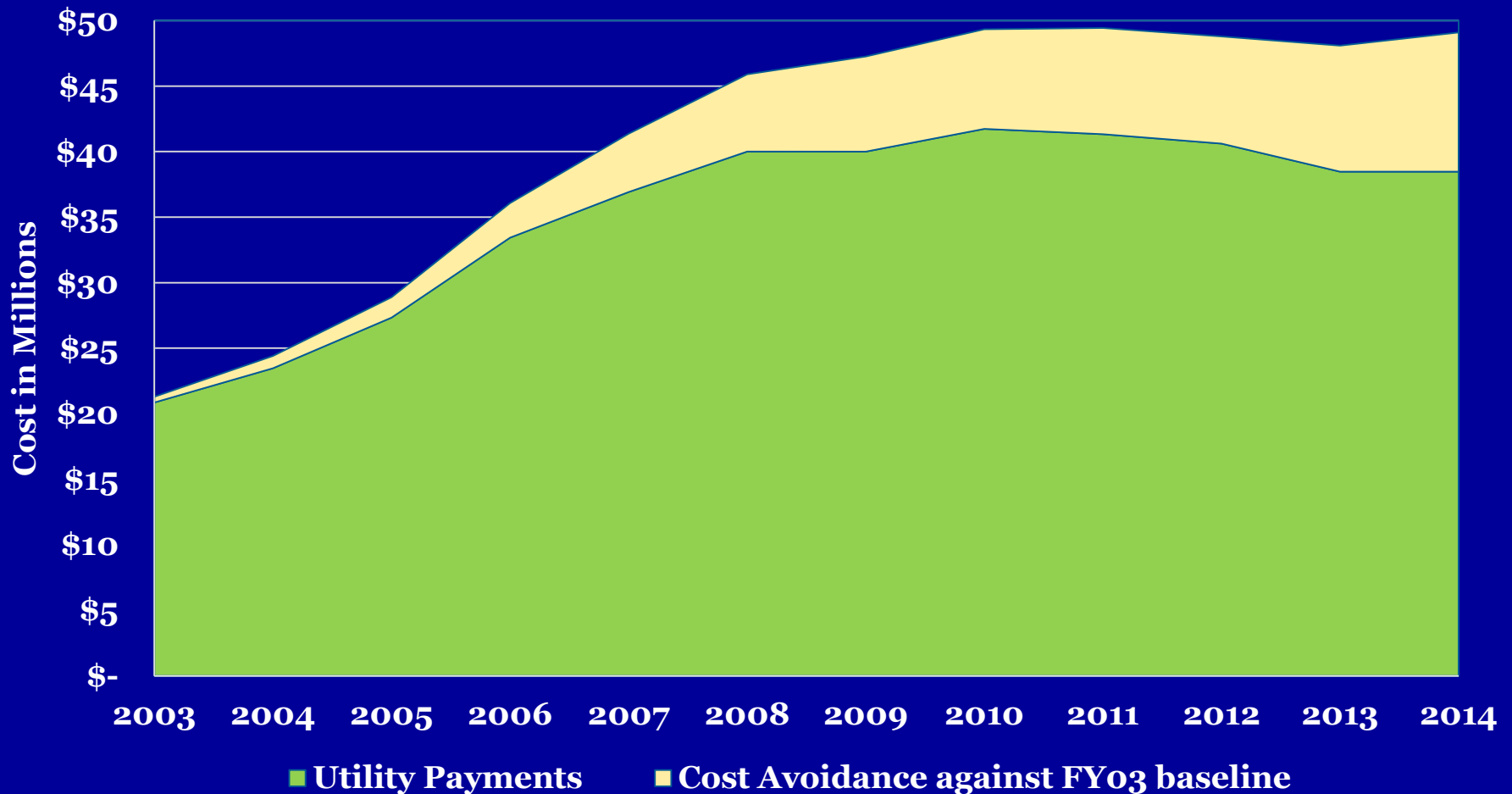
As of: 7/23/2012

Awards are granted based on performance and demonstrated savings.

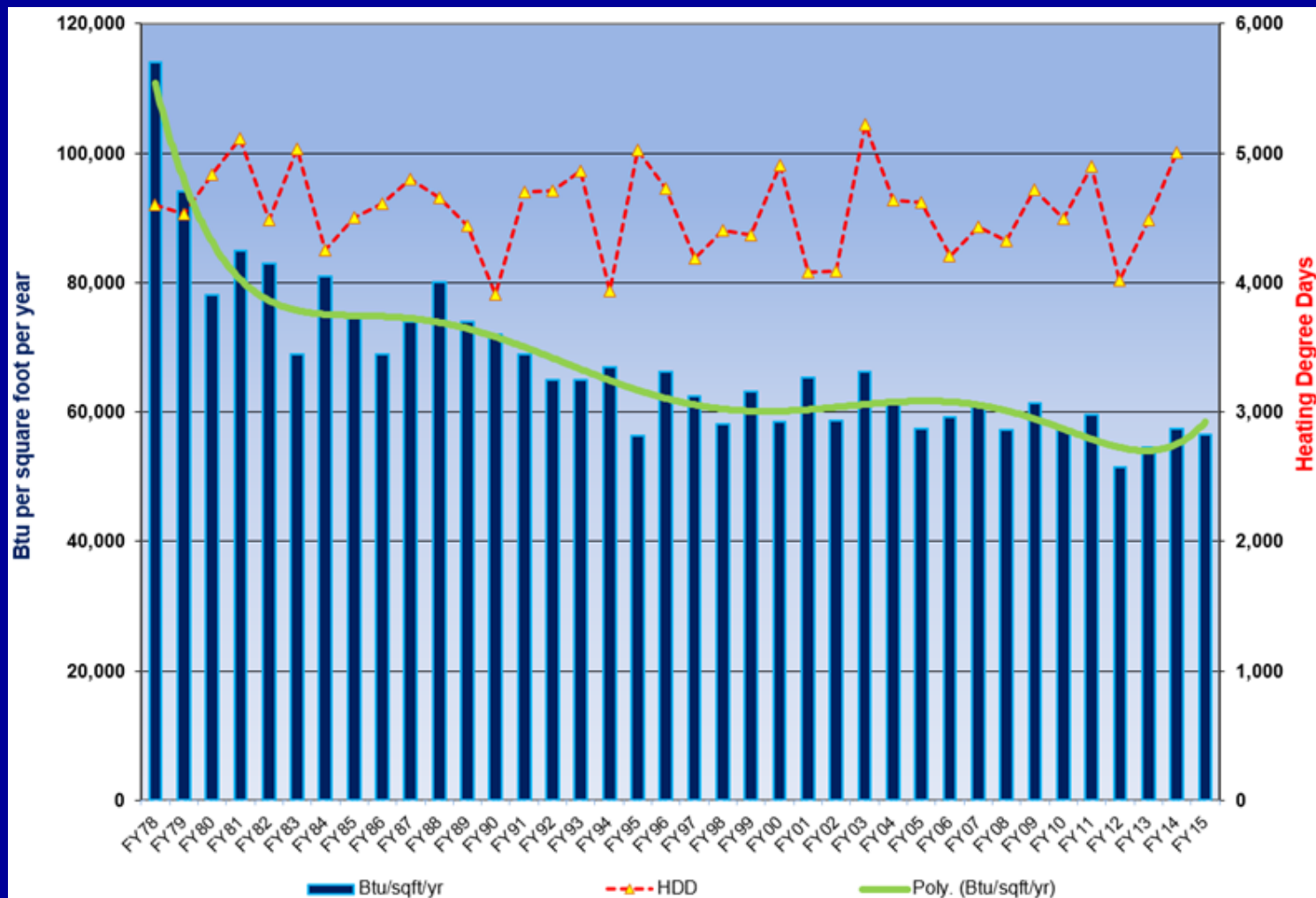
Major Sustainability Areas

- Education and Awareness
- **Resource
Conservation/Utilities**
- Solid Waste and Recycling
- Construction and Land Use
- Transportation
- Technology

MCPS Utility Cost and Cost Avoidance FY 2003–2014



MCPS Energy Performance History FY78 through FY15



Energy Retrofit Initiatives

Exterior Lighting Controls

- Retrofitted all parking lot lighting controls with electronic time clocks
- Keeps parking lot lights off during the daylight hours
- Allows tighter control of hours of operation
- Automatically adjusts for sunset and sunrise
- Verified \$590,000 per year avoided cost

Controlling Portable Classroom HVAC

- Remote controlled to schedule occupancy and setpoint
- Shut down over breaks, snow days, and emergency closings
- 2 hour override available



LED Fixtures

Pilot Project

Replacement of incandescent and halogen technology with LED fixtures in auditoriums.

Benefits:

- More than 5 times the current rated life
- >50 percent decrease in electricity consumption
- Reduced maintenance



LED technology on exterior wall pack fixtures

15 minute interval electric meters

Smart Meter

Greatly improve electric profile information

Improve efforts to curtail peak operating demand on the electricity grid

Better power outage reporting and management

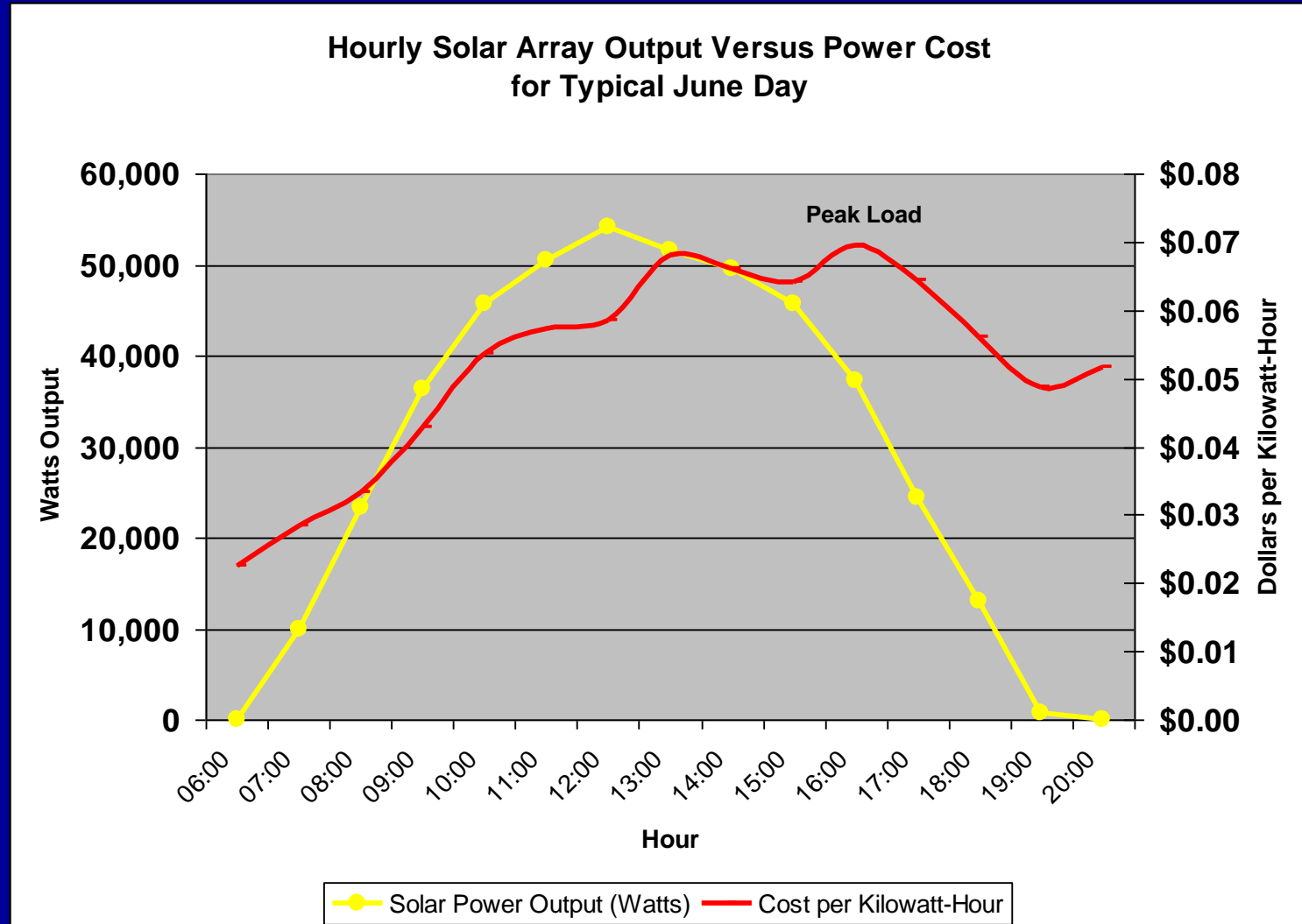




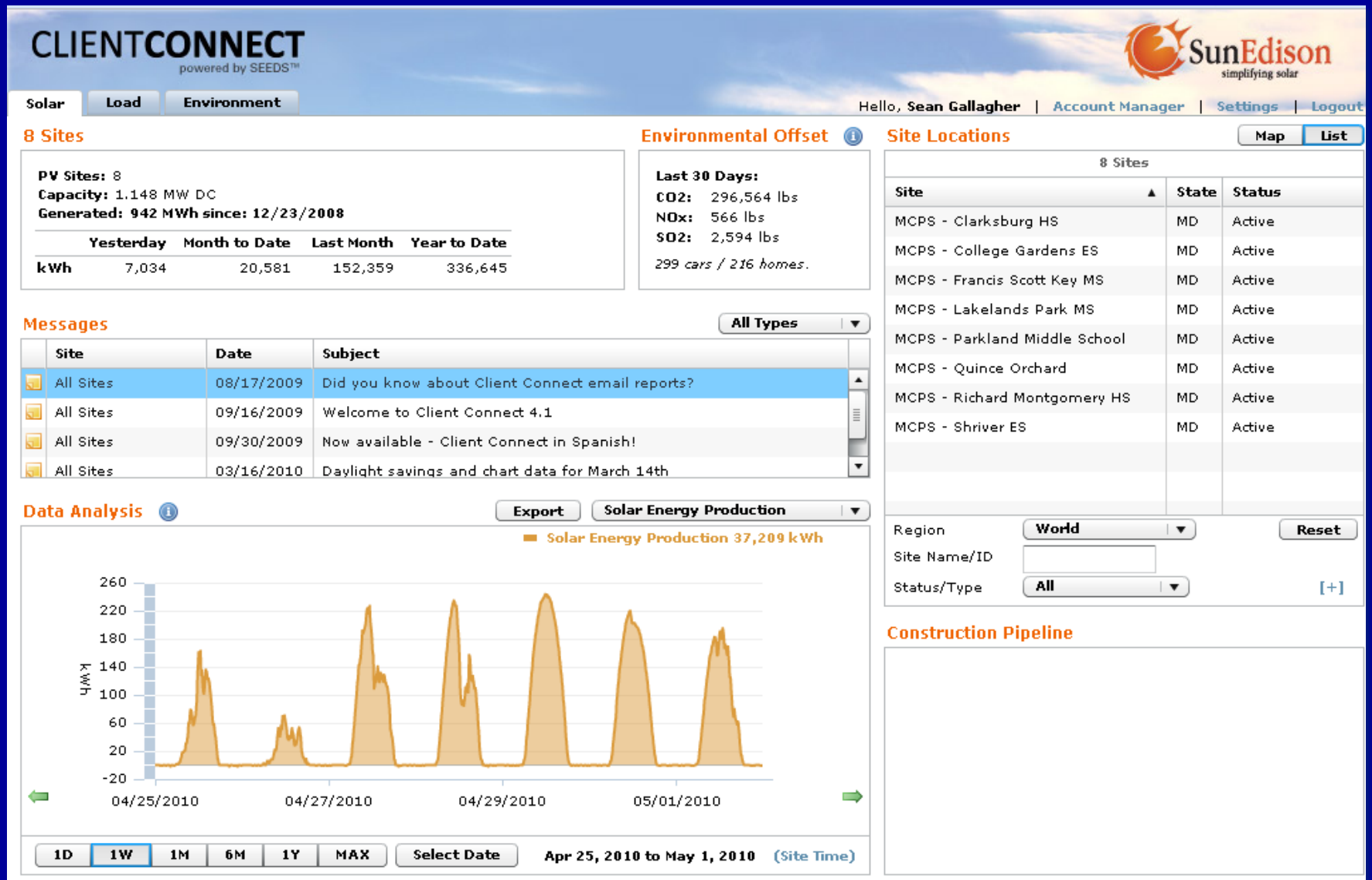
Solar PV PPA Hosting Program

Year	Description	Type	Capacity (MW)	Annual production (KWH)	Status
2008	4 schools	rooftop PPAs	0.6	1,000,000	operating
2009	4 schools	rooftop PPAs	0.6	1,000,000	operating
2015	4 schools	rooftop PPAs	1.3	2,200,000	construction
2016	4 schools	rooftop PPAs	0.8	1,400,000	design/permitting
		Total rooftop	3.3	5,600,000	
2016	field	ground mount PPA	2.0	3,600,000	design/permitting
2016	field	ground mount PPA	2.0	3,600,000	information gathering - public comment
2016	field	ground mount PPA	2.0	3,600,000	information gathering - public comment
2016	field	ground mount PPA	2.0	3,600,000	information gathering - public comment
		Possible ground mount	8	14,400,000	

Solar PV output correlates well with summer cost of power



Information portal for solar PV production data



Major Sustainability Areas

- Education and Awareness
- Resource Conservation/Utilities
- **Solid Waste and Recycling**
- Construction and Land Use
- Transportation
- Technology

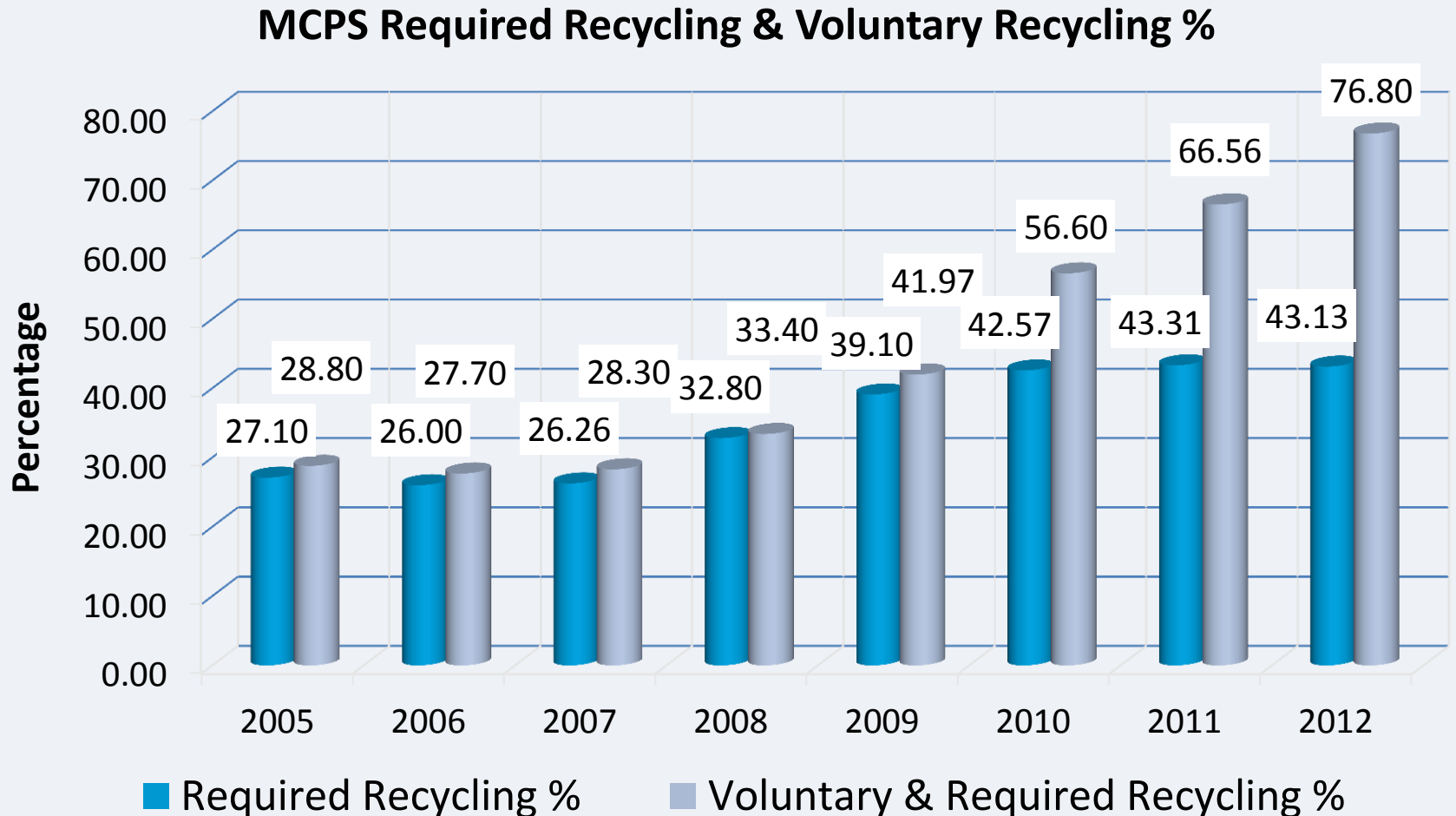
Solid Waste and Recycling



- Requirements to recycle paper, bottles and cans, scrap metal, and yard waste.
- County DEP requires reporting bi-annual solid waste hauling reports
- State of Maryland requires report annual recycling plan to demonstrate future initiatives and performance

Solid Waste and Recycling

Historical Recycling Rates(%)

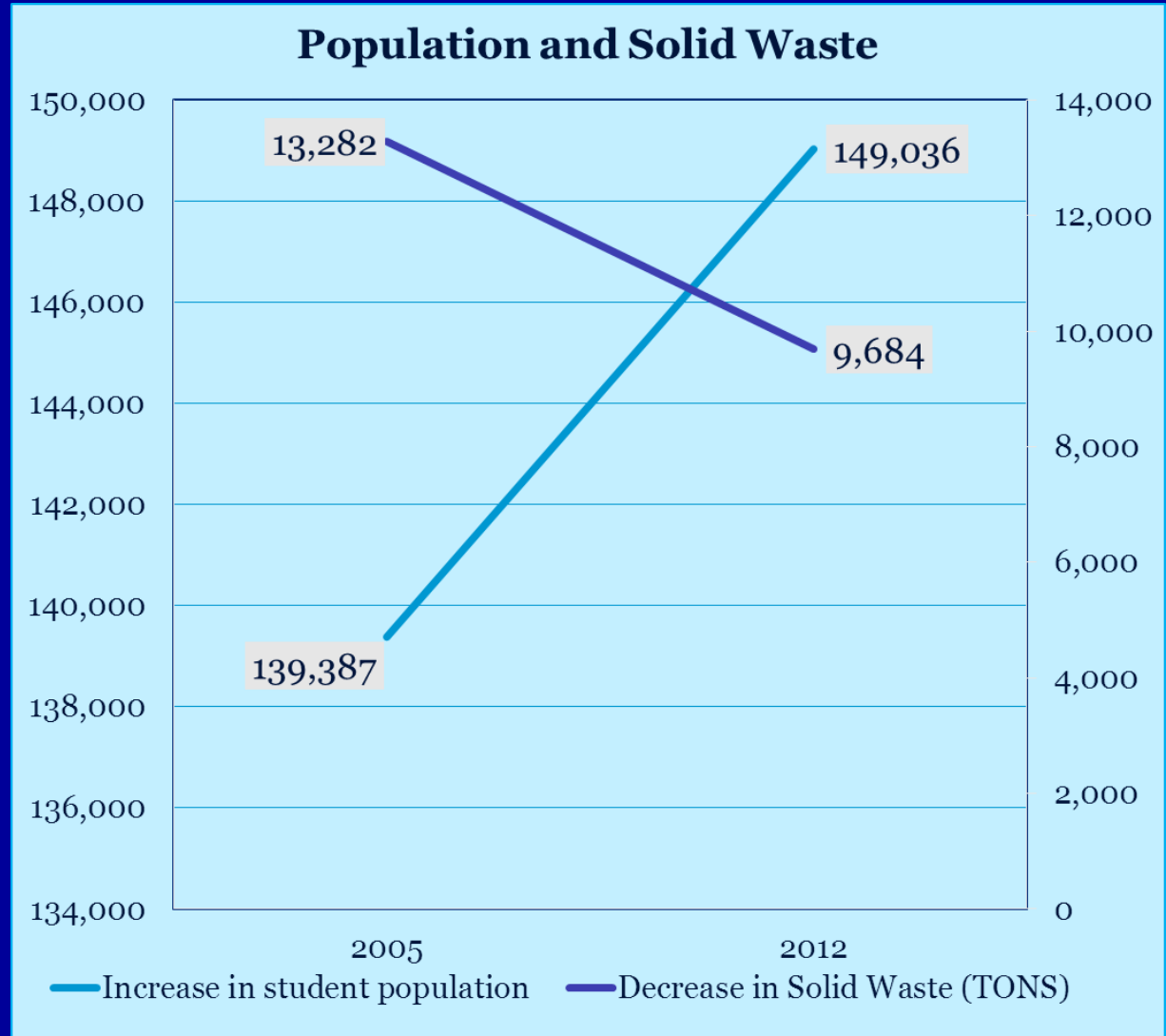


Solid Waste and Recycling

Reduced solid waste disposal by 27 percent despite increased student enrollment

Reduction in solid waste (tons)

↓
\$avings



Major Sustainability Areas

- Education and Awareness
- Resource Conservation/Utilities
- Solid Waste and Recycling
- **Construction and Land Use**
- Transportation
- Technology

MCPS LEED Schools

Awarded LEED GOLD Level Certification

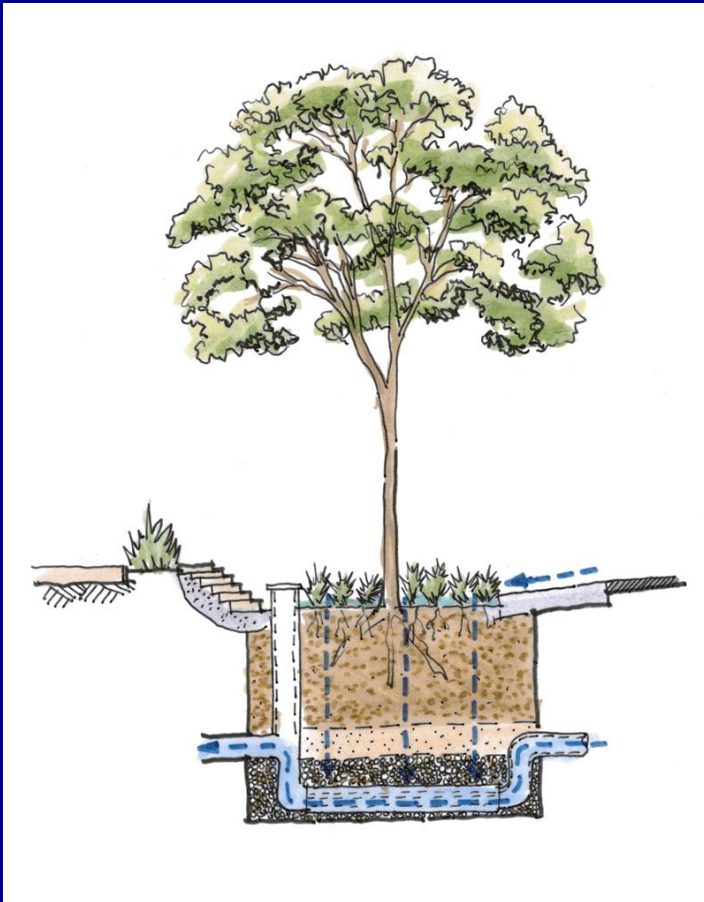


Great Seneca Creek ES
Francis Scott Key MS
William B. Gibbs, Jr. ES
Cabin John MS
Cashell ES
Carderock Springs ES
Cresthaven ES
Farmland ES
Cannon Road ES
Seven Locks ES

Two LEED schools complete and awaiting certification
Seventeen more schools LEED registered (in design/construction)

Sustainable Site Design

**STORMWATER
CAN SUSTAIN THE
LANDSCAPE**



**194,000
square
feet of
vegetated
roof**



Green Cleaning—what is it?

Use of Green Seal-Certified Chemicals



➤ ***Multipurpose Cleaner***

- ✓ Eliminates need for multipurpose chemicals
- ✓ Dilution system prevents waste
- ✓ Recyclable packaging

➤ ***Disinfectant***

- ✓ Effective against MRSA, H1N1
- ✓ Dilution system
- ✓ Recyclable packaging

Major Sustainability Areas

- Education and Awareness
- Resource Conservation/Utilities
- Solid Waste and Recycling
- Construction and Land Use
- **Transportation**
- Technology

Sustainable Transportation Strategies

- Yearly review of all school bus routes effectively reduces the number of buses transporting students.
 - Reduces carbon emissions
 - Reduces operating costs
 - Reduces environmental impacts including air pollution



Academic Year	# of Routes	Miles Driven	Students Transported
2009–2010	1117	19,025,226	97,100
2010–2011	1102	18,891,219	98,535
2011–2012	1108	19,371,775	100,158

Sustainable Equipment



- 601 school buses equipped with catalytic converters
- 689 school buses equipped with Diesel Particulate Filter (DPF)
- 678 school buses equipped with Exhaust Gas Recirculation (EGR)
- 291 buses equipped with Diesel Exhaust Fluid (DEF)
- Hybrid vehicles—15, Flex fuel—17, Partial Zero Emission Vehicles (PZEV)—4
- Recycle used engine fluids

**No idling practice:
education and
enforcement**



Major Sustainability Areas

- Education and Awareness
- Resource Conservation/Utilities
- Solid Waste and Recycling
- Construction and Land Use
- Transportation
- **Technology**

Sustainable Practices in Technology

- **Standardized use of Energy Star, flat panel computer monitors**
- **Centralized scheduled daily shutdown of computers to streamline power conservation**
- **Encouraged use of recyclable packing material from our vendors**
- **Default duplex printing setting to support efficient use of resources**
- **Environmentally sensitive end of life computer resale, reuse, or recycle**
- **Recycle toner cartridges and packaging**



Sustainability

The MCPS sustainability plan provides a formal framework to:

- coordinate efforts
- track progress
- explore innovations
- communicate with the public

