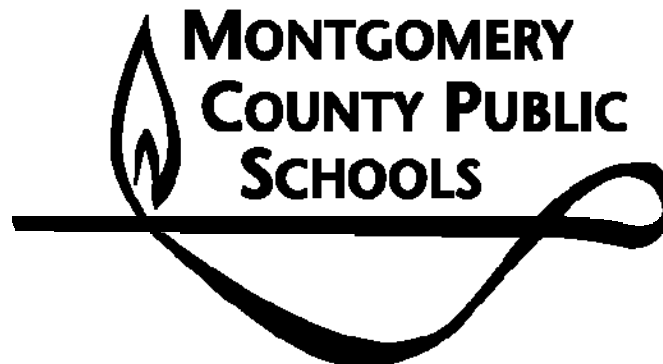


FY 2009 Resource Conservation Plan

Montgomery County Public Schools

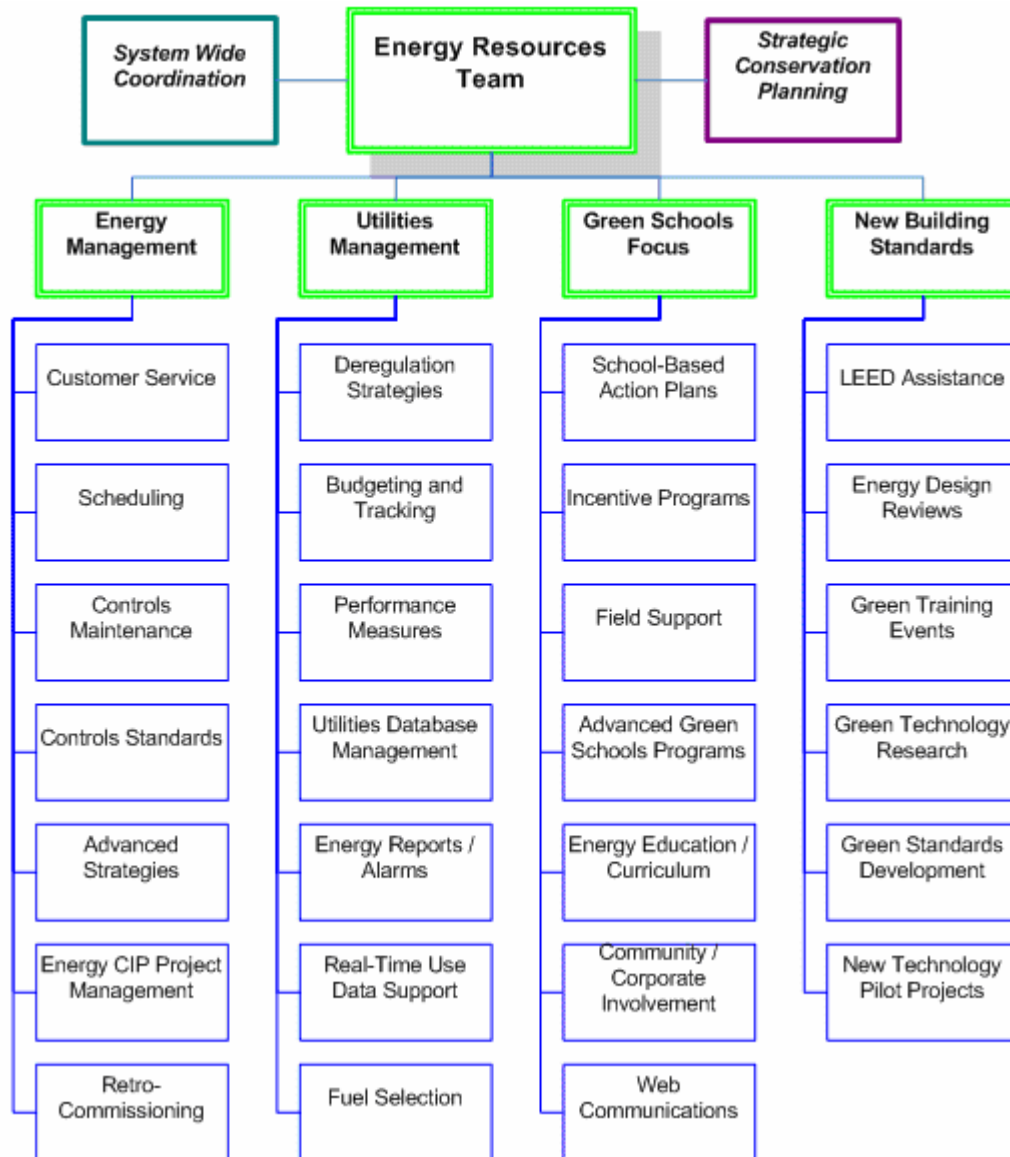


Rockville, Maryland

Department of Facilities Management
2096 Gaither Road, Suite 200
Rockville, MD 20850
240-314-1090

Introduction

The Montgomery County Public Schools (MCPS) maintains a comprehensive program of resource conservation and management for its facilities. The following chart summarizes the program elements in place:



For additional information on these program initiatives, please visit our Web site at www.greenschoolsfocus.org

The MCPS **Resource Conservation Plan** follows a standardized reporting format suggested by the Montgomery County Department of Environmental Protection. Energy information is formatted in predefined tables for easy reference and consistent tracking of data from year to year. The categories of information presented are [Facility Summary](#), [New Measures](#), [Existing Measures](#), and [Planned Measures](#). An [Innovations](#) section lists significant “firsts” achieved over the past year and an [Appendix](#) lists conservation policies and guidelines.

**Resource Conservation Plan
FY 2009
Summary**

The information on this page reflects the facilities owned or operated
by this agency as of the end of **FY 2007 (June 30, 2007)**

Agency	Montgomery County Public Schools, Maryland				
Number of Facilities	222	Change in number of facilities	+1		
Total square feet	22,642,410	Change in total square feet	445,045		
Average operating hrs, year	3,220	Change in avg. operating hrs, year	+50		
Other changes effecting energy consumption	<p>Expanding Community Use of Schools: MCPS schools are used for a growing number of outside groups scheduled through the Community Use of Public Facilities (CUPF). Annual operating hours are on the rise.</p> <p>Increasing Summer Use of Schools: Schools have been fully air-conditioned and are used over the summer for an increasing number of academic, extended learning opportunities (ELO), recreational, and community activities.</p>				
	Units	Total Consumption (Actual FY 2007)	Percent Change from Actual FY 2006	Total Cost (Actual FY 2007) \$	Percent Change from Actual FY 2006
Electricity	kWh	215,846,705	1%	\$ 24,593,062	18%
Natural Gas (Firm)	therms	6,437,572	8%	\$ 9,725,339	-4%
Natural Gas (Irate)	therms				
Fuel Oil #2	gallons	95,872	-40%	\$ 211,178	-44%
Propane	gallons	37,846	7%	\$ 70,100	19%
Water/Sewer	kgallons	519,472	18%	\$ 2,317,911	20%
Total				\$ 36,917,590	11%

New Measures

The **New Measures** table on the following page lists and describes energy retrofit activities occurring in the current fiscal year. Other new measures in ongoing MCPS processes are described below.

New Construction: In addition to the indicated retrofits, new building design guidelines generate substantial energy savings in each MCPS construction project. For example, Spark Matsunaga Elementary School opened in 2001 with the first ground source heat pump HVAC system in MCPS. This highly efficient heating and cooling system has now been installed in Great Seneca Creek and Little Bennett elementary schools and Richard Montgomery High School. Ground source heat pumps exchange heat with the earth through fields of closed-loop wells and reduce annual heating and cooling energy by 30 percent compared to conventional HVAC systems. New construction measures are not listed in this table, due to the large number involved and because the cost and benefits of these measures are integrated into the total building design.

Utility Procurement: MCPS also controls utility costs through competitive procurement of deregulated energy supplies. Natural gas is procured by locking in one-third increments when market conditions are favorable. Starting in fiscal year 2008, MCPS procures electricity in preplanned blocks of on peak, off peak, and around-the-clock products for various times of year, managed through a wholesale account on the PJM (Pennsylvania, New Jersey, Maryland) electric system. We believe this flexibility and other market advantages of a wholesale electric account will keep electric prices well below the standard offer of the local utility company, and also below one-time annual bid approaches used in the past. To minimize the risk of price increases, the procurement of both natural gas and electricity are planned and executed for the current year and for parts of up to two years into the future.

Environmental Standards: Beyond energy conservation measures, MCPS seeks to be environmentally responsible in all aspects of facility design and operation. To comply with the Montgomery County Green Buildings Law of 2006 for new buildings, MCPS has established a Green Building Program within the Division of Construction (www.Schools2Green.org). All new MCPS facilities starting design in FY 08 will be certified by the U.S. Green Building Council under the Leadership in Energy and Environmental Design (**LEED**) rating system. The MCPS Green Building Program directs sustainable design in the categories of (1) Site Selection, (2) Efficient use of Water, (3) Energy and Atmosphere, (4) Materials and Resources, (5) Indoor Environmental Quality, and (6) Innovative Design. Great Seneca Creek Elementary School, which opened in September of 2007, was a LEED pilot project. It became the first school in Maryland to receive LEED Gold certification. By applying LEED the Division of Construction expects to improve energy efficiency by 30 percent. This will translate into a total of at least \$750,000 in annual utility savings through sustainable design practices for the new school buildings built over the next six years.

New Measures

This table shows information on resource conservation measures planned to be implemented in
FY 2008 (July 1, 2007 through June 30, 2008)

Measures - Planned: (For FY 2008)	Projected Completion Date (Mo/Yr)	Projected Initial Cost (\$)	Projected Annual Net Impact on Maintenance Cost (\$)(-)	Fuel Type(S) Affected and Units	Estimated Units Saved Per Year	Projected Annual Cost Savings (\$)
Capital Improvement Projects:						
EMS Upgrades	03/2008	\$ 1,200,000	(\$97,000)	NG Therm	139,000	\$115,000
				Elect kWh	242,857	\$31,000
Lighting Retrofits	03/2008	\$ 500,000	(\$50,000)	Elect kWh	850,000	\$125,000
Subtotal		\$1,700,000	(\$147,000)			\$271,000
Operations and Maintenance:						
Group Relamp with 25 Watt T8 – Phase 2	6/2008	\$600,000	(\$31,000)	Elect kWh	4,020,000	\$522,000
Subtotal		\$600,000	(\$31,000)			\$522,000
Grand Totals		\$2,300,000	(\$178,000)			\$793,000

Description of Activities

Energy Management Upgrades: The infrastructure of energy management systems at MCPS has reached an age where many systems need to be replaced or upgraded. Advances in electronics and communications now enable greater savings from EMS than previously was possible.

MCPS Comprehensive Lighting Retrofits: This program improves building light fixtures. Fluorescent fixtures receive T8 lamps and electronic ballasts, 400-watt mercury vapor fixtures are replaced with 250-watt metal halide fixtures (with improved light output), incandescent fixtures are changed to compact fluorescent, and incandescent exit signs are changed to light emitting diode (LED) type. LED exit signs consume only 5 watts and have an extremely long life cycle, thus also improving the safety of the facilities.

Group Relamp with 25 watt T8: Group relamping with new higher-efficiency and longer-life T8 lamps allow a 25 percent reduction in energy use in existing fixtures without loss of light. MCPS plans to change all existing lamps to take advantage of this new technology system wide. Pilot installation started in FY 2006. Financing has been provided by the Maryland Energy Administration for full implementation in FY 2007 and 2008.

Replace Pin Timers with Digital: Until now, unreliable electro-mechanical time clocks, using thumbscrew pins to set ON/OFF times, have operated all exterior lighting for schools. These clocks become unreliable as pins become loose, power failures cause loss of time, and the clocks do not compensate for monthly changes in sunrise/sunset times. As a result, lights are frequently on when not needed, resulting in a waste of hundreds of thousands of dollars each year. Throughout the system MCPS is installing modern technology digital clocks designed for exterior lighting. These electronic clocks, the Paragon EL (Exterior Lighting) 72, have digital accuracy, daily sunrise/sunset adjustments, seven-day capacitor backup for power outages, and can download programming from a notebook PC.

Existing Measures

MCPS has made significant investments in energy conservation going back to 1980. The **Existing Measures Summary** table on the following page includes projects back to FY 1998. Subsequent detailed tables document the specific types of projects, investment, and savings by year.

Conservation Culture: In addition to capital improvements, MCPS has long maintained a program of behavioral education to reduce energy use by facility users. The original **School Eco-Response Teams (SERT)** program (1991), and the more comprehensive **Green Schools Focus** (2002), continually promote and reward a culture of conservation in the school system. These programs communicate with the schools through group training and professional development events, newsletters, curriculum modules, informational flyers, e-mail, Web sites, a telephone hot line, and, most importantly, regular site visits. As rewards for participation, the programs offer quarterly cash awards and annual celebration events. These programs produce hundreds of thousands of dollars a year in utility savings for the school system and help to instill environmental responsibility in future generations.

In FY 2005 and 2006, program staff was increased to provide frequent on-site monitoring of behavior and assistance to schools in saving energy by trained energy facilitators. The energy-saving results have been broad-based and significant across the system. In FY 2007, 106 schools achieved the initial goal of a 5 percent reduction in electric use over the baseline year. Of those 106 schools, 72 significantly exceeded the goal, scoring in the range of a 10 to 30 percent reduction in electric consumption.

In FY 2007, cost avoidance for this program was \$1.6 million. At this rate, the program is returning more than twice its annual cost in new savings.

Existing Measures Summary

This table summarizes information on resource conservation measures implemented from
FY 1998 through FY2007

Existing Measures	Completion Year	Implementation Cost	Annual Cost Savings	Average Simple Payback (Years)
Project Types				
All types	FY 2007	\$2,649,000	\$1,731,000	1.5
All types	FY 2004 to FY 2006	\$1,185,000	\$845,000	1.4
All types	FY 1998 To FY 2003	\$3,555,175	\$1,118,442	3.2
Existing Measures Grand Totals		\$7,389,175	\$3,694,442	2.0

Please see the following **Existing Measures Details** tables for project descriptions and financial details on the above line items. Energy savings through operations and behavior change are accomplished through the **SERT** and **Green Schools** programs and reported separately on page 6.

Existing Measures Details

This table shows information on resource conservation measures implemented in
FY 2007 (July 1, 2006 through June 30, 2007)

Measures Existing	Projected Completion Date (Mo/Yr)	Projected Initial Cost (\$)	Projected Annual Net Impact On Maintenance Cost (\$)(-)	Fuel Type(S) Affected And Units	Estimated Units Saved Per Year	Projected Annual Cost Savings (\$)
Capital Improvement Projects:						
Energy Management Upgrades	03/2007	\$ 1,200,000	(\$97,000)	NG Therm	139,000	\$115,000
				Elect kWh	242,857	\$31,000
Lighting Retrofits	03/2007	\$ 500,000	(\$50,000)	Elect kWh	850,000	\$125,000
Subtotal		\$1,700,000	(\$147,000)			\$271,000
Operations and Maintenance:						
Group Relamp with 25 Watt T8 – Phase 1	6/2007	\$804,000	(\$31,000)	Elect kWh	5,360,000	\$680,000
Replace pin timers for exterior lighting with digital	6/2007	\$145,000	(\$15,000)	Elect kWh	6,030,000	\$780,000
Subtotal		\$949,000	(\$46,000)			\$1,460,000
FY 2007 Page Total		\$2,649,000	(\$193,000)			\$1,731,000

Description of Activities

Energy Management Upgrades: The infrastructure of energy management systems (EMS) at MCPS has reached an age where many systems need to be replaced or upgraded. Advances in electronics and communications now enable greater savings from EMS than previously was possible.

MCPS comprehensive lighting retrofits: This program improves building light fixtures. Fluorescent fixtures receive T8 lamps and electronic ballasts, 400-watt mercury vapor fixtures are replaced with 250-watt metal halide fixtures (with improved light output), incandescent fixtures are changed to compact fluorescent, and incandescent exit signs are changed to light emitting diode (LED) type. LED exit signs consume only 5 watts and have an extremely long life cycle, thus also improving the safety of the facilities.

Group Relamp with 25 watt T8: Group relamping with new higher efficiency and longer life T8 lamps allow a 25 percent reduction in energy use in existing fixtures without loss of light. MCPS plans to change all existing lamps to take advantage of this new technology system wide. Pilot installation started in FY 06. Financing has been provided by the Maryland Energy Administration for full implementation starting in FY 07.

Replace Pin Timers with Digital: Until now unreliable electro-mechanical time clocks, using thumbscrew pins to set ON/OFF times, have operated all exterior lighting for schools. These clocks become unreliable as pins become loose, power failures cause loss of time, and the clocks do not compensate for monthly changes in sunrise/sunset times. As a result, lights are frequently on when not needed, resulting in a waste of hundreds of thousands of dollars each year. MCPS is installing modern technology digital clocks designed for exterior lighting as retrofits throughout the system. These electronic clocks, the Paragon EL (Exterior Lighting) 72, have digital accuracy, daily sunrise/sunset adjustments, 7-day capacitor backup for power outages, and can download programming from a notebook PC.

Existing Measures Details

This table shows information on resource conservation measures implemented in
FY 2004 through FY 2006

Measures - Existing	Date Implemented (Mo/Yr)	Initial Cost (\$)	Annual Net Impact on Maintenance Cost (\$)(-)	Fuel Type(S) Affected And Units	Units Saved Per Year	Annual Cost Savings (\$)
Capital Improvement Projects:						
Energy Management Upgrades	1/2006	\$500,000	(\$50,000)	Elect kWh	354,000	\$45,000
Lighting Retrofit at Clopper Mill Elementary School	12/2004	\$ 70,000	(\$ 3,500)	Elect kWh	330,000	\$ 28,000
Internet Control of Portable Classrooms	8/2004	\$350,000		Elect kWh	5,000,000	\$450,000
Waterless Urinals at Martin Luther King Middle School	10/2004	\$ 10,000	(\$ 500)	Water Gal	560,000	\$ 4,000
Retro-Commissioning Wheaton / Edison High School	09/2004	\$255,000	(\$ 8,000)	Elect kWh	420,000	\$ 43,000
Subtotal		\$1,185,000	(\$62,000)			\$570,000
Operations and Maintenance:						
Shutdown of Network Computers	7/2004	0	0	Elect kWh	3,060,000	\$275,000
Subtotal		0	0			\$275,000
FY 2004 – FY 2006 Page Totals		\$1,185,000	(\$62,000)			\$845,000

Description of Activities

The “Internet Control of Portable Classrooms”: A first-of-its-kind application to portable classrooms of Carrier’s “Broadcast Energy Savings” (BES) technology. MCPS and Carrier jointly developed the approach in which an Internet interface allows MCPS to synchronize the HVAC schedules and thermostat set points at all portables. The savings for this project is large because portables originally contained only manual thermostats and ran essentially uncontrolled. The use of conventional seven-day programmable (but non-communicating) thermostats is impractical in this application because of the inability to verify programs at more than 500 locations and the inability of seven-day programmable thermostats to schedule holidays, breaks, and summer closings. The BES interface supports a 24-hour override to a setback temperature, or “snow day” command, allowing MCPS to shut down portables and save energy opportunistically. The newly developed system now makes it feasible to efficiently control large numbers of small, relocatable buildings, with a payback of under a year.

Shutdown of Network Computers: In FY 2005 MCPS instituted the system-wide shutdown of all 40,000 computers at the end of the evening via network controls. The network also sets Energy Star settings on each computer to deactivate the monitor after 30 minutes of idle time. Research is continuing to optimize these settings.

Existing Measures Details

This table shows information on resource conservation measures implemented in
FY 1998 through FY 2003

Measures - Existing:	Date Implemented (Mo/Yr)	Initial Cost (\$)	Annual Net Impact on Maintenance Cost (\$)(-)	Fuel Type(S) Affected and Units	Units Saved Per Year	Annual Cost Savings (\$)
Capital Improvement Projects:						
Lighting Retrofits	01/1998	\$ 644,633	(\$25,325)	Elect kWh	2,992,939	\$209,506
Lighting Retrofits	01/1999	\$ 467,748	(\$18,376)	Elect kWh	2,171,687	\$152,018
Lighting Retrofits	01/2000	\$ 241,693	(\$ 9,495)	Elect kWh	1,122,147	\$ 78,550
Lighting Retrofits	01/2001	\$ 193,471	(\$ 7,601)	Elect kWh	898,259	\$ 62,878
Lighting Retrofits	01/2002	\$1,544,630	(\$60,682)	Elect kWh	7,171,498	\$502,005
Lighting Retrofits	01/2003	\$ 237,000	(\$ 9,377)	Elect kWh	635,496	\$ 54,485
Energy Management Upgrades	01/2003	\$ 161,000	0	Elect kWh	442,000	\$ 31,800
		0	0	NG Therm	18,500	\$ 15,200
Cooling Tower Water Monitors	01/2003	\$ 65,000	(\$15,000)	Water Gallons	2,800,000	\$ 12,000
Subtotal		\$3,555,175	(\$145,856)			\$1,118,442
Operations and Maintenance:						
Subtotal						
FY 1998 – FY 2003 Page Totals		\$3,555,175	(\$145,856)			\$1,118,442

Description of Activities

MCPS comprehensive lighting retrofits: This program improves building light fixtures. Fluorescent fixtures receive T8 lamps and electronic ballasts, 400-watt mercury vapor fixtures are replaced with 250-watt metal halide fixtures (with improved light output), incandescent fixtures are changed to compact fluorescent, and incandescent exit signs are changed to light emitting diode (LED) type. LED exit signs consume only 5 watts and have an extremely long life cycle, thus improving the safety of the facilities.

Cooling tower water monitors: Monitors are installed and detect excess water flow through cooling towers caused by malfunctioning controls and alerts maintenance staff. The monitors send a pager signal to the responsible person, including the type of alarm and the facility number. Monitors were installed on 92 cooling towers owned by MCPS, averting water losses of hundreds of thousands of gallons per year.

Operations and Maintenance: As a policy, the Division of Maintenance uses high-efficiency replacement equipment when replacing failed equipment in facilities. The incremental cost for efficiency is small at the point of equipment replacement and not tracked.

Planned Measures

Energy Capital Improvement Program (Energy CIP): A significant backlog of profitable energy projects exists in MCPS for energy management, lighting, and water conservation. The **Planned Measures** table on the following page reflects the target areas for the coming fiscal year.

Planned Measures

This table shows information on resource conservation measures planned to be implemented in
FY 2009 (July 1, 2008 through June 30, 2009)

Measures - Planned:	Projected Completion Date (mo/yr)	Projected Initial Cost (\$)	Projected Annual Net Impact on Maintenance Cost (\$)(-)	Fuel Type(s) Affected And Units	Estimated Units Saved Per Year	Projected Annual Cost Savings (\$)
Capital Improvement Projects:						
Energy Management Upgrades	03/2008	\$ 1,200,000	(\$97,000)	NG Therm	139,000	\$115,000
				Elect kWh	242,857	\$31,000
Lighting Retrofits	03/2008	\$ 500,000	(\$50,000)	Elect kWh	850,000	\$125,000
Subtotal		\$1,700,000	(\$147,000)			\$271,000
Operations and Maintenance:						
Subtotal						
FY 2009 Page Totals		\$1,700,000	(\$147,000)			\$271,000

Description of Activities

Energy Management Upgrades: The infrastructure of energy management systems (EMS) at MCPS has reached an age where many systems need to be upgraded or replaced. Advances in electronics and communications now enable greater savings from EMS than previously was possible. Also, new network interface standards now can distribute real-time EMS data instantly to widely distributed facility users and staff. Access to building automation data across the Wide Area Network multiplies the value of energy management systems well beyond the simple energy savings shown above. These and other strategic improvements will be made during the systematic EMS upgrade initiative.

MCPS Comprehensive Lighting Retrofits: This program improves building light fixtures. Fluorescent fixtures receive T8 lamps and electronic ballasts, 400-watt mercury vapor fixtures are replaced with 250-watt metal halide fixtures (with improved light output), incandescent fixtures are changed to compact fluorescent, and incandescent exit signs are changed to light emitting diode (LED) type. LED exit signs consume only 5 watts and have an extremely long life cycle, thus also improving the safety of the facilities.

Operations and Maintenance: As a policy, the Division of Maintenance uses high-efficiency replacement equipment when replacing failed equipment in facilities. The incremental cost for efficiency is small at the point of equipment replacement and not tracked. For operational savings from operations and behavior changes please see the **SERT** and **Green Schools** program descriptions on page 6 above.






Significant Technology and Program Advances in Resource Conservation

- 1) First use of **Internet-communicating thermostats** in a U.S. school system to control HVAC in portables.
- 2) **First public school system in Maryland** to register a new building design for LEED Certification, and first to achieve a LEED Gold certification (Great Seneca Creek Elementary School was LEED Gold certified in 2007).
- 3) Started **MCPS Green Schools**, supported by Green Schools Focus staff and modeled on the national Green Schools program of the Alliance to Save Energy:
Forty-three secondary schools have received training, including sessions on—
 - a. an **investigation-based approach** for energy and environmental activities,
 - b. use of professional instrument **toolkits**, and
 - c. **energy-related curriculum** materials and support.
- 4) Started deployment of a **Web interface in MCPS** to view real-time building information.
 - a. Sixty schools are now “online” to anyone on the MCPS-wide area network to view building environmental conditions through a Web browser.
- 5) Started use of a **Web-based system to monitor daily electric profiles** in buildings and detect abnormal use patterns, control, and scheduling problems.
 - a. Forty-nine sites are installed under the Potomac Electric Power Company (PEPCO) “CEO Online” subscription program.
 - b. A ten-building pilot project is testing a similar and less expensive approach completely owned by MCPS.
- 6) Started MCPS use of the **automated scheduling database** operated by the ICB/Community Use of Public Facilities program to receive HVAC scheduling requests from three school clusters in place of paper calendars manually filled out by school staff.
 - a. This system was extended to all elementary and middle schools in FY 2005.

- 7) Started **network control** of power-saving settings on all MCPS computers.
- 8) Started systematic **retro-commissioning** of MCPS facilities to correct control failures, improve comfort, and reduce energy expenses (six facilities to date).
- 9) First MCPS school opened with a **GeoExchange system** for heating and cooling.
 - a. Spark Matsunaga Elementary School and Longview Center, 125,000 square feet.
 - b. First MCPS school to have no comfort complaints in the first two years of operation.
- 10) New staff (**energy facilitators**) and program support designated to **visit schools monthly** and monitor and assist with energy saving plans.
- 11) Started use of Community Energy Loan Program (CELP) financing from the Maryland Energy Administration for new energy conservation opportunities, including the premium for GeoExchange at the new Richard Montgomery High School, and the conversion to 25-watt T8 lamps listed next.
- 12) Started use of **new technology 25-watt T8 lamps** in a system-wide retrofit to reduced lighting energy use 25 percent, including:
 - a. Started use of building service staff to implement a system-wide energy retrofit.
 - b. Started use of students to assist staff in a system-wide energy retrofit.
- 13) Started use of **electronic time clocks to control exterior lighting**, including:
 - a. Use of automatic compensation for time of sunrise and sunset.
 - b. Use of capacitor back-up to hold time and program over power outages.
 - c. Use of automatic changeover for daylight saving time.
- 14) Started use of Energy Star 4.0 standard in computer technology renewal cycle, including:
 - a. **Flat panel displays**
 - b. **“80+” efficiency** power supplies in CPUs.

Appendix – Montgomery County Public Schools

Resource Conservation Policy and Guidelines

-  [Board of Education Policy On Energy Conservation](#)
-  [Electricity Guidelines](#)
-  [Heating Guidelines](#)
-  [Food Preparation Guidelines](#)
-  [Water Use Guidelines](#)

POLICY

BOARD OF EDUCATION OF MONTGOMERY

Related Entries: ECM, ECM-RA
Responsible Office: Supportive Services

Energy Conservation

A. PURPOSE

To ensure that Montgomery County Public Schools pursues energy conservation efforts and practices that continue to preserve our natural resources while providing a safe and comfortable learning environment for all staff and students

B. ISSUE

The nation is experiencing a depletion of its natural resources which include crude oil, natural gas, and other energy sources. The Montgomery County Public Schools is committed to reducing its consumption of natural resources and still improving the quality of its educational programs. The Montgomery County Board of Education desires to work with other agencies of government and plan school system activities so that the learning environment of essential education programs are not curtailed or compromised.

C. POSITION

1. The superintendent of schools shall continue to establish procedures to ensure the conservation of natural resources by personnel at all levels of the school system, which shall include the following practices:
 - a) Generation of a system-wide resource conservation plan that outlines goals and objectives
 - b) Development of acceptable energy conservation guidelines as outlined in the resource conservation plan
 - c) Continued development and implementation of conservation programs
 - d) Performance of energy studies on all new MCPS construction
 - e) Monitoring the general operation and maintenance of all heating, ventilation and air-conditioning equipment

- f) Procurement and consumption management of fossil fuels and electricity
 - g) Continuing reminders to staff and students of the need for conservation of all natural resources
2. MCPS will participate in a coordinated effort by government authorities to establish appropriate resource conservation plans and utility price monitoring systems to ensure that public schools have adequate supplies of essential fuels and can obtain these at the best possible prices.

D. DESIRED OUTCOME

Create a healthy and comfortable learning environment while controlling energy consumption more efficiently and diverting the otherwise rising utility costs towards educational programs. Continue development of energy conservation efforts that proportionally reduces energy consumption in new and existing facilities.

E. IMPLEMENTATION STRATEGIES

1. Should natural resources be insufficient to meet normal operating needs, the superintendent will develop further plans for the consideration of the Board of Education to conserve energy.
2. Copies of this policy and the annual resource conservation plan will be sent to appropriate school system and county government officials.

F. REVIEW AND REPORTING

This policy will be reviewed on an on-going basis in accordance with the Board of Education's policy review process.

Policy History: Adopted by Resolution No. 654-73, November 13, 1973; amended by Resolution No. 285-97, May 13, 1997.

Electricity

- 1. Temperature Set Point:** The maximum cooling level is 76° F. Set thermostats accordingly. Some temperature variation will occur as equipment cycles on and off. Report cooling problems only if room temperature measured with a thermometer stays three degrees or more above or below set point.
- 2. Controls:** Do not attempt to tamper with energy management or HVAC controls on equipment. Any problems with controls or equipment should be dealt with promptly through the work order system. Provide frequent inspection of pneumatic controls, including system filter/dryer, automatic bleed, and compressor run time. Test and calibrate all pneumatic thermostats at the start of each cooling season.
- 3. Computers:** Shutting down computers not in use is important. Computers in our schools consume more energy than the lighting. **Teachers and students should shut down the computer at the end of each use, unless a new user is waiting.** Sweeps should be made to shut down all computers immediately after school hours and before weekends, holidays, and breaks. Use of **flat panel monitors** is encouraged whenever procuring new displays. Flat panel monitors use 70 percent less energy than CRT models and help reduce excessive heat build-up in computer labs and closets.
- 4. Lights:** Teachers should ensure lights are turned off when leaving the classrooms unoccupied, even for a few minutes. Every effort should be made to avoid accidentally leaving lights on in storerooms, crawl spaces, attics, and other unoccupied spaces. Corridor lighting should be reduced in over-illuminated areas and turned off during unoccupied periods. Gym, auditorium, and stadium lights should be controlled on a tight schedule. Gym lights should be turned off during class periods when the gym is not in use.
- 5. Light Levels:** Light levels may be reduced to the acceptable levels for different activities as listed on the attached chart: **Recommended Footcandle Levels.** Your SERT Energy Facilitator will provide you with instruments and instructions to successfully reduce light levels and save energy.
- 6. Task Lighting:** Use a desk lamp (with compact fluorescent bulb) instead of overhead lighting as much as possible, especially at teaching stations when students are out. Computer labs should use compact fluorescent uplights (torchiere lamps) to improve visibility of computer screens, and save energy by turning out overhead lights.
- 7. Lighting Maintenance:** Maintain automatic lighting controls, occupancy sensors, or daylight sensors where installed. Light fixtures and lenses should be cleaned annually and the date documented.
- 8. Daylighting:** Whenever possible, teachers should utilize natural light instead

of artificial light. Window shades should be adjusted to make best use of daylighting. Most classroom lights are controlled by two or more switches, so artificial lighting can be reduced when daylight is available.

- 9. Exterior Lighting:** All outside lighting should be **off** during daylight hours. Building security lighting should be on from dusk to dawn daily. Parking lot lights should be turned off at the close of the regular school day or evening activities (by 12:00 midnight at the latest) and back on at 6:00 a.m., to dawn (unless sunrise is before 6:00 a.m.) Building service managers should notify the maintenance depot of any irregularities in exterior lighting control.
- 10. Cleaning Crews:** All lights are to be turned **off** when students and teachers leave school. Building service workers are to turn on lights only in the areas in which they are currently working.
- 11. Holidays and Breaks:** All electrical equipment should be shut down or unplugged per checklists before long weekends and school breaks.
- 12. Off-Peak Use:** When possible, electricity use (for kilns, laminators, etc.) should be scheduled prior to 12:00 noon when lower, off-peak rates are in effect.
- 13. Infiltration Control:** All windows and outside doors are to be kept closed when cooling systems are in operation. Corridor doors and doors to classrooms should remain closed when HVAC is provided. Doors to gyms and pools are to be kept closed. Report faulty door closers to the maintenance depot.
- 14. Vending Machines:** Vending machines are major electric users that often cost more to operate than the school receives in revenues. A typical soft drink machine costs over \$500 per year to operate. Measures should be taken to minimize the number of vending machines and the hours of use.
 - a. Review your school's vending machine use and have little-used units removed.
 - b. Vending machines must be removed from the main entrance or lobby of all schools effective with the 2004-2005 school year.
 - c. Unplug vending machine units when "Sold Out" is displayed.
 - d. Operation of vending machines must be automatically controlled per the following specifications.

Vending Machine Specification for Montgomery County Public Schools

Effective Date: August 1st, 2006

Application: This specification applies to all vending machines in Montgomery County Public Schools (MCPS), located inside the buildings or in outside areas surrounding the school buildings. These items include beverages, such as soft drinks, fruit juice and juice beverages, water, sports drinks; and snacks, such as cookies, crackers, chips, ice cream and candy.

References: Maryland Code, Education, Section 7-423, Division II, title 7 subtitle 4, “Health and Safety of Students”

MCPS Policy JPG: *Wellness: physical and Nutritional Health*; MCPS Regulation JPG-RA: *Wellness: physical and Nutritional Health*; MCPS Policy ECA: *Energy Conservation*

Timing Controls: Vending machines in MCPS schools must have an integrated timing device to automatically shut off operation of the machine in accordance with nutrition policies established by the Board of Education and energy conservation policy.

Automatic shut off is to include the following features:

1. Prohibit access to products
2. Turn off all lighting
3. Turn off refrigeration

Hours of Operation

Machines containing approved items-

- Non-perishable—7:00 a.m. until midnight, with refrigeration timed to resume one hour before access.
- Perishable—Refrigeration units remain on 24 hours; however access by students is limited too 7:00 a.m. until midnight.
- Machines containing items not approved for sale during the instructional day must be programmed for automatic shutoff from midnight until the end of the instructional day. Refrigeration may be timed to resume one hour before access.
- Vending machines in teachers’ lounges must be operational from 5:30 a.m. until midnight. Refrigeration may be timed to resume one hour before access.

Approved Items:

Beverages (container size not to exceed 16 ounces except for unflavored water)

- Flavored, non-carbonated water
- 100% fruit juice
- Fruit juice beverages with a minimum 50% fruit juice
- Low fat or nonfat milk
- Sports drinks (only allowed in the immediate area of the gymnasiums)

Snacks

- Single-serving size packages
- 7 grams or less of fat (except for nuts and seeds)
- 2 grams or less of saturated fat
- 15 grams or less of sugar (except for fruit)

**Recommended Footcandle (fc) Levels For
Voluntary SERT De-Lamping Projects**

Corridor and Stairways	10 -20 fc
<ul style="list-style-type: none"> ▪ As low as 10fc – for high reflectivity flooring/walls (white or pastel) ▪ Up to 20 fc for dark-colored flooring 	
Conference Rooms	30 fc at table height
Reception Areas	20 fc (average ambient) 50 fc (on task surface/desk)
Classrooms	30 fc (reading/ writing)
Art class	75 fc (preferably natural lighting)
Computer labs	15 fc
Restrooms	15 fc
Gyms	30 fc
Cafeteria (seating area)	30 fc
Cafeteria (food prep area)	75 fc

Heating

1. **Temperature Setpoint:** The maximum heating level is 70° F. Set thermostats accordingly and recheck monthly. Some temperature variation will occur as equipment cycles on and off. Report heating problems only if room temperature measured with a thermometer stays 3° or more below set point.
2. **Controls:** Building staff or occupants should not attempt to manually control equipment by tampering with energy management or HVAC controls of equipment. Any problems with controls or equipment should be dealt with promptly through the work order system. Provide frequent inspection of pneumatic controls, including system filter/dryer, automatic bleed and compressor run time. Test and calibrate all pneumatic thermostats at the start of each heating season.
3. **Hours:** During non-school hours, heat is furnished only for MCPS activities and user groups with reservations through the ICB/CUPF. Consolidate necessary MCPS evening activities into the minimum number of zones possible. HVAC will not be provided for an individual to use a classroom or office outside of normal hours. HVAC systems will remain off during cleaning, except when ventilation is required for waxing or stripping activities.
4. **Filters:** Replace filters of all equipment at recommended intervals. Maintain documentation per your building maintenance plan.
5. **Boiler Maintenance:** Fuel oil burners should be cleaned and tuned for optimum combustion twice yearly.
6. **Pumps:** Only one main heating pump should be operated, except where additional pumps are provided for separate zones. Do not operate main pump and standby pump at the same time.
7. **Unit Ventilators:** Maintain unit ventilators free of obstruction, such as books, plants, and furnishings, both on the top grill and at the bottom intake, so that air can circulate efficiently throughout the room.
8. **Infiltration Control:** All windows and outside doors are to be kept closed when heating systems are in operation. Corridor doors and doors to classrooms should remain closed when HVAC is provided. Doors to gyms and pools are to be kept closed. Report faulty door closers to the maintenance depot.
9. **Storage Spaces:** Close unused storage rooms and set thermostat controls, where installed, to the lowest possible temperature setting that will prevent freezing.
10. **Personal Electric Space Heaters:** Personal space heaters will not be permitted. Such units, in addition to having high energy costs, are a fire and safety hazard. Only heaters installed by the Division of Maintenance for emergency use will be permitted; others will be confiscated.

Food Preparation

Cooking Equipment

1. Preheat only equipment to be used 15 minutes before using.
2. Reduce temperature or turn equipment off during slack periods.
3. Cook full loads on every cooking cycle when possible.
4. Use the correct size equipment for all operations.
5. Avoid slow loading and unloading of ovens and opening doors unnecessarily.
6. Keep equipment clean for efficient operation.

Hot Food Holding and Transporting

1. Preheat equipment before loading.
2. Always use at full capacity when possible.
3. Clean thoroughly daily.

Refrigeration Equipment

1. Keep doors tightly closed and avoid frequent or prolonged opening.
2. Place food in refrigerator or freezer immediately upon arrival from supplier.
3. Keep evaporator coils free of excessive frost.
4. Keep condenser coils free of dust, lint, or obstructions.
5. Unplug equipment that is not needed.

Ware Washing Equipment

1. Always operate equipment at full capacity when possible.
2. Flush after heavy meal periods—clean thoroughly, daily.

Water Heating

1. Repair leaking faucets as soon as possible.
2. Reduce storage temperature to 120° F where possible.
3. Insulate hot water pipes.

Ventilating System

1. Use only the number of fans necessary at all times to provide adequate ventilation.
2. Turn fans off upon completion of cooking.
3. Operate two-speed fans on the lower speed when possible.
4. Keep filters and extractors clean.

WATER USE

GENERAL

1. **Be alert for water leaks** and water main breaks. Look for continuous water flow through the water meter at any time, ponding of water around the building, and report leaks to maintenance immediately. A broken water main can release tens of thousands of dollars in water a week until it is repaired.
2. **Report and repair leaking faucets** and faulty flush valves promptly. Check and adjust valves for proper timing annually.
3. **Water is an MCPS resource and not to be given away** or used by outsiders. Users scheduled through ICB are allowed to use water related to their activities. Do not provide free water to road maintenance tankers or any other non-MCPS agency.
4. Do not allow local residents to use school hose bibbs or to control irrigation.
5. **Car washes may not** use school water supplies. Off-site arrangements may be made with a local gas station to hold a car wash for fund raising.
6. The utility budget pays for bottled water only in elementary school portable classrooms.

IRRIGATION

These general guidelines are supplied for the education of individuals operating turf irrigation equipment to help with the successful management of healthy turf.

1. **Avoid Excess Watering.** Excessive watering promotes fungal growth and prevents the development of long, deep root systems needed for healthy turf.
 - a. **Use a simple rain gauge.** Turf in our climate needs only 1” of water per week for optimum health. Use weather reports or your school’s rain gauge to determine whether irrigation is needed each week.
 - b. **With timer systems, check zones for proper saturation levels.** Make sure water saturates the root zone when irrigating but no further. No runoff should occur from the area being watered.
 - c. **Make sure irrigation systems are turned off when it rains.** The installation of rain switches on automated irrigation systems is highly recommended.
2. **Irrigate only in early morning or late evening hours.** This timing minimizes evaporation to the air.
3. **Irrigate only two or three times a week.** This interval promotes deeper root growth, which establishes healthier and sturdier turf.