Montgomery County, Maryland

Resource Conservation Plans

Fiscal Year 2008

(July 1, 2007 – June 30, 2008)

In Support of
Energy Management Capital Projects and
Utility Operating Budgets

Prepared by the Member Agencies of the

Interagency Committee on Energy and Utilities Management (ICEUM)

March 2007

Resource Conservation Plans - FY 08

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About the Interagency Committee on Utilities Management (ICEUM) and the Resource Conservation Plan (RCP)

This document provides the Resource Conservation Plans (RCP) submitted by members of the Interagency Committee on Energy and Utilities Management (ICEUM), as required under Chapter 18A-9(d)(2) of the Montgomery County Code, in support of the Fiscal Year 2008 (FY 08) Energy Conservation Capital Improvement Projects and Utility Operating Budgets.

General Information

According to the County Code, The Interagency Committee on Energy and Utilities Management (ICEUM) is responsible for:

1. Establishing uniform utility unit costs for county operating budget proposes;

2. Preparing agency Resource Conservation Plans annually, describing current and anticipated energy efficiency and conservation programs with actual and projected energy and cost savings; and

3. Advising the County Executive and County Council on energy conservation goals, cost savings, and new technologies.

The plans contained in this document are prepared in accordance with item number 2, above. As in previous years, ICEUM members describe the energy management goals and objectives of the agencies they represent, and provide information on the performance of some of the efforts undertaken in previous years. This document includes introductory materials prepared by the Department of Environmental Protection.

The Department of Environmental Protection, Department of Public Works and Transportation's (DPWT) Division of Fleet Management Services, and the Office of Management and Budget (OMB) do not have Energy Conservation Capital Improvement Projects or Utility Operating Budgets. These agencies support information sharing, provide technical support, facilitate collaboration, and engage in energy planning to ICEUM.

ICEUM Members

Agency	Division/Group	Representatives
County Government		
DPWT	**Operations/Facilities Management**	**Victor Sousa**
	Operations/Facilities Management	Stephen Nash
	Fleet Operations	Sharon Subadan
	Fleet Operations	Aubrey Bentham
	Fleet Operations	Calvin Jones
Department of Environmental Protection	**Environmental Policy & Compliance**	**Eric R. Coffman**
Office of Management & Budget		Bryan Hunt
Office of the County Attorney		Betty Ferber
Procurement		Ed Stockdale
County Council		Chuck Sherer
County Agencies		
Montgomery County Public Schools	**Facilities Management**	**Ron Balon**
	Facilities Management	Sean Gallagher
	Facilities Management	Jeffrey Price
	Green Schools Focus	Karen Anderson
	Green Schools Focus	Anja Caldwell
Washington Suburban Sanitary Commission		**Rob Taylor**
Montgomery College	**Office of Facilities**	**Michael Whitcomb**
	Consultant	Edward Boone
Maryland National Park and Planning Commission, Department of Park and Department of Planning	**Consultant**	**Richard Anderson**
		Nancy Keogh
	Consultant	Edward Boone
***Note: Primary RCP authors are in bold* text**		

Challenges and Policy Drivers

Across the nation, energy and the environment have become hot topics and are the subject of significant attention by policy makers and the public on the local, state, and national level. In 2007 and 2008, this trend will certainly continue as these issues are discussed in policy arenas. Key issues that will impact the County government and County agencies include:

Climate Change – Over the last several decades a significant amount of quality, well vetted scientific research has been conducted that indicates that human activities are impacting the Earth's climate and that the consequences of these changes may be severe. The delivery of services to residents and businesses by County agencies requires the operation of facilities and fleets, both of which are key contributors of greenhouse gases to the atmosphere.

Public awareness of climate change and a desire for action is at an all time high, according to a survey conducted by the Massachusetts Institute of Technology. Over 70% of Americans believe that governments should do more to reduce the impact of human activities on the climate*. The County has responded by adopting technologies and measures in buildings and fleets that reduce greenhouse gas emissions. In addition, the County purchases a large volume of electricity generated from clean wind energy, further reducing the potential impact of County activities on the environment. The County will continue to embrace climate protection through sound energy-efficiency, energy management and clean energy. ICEUM representatives will collaborate with the Department of Environmental Protection's (DEP) efforts to develop a new greenhouse gas inventory and action plan anticipated by the end of 2007.

Air and Environmental Quality – The extraction, processing, transportation, and consumption of energy sources, primarily fossil fuels, has a dramatic impact on the quality of the environment on a local and global scale. Electricity generation, transportation and building energy use generate nitrogen oxides, particulates and other pollutants which have a direct impact on the air quality in the region. Emissions from sources such as electricity generation can travel up to hundreds of miles from their source on the predominating winds. Reducing the consumption of energy through energy management and efficiency helps reduce the impact of these human activities on the environment including air, water and land.

Changing Energy Markets – In general, energy costs have continued to increase over the past several years, straining County energy budgets. Nationally, electricity and most fuels have increased substantially in price due to the confluence of a variety of issues including:

- Increasing fossil fuel prices
- A severe hurricane season in 2005
- Unrest in fossil fuel producing regions
- Accidents, damage and age of energy infrastructure

Concurrently, at the local and state level, the following issues have spurred cost increases:

- Market adjustments reflecting realities of a deregulated electricity market
- Continuing growth resulting in increased demand
- Voluntary clean energy purchases

* Ansolabehere, S., Curry, T., Herzog H., Trends in Public Attitudes on Global Warming (Survey), Massachusetts Institute of Technology, October 2006.

Future factors that are likely to result in continued escalation of energy costs include:

- Need for substantial investment in transmission and distribution infrastructure
- Competition from emerging economies
- Continued depletion of fossil fuels
- Increased requirements and voluntary actions to adopt clean energy
- Voluntary and mandatory responses to climate change and other environmental issues by the energy industries

Local Policies – A number of local policies, though extremely beneficial to the environment, may result in an increased need for expanded operating and capital improvement budgets in FY 2008 and beyond. These policies include:

- Commitment to clean energy purchasing – Montgomery County's Energy Policy, most recently amended in 2006, requires the procurement of 10% of the County Government's annual electricity consumption from clean energy in 2007 and an escalation to 20% by 2010 where practical. Montgomery County Government, and many partners in the Wind Power Purchasing Group, increased their purchase in 2007 to 10% with several others participants planning to voluntarily commit to the increase in 2008.
- Green Building Legislation – In November 2006, the Montgomery County Council passed Bill 17-06, requiring any new or extensively modified building in which the County Government finances over 30% of the project cost to achieve a minimum of a silver rating within the applicable United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system or equivalent. The bill includes additional mandates for private development. This landmark legislation will reduce the environmental impact and improve the quality of public building stock within the County. Utility costs, particularly electricity, natural gas and water, should be reduced for buildings constructed under the standard for the lifecycle of the building.

Generation, Transmission and Distribution System Capacity – The nation's existing electricity generation, transmission and distribution infrastructure is inadequate to serve growing demand, particularly near major metropolitan centers such as Washington, DC. As demonstrated in July 2006 when PJM, the power pool that serves the metro area as well as much of the mid-Atlantic and parts of the Ohio Valley and Great Lakes regions, set record levels of demand. Over 144 gigawatts (GW) of demand was recorded at the peak of this summer heat wave, approaching the theoretical capacity of the system. Over the next 20 years the electricity grid that serves the metropolitan area requires significant investment to ensure electricity reliability and availability. One key expansion being planned for completion by 2011 is the Trans-Allegheny Interstate Line (TraIL) by Allegheny Power that will stretch from Pennsylvania and West Virginia to Northern Virginia. Numerous other projects are expected to occur and the costs of these improvements will in part be passed onto rate payers.

Utility Rates

The County Code Chapter 18A-9(d)(2) charges ICEUM with the establishment of uniform utility unit costs for county operating budget proposes. To that end, ICEUM members develop utility rate projections each year. In order to utilize a consistent methodology for projecting energy costs, ICEUM members review trends in futures markets for energy commodities. Futures markets are also considered in projections of motor vehicle fuel costs; however, final rate projections are set based upon predictions of DPWT's Division of Fleet Management Services for contractual costs for vehicle fuels.

ICEUM rates are intended as reasonable estimates which individual agencies do not exceed in developing their budgets. Since each agency purchases different volumes and types of fuels, each agency sets its own budget amounts for utilities, under the established ICEUM unit rates.

INTERAGENCY COMMITTEE ON ENERGY AND UTILITIES MANAGEMENT

UTILITY RATES

Established October 11, 2006

FY2007, FY2008

Utilities	ACTUAL FY05	ACTUAL FY06	Budget PROJECTED FY07	PROJECTED FY07	PROJECTED FY08
Electricity	**68.8**	**100.0**	**139.9**	**130.5**	**141.2**
No. 2 Fuel Oil	**$1.60** per gallon	**$2.05** per gallon	$**2.09** per gallon	$**2.05** per gallon	**$2.10** per gallon
Natural Gas	**$1.33** per therm	**$1.86** per therm	**$1.70** per therm	$**1.57** per therm	**$1.57** per therm
Propane	**$1.39** per gallon	$**1.86** per gallon	**$1.67** per gallon	**$1.80** per gallon	**$2.00** per gallon
Water & Sewer	**3%** increase over Actual FY04	**2.5**% increase over Actual FY05	**2.5**% increase over Proj. FY06	**3.0 %** increase over Actual Fy06	**3.0%** increase over Proj. Fy07
Motor Fuels:					
Unleaded	$**1.70** per gallon	$**2.30** per gallon	**$2.72** per gallon	$**2.72** per gallon	$**2.85** per gallon
Diesel	$ **1.77** per gallon	**$2.28** per gallon	**$2.80** per gallon	$**2.80** per gallon	$**2.95** per gallon
CNG:	**$1.92** per gallon equivalent	**$2.45** per gallon equivalent	**$2.45** per gallon equivalent	$**2.45** per gallon equivalent	$**2.59** per gallon equivalent
Ethanol	**$1.95** per gallon	**$2.69** per gallon	**$2.61** per gallon	$**2.75** per gallon	$**3.05** per gallon

Notes:
1. Unit cost or percentage change is a cap. Individual agency unit costs may be below the ICEUM established number, but can not exceed the projection. Energy cost projections for FY07 and FY08 assume the fuel energy tax at the level established in FY06.
2. Electricity rates are expressed as an index, Actual 2006 equals 100%.
3. Electricity rate projections include the price premium for wind energy.
4. Motor fuels include State tax.
5. CNG rate excludes Federal excise taxes, which the County does not pay.

Executive Summary of Agency Resource Conservation Plans

RCPs are developed annually by five ICEUM member agencies. Each RCP includes content on past and existing efficiency measures implemented by the agencies, planned measures, innovative measures, and energy consumption and expenditure data. Agencies preparing RCPs include:

- Department of Public Works and Transportation, Division of Operations
- Montgomery County Public Schools
- Montgomery College
- Maryland-National Capital Park and Planning Commission
- Washington Suburban Sanitary Commission

The Department of Environmental Protection, acting as the coordinating agency for ICEUM, collects and compiles the individual RCPs into a single document, and develops an Executive Summary in consultation with other ICEUM members. The purpose of this summary is to present a high-level overview of the utility expenditures for each participating agency, the degree of energy investment and total savings, the results of collective procurements, the volume of clean energy purchasing, and to highlight selected innovations.

Energy Management

The objective of an energy management program is to use engineering and economic principles to control the cost of energy needed to operate buildings and provide services. In order for energy management to be effective, it is first necessary for the energy manager to understand how much energy is being consumed and by what specific activities or equipment it is used. With this information, it becomes possible to identify opportunities for improvements in energy efficiency and to determine the amount of energy and money that can be saved by each measure. The energy manager may then compare the cost effectiveness of potential measures, and evaluate the effectiveness of measures that were implemented in the past. Each member agency of ICEUM currently has programs in place to provide energy management. However, programs differ widely among agencies, and the descriptions of energy management efforts presented in the annual RCPs also differ widely in both content and format.

In order to provide some uniformity in the RCPs, summary forms were developed that contain the main components of energy planning. These forms are divided into sections on:

- general facilities characteristics,
- energy consumption information,
- existing energy management measures,
- new energy management measures implemented during the current fiscal year, and
- measures planned for implementation during future years.

Narrative material is also provided to supplement and explain the information in the summary forms.

Energy Use and Costs

Utility costs fluctuate with rate changes and are influenced by a variety of external factors. Exhibit 1 illustrates the annual utility costs by agency for FY2006. Fuels include electricity, natural gas, fuel oil, propane, and diesel fuel for standby generators. The relative percentages of the fuels consumed by ICEUM agencies are illustrated in Exhibit 2. Water and sewer utility costs are also reflected in Exhibit 1. Details on the distribution of costs among various sources and agencies are included in the agency RCP submissions included in this document.

Exhibit 1. Annual Utility Costs by Agency ($1000s)

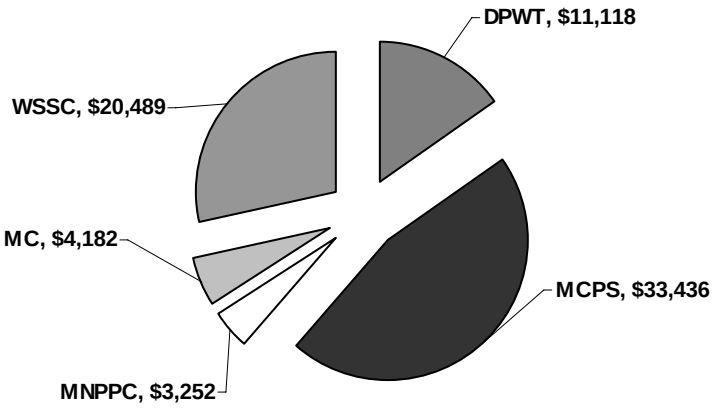
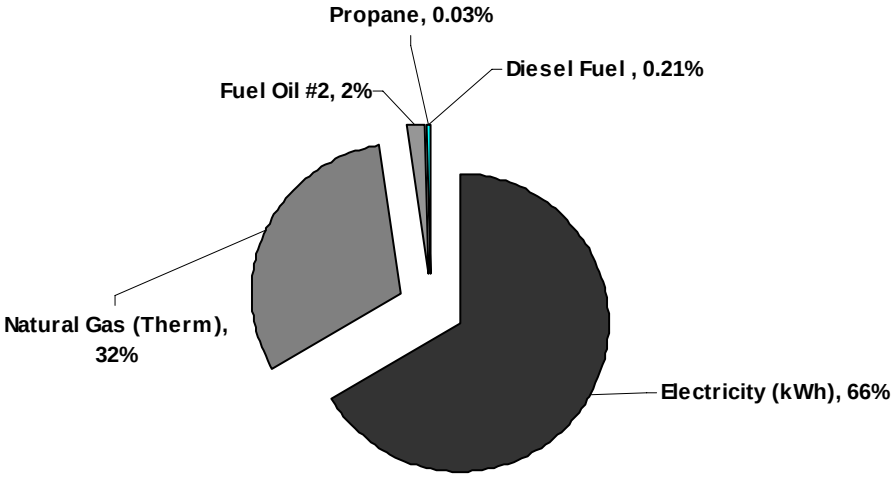


Exhibit 2. Aggregate Energy Consumption by Fuel Type (%BTUs)



Resource Savings

All ICEUM member agencies have been implementing energy and water efficiency measures as the primary component of their energy management programs. Individual measures that were implemented in the past, and estimates of the cost savings resulting from each measure, are reported in the "Existing Measures" section of the summary forms of the RCPs. Measures that were implemented during the current year (FY 07) are listed as "New Measures," and measures planned for the coming fiscal year (FY 08) are listed as "Planned Measures." The initial costs and annual savings associated with these measures for each agency are shown in Table 3.

Exhibit 3. Resource Management Measures by Agency†

	Existing Measures		
Agency	**Implementation Cost ($1000s)**	**Annual Cost Savings ($1000s)**	**Average Simple Payback (Years)**
DPWT	$14,612	$6,576	2.2
MCPS	$1,185	$745	1.6
MNPPC	$318	$152	2.1
MC	$2,055	$382	5.4
WSSC	$10,250	$2,800	3.7
Total	**$28,420**	**$10,655**	**2.7**

	New Measures 2007		
Agency	**Implementation Cost ($1000s)**	**Annual Utility Savings ($1000s)**	**Average Simple Payback (Years)**
DPWT	$1,025	$2,224	0.5
MCPS	$3,555	$1,118	3.2
MNPPC	$68	$32	2.1
MC	$125	$25	5.0
WSSC	$470	$773	0.6
Total	**$5,243**	**$4,172**	**1.3**

	Planned Measures for 2008		
Agency	**Implementation Cost ($1000s)**	**Annual Cost Savings ($1000s)**	**Average Simple Payback (Years)**
DPWT	$1,535	$824	1.9
MCPS	$804	$680	1.2
MNPPC	$85	$38	2.2
MC	$125	$37	3.4
WSSC	$10,000	$2,100	4.8
Total	**$12,549**	**$3,679**	**3.4**

Without the implementation of the energy saving measures summarized in the table above, the FY 06 aggregate utilities budget for all agencies would have been higher by a total of approximately $14.8 million.

† Estimates are based on RCP submissions by participating agencies, using FY2006 utility costs. Methodologies for calculating savings are established by the individual agencies and may not be uniform across all ICEUM members.

Cooperative Energy Purchasing

In response to historically increasing energy costs, ICEUM has led interagency cooperative purchases of energy resulting in substantial cost avoidance for all participating members. Most recently, in March 2007, DPWT in coordination with ICEUM conducted a web-based reverse auction involving Montgomery County and 18 Municipalities for electricity supply. During the auction, bids were received from pre-qualified suppliers and awards made the same day. As a result of the auction, the majority of electricity accounts were placed and avoided costs of 19.6%, or $25 million, are expected.‡

Clean Energy Purchases

Beginning in 2004, Montgomery County orchestrated, at the time, the largest municipal clean energy purchasing group in the nation. Consisting of 18 members, the group committed to purchasing 5% of their annual electricity consumption from regional clean energy sources, in this case the Mountaineer Wind Energy Center in West Virginia.

Emphasizing the importance of Clean Energy, in 2006 Montgomery County Council and the Executive approved a resolution that required Montgomery County Government to purchase 10% its annual energy consumption from clean sources in 2007, increasing to 20% by 2010. In 2007, the group purchased over 56,000 Megawatt-hours (MWH) of clean energy, the 3rd largest municipal purchase by a member of the U.S. Environmental Protection Agency's Green Power Partnership. Starting early in 2007, ICEUM will begin reviewing options for the next clean energy procurement when the existing contract expires on July 1st, 2008.

Starting in January of 2008, WSSC will purchase an estimated 70,000 MWHs annually (85% of the output) from a new wind farm being constructed in Somerset County, Pennsylvania. WSSC has contracted for both the electricity generated by this facility and the renewable energy credits and anticipates by 2011, 20% of the agency's electricity consumption will be supplied from this source.

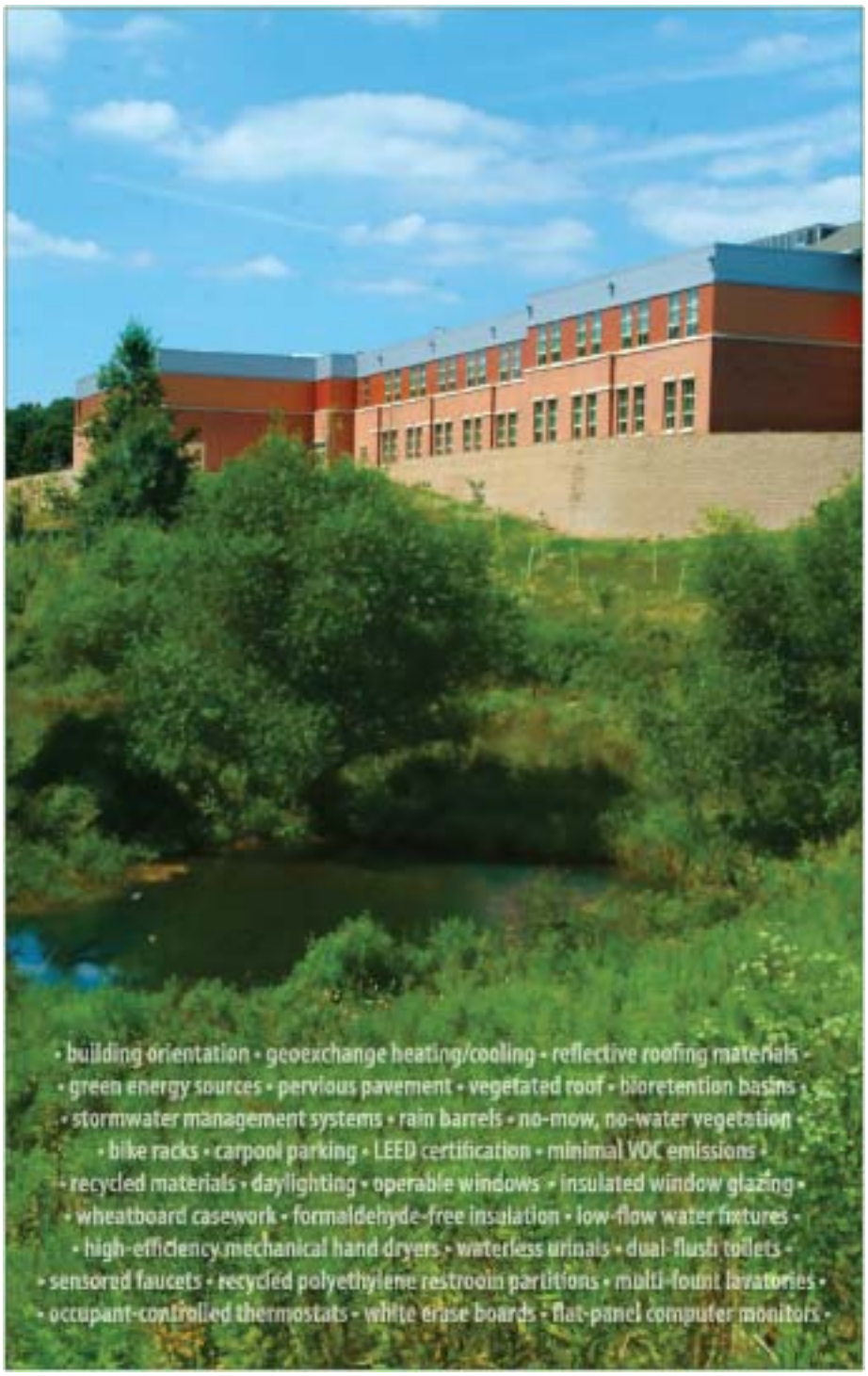
Conclusion

The challenges related to the environmental impact, cost, availability and reliability of energy require continued vigilance and innovation by ICEUM member agencies. Using collaboration, cooperative procurement and education, ICEUM has established a track record of solutions that have resulted in real cost and environmental benefits. In FY2008 ICEUM will continue to implement the measures discussed in this plan. In addition, the committee will bring forth innovative ideas for FY2009 to help the County address its responsibility to the environment while seeking the best financial returns possible from capital improvement funds and other resources committed by the County Executive and County Council.

‡ Details of the reverse auction results are included in Section 6, pages 4 to 9.

Resource Conservation Plan FY 2008

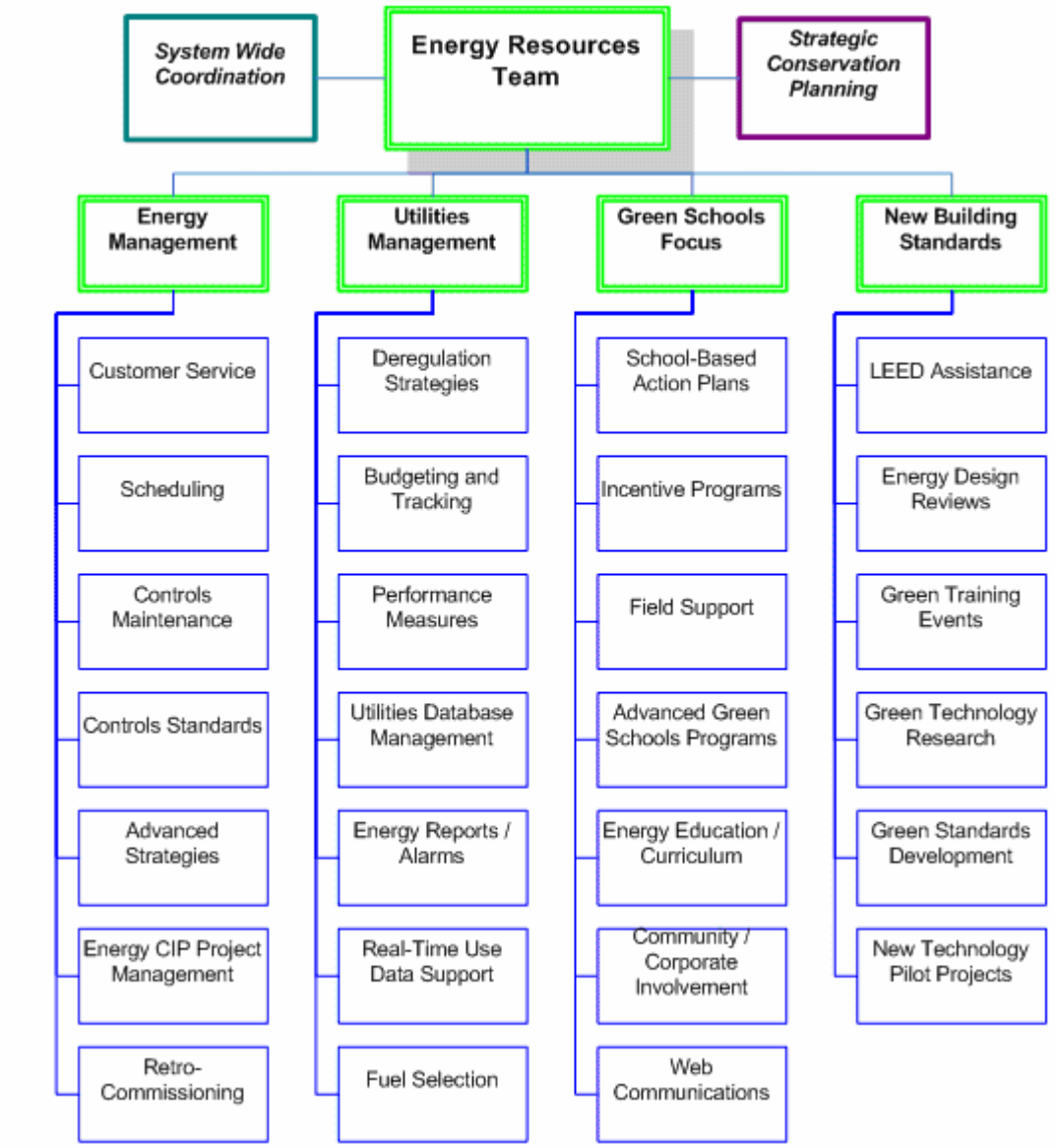
Montgomery County Public Schools
Maryland



Pictured above: Great Seneca Creek Elementary School
First LEED Registered Public School in Maryland

Summary

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 website 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 2008
Summary

The information on this page reflects the facilities owned or operated by this agency as of the end of **FY 2006 (June 30, 2006)**

Agency	**Montgomery County Public Schools, Maryland**		
Number of Facilities	221	Change in number of facilities	+2
Total square feet	22,197,365	Change in total square feet	442,531
Average operating hrs, year	3,170	Change in avg. operating hrs, year	+210
Other changes effecting energy consumption	**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 and energy use are on the rise. In FY 2007 in particular the Montgomery County Department of Recreation added RecExtra after-school programs at all 38 middle schools and three of the largest high schools. **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. **Heating and Air-conditioning Policy Change:** At the start of FY 2006 a policy change made heating and cooling automatic instead of optional for all events scheduled through the CUPF, greatly increasing the energy impact of after-hours and summer use of schools. **Peak Number of Portables:** Portables are electrically heated and use twice the electrical energy per square foot of permanent classrooms. The number of portables peaked in FY 06 at 656,000 square foot – the energy equivalent of 20 average elementary schools. **Extreme Weather:** FY 2006 recorded the hottest summer on record for the area. Summer electric use set new records 10% higher than normal. Seven of the hottest summers on record have occurred in the past ten years.		

	Units	Total consumption (actual FY 2006)	Percent change from actual FY 2005	Total cost (actual FY 2005) $	Percent change from actual FY 2005
Electricity	kWh	214,202,351	11%	$20,985,863	18%
Natural Gas (Firm)	therms	5,969,862	-2.5%	$10,083,211	35%
Natural Gas (Irate)	therms	0	0	0	0
Fuel Oil #2	gallons	187,360	-20.8%	$376,832	-1%
Propane	gallons	35,471	11%	$58,749	-33%
Water/Sewer	kgallons	438,871	2.3%	$1,931,602	13%
Total				$33,436,260	22%

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 Montgomery County Public Schools (MCPS). This highly efficient heating and cooling system has now been installed in Great Seneca Creek and Little Bennet 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 joint procurement efforts of deregulated energy supplies with other county and bi-county agencies. The last electricity procurement was performed on the web using an innovative reverse auction approach to minimize the price offered.

Environmental Standards: Beyond energy conservation measures, MCPS seeks to be environmentally responsible in all aspects of facility design and operation. New MCPS facilities are rated by the U.S. Green Building Council for certification under the Leadership in Energy and Environmental Design (**LEED**) program. This program recognizes sustainable design in facilities, sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. Great Seneca Creek Elementary School was designed as a **LEED** pilot project and will be the first school in Maryland to receive LEED certification. Lessons learned from the LEED process have been incorporated into the design and construction of future MCPS new construction projects.

"….because good planets are hard to find."
Greens Schools Focus Motto

New Measures

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

Measures - Planned: (for FY 2007)	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	03/2007	$ 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
Total		$1,700,000	($147,000)			$271,000
Operations and Maintenance:						
Group Relamp with 25 W 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
Total		$949,000	($46,000)			$1,460,000
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 deeper savings from energy management systems (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's consume only 5 Watts and have an extremely long life cycle, thus also improving the safety of the facilities.

Group Relamp with 25 W 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 lose 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

MCPS has made significant investments in energy conservation going back to 1980. The **Existing Measures** table on the following page highlights the past few years of projects.

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 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 and assistance to schools in saving energy by trained energy facilitators. The program is returning more than twice its annual cost in new savings.

"The problem of energy conservation has been solved, technically. All that remains is 20 years of implementation."

Amory Lovins, Ph.D., Rocky Mountain Institute

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 2007

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:						
EMS	1/2006	$500,000	($50,000)	Elect kWh	354,000	$45,000
Lighting Retrofit at Clopper Mill ES	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 MLK MS	10/2004	$ 10,000	($ 500)	Water Gal	560,000	$ 4,000
Retro-Commissioning Wheaton / Edison HS	09/2004	$255,000	($ 8,000)	Elect kWh	420,000	$ 43,000
Total		$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
Total		0	0			$275,000
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 high because portables originally contained only manual thermostats and ran essentially uncontrolled. The use of conventional 7-day programmable (but non-communicating) thermostats is impractical in this application because of the inability to verify programs at over 700 locations and the inability of 7-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 makes it feasible for the first time to efficiently control large numbers of small, relocatable buildings with a payback of under a year.

Waterless Urinals: Urinals are being tested that use no water for flushing, while improving sanitation and reducing restroom odors. One school and maintenance depot will be tested this year, with an anticipated payback of less than 3 years. If successful, this technology will be applied to 50 schools scheduled for work under the Restroom Renovations CIP.

Shutdown of Network Computers: In addition to using Energy Star computer equipment, 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

This table shows information on resource conservation measures implemented prior to FY 2007

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
EMS Upgrades	01/2003	$ 161,000		Elect kWh	442,000	$ 31,800
				NG Therm	18,500	$ 15,200
Cooling Tower Water Monitors	01/2003	$ 65,000	($15,000)	Water Gallons	2,800,000	$ 12,000
Total		$3,555,175	($145,856)			$1,118,442
Operations and Maintenance:						
Total						
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's 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: 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 outside of the Energy CIP are described below.

Improved New School Design: MCPS plans to pursue USGBC LEED certification of all future new buildings and modernizations. MCPS believes that, at a minimum, new construction projects would score a 26 or better under the current LEED criteria, sufficient to achieve certification. On a project-by-project basis, "stretch" measures will be included for pilot testing. As these measures and technologies prove themselves reliable and effective, the measure will be incorporated in the design guidelines.

New Green Schools: MCPS plans to continue Green Schools training and support to schools at the rate of 10 per year, with a goal of eventually having all middle and high schools become part of this program.

Water Conservation Retrofits: In the area of water conservation, MCPS plans to incorporate successful technologies from pilot studies into design for a 50-school Restroom Renovations Capital Improvement Project.

"I think, therefore I conserve"
Ron Balon, Energy Team Leader

Planned 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:	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	03/2007	$ 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
Total		$1,700,000	($147,000)			$306,000
Operations and Maintenance:						
Group Relamp with 25 W T8 – Phase 2	6/2007	$804,000	($31,000)	Elect kWh	5,360,000	$680,000
Total		$804,000	($31,000)			$680,000
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 deeper savings from energy management systems (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's consume only 5 Watts and have an extremely long life cycle, thus also improving the safety of the facilities.

Group Relamp with 25 W 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 output. 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.

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 school system in Maryland** to register a new building design for LEED Certification (NWES #7, now named Great Seneca Creek ES).

3) First **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) First deployment of a **web interface in MCPS** to view real-time building information.

   a. Twenty schools are now "online" to anyone on the MCPS-wide area network to view building environmental conditions through a web browser.

5) First 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 PEPCO "CEO Online" subscription program.

   b. A 10-building pilot project is testing a similar and less expensive approach completely owned by MCPS.

6) First 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) First **network control** of power-saving settings on all MCPS computers.

8) First 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) First school (Roberto Clemente Middle School) to receive an **energy savings company (ESCO) Performance Contract** for comprehensive energy audit and implementation of energy conservation measures.

   a. First use of energy project financing through the Community Energy Loan Program of the Maryland Energy Administration

11) First use of **waterless urinals** (Martin Luther King Middle School) in a Maryland school.

12) New staff (**energy facilitators**) and program support designated to **visit schools monthly** and monitor and assist with energy saving plans.

Appendix – Montgomery County Public Schools

Resource Conservation Policy and Guidelines

- BOE 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 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 empty, 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 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 for successfully reducing light levels and saving 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. Because most classroom lights are controlled by two or more switches, maximum lighting and lights nearest the windows should be used only when daylight is not available.

9. **Exterior Lighting:** All outside lighting shall be **off** during daylight hours. Parking lot lights should be turned off at the close of the regular school day or evening activities (by 12:00 a.m. at the latest), and back on at 6:00 a.m. to 8:00 a.m. (unless sunrise is before 6:00 a.m.) Building service managers should seasonally check/reset the time clock for all outside lighting.

10. **Cleaning Crews:** All lights will be turned **off** when students and teachers leave school. Building service workers will turn on lights only in the areas in which they are currently working.

11. **Holidays and Breaks:** All electrical equipment will 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 will be kept closed when cooling systems are in operation. Corridor doors and doors to classrooms will remain closed when HVAC is provided. Doors to unconditioned spaces, including gyms and pools, will be kept closed. Inspect automatic door closers weekly.

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 $500.00 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 ▪ 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 (avg. 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 three degrees 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 will be kept closed when heating systems are in operation. Corridor doors and doors to classrooms will remain closed when HVAC is provided. Doors to unconditioned spaces, including gyms and pools, will be kept closed. Inspect automatic door closers weekly.

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. 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.
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.

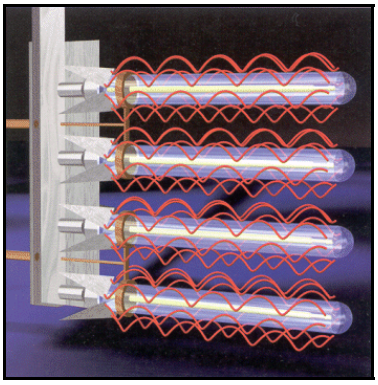
    b. **With timer systems, check zones for proper saturation levels.** Make sure water saturates the root zone when irrigating but no further. No runoff should occur from the area being watered.

    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.

WASHINGTON SUBURBAN SANITARY COMMISSION



Resource Conservation Plan- FY'08

Rob Taylor, Energy Manager
Washington Suburban Sanitary Commission

January 2007

WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2008
RESOURCE CONSERVATION PLAN

Summary

The information on this page reflects the facilities owned or operated
By WSSC as of the end of **FY 06 (June 30, 2006)**

Number of Facilities	202	Change in number of facilities	+1
Total square feet	N/A	Change in total ft^2	N/A
Average operating hrs/year	N/A (most 24/7)	Change in avg. operating hrs/year	N/A
Other changes effecting energy consumption	See Narrative		

Utilities:	units	total consumption (actual FY 06)	percent change from actual FY 05	total cost (actual FY 06) $	percent change from actual FY 05
Electricity	kWh	207,796,000	+1%	$19,351,000	+30%
Natural Gas (firm)	therms	306,000	0%	$498,000	+35%
Natural Gas (rate)	therms	385,000	-5%	$555,000	+42%
Diesel Fuel (generators)	gallons	15,000	+88%	$37,000	+85%
Fuel Oil #2	gallons	19,000	-27%	$38,000	-14%
Propane	gallons	5,000	+100%	$10,000	+100%
Water/Sewer	gallons	N/A	N/A%	N/A	N/A%
Total				$20,489,000	+30%

WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2008
RESOURCE CONSERVATION PLAN

New Measures

This table shows information on resource conservation measures implemented during FY 06
(July 1, 2005 through June 30, 2006)

Measures - New: (Implemented during FY 06)	date implemented (mo/yr)	initial cost ($)	annual net impact on maintenance cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($)
Capital Improvement Projects:						
Total, CIP						
Operations and Maintenance:						
Pump Turbine Utilization (Rocky Gorge)	7/05 – 6/06	$0	$0	Electric	2,732,000 kWh	$273,000
Derceto Water Pumping Optimization System - Electric /Load Shifting & Efficiency Optimization	4/06	$470,000	$0	Electric	5,000 kW	$500,000
Energy Performance Project- Phase IIC- Electric Supply/Risk Mgmt.						
Total, O&M					2,732,000 kWh 5,000 kW	$773,000
Page Total					2,732,000 kWh 5,000 kW	$773,000
Description of Activities:						
See narrative						

WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2008
RESOURCE CONSERVATION PLAN

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 06

Measures - Existing: (implemented from FY 00 to FY 05)	date implemented (mo/yr)	initial cost ($)	annual net impact on maintenance cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($)
Capital Improvement Projects:						
Variable Frequency Drives	FY 01-03	$250,000	$0	Electric	1,000,000 kWh	$50,000
					1000 kW	$50,000
Energy Performance Project- Phase IIA	FY 02-05	$10,000,000	$0	Electric	9,000,000 kWh	$800,000
Total, CIP					10,000,000 kWh 1000 kW	$900,000
Operations and Maintenance:						
Load Curtailment	FY 00-05	$0	$0	Electric	3,000 kW	$100,000
Pump Turbine Utilization (Rocky Gorge)	FY 00-05	$0	$0	Electric	2,000,000 kWh	$150,000
Aggregated Electric Supply Procurement- Pepco/BGE accounts	FY 00-03	$0	$0	Electric	0	$150,000
Energy Performance Project- Phase IIC- Electric Supply/Risk Mgmt.						$1,500,000
Total, O&M					2,000,000 kWh 3,000 kW	$1,900,000
Page Total					12,000,000 kWh 4000 kW	$2,800,000
Description of Activities:						
See narrative						

WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2008
RESOURCE CONSERVATION PLAN

Planned Measures

This table shows information on resource conservation measures planned
To be implemented in FY 07 **(July 1, 2006 through June 30, 2007)**

Measures - Planned: (for FY07)	projected completion date (mo/yr)	projected initial cost ($)	projected annual net impact on maintenance cost ($)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings ($)
Capital Improvement Projects:						
Energy Performance Project- Phase IIB (under design)	12/09	$10,000,000 (total over 24 months)		Electricity		
				Natural Gas		
Total, CIP		$10,000,000				
Operations and Maintenance:						
Energy Performance Project- Phase IIC- Electric Supply & Supply Mgmt. Services	6/07					$1,500,000
Derceto Water System Optimization					5000 kW load shifting	$500,000
Pump Turbine Utilization (Rocky Gorge)	7/07	$0	$0	Electric	1,000,000 kWh	$100,000
Total, O&M					5000 kW load shifting 1,000,000 kWh	$2,100,000
Page Total					5,000 kW 1,000,000 kWh	$2,100,000
Description of Activities:						
See narrative						

WASHINGTON SUBURBAN SANITARY COMMISSION
FY 2008
RESOURCE CONSERVATION PLAN

ENERGY MANAGEMENT- MISSION:

The mission of this Section is to optimize the usage, reliability, and cost of electricity, natural gas, fuel oil, propane, and diesel fuel in conjunction with maintaining or improving the quality of operation and maintenance of all water/wastewater treatment plants, pumping stations, storage sites and field offices.

MAJOR INITIATIVES:

Energy Information System (EIS)

Our Intranet-based energy billing and tracking system is entering its 4th year of successful operation and is continually being developed to adapt to more advanced billing methods and the growing complexity of the de-regulated electricity market. EIS now includes detailed information for actual FY'04, FY'05 and FY'06 including consumption, demand and costs. FY'06's milestones included:

- Reorganization of EIS Tariff Management - As a consequence of de-regulation, the Provider of Last Resort (POLR) tariff rates for utility company electricity services now change annually or semi-annually to reflect energy market conditions. In order to maintain accurate records of historical rates while avoiding the increasing overhead of frequently re-assigning 230 accounts to new versions of SOS tariffs, EIS was modified to organize utility tariffs by class. Under this scheme, utility companies are set up with various classes of tariff offered, and the individual tariffs are maintained as part of their class. Accounts are assigned to a tariff class rather than an individual tariff. Therefore, when new SOS tariffs are published, the tariff is updated in EIS, while EIS now automatically discerns which particular tariff to use based upon the effective dates of the tariffs and the date of each invoice being verified. The 230 accounts no longer require manual maintenance when SOS rates change, saving time and ensuring accuracy.

- Measurement and Verification Module – A performance measurement and verification module was developed to monitor the performance of the Derceto pump optimization project (see below). This entailed detailed historical data analysis using SCADA data from over a fifteen-month period corresponding to the time WSSC as operated under real-time energy purchasing contracts with CEPS. Detailed models documenting plant performance with respect to energy efficiency and load shifting were developed for the Potomac and Patuxent treatment plants and water pumping stations. EIS is now set up to perform baseline calculations for these facilities and report progress as invoices enter the system.

- EDI Invoice Processing Module– The first phase of an EIS extension for receiving and processing invoices in Electronic Data Interchange (EDI format was completed. This will enable WSSC to manual data entry for all electricity accounts, and reduce paper processing from over 4,800 pages per year to approximately 48 summary pages (2 pages/month for two main utilities). The system was rolled out in December 2006 and WSSC accounting staff will be trained on the new system in January- March of 2007. See **Appendix A** for illustration of the new system.

- FY'06 marked the second full year of electronic invoicing and verification from our electricity broker, Constellation Energy Projects & Services (CEPS). Invoices include a combination of real-time energy prices and block purchases made at fixed prices, and rely on PJM hourly LMP rates downloaded from PJM's web site on a weekly basis. EIS automatically performs the complex calculations to verify the invoices are correct, as well as stores the invoice data in the database. This data can be accessed by any authorized WSSC employee at any location on the WSSC intranet.

Energy Performance Project

Phase IIA:
Constellation Energy Projects & Services Group (CEPS) completed nine Energy Conservation Measures as part of a $10 million capital energy efficient upgrade of aeration, solids handling, grit removal, peak shaving electric generation, HVAC modifications, and variable speed drives at Western Branch, Parkway, Piscataway, Damascus, and RGHB. This energy performance project has already produced dramatic savings at our facilities and is the first of its kind at WSSC and one of the most comprehensive in the water and wastewater industry, combining design, construction, monitoring, energy guarantee, and maintenance, into one project. The $691,000 annual guaranteed energy and related savings resulting from the installation paid for 100% of the capital funds required over the 15-year State required payback period. If the actual annual savings does not meet or exceed the guaranteed savings during any year of the contract, CEPS will pay the Commission the difference. CEPS and WSSC have been monitoring the performance of the new equipment to insure that the projected savings is met. WSSC received a low-interest (1.2%) loan from MDE's Water Quality Revolving Loan Fund for this project. In the first two years following substantial completion of the project, WSSC has realized approximately $1,500,000 in savings. In addition, some of the installed equipment includes a five year warranty and preventive maintenance. As part of the overall contract, CEPS submits an annual monitoring and verification (M&V) report of the actual savings achieved. The M&V report is submitted to the Montgomery and Prince George's County Councils for their review. **Appendix B** shows increasing wastewater production rates having no impact on kWh consumption use due to these dramatic efficiency improvements.

Phase IIB:
1. On August 16, 2006, CEPS was awarded the 2nd phase of the design/build/guarantee project, after an extensive engineering feasibility study and audit of all major WSSC water pumping stations, Potomac, and Patuxent water treatment plants, selected wastewater pumping stations, major field offices, and Western Branch and Seneca wastewater treatment plants. The $11,218,510 project includes design, construction, annual energy guarantee, monitoring & verification, and maintenance, with a payback less than 15 years. Upgrades include:
   - 1500 kW emergency generator with electric peak shaving capability at Seneca WWTP
   - Biosolids incinerator upgrades to increase capacity, lower emissions, and lower natural gas usage at Western Branch WWTP
   - Addition of (2) 200 HP pumps and controls to accommodate average dry day flow with lower HP at Anacostia II WWPS.
2. As of the writing of this Resource Conservation Plan, detailed design is approximately 50% complete for each of the energy conservation measures (ECM). The design and construction of the ECMs are estimated to be completed by December 2009 for all three sites. Guaranteed annual savings is $874,000 per year.

Derceto Energy Optimization -Water Distribution System
Derceto completed initial installation of their automated SCADA-based control software system in May 2006. The system is designed to automatically control pumping and storage to optimize energy costs, while meeting WSSC's water quality and system demand requirements. The system modifies pumping, clear well and tank storage levels based on demand as well as PJM day-ahead hourly electricity pricing. It also maximizes water turnover rates to help maintain water quality. The WSSC water pumping and storage model is still being modified, and both WSSC and Derceto continue to troubleshoot communications and operational issues. The EIS is tracking system savings from load shifting and pump efficiency improvements compared to a 15 month FY'05 baseline. The Systems Control Group and Derceto expect to improve the efficiency of the system to be

on track in achieving significant electricity cost savings by the end of FY'07. See **Appendix C and D** for illustration of system operation and tracking of load shifting and efficiency savings in the Energy Information System (EIS).

Turbine Operation

Due to the low amount of rainfall this year and the corresponding low water level at Rocky Gorge Reservoir, the Rocky Gorge Water Pumping Station, pump turbines (700 HP each) could only be run a total of 5,464 hours in FY'06. However, due to increasing electric rates, $273,000 savings was achieved. The turbines are run in lieu of electric motors when the reservoir level permits.

FY'08 ENERGY BUDGET REQUEST DETAILS:

The purpose of these activities is to provide for the purchase of electricity, natural gas, propane, and diesel fuel associated with the operation of all Commission facilities.

	FY'05 ACTUAL	FY'06 ACTUAL	FY'07 BUDGET	FY'08 REQUEST
Electricity	$14,897,000	$19,351,000	$19,790,000	$19,790,000
Natural Gas (firm)	$369,000	$498,000	$480,000	$439,000
Natural Gas (Irate)	$392,000	$555,000	$520,000	$536,000
Diesel Fuel (generators)	$20,000	$37,000	$38,000	$46,000
Fuel Oil #2	$45,000	$38,000	$50,000	$40,000
Propane	0	$10,000	$5,000	$20,000
Water/Sewer	N/A	N/A	N/A	N/A
WSSC ENERGY COSTS- Total	$15,723,000	$20,489,000	$20,883,000	$23,028,000

ENERGY BUDGET ANALYSIS:

Electricity Market

BGE and Pepco took wholesale bids in December '05, January '06, and February '06 for the following fixed price POLR (Provider of Last Resort) services effective June 1, 2006: BGE Type I (0-60 kW peak load contribution)for summer and non-summer rates; PEPCO Type I (0-25 kW peak load contribution)for summer and non-summer rates; BGE Type II A (peak load contribution greater than 100 kW) for summer rates only; PEPCO Type II A (peak load contribution greater than 100 kW) for summer rates only; BGE Type II B (peak load contribution less than 100 kW but greater than 60 kW) for summer and non-summer rates; and PEPCO Type II B (peak load contribution less than 100 kW but greater than 25 kW) for summer and non-summer rates. For the non-summer Type II BGE and non-summer Type II- A PEPCO accounts, the respective utility took wholesale bids in August 2006. As a result of all the bids, new Type I and II (A & B) supply rates increased considerably, by approximately 40% over the previous year.

Since the December '05/January '06, and February '06 wholesale bids for all Type I accounts and all Type II summer accounts, electricity market prices have decreased somewhat due to the recent high levels of natural gas inventories forcing a decline in natural gas price. Also contributing to lower electricity prices is the absence of hurricane damage in the Gulf this fall (2006). Because of the downward trend in energy prices since early spring of 2006, many Type I and II customers during the summer of 2006 have exited from the POLR rates effective June 1, 2006 to third party alternative retail electric supply. Currently, for the non summer 2006 through 2007 period, Type I and Type II rates are close to alternative third party retail supplier bid rates. WSSC and CEPS continue to monitor the market to determine which Type II accounts are better served by bids than under POLR rates.

a) Electrical Supply- BGE Accounts

Since June 1, 2005 all 29 of WSSC's G accounts have remained under BGE's POLR Type I service which is currently priced at about market. G accounts are most likely to remain on POLR throughout FY'07 unless we see a continued movement downward in wholesale electricity costs – this scenario is not likely as we enter in the winter season where natural gas prices typically trend upward. BGE POLR- Type I service expires in 5/31/08 but will be re-priced on June 1, 2007 based on BGE's wholesale bids to take place in the winter of 2006-2007.

BGE POLR Type II service (schedule GL) is planned to expire on 5/31/07 -- with no MD PSC order in place at this time to extend the service beyond July 1, 2007. Consequently, with no action by the MD PSC, after June 1, 2007 these accounts will be forced to the hourly spot market energy service of the utility. Currently, supply for our Type II GL accounts (4) are being purchased under our interval meter block load and day ahead wholesale bidding methodology (see "d" below) and are expected to be continued under this supply umbrella through the end of fiscal year 2007.

In order to mitigate trending energy costs during FY '06 and FY '07, WSSC insured itself from growing electricity prices by planning a diversified hedged electric supply position consisting of round the clock energy blocks purchases of on average 18 MW at a fixed price range of $49-$89 per MWH. Since July 2005 to June 2006, WSSC hedge positions have save the water company $1.7 million in energy costs vs. the alternative option of staying with the hourly spot market service of the utility.

Long term round the clock (RTC) energy blocks totaling 9 MW were purchased in May '05 to provide fixed price hedged positions for the period covering the entire fiscal year 2007 at a fixed price range of $54-$74 per MWH. These long term hedge positions were further buttressed by more recent round the clock energy block purchases consisting of 7 MW for fiscal 2007 at a range of $77-$81 per MWH. Recently WSSC purchased an additional round the clock energy block of 4 MW for the fiscal year 2007 non-summer period at $60 per MWH.

b) Electrical Supply- Pepco Accounts

All WSSC Pepco GS accounts (100) are now under Pepco's new POLR Type I service which is currently priced less than the market. GS accounts should remain on POLR Type I rates throughout FY'08. Supply for the smallest Pepco MGT accounts (14) also is being purchased under Type II POLR rates, as this is the most economical choice throughout FY'07. WSSC and CEPS continue to analyze the POLR rates vs market when new POLR rates are updated (twice a year) to confirm whether any Type II accounts should be shifted over to market rates under CEPS supply.

c) Electrical Supply- BGE, Pepco, Allegheny, and SMECO Interval Accounts: FY'06

WSSC's Competitively Bid Wholesale Power Purchase Program (CEPS EPC-Phase IIC): During the last two FY, WSSC's electricity procurement program under Phase IIC has been very successful. CEPS has procured competitively bid wholesale energy and capacity supply for WSSC's interval accounts (all BGE/Pepco Type III and some Type II -approximately 93% of consumption), real time and day ahead LMP purchasing on the PJM grid, and supply load management services. For FY'05 and FY'06, WSSC's electric supply cost has been 15% less than what it would have paid under the utilities' POLR rates, and have given WSSC the flexibility to take advantage of volatile electric markets quickly to lock in attractive pricing. Purchasing electricity supply in this manner has tied together existing WSSC initiatives in energy conservation (Energy Performance Projects Phase IIA

and IIB) with real time load management programs including water system optimization and utilization of back-up generation to reduce WSSC energy costs and minimize financial risks. Using a prequalified wholesale bidders list of 16 suppliers, energy block bids were taken twice in November 2005, and April 2006. During FY'05 and FY'06, WSSC has saved a total of $3,200,000 compared to utility POLR rates, including HPS.

Type I and Type II and III POLR service and Standard Offer service (SOS) for Allegheny and SMECO accounts, respectively remained below current market based prices for FY'06. However, with the recent downturn in energy prices, WSSC and CEPS will look at the next round of POLR bids to see if electric supply for any of these accounts can be purchased more economically in the marketplace.

d) Electrical Supply- BGE and Pepco Interval Accounts: FY'06, FY'07 to date, and forecasted FY'08:

In order to mitigate trending energy costs during FY '06 and FY '07, WSSC insured itself from growing electricity prices by planning a diversified hedged electric supply position consisting of round the clock energy blocks purchases of on average 18 MW at a fixed price range of $49-$89 per MWH. Since July 2005 to June 2006, WSSC hedge positions have saved $1,700,000 million in energy costs vs. the alternative option of staying with the hourly spot market service of the utility.

Long term round the clock energy blocks totaling 9 MW were purchased in May '05 to provide fixed price hedged positions for the period covering the entire fiscal year 2007 at a fixed price range of $54-$74 per MWH. These long term hedge positions were further buttressed by more recent round the clock energy block purchases consisting of 7 MW for fiscal 2007 at a range of $77-$81 per MWH. Recently WSSC purchased an additional round the clock energy block of 4 MW for the fiscal year 2007 non-summer period at $60 per MWH. **Appendix E** illustrates the wholesale blocks purchased to date since the beginning of Phase IIC (FY'05).

As of this writing, wholesale forward market energy prices are currently trading down 10% less since April 2006. Taking into account line losses, CEPS markup, and distribution costs, it is reasonable to expect slight decrease of 5% in for FY'08 prices over projected FY'07. However, it is expected that this will be offset by an major increase in capacity charges, as PJM's proposed change over to zonal based (i.e., BGE, Pepco) pricing vs. PJM regional based system. Such change will cause an increase in the cost of capacity in the congested market zones, which includes BGE and PEPCO zones. Currently, capacity at the BGE and PEPCO zones for the period July 2007 through June 2008 is trading at about $90/MWD or about $3.70/MWH. During the current fiscal Year WSSC purchased capacity at $9.50/MWH or about $.40/MWH Consequently, based on the current market price of $90/MWD for July '07 through June '08, this would constitute an increase of $3.30/MWh in capacity costs for this period. We project the combination of energy supply and capacity rates will cause our blended supply rate for interval accounts to increase from $82/MWh in FY'07 to $84/MWh on FY'08

e) Wind Power

WSSC culminated a year-long effort during FY'06 and FY'07 to increase the amount of renewable energy it consumes as well as hedging future generation and transmission (G&T) rates by committing to a long-term physical wind purchase for 33% of its total electricity consumption for a 10 year period, starting in January 2008. WSSC will purchase an estimated 70,000 MWH/yr or 85% of a new wind farm to be constructed by Edison Mission in Somerset County, Pennsylvania. Construction will begin in the spring of 2007. The physical wind power also will include all renewable energy credits and will exceed Montgomery County's recent mandate to buy at least 20% renewable power by FY 2011.

WSSC is committed to purchase 5% wind power through the Montgomery County Renewable Energy Certificate purchasing program through December 2007.

Natural Gas Market

a) Natural Gas Supply: Firm and Interruptible Accounts

WSSC has been purchasing natural gas since 2001 through a joint contract managed by Montgomery College. This has enabled WSSC to mitigate wild price fluctuations experienced in the spot market by locking in competitive rates on either a monthly or yearly NYMEX basis. In June 2006, the Montgomery College contract expired and was replaced by a new regional contract managed by Montgomery County Public Schools. This contract allows all participating using agencies to either float gas supply month to month on the NYMEX natural gas index, or lock in for 1-2 years. WSSC chose to lock in for FY'07, but waited to lock in for FY'08 when prices dropped due to mild weather conditions and high storage. For these reasons, we are forecasting a decrease of 10% in gas prices for FY'08 from projected FY'07

Montgomery County Energy Tax

Montgomery County Energy Tax remains at $.0129/kWh, and accounted for a $1,370,000 cost premium in FY'06.

Project	Description	Cost Effect
Ultraviolet Disinfection System	UV systems added at Piscataway, Western Branch, Seneca and Parkway WWTP replacing chlorine disinfection.	Increase kWh usage; increase cost by $160,000

Basis for Energy Consumption and Cost Projections

Energy consumption and cost projections are based on WSSC's MOST historical data and workload indices for the FY'08 Program/Budget.

Historical Data	FY '01 Actual	FY 02 Actual	FY '03 Actual	FY '04 Actual	FY '05 Actual	FY '06 Actual	FY '07 Estimated	FY '08 Projected
Field Office (SF)	559,133	559,133	559,133	559,133	559,133	509,133	509,133	509,133
Water Treated (MG)	60,189	59,605	59,605	61,089	61,576	62,233	61,320	61,503
Water Pumped-Boosted (MG)	19,021	13,295	13,295	13,626	10,686	10,979	10,642	10,673
Waste Water Pumped (MG)	32,534	30,765	30,765	37,464	34,678	30,622	31,656	36,976
Waste Water Treated (MG)	18,866	17,270	17,270	22,891	23,119	21,462	26,006	25,915

FY'08 Electric Rates and Buying strategy

FY'08 electric rates are estimated to be slightly less than actual FY'06 rates, due to the following:

- Crude oil prices have dropped significantly due to mild weather conditions, lower natural gas prices and easing tensions in the Middle East.
- Natural gas (see below) prices have decreased due to build-up of storage and no hurricanes during 2006 tropical storm season.
- Without our new hourly pricing procurement strategy (which includes a combination of competitively bid energy block and capacity purchases) accompanied by managed load shifting, our rates would be 20%-30% higher- close to the utility POLR hourly spot market rates. We are saving approximately $.01/kWh by buying under this strategy, resulting in $1,700,000 savings in FY'06 ($1,500,000 in FY'05).
- **Appendix F** shows that during the last 4 years, WSSC has held its kWh consumption level despite rising wastewater and water production rates; however despite best efforts to mitigate price inflation, electricity costs increased 58% during this period.

FY'08 Natural Gas Rates

FY'08 natural gas rates are estimated to be 10% lower than natural gas prices during FY '06, due to the following:

- Prices for FY'07 expired in June 2006. Under the new Montgomery County Public Schools gas supply contract, WSSC chose to float at the NYMEX monthly rate (which has been decreasing since July 2006). WSSC then locked in the FY'08 prices at a lower rate than the FY'07 rate.
- Lack of hurricanes during the 2006 tropical storm season and an average temperature summer allowed gas utilities to increase storage to levels 15% above the 5 year average.
- The Western Branch incinerator, WSSC's only interruptible natural gas account, continues to operate inefficiently due to its age (30+ years); **Appendix G** shows increased gas usage due to degradation of equipment along with increase in recent gas market prices. However, under Energy Performance Project Phase IIB, which is has 50% design completed, the incinerators will be upgraded to eliminate most of natural gas usage; project is due to be completed in December 2009.

Water Pumped, Treated, Waste Water Pumped, Treated:
Historical (FY'01- FY'06) kWh/MG indices have been applied to projected treatment and pumping efficiencies (MG/kWh), based on WSSC-Budget Group's projected FY'08 flows for water treatment and wastewater treatment plants; kWh were adjusted for changes in efficiency and operational changes including the effect of the Derceto Water Pumping System Energy Efficiency program; $/kWh projected rates for FY'08 were based on forward rates from the electricity market, then applied to each category of facilities (WTP, WWTP, WPS, etc.) to estimate total projected cost.

Field Offices:
Historical kWh/SF indices have been applied to projected SF to determine projected FY'08 kWh; kWh were adjusted for changes in efficiency and creep in energy usage per square foot ; $/kWh projected rates for FY'08 were based on latest POLR rates from Pepco and BGE, and applied to total SF to estimate total cost.

Dams, WWMVs, PRVs and Tanks:
Electric consumption was projected based on kWh 3-5 year historical averages; kWh total was applied to latest $/kWh POLR rates to estimate total cost.

EDC Invoice - Microsoft Internet Explorer

Invoice Detail

EIS Invoice | EDI Data

EDI Invoice Heading Data

Sender ID	006920284PEP
EDI Interchange Number	000000001
Transaction Control Number	0002
EDI Invoice Number	2002072508200612040837
Issue Date	20061204
Due Date	20061227
Service Dates	10/30/06 - 11/30/06

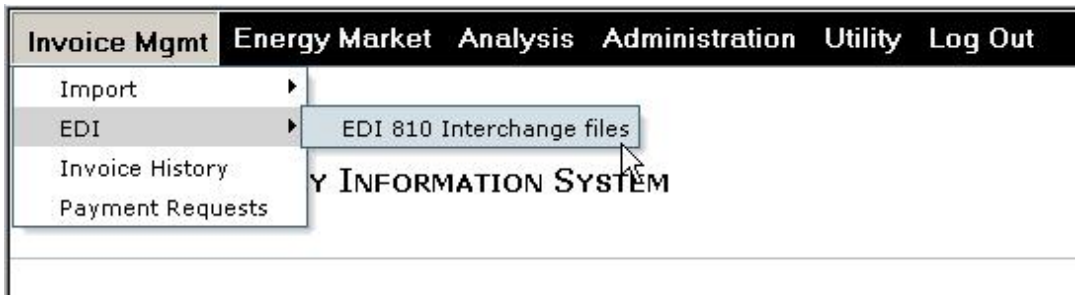
Invoice Measurements

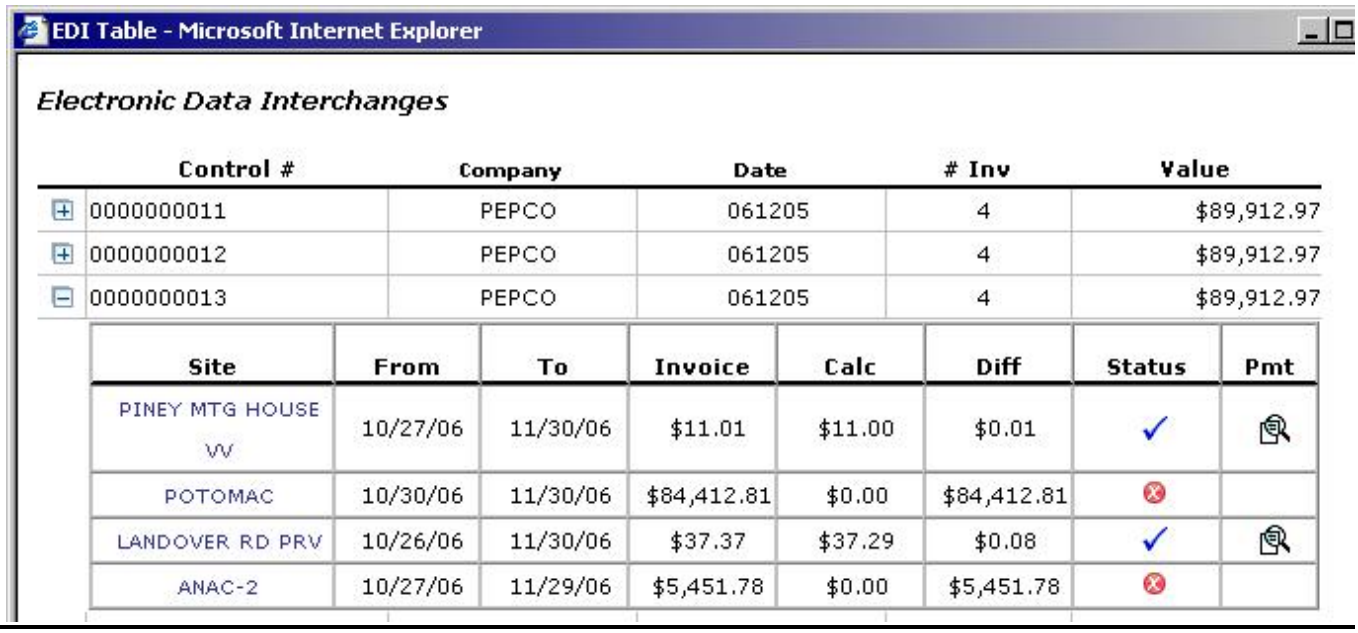
	Time of Day Code	Units	Quantity	Ref. Code
0	None given	KH	2,894,400	AA
1	None given	KH	2,064,000	AA
2	41 (Off Peak)	KH	2,860,656	AA
3	43 (Intermediate Peak)	KH	1,025,388	AA
4	42 (On Peak)	KH	1,099,865	AA

Invoice Line Items

	Description	Units	Quantity	Unit Cost	Amount
0	Total KWH Billed: 004985909 Hourly Priced HPS-GT-3B	KH	4,985,909	$0.0000	$0.00
1	Customer Charge	KH	0	$0.0000	$261.16
2	On-Peak Energy 1099865 KWH x 0.003440	KH	0	$0.0034	$3,783.54
3	Int-Peak Energy 1025388 KWH x 0.003439	KH	0	$0.0034	$3,527.33
4	Off-Peak Energy 2860656 KWH x 0.003440	KH	0	$0.0034	$9,840.66
5	Maximum Demand 10555. KWD	K1	10,555	$0.0000	$5,270.21
6	Universal Service Charge	KH	0	$0.0000	$1,235.33
7	Generation Procurement Credit at 0.0016080 per KWH	KH	0	$0.0016	($8,017.33)
8	Total Charges - Other	KH	0	$0.0000	$30.00
9	Franchise Tax		0	$0.0006	$3,091.27
10	Environmental Tax		0	$0.0001	$693.04
11	Gross Receipts Tax - Distribution		0	$0.0204	$565.35
12	Montgomery County Energy Tax		0	$0.0129	$64,132.25
				Invoice Total	**$84,412.81**
				Previous Balance	$0.00
				Balance Forward	$0.00
				Total Balance	**$84,412.81**

APPENDIX A:
ELECTRONIC DATA INVOICING (EDI)

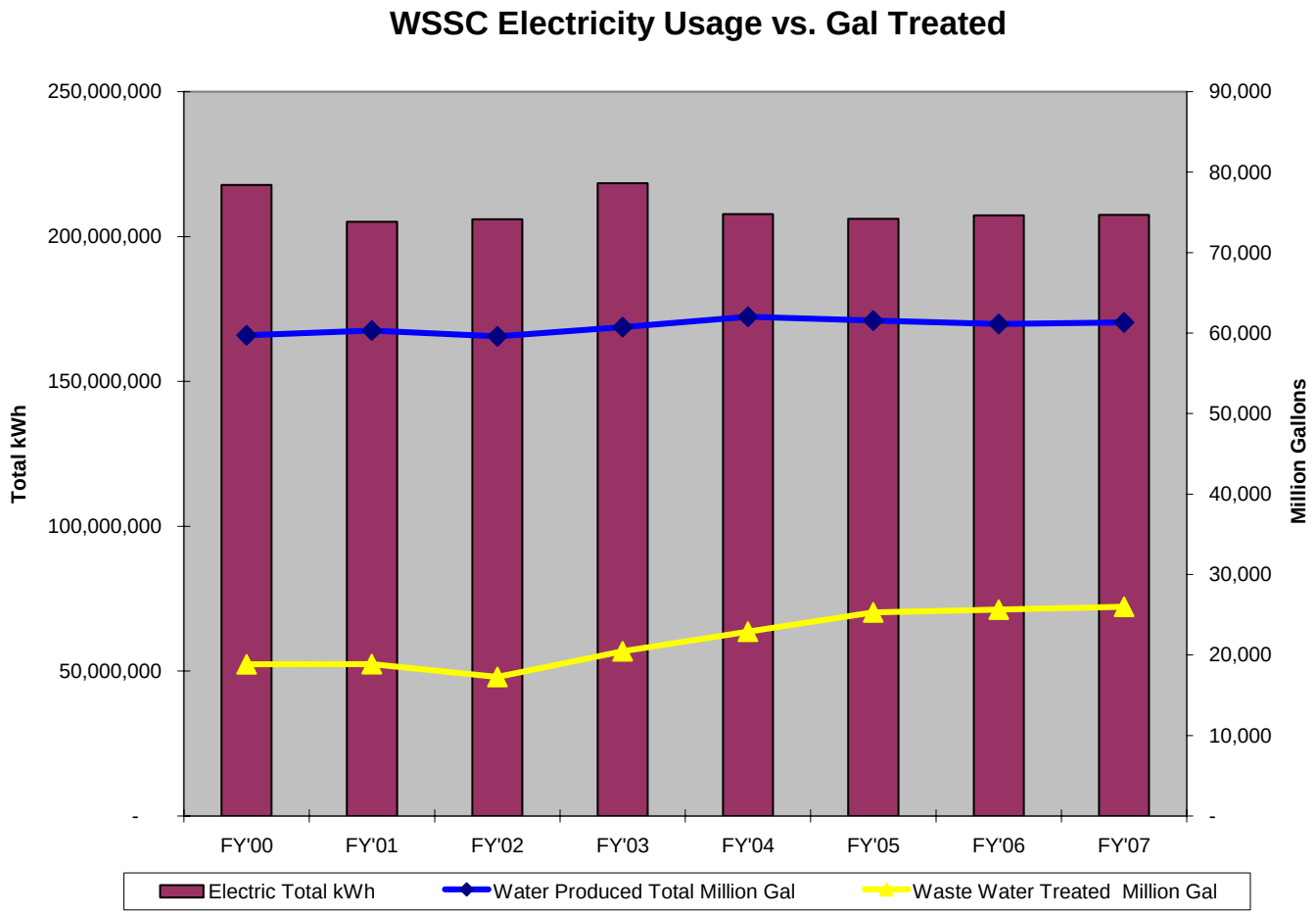




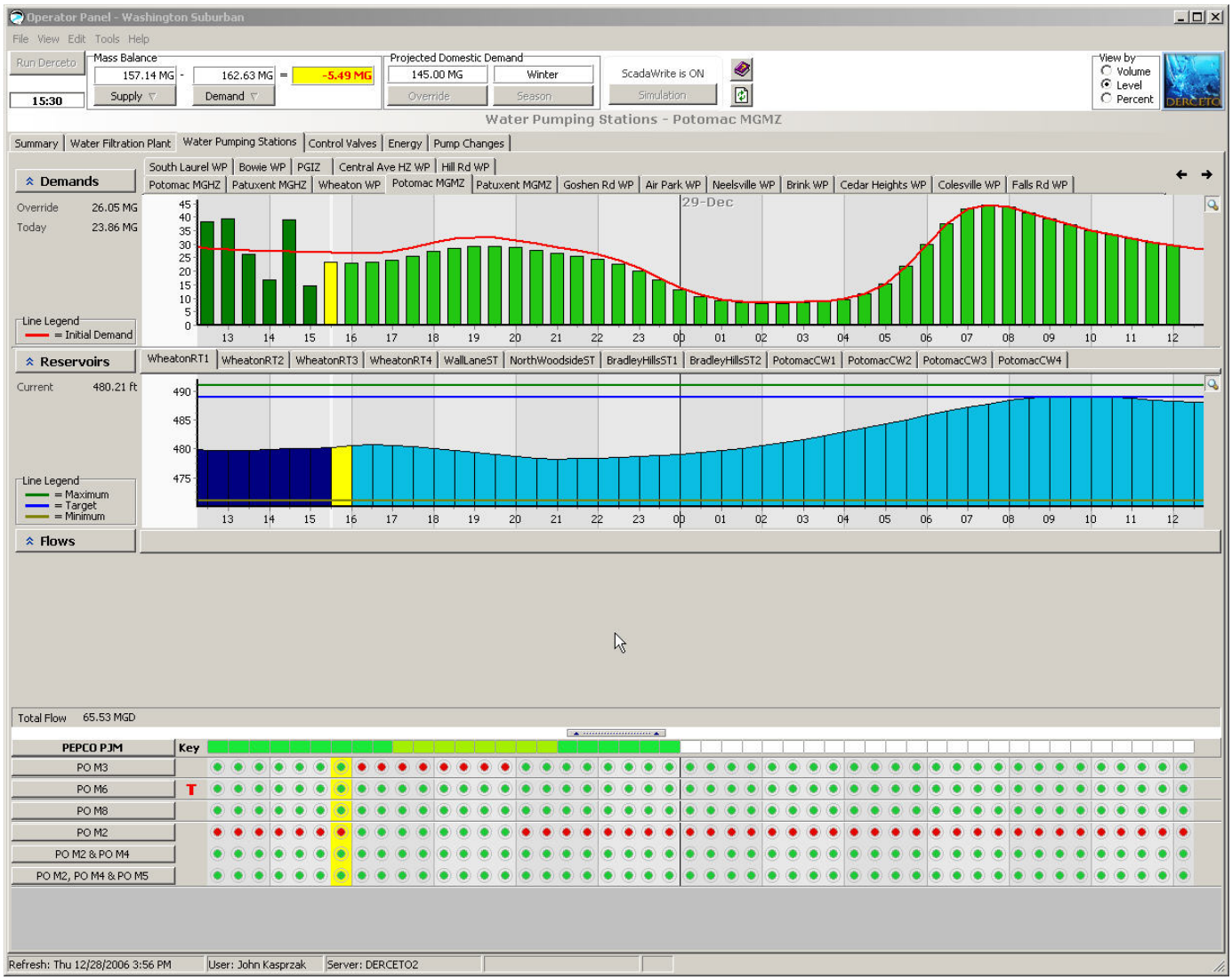
Control #	Company	Date	# Inv	Value
0000000011	PEPCO	061205	4	$89,912.97
0000000012	PEPCO	061205	4	$89,912.97
0000000013	PEPCO	061205	4	$89,912.97

Site	From	To	Invoice	Calc	Diff	Status	Pmt
PINEY MTG HOUSE VV	10/27/06	11/30/06	$11.01	$11.00	$0.01	✓	
POTOMAC	10/30/06	11/30/06	$84,412.81	$0.00	$84,412.81	⊗	
LANDOVER RD PRV	10/26/06	11/30/06	$37.37	$37.29	$0.08	✓	
ANAC-2	10/27/06	11/29/06	$5,451.78	$0.00	$5,451.78	⊗	

APPENDIX A, cont'd:
ELECTRONIC DATA INVOICING (EDI)

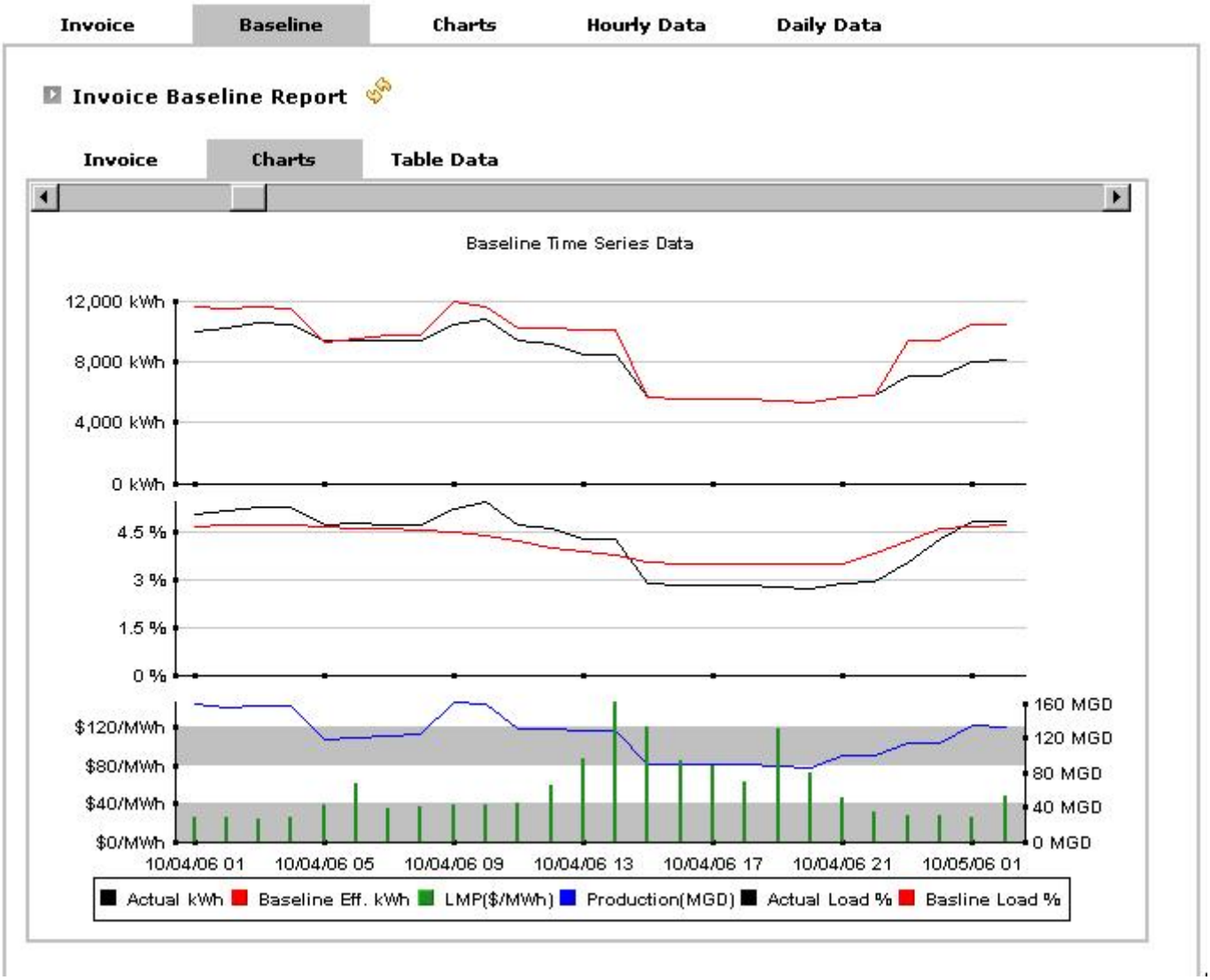


APPENDIX B:
ELECTRICITY USAGE VS. PRODUCTION

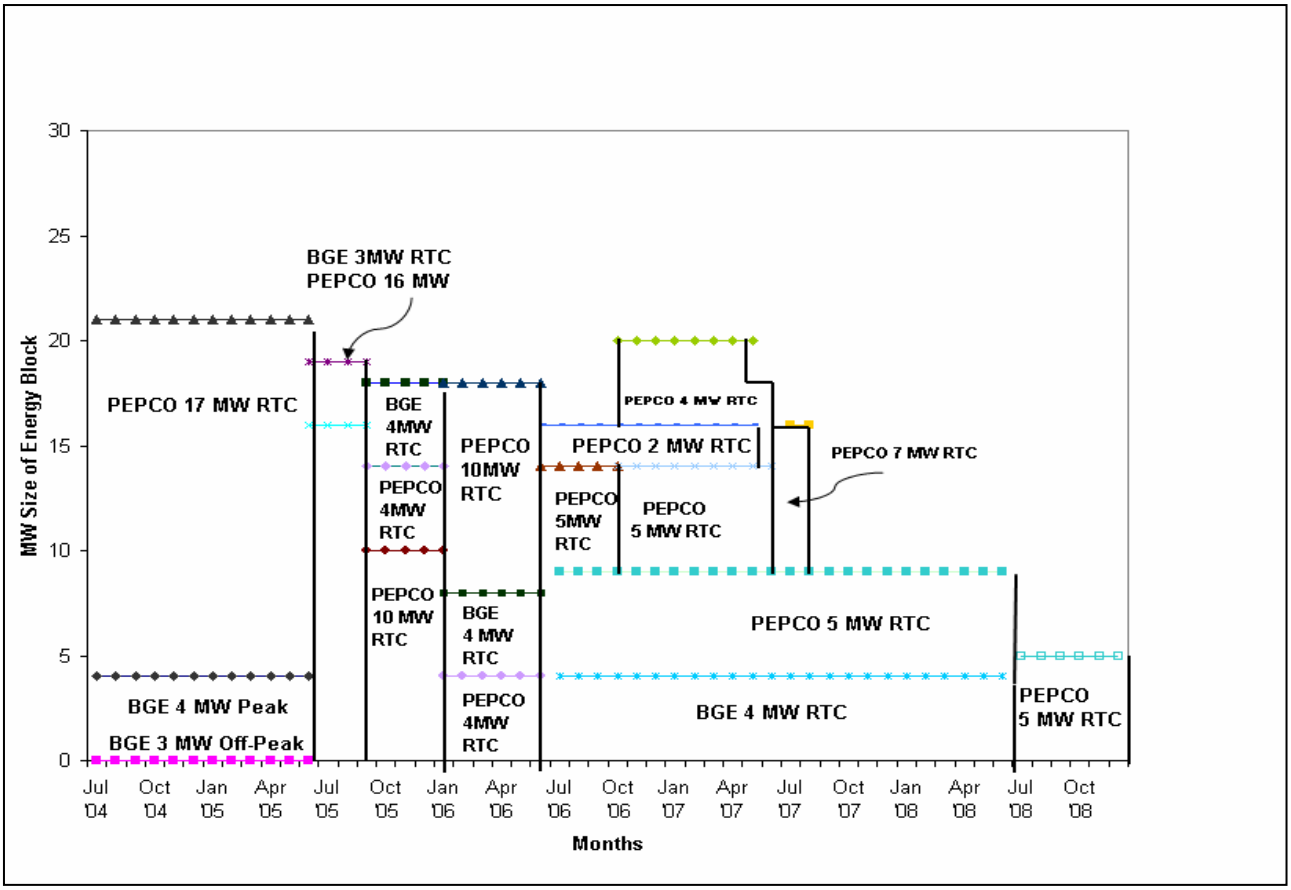


APPENDIX C:
DERCETO WATER DISTRIBUTION SYSTEM ENERGY OPTIMIZATION

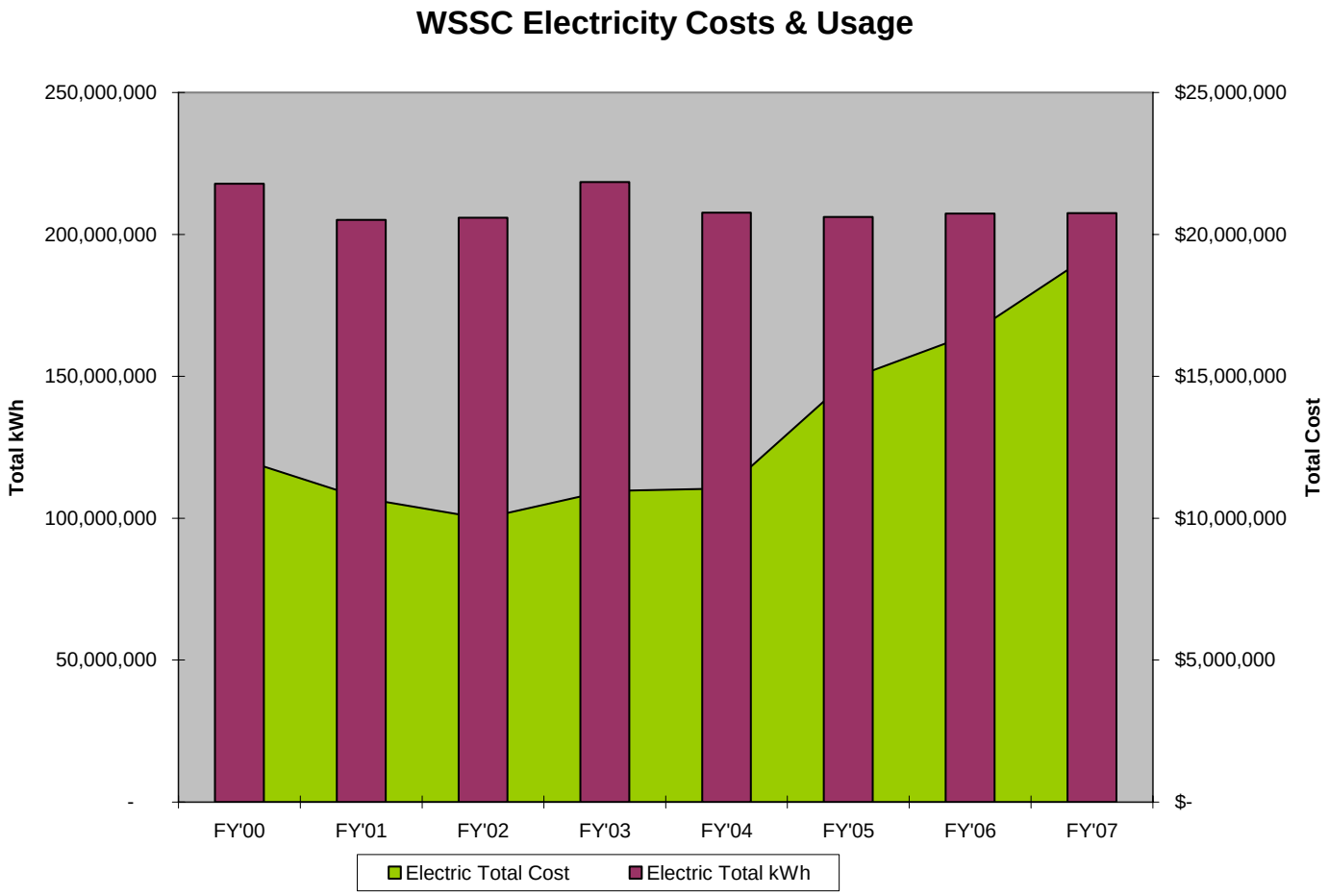
APPENDIX D:
DERCETO WATER DISTRIBUTION SYSTEM ENERGY OPTIMIZATION- SAVINGS TRACKING IN EIS (30 day billing period)



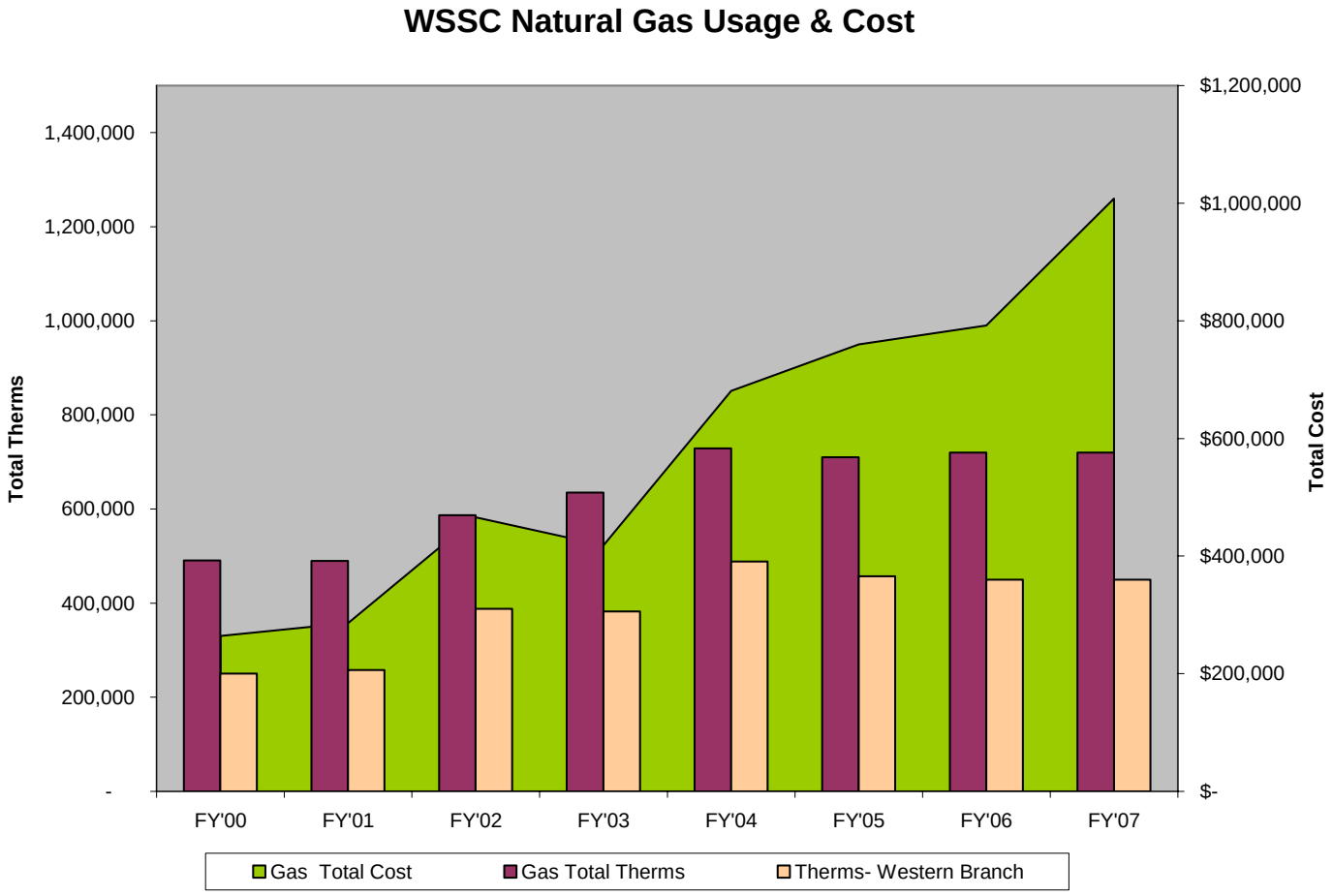
APPENDIX D, contd.:
DERCETO WATER DISTRIBUTION SYSTEM ENERGY OPTIMIZATION- SAVINGS TRACKING IN EIS (one day)



APPENDIX E:
WSSC WHOLESALE ENERGY SUPPLY (KWH) BLOCK PURCHASES FY'04 TO DATE



APPENDIX F:
ELECTRICITY COSTS & USAGE



APPENDIX G:
NATURAL GAS USAGE & COST- INCINERATOR

MONTGOMERY
COLLEGE

RESOURCE CONSERVATION PLAN

FY 2008

The Morris and Gwendolyn Cafritz Foundation Art Center

Takoma Park/Silver Spring Campus
Schedule Opening Spring 2007

Prepared
by

Office of Facilities
January 2007

EXECUTIVE SUMMARY

This Resource Conservation Plan (RCP) is prepared by the Montgomery College Office of Facilities, to support the College's FY 2008 Energy Management Capital Improvements Program (CIP) and Utility Operating Budget requests for funding.

This document describes the Montgomery College energy organization, discusses energy consumption, and summarizes resource conservation program accomplishments and plans. Tables present information on historical utility consumption and utility budget estimates. The Capital Improvements Program (CIP) Project Description Forms (PDF) that impact College Energy Management are also contained in this document.

In FY 2007, the Energy Management Program focused on the sustainable expansion of College facilities. This includes construction and commissioning of the new 111,000 Gross Square Foot(GSF) Student Services Center(SSC) and East Campus Central Plant which opened Summer 2006 and incorporates the latest sustainable and energy efficiency technologies. Construction continued on the 135,000 GSF, Morris and Gwendolyn Cafritz Foundation Arts Center and West Campus Central Plant. In FY 2007 the College incorporated Green Building design requirements into the design of the 142,000 GSF Rockville Science Center and the 127,000 GSF Germantown BioScience Education Center with the goal of obtaining at least a LEED Rating for all new construction projects and participated in the development of Green Building legislation with other County Agency Staff.

In FY 2006/2007, the College again participated in the joint procurement of deregulated utility supplies of electricity and natural gas. 10% of the College's electricity is being purchased from wind generators. The College continues to implement recommendations in recently completed College-wide Master Plans and Utility Master Plans for all three campuses. In FY 2007 the College continued to participate as a member of the County sponsored Environmental Policy Implementation Committee(EPIC), prepared its annual Environmental Action Plan and participated as a member of the Green Building Technical Committee.

Montgomery College is requesting $125,000 for the FY 2008 College Energy Management Capital Improvements Program(CIP) for various energy retrofits, and new energy programs. An additional $125,000 is requested for the FY 2008 operating budget that funds one energy staff position and other operating budget energy projects. This request is the same as in past fiscal years. The FY 2008 utility operating budget request is $5,937,126, a 7.7 % increase over the FY 2007 request, primarily due to increased unit costs and the addition of new building space.

Montgomery College is dedicated to implementing and maintaining a life cycle cost-effective, low-risk Resource Conservation Program. Although all energy conservation and environmentally friendly opportunities are considered, only those opportunities which are of the appropriate level of technology, have a high probability of success and meet the lowest net present value criteria will be implemented. To ensure that the Resource Conservation

Program is operating as predicted, the appropriate databases are maintained. The goal of the program is to provide safe, comfortable, economical and environmentally friendly facilities, which will enhance the learning environment and contribute to student success at Montgomery College.

Rockville Science Center
142,000 Gross Square Feet
Schedule Opening Spring 2009
LEED Certified

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GENERAL INFORMATION

Montgomery College was founded in 1946 and established its first campus in Takoma Park in 1950. The College added a second campus in Rockville in 1965, a third campus in Germantown in 1976, and expanded the Takoma Park Campus into Silver Spring in 2000. The College owns and maintains approximately 336.7 acres of property on three campuses and operates a total of 50 buildings in excess of 1.8 million gross square feet (GSF), with additional off campus leased space. The buildings consist of classrooms, offices, laboratories, libraries, meeting rooms, gymnasiums, child care centers, natatoria and greenhouses. The Takoma Park Campus operates a 224,310 GSF, 5 story parking garage. In addition to the programs offered at each campus, the College offers regular college credit programs and non-credit courses in off-campus locations throughout the County. Classes are held in campus facilities seven (7) days a week. The hours of use are generally from 7:00 a.m. until 11:00 p.m. on weekdays, and at various times during the day on weekends. Major building cleaning and maintenance occurs after occupied hours. Some classes are held on weekends and there are frequently intramural and varsity activities in the Physical Education buildings as well as community use (rentals) of other spaces on the weekends. The College's Network Operations Center(NOC) is located on the Rockville Campus and is operational 24 hours a day. Classes are in session during the summer at all three campuses. The College's administrative and academic offices are open year-round. Central plants on the Rockville, Germantown, Takoma Park/Silver Spring(East & West) campus distribute heating and cooling water for environmental conditioning of the spaces.

Montgomery College began its resource conservation program prior to the oil embargo in 1973, is a charter member of the Interagency Committee on Energy and Utility Management (ICEUM), and has submitted a Resource Conservation Plan in support of the utility operating budget since January 1976. The Office of Facilities is responsible implementing the Resource Conservation Plan. The College has been a member of the Electricity Deregulation Task Force, has participated with other agencies in the joint procurement of the Electricity Supply and has been the lead agency for the joint procurement of natural gas supply. In FY2004, the College joined other County agencies in forming the Environmental Policy Implementation Task Force(EPITF), and assisted in producing the first Environmental Policy Issues and Action Report. In FY2006 and FY2007 the College participated with other County Agencies in crafting Green Building Legislation which was passed by the County Council in the first half of FY2007. Current building designs will obtain LEED Certification while future buildings will obtain LEED Silver Certification.

RESOURCE CONSERVATION ORGANIZATION

The Office of Facilities, under the direction of Mr. David J. Capp, provides college-wide support services for all three campuses and the central administration of the College, and is responsible for resource conservation activities. In February 1987, Montgomery College hired an Energy Manager who reports directly to the Chief Facilities Officer, and is responsible for implementing the energy components of the Resource Conservation Plan. Figure 1, shows the office organization chart, those individuals directly responsible for managing the Resource Conservation Program are highlighted.

Office of Facilities
Resource Conservation Organization Chart

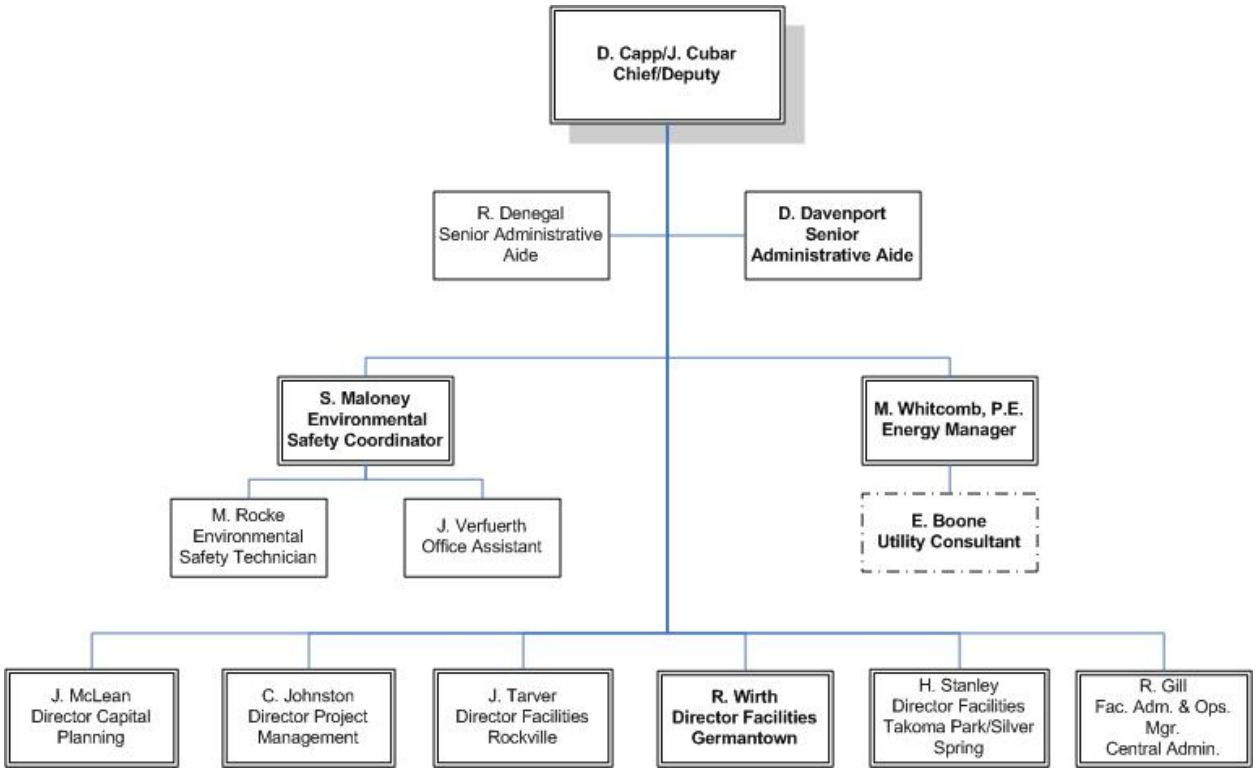

Figure 1

The Energy Manager coordinates Utilities Master Plans and Sustainable Design of new and renovated buildings with the Director of Capital Planning and Director of Project Management and coordinates utility consumption, energy audits, and retrofits with the three Campus Director of Facilities and the Facilities Administrative & Operations Manager. The Energy Manager also coordinates with the Deputy Chief's, Senior Administrative Aide on matters relating to utility bills and the utility bill accounting database. The College contracts utility consultant services to provide assistance with utility management and deregulation issues.

The College maintains a vehicle fleet to support the functions of the various College departments. In addition to road vehicles, the College maintains various vehicles such as mowers, tractors and powered carts. The Director of Facilities, Germantown is responsible for College-wide maintenance support of these vehicles and staffs an auto maintenance shop on that campus.

The Energy Manager represents the College on the Interagency Committee on Energy and Utility Management (ICEUM), is a member of the County Deregulation Task Force and represents the College as necessary on issues related to Resource Conservation.

ICEUM MEMBER: Mr. J. Michael Whitcomb, P.E.
Energy Manager
Office of Facilities
Suite 200
40 West Gude Drive
Rockville, MD 20850
Phone No. (301) 251-7375.
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Mr. Whitcomb has been a member of the ICEUM committee, representing various county agencies since its formation in 1983. Mr. Whitcomb has served as the Interim Chairman of ICEUM, and is a former member of the Montgomery County Citizens Energy Conservation Advisory Committee (ECAC). Mr. Whitcomb is a Registered Professional Mechanical Engineer in the State of Maryland, a Certified Energy Manager and holds a B.S. in Mechanical Engineering and a Masters in Engineering from the University of Maryland.

In FY 2004 the Montgomery County Government initiated the Environmental Policy Implementation Policy Task Force(EPITF) which was approved by resolution by the Montgomery County Council. The goal of the task force is to provide interagency coordination and guidance on issues impacting the environment such as energy, transportation, recycling and hazardous waste. Mr. David Capp, Chief Facilities Officer is a member of the EPITF and is supported by Mr. Mike Whitcomb and Mr. Steve Maloney who serve on the EPITF Technical Sub-committee. Mr. Maloney is the College's Environmental Safety Coordinator, responsible for College-wide safety and environmental(hazardous waste management) issues. An Environmental Action Plan has been submitted since FY 2004.

The College's recycling program is coordinated at the by Mr. Robert Wirth, Director of Facilities, Germantown Campus and managed by each Campus Facilities Director. Mr. Wirth prepares the Annual Recycling Report.

In FY2006 & FY2007 the College assisted other County Agencies in drafting Green Building legislation which was passed by the County Council in the Fall 2006.

Resource Conservation Plan

Summary

FY 2007

The information on this page reflects the facilities owned or operated by this agency as of Fall of FY 2006

Agency	Montgomery College		
Number of Facilities	43 Owned 7 Leased 50 Total	Change in number of facilities	+3 -TP/SS Student Serv. Center -CA 40 West Gude Drive -GT 20271 Goldenrod
Total square feet	Gross (2,023,878) Net Assignable (1,163,150) Conditioned (1,517,908)	Change in total ft^2	+180,588
Average operating hrs/year	4640	Change in avg. operating hrs/year	+20

Other changes effecting energy consumption	1. **Information Technology:** Similar to other agencies, the College continues to expand its information technology capabilities. Most classrooms are being retrofitted with Smart Instructor Work Stations(SIWS) that include computers to control electronic audio and video multi-media presentation devices. Many traditional multi-purpose classrooms are being retrofitted with computer workstations to meet the "high tech" demands of the educational programs. A traditional classroom might consume 2-3 watts/sf while the newer energy intensive classrooms might consume 2-3 times that amount. New computer equipment is more efficient and complies with the EPA's Energy Star requirements. 2. **Expansion:** The College continues to expand to meet the demands of its educational programs and to meet the needs of its student population. Since Fall 2001 the College has seen a 13% increase in Gross Square Feet. The largest growth is being seen on the Takoma Park Campus which expanded into Silver Spring in FY 2001 with the acquisition of Giant Bakery and surrounding property bounded by CSX tracks, Burlington Ave, Georgia Ave and Blair Park. The 98,038 GSF Health Science Center was added in 2004 and the 110,504 GSF Student Services Center was added in Summer 2006. The redevelopment of the Giant Bakery building into the 134,748 GSF, Morris and Gwendolyn Cafritz Foundation Art Center will be completed in Spring 2007, the new 57,243 GSF Cultural Arts Center is scheduled to be completed in Spring 2009 as well as a 5 level, 300+ space parking garage. Expansion on the Rockville Campus will occur in Spring 2009 with the 142,100 GSF Science Center and on the Germantown Campus with the 5,000 GSF Child Care Center in Summer 2007 and the 126,900 GSF BioSciences Education Center in Spring 2010. Building renovations occur as programs shift to new space, for

example, the renovation of the 28,241 GSF Commons building on the Takoma Park Campus will be completed in Summer 2008. All new and renovated buildings are required to meet strict resource conservation and green building guidelines, using the latest life-cycle cost effective technologies. College-wide Master Plans have been developed and coordinated with Utility Master Plans to ensure optimum life cycle cost effective infrastructure.

3. **Competitive Procurement of Utilities:** The College has joined with other County Government agencies and local municipalities to procure utilities. Spring 2006 procurement resulted in long term(3 year) contracts with electricity and natural gas suppliers which should result in more stable prices and make utility budget predictions more reliable. Deregulated procurement has required additional staff and consultant hours for procurement and verification of bills. Approximately 15% additional man-hours are required for this effort.

4. **New and Renovated Building Design:** The College continues to improve and refine the energy efficient design process to meet the requirements of the Montgomery County Code. The College has developed Energy Design Guidelines specifically tailored to the needs of the College's design and project management teams. All buildings undergo rigorous analysis during the design process which results in an estimated 40% reduction in energy and maintenance costs. Efficiently designed and constructed buildings generally incur slightly higher first costs which are recovered over the life cycle in energy, maintenance and occupant productivity savings. Sustainable and renewable technologies are incorporated into all building designs. Commissioning ensures that buildings are built to the specifications and are turned over to the operations and maintenance staffs in proper operating order. Small scope alterations and renovations are also scrutinized for energy opportunities. The College has been using the evaluation criteria established by the U.S. Green Building Council Leadership in Energy and Environmental Design(LEED), the College has established a goal of all future buildings attaining at least a LEED Certification. In 2006 the College assisted other County agencies in drafting legislation which requires LEED Certification of new constructed buildings. The legislation was passed by the County Council in Fall 2006.

5. **Utility Master Planning and Central Plant Technology:** The recommendations of utility master plans continue to be implemented on the three campuses. Highly efficient life cycle cost effective central plant technology has been implemented on the Rockville, Germantown and Takoma Park/Silver Spring Campuses. On the Takoma Park/Silver Spring Campus a new East Campus central plant was completed in the Summer 2006 in the basement of the Student Serves Center, and a new West Campus central plant is under construction in the Cafritz Foundation Art Center, scheduled to be completed Spring 2007. The central plant technology includes highly efficient chilled water and hot water generation systems with ice storage and co-generation technologies, designed to minimize cost and environmental impacts.

6. **Building Automation Controls and BACnet System Integration:** Standardization of communications protocols(BACnet) by the American Society of Heating, Refrigeration and Air Conditioning Engineers(ASHRAE) and acceptance by the engineering and manufacturing community has resulted in building control system integration capabilities and open competition. Integration also allows communications between building system components through the building automation system which increases capabilities while reducing costs. These systems are also capable of communicating over existing building networks, which eliminates redundant networks and further reduces costs. The College

has introduced this technology on all three campuses and is incorporating it into all new building designs. A College-wide controls mater plan will be prepared in FY 2007.

7. **Recycling and Hazardous Waste Disposal:** The College has an active recycling and hazardous waste disposal program. The results of the recycling program for FY 2006(Calendar Year 2005) are reported in the summary sheets.

8. **Vehicle Fleet:** The College maintains approximately 54 vehicles to support the various functions of the College. The fleet is maintained by the Director of Facilities on the Germantown Campus. These vehicles are described on the summary sheets. The College also maintains various other specialty vehicles, such as mower, tractors, forklifts and carts. These are not included in the summary sheets.

9. **Capital Improvement Projects -** The College Resource Conservation Program projects are funded primarily by three Capital Improvement Projects(CIP), Energy Conservation(No. 816611), Planned Lifecycle Asset Replacement(No. 926659) and Takoma Park Central Plant(No. 016600). The Resource Conservation Program does however influence decisions made in all capital and operating projects that involve the consumption of resources by the College community. $125,000 for staff salary and energy projects is included in the operating budget.

10. **Renewable Solar & Wind Energy:** The College currently has 83 kW of solar photovoltaic electric capacity and a 900 evacuated tube solar thermal array. These generate approximately 160,000 kWh of electricity and 183,960 kWh of thermal energy saving the College approximately $25,000 annually. The College participates with other County agencies and procures 10% or approximately 3,135,738 kWh of it electricity from Wind Generation at an additional annual cost of $46,974.

11. **Utility Management Databases;** The College continues to monitor utility expenditures and maintain utility consumption databases. This activity has proved valuable since the recent deregulation and resulting competitive procurement of electricity and natural gas has resulted in numerous billing errors. Timely monitoring and accurate records has allowed resolution of disputes with suppliers. Due to the increase quantity and complexity of billing issues since deregulation, the College has obtained consultant services to assist in billing monitoring and resolution. Accurate records and monthly monitoring also provide early warnings of unusual operating conditions that result in changes to utility consumption. In FY 2006 the utility management database was updated to a WEB based platform with expanded reporting features.

The chart below shows the College-wide utility cost comparison for the past six fiscal years. Last years increased cost was primarily due to increases in unit costs for electricity, natural gas and the phase-out of utility Standard Offer Service price caps.

12. **Occupant Awareness Programs:** The College continues to promote occupant energy awareness. In FY 2007 a Facilities Energy Management Web Site will be completed.

College Utility Consumption & Cost Comparison(FY05-FY06)

Utilities	Total Consumption Actual FY 05	Consumption Percent Change From Actual FY 04	Total Cost Actual FY 05	Cost Percent Change From Actual FY 04
Electricity	30,231,974 kWh	+6.9%	$2,902,255	+15.1%
Firm Natural Gas	173,961 therms	-1.5%	$316,092	+37.4%
Interruptible Rate Natural Gas	440,205 therms	+0.026%	$707,298	+49.2%
Fuel Oil #2	38,519 gal.	+10.0%	$80,092	+42.6%
Propane	2,954 gal	-12.0%	$9,410	+15.8%
Water	27,070 kgal	+43.0%	$77,419	+31.5%
Sewer	19,663 kgal	+65.7%	$89,802	+52.9%
Total			$4,182,368	+22.8%

New Measures

This table shows information on resource conservation measures implemented during FY 07
(July 1, 2006 through June 30, 2007)

Measures	Date Implemented (mo/yr)	Initial Cost ($)	Annual Net Impact On Maintenance Cost ($)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cost Savings ($)
Capital Improvement Projects:						
Lighting	Various	50,000	(2,000)	Elect.	125,000	9,500
HVAC	Various	50,000	(2,500)	Elect., N.Gas & Fuel Oil	50,000 kWh, 5000 Th	3,750 4,600
Controls	Various	25,000	(2,000)	Elect.N.Gas & Fuel Oil	25,000 kWh 5000 Th	2,200 4,700
Total		125,000	(6,500)			24,750
Operations and Maintenance:						
Total						
Description of Activities:						

New measures consist of Lighting, HVAC & Controls, New Building and Renovated Building Design and Central Plant Technologies that reduce energy cost, reduce energy consumption and reduce maintenance costs.

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 07 (FY98 TOFY06)

Measures	Date Implemented (mo/yr)	Initial Cost ($)	Annual Net Impact On Maintenance Cost ($)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cumulative Cost Savings ($)
Capital Improvement Projects:						
Lighting	Various	75,000	(7,000)	Electricity	877,500 kWh	157,500
HVAC & Controls	Various	780,000	(14,500)	Elect., N. Gas & Fuel Oil	612,500 kWh 20,000 therms	42,950 20,300
New Building Design	Various	700,000	(17,250)	Elect., N. Gas & Fuel Oil	803,000 kWh 27,500 therms	61,000 20,000
Central Plant Technology	Various	500,000	(12,000)	Elect., N. Gas & Fuel Oil	785,400 kWh 16,500 therms	60,000 20,000
Total		2,055,000			3,078,400 kWh 64,000 Th	381,700
Operations and Maintenance:						
N/A						
Total		N/A			N/A	N/A
Description of Activities:						

Existing measures consist of Lighting, HVAC & Controls, New Building and Renovated Building Design and Central Plant Technologies that reduce energy cost, reduce energy consumption and reduce maintenance costs.

Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 08 (July 1, 2007 through June 30, 2008)

Measures	Date Implemented (mo/yr)	Initial Cost ($)	Annual Net Impact On Maintenance Cost ($)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cost Savings ($)
Capital Improvement Projects:						
Lighting, HVAC & Controls	June 2005	125,000	(3,000)	Elect., N.Gas & Fuel Oil	200,000 kWh 10,000 Th	22,000 15,400
Total		125,000	(3000)			37,400
Operations and Maintenance:						
N/A						
Total		N/A	N/A			N/A
Description of Activities:						

New lighting, HVAC and controls technology now available will provide energy and maintenance savings while improving occupant comfort.

Summary Page - Vehicle Fleet

Vehicle Type or Vehicle Group (other than AFVs) Existing Fleet During FY04	No. of Vehicles	Type of Fuel	Units	Total Units per Year	Cost per Unit	Total VMT per Year
Trucks	24	Unleaded	Gals	3,700	$ 2.24	63,000
Vans	28	Unleaded	Gals	3,900	$ 2.24	66,000
Dump Truck	1	Diesel	Gals	118	$ 2.47	2,000
Car	1	Unleaded	Gals	1,180	$ 2.29	20,000

Changes in Vehicle Fleet From FY05 to FY06

New Vehicles Purchased	No. of Vehicles	Fuel Type	Units	Expected Average Units per Year	Expected Average VMT per Year
Vans	2	Unleaded	Gals	600	10,000
Car	0	Unleaded	Gals	2,000	20,000
Truck	3	Unleaded	Gals	500	3,700
Old Vehicles Retired	**No. of Vehicles**	**Fuel type**	**Units**	**Average Units per Year**	**Average VMT per Year**
Vans	1	Unleaded	Gals	2,000	20,000
Car	0	Unleaded	Gals	2,000	20,000
Truck	2	Unleaded	Gals	400	3,700
AFVs Purchased	**Type or Group**	**Fuel Type**	**Units**	**Expected Average Units per Year**	**Expected Average VMT per Year**
N/A					

Summary Page - Solid Waste & Recycling*

Waste Type	Quantity Collected (pounds/yr)	% of Total
Corrugated Cardboard	28,854	1.1
Co-mingled Containers	28,235	1.0
Co-mingled Paper/Cardboard	465,302	17.1
Yard Waste	579,596	21.3
Solid Waste For Disposal	1,608,290	59.0
Total	2,722,694	100.0

Summary Page – Other Recycling*

Waste Type	Quantity Collected (pounds/ yr.)	% of Total
Oils – motor, hydraulic, etc.	8,260	100
Anti-Freeze	1,700	100
Auto Batteries & Power Supplies	3,385	100
Fluorescent Light Tubes	530	100
Scrap Metal	24,100	100
Computer Equipment	152,710	100
Printer Toner Cartridges	480	100

* Based upon January 2006 Annual Recycling Report for Calendar Year 2005.

CONCLUSIONS

The FY 2008 Montgomery College Resource Conservation Program is a well-balanced, environmentally friendly, low risk, high return on investment program, based upon results of Master Planning and Best Practice Resource Conservation efforts. All investments are selected based upon their life cycle cost effectiveness and on their high probability for success. Utility consumption figures indicate that energy conservation measures implemented have had a positive, cost-effective impact. The potential exists for significant savings in lighting and controls, which continue to be identified during the walk-through and detailed energy audits. All new or renovated buildings undergo rigorous analysis to determine the optimum life cycle cost effective systems and meet or exceed the requirements of the Montgomery County Building Energy Design Guidelines. It is the College's goal to attain at least the U.S. Green Building Council LEED Certificate Rating on current building designs and attain at least a LEED Silver Certificate rating on all future building designs. To ensure that the program is proceeding as predicted, various databases have been developed to provide accountability for the energy dollars spent. Montgomery College is confident that the FY 2008 Resource Conservation Program will meet the goal of providing safe, reliable, environmentally friendly and economical facilities which enhance the learning environment at Montgomery College.

APPENDIX A

Energy Conservation CIP, No. 816611, PDF
Planned Lifecycle Asset Replacement CIP, No. 926659, PDF
Takoma Park Central Plant, CIP, No. 016600, PDF
Montgomery College FY 2008, Utility Projection Report, January 8, 2007
ICEUM Utility Rates, FY07/FY08, October 11, 2006

Energy Conservation: College -- No. 816611

Category	**Montgomery College**	Date Last Modified	**October 13, 2006**
Agency	**Montgomery College**	Previous PDF Page Number	**20-7 (05 App)**
Planning Area	**Countywide**	Required Adequate Public Facility	**NO**
Relocation Impact			

EXPENDITURE SCHEDULE ($000)

Cost Element	Total	Thru FY06	Rem. FY06	Total 6 Years	FY07	FY08	FY09	FY10	FY11	FY12	Beyond 6 Years
Planning, Design and Supervision	1,625	1,614	11	0	0	0	0	0	0	0	0
Land											
Site Improvements and Utilities	59	59	0	0	0	0	0	0	0	0	0
Construction	2,603	1,853	0	750	125	125	125	125	125	125	0
Other	130	130	0	0	0	0	0	0	0	0	0
Total	4,417	3,656	11	750	125	125	125	125	125	125	0

FUNDING SCHEDULE ($000)

G.O. Bonds	2,323	1,562	11	750	125	125	125	125	125	125	0
Current Revenue: General	1,994	1,994	0	0	0	0	0	0	0	0	0
Federal Aid	49	49	0	0	0	0	0	0	0	0	0
State Aid	51	51	0	0	0	0	0	0	0	0	0

ANNUAL OPERATING BUDGET IMPACT ($000)

Maintenance				-1,380	-180	-200	-220	-240	-260	-280	0
Energy				-3,775	-495	-550	-600	-660	-710	-760	0
Net Impact				-5,155	-675	-750	-820	-900	-970	-1,040	0

DESCRIPTION

This project provides funding to (1) continue development of a Collegewide energy management program, (2) implement life-cycle cost effective energy conservation measures based upon energy audits, and (3) review new building/renovation designs for compliance with Montgomery County Code, Ch. 8 Building Energy Performance Standards. Typical project activities include retrofits and modifications of lighting, controls, and HVAC equipment; building envelope modifications; solar energy retrofits; computer equipment for equipment control and energy-use monitoring; HVAC system evaluation/balancing studies; long-range energy/utility planning studies; central plant design plans (GT, TP/SS); and waste management studies. Typical payback on lighting, controls, HVAC and solar energy modifications is five to six years.

JUSTIFICATION

As mandated by Ch. 8 of the County Code and supported by the College, County Council, the Interagency Committee on Energy & Utility Management (ICEUM), and the Citizens Energy Conservation Advisory Committee (ECAC), an energy cost reduction program has been developed. This program consists of energy audits performed by College staff to identify life cycle cost effective retrofits, including a lighting retrofit program.

STATUS

Continuing project. New construction and building renovation projects under review during FY07-08 include the Takoma Park/Silver Spring Campus expansion and planning for new buildings on the Rockville and Germantown campuses. Campus utilities master plans were completed in FY90 (RV) and FY92 (TP/SS and GT), and were updated in FY05. This project is coordinated with the outcome of the Collegewide Facilities Condition Assessment (8/02).

OTHER

The following fund transfers have been made from this project: $21,420 to Central Plant Distribution System project (#886676) (BOT Resolution #90-102 (6/18/90)); $70,000 to Fine Arts Renovation (#906601) (BOT Resolution #94-114 (9/19/94)), and $7,000 to Planning, Design & Construction project (#906605) (BOT Resolution #01-153 (10/15/01)). Beginning in FY98, the portion of this project funded by County Current Revenues migrated to the College's Operating Budget. It is anticipated that migration of this portion of the project will promote a desirable consistency with County budgeting practices and encourage greater competition in an environment of scarce resources. Reflecting the migration of this portion of the project, the College's Operating Budget includes funds for this effort.

FY2008 Appropriation: $125,000 (G.O. Bonds). * Project expenditures will continue indefinitely.

APPROPRIATION AND EXPENDITURE DATA

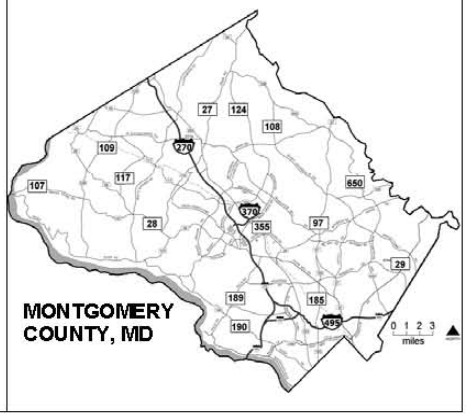
Date First Appropriation	FY81	($000)
Initial Cost Estimate		1,008
First Cost Estimate Current Scope	FY02	3,918
Last FY's Cost Estimate		4,418
Present Cost Estimate		4,417
Appropriation Request	FY08	125
Supplemental Appropriation Request	FY07	0
Transfer		0
Cumulative Appropriation		3,793
Expenditures/ Encumbrances		3,657
Unencumbered Balance		136
Partial Closeout Thru	FY05	0
New Partial Closeout	FY06	0
Total Partial Closeout		0

COORDINATION

This project is coordinated with the scheduled building renovations on the Rockville and Takoma Park/Silver Spring Campuses, and the planned construction of new buildings on the Rockville, Germantown and Takoma Park/Silver Spring Campuses.

ICEUM & ECAC
Facility Planning: College (#886686)
PLAR: College (CIP#926659)
Roof Replacement: College (CIP#876664)
Takoma Park Central Plant (CIP#016600)
King Street Art Center (CIP#056604)

MAP



Planned Lifecycle Asset Replacement: College -- No. 926659

Category	**Montgomery College**	Date Last Modified	**October 13, 2006**
Agency	**Montgomery College**	Previous PDF Page Number	**20-14 (05 App)**
Planning Area	**Countywide**	Required Adequate Public Facility	**NO**
Relocation Impact	**None**		

EXPENDITURE SCHEDULE ($000)

Cost Element	Total	Thru FY06	Rem. FY06	Total 6 Years	FY07	FY08	FY09	FY10	FY11	FY12	Beyond 6 Years
Planning, Design and Supervision	1,819	657	62	1,100	150	150	200	200	200	200	0
Land											
Site Improvements and Utilities											
Construction	25,537	8,957	1,180	15,400	1,850	2,350	2,800	2,800	2,800	2,800	0
Other											
Total	27,356	9,614	1,242	16,500	2,000	2,500	3,000	3,000	3,000	3,000	0

FUNDING SCHEDULE ($000)

G.O. Bonds	25,416	7,674	1,242	16,500	2,000	2,500	3,000	3,000	3,000	3,000	0
Current Revenue: General	1,940	1,940	0	0	0	0	0	0	0	0	0

ANNUAL OPERATING BUDGET IMPACT ($000)

DESCRIPTION

This project provides funding for a comprehensive lifecycle renewal and replacement program to protect the investment in College facilities and equipment and to meet current safety and environmental requirements. Funding also provides for project management staff and/or services. This collegewide project is targeted at deteriorating facilities and deferred maintenance of major building systems. This project includes: (1) HVAC system renovation/replacement; (2) major mechanical/plumbing equipment renovation/replacement; (3) interior and exterior lighting system renovation/replacements; (4) electrical service/switchgear renovation/replacement; (5) building structural and exterior envelope refurbishment; (6) asbestos removals not tied to building renovations; (7) major carpet replacement; (8) underground petroleum tank upgrades; and (9) site utility replacement/improvements.

JUSTIFICATION

In August 2002, the College completed a comprehensive building system/equipment assessment, including site utilities and improvements, that identified deficiencies, prioritized replacements and upgrades, and provides the framework for implementing a systematic capital renewal program to complement on-going preventive maintenance efforts. The College continues to have a significant backlog of major building systems and equipment renovations and/or replacements due to the age of the Campuses and deferral of major equipment replacement. Key components of the HVAC, mechanical and electrical systems are outdated, energy inefficient, and costly to continue to repair. The renovation and/or replacement of major building systems, building components and equipment, and site improvements will significantly extend the useful life of the College's buildings and correct safety and environmental problems. The Collegewide Facilities Condition Assessment identified a $57.8 million deferred maintenance backlog for the three campuses. If additional financial resources are not directed at this problem, College facilities will continue to deteriorate leading to higher cost renovations or building replacements.

Plans and Studies

Collegewide Facilities Condition Assessment (8/02), Collegewide Facilities Master Plan (1/04) and County Council Report of the Infrastructure Maintenance Task Force (3/05).

STATUS

Ongoing. An updated conditions assessment is currently underway and is anticipated to be completed by November 2006.

OTHER

The following fund transfers have been made from this project: $47,685 to Takoma Park Child Care Center (#946657) (BOT Resol. #93106, #9426 & #94128); $185,000 to Rockville Surge Building (#966665) (BOT Resol. #11-2291 - 1/21/97); and $7,000 to Planning, Design & Construction (#906605) (BOT Resol. #01-153). The following fund transfers have been made into this project: $15,000 from Central Plant Distribution System (#886676) (BOT Resol. #98-82 - 6/15/98) and $25,000 from Clean Air Act (#956643) (BOT Resol. # 98-82 - 6/15/98). Beginning in FY98, the portion of this project funded by County Current Revenues migrated to the College's Operating Budget. Reflecting the migration of this portion of the project, the College's Operating Budget includes funds for this effort.

FY2008 Appropriation: $2,500,000 (G.O. Bonds). * Project expenditures will continue indefinitely.

APPROPRIATION AND EXPENDITURE DATA

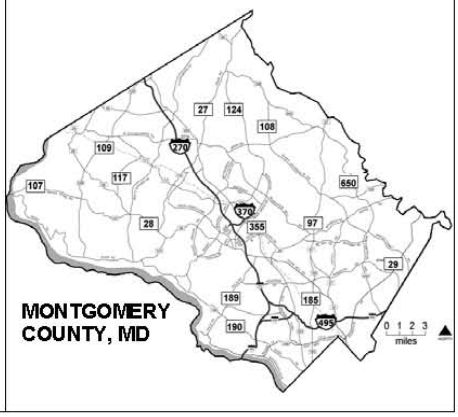
Date First Appropriation	FY93	($000)
Initial Cost Estimate		3,000
First Cost Estimate Current Scope	FY03	22,081
Last FY's Cost Estimate		27,356
Present Cost Estimate		27,356
Appropriation Request	FY08	2,500
Supplemental Appropriation Request	FY07	0
Transfer		0
Cumulative Appropriation		12,856
Expenditures/ Encumbrances		9,834
Unencumbered Balance		3,022
Partial Closeout Thru	FY05	0
New Partial Closeout	FY06	0
Total Partial Closeout		0

COORDINATION

This project is coordinated with the Rockville, Takoma Park/Silver Spring and Germantown Campus Utility Master Plans, building renovations on the Rockville and Takoma Park/Silver Spring Campuses, and the following projects:

Elevator Modernization: College (CIP#046600)
Energy Conservation: College (CIP#816611)
Facility Planning: College (CIP#886686)
Life Safety Improvements: College (CIP#046601)
Macklin Tower Alterations (CIP#036603)
Roof Replacement: College (CIP#876664)
TP Central Plant (CIP#016600)
Roof Replacement: College (CIP #876664)

MAP



Takoma Park Central Plant -- No. 016600

Category	**Montgomery College**	Date Last Modified	**December 5, 2006**
Agency	**Montgomery College**	Previous PDF Page Number	**20-18 (03 App)**
Planning Area	**Takoma Park**	Required Adequate Public Facility	**NO**
Relocation Impact	**None.**		

EXPENDITURE SCHEDULE ($000)

Cost Element	Total	Thru FY06	Rem. FY06	Total 6 Years	FY07	FY08	FY09	FY10	FY11	FY12	Beyond 6 Years
Planning, Design and Supervision	375	373	2	0	0	0	0	0	0	0	0
Land											
Site Improvements and Utilities	5,293	3,242	1,011	1,040	1,040	0	0	0	0	0	0
Construction											
Other											
Total	5,668	3,615	1,013	1,040	1,040	0	0	0	0	0	0

FUNDING SCHEDULE ($000)

G.O. Bonds	2,834	1,808	506	520	520	0	0	0	0	0	0
State Aid	2,834	1,807	507	520	520	0	0	0	0	0	0

ANNUAL OPERATING BUDGET IMPACT ($000)

Maintenance				-32	-8	-8	-8	-8	0	0	0
Energy				-80	-20	-20	-20	-20	0	0	0
Program-Staff				-32	-8	-8	-8	-8	0	0	0
Program-Other				-200	-50	-50	-50	-50	0	0	0
Net Impact				-344	-86	-86	-86	-86	0	0	0

DESCRIPTION

This project provides for the design and construction of a central heating and cooling plant on the Takoma Park Campus as recommended in the College's campus utilities master plan (10/91). The plan for a Campus central plant was further developed in the Campus facilities master plan (1/98) where it was recommended that the plant be located in the planned Student Services Center on the north end of the existing Campus. This project is integrated into the overall planning and coordination for the Campus expansion project. The project includes installation of boilers and chillers with associated equipment, the provision of natural gas service, and the construction of a hot water and cold water distribution piping system to eleven existing campus buildings.

JUSTIFICATION

This project implements the recommendations of the campus utilities master plan (10/91) and campus facilities master plan (2/98). The Campus' existing heating and cooling equipment is typically 20-30 years old and beyond its useful economic life. Due to the age of the equipment and increasing maintenance problems and costs, the Campus is experiencing a significant increase in mechanical system problems and heating/cooling outages. Based on a life cycle cost analysis, the installation of a central heating/cooling plant offers significant equipment replacement, energy and maintenance savings to the College.

Plans and Studies

Takoma Park Campus Utilities Master Plan (10/91); Takoma Park Campus Facilities Master Plan (2/98); Program Justification and Description Report for Students Services Ctr (3/27/98); and Takoma Park Campus Central Plant & Dist. System (8/15/99).

STATUS

Phase I of construction complete. The Takoma Park central plant project implements a portion of the Campus' utilities master plan. The need to provide new systems for heating and cooling campus buildings was articulated in the utilities master plan and satisfying this requirement is critical to the planned renovation of the existing campus buildings. The planning for the central plant project was integrated into the plan for the Takoma Park Campus expansion with the September 1999 submission of the Part I/II facility program for the project to the State. The State approved the project program in July 2000. The College awarded an engineering design contract for this project in December 2001 and the central plant design was coordinated with the design of the Student Services Center as part of the Campus expansion project. The facilities program for the project was revised to reflect the relocation of the Cultural Arts Center and the concomitant decision to not extend the piping distribution system over the WMATA/CSX tracks to the College's Georgia Avenue expansion site. The revised program reflects a total cost reduction of $846,000, which includes a reconciliation of the state and county funding amounts for design and construction administration ($280,000), and a reduction in the pipe distribution system ($566,000). The final phase of the project will extend a heating and cooling pipe distribution system throughout the east campus.

OTHER

State share of project based on anticipated eligible costs. Design fees above approximately 7% of estimated construction costs may not be eligible for State reimbursement.

Fund Sources: G.O. Bonds and State Aid.

APPROPRIATION AND EXPENDITURE DATA

Date First Appropriation	FY01	($000)
Initial Cost Estimate		5,204
First Cost Estimate Current Scope	FY05	5,668
Last FY's Cost Estimate		6,708
Present Cost Estimate		5,668
Appropriation Request	FY08	0
Supplemental Appropriation Request	FY07	0
Transfer		0
Cumulative Appropriation		5,668
Expenditures/ Encumbrances		3,615
Unencumbered Balance		2,053
Partial Closeout Thru	FY05	0
New Partial Closeout	FY06	0
Total Partial Closeout		0

COORDINATION

Takoma Park Campus Expansion (#996662)
Takoma Park/Silver Spring Campus building renovations.

Montgomery College asserts that this project conforms to the requirements of relevant local plans, as required by the Maryland Economic Growth, Resource Protection and Planning Act.

MAP

Montgomery College Office of Facilities FY2008 Utility Projection Report
1/8/2007

UTILITY	ACTUAL FY 2003	Actual FY 2004	ACTUAL FY 2005	ACTUAL FY 2006	PROJECTED FY 2007	CONSUMP.CHNG. FY 2008	UNIT.CHNG. FY 2008	PROJECTED FY 2008
ELECTRICITY								
kWh	26,901,141	26,474,982	28,281,748	30,231,974	32,887,059	2,052,550	32,887,059	34,939,609
Cost($)	1,669,152	1,798,698	2,520,601	2,902,255	4,041,820	252,258	302,561	4,615,522
UNIT($/kWh)	0.0620	0.0679	0.0891	0.0960	0.1229	0.1229	0.0092	0.1321
N.GAS (Firm)								
Therms(thm)	148,024	155,377	176,630	173,961	215,400	20,400	215,400	235,800
Cost($)	107,764	162,936	229,998	316,092	331,716	31,416	0.00	363,132
Unit($/therm)	0.728	1.049	1.302	1.82	1.54	1.54	0.00	1.54
N.GAS(Irate)								
Therms(thm)	425,376	406,098	440,090	440,205	450,000	0	450,000	450,000
Cost($)	243,037	335,400	473,948	707,298	643,500	0.00	0.00	643,500
Unit($/therm)	0.571	0.826	1.077	1.61	1.43	1.43	0.00	1.43
WATER								
kilogallons	22,236	16,163	18,926	27,070	30,946	2,050	30,946	32,996
Cost($)	59,039	50,462	58,871	77,419	92,219	6,109	1,857	100,308
Unit($/kgal)	2.66	3.12	3.11	2.86	2.98	2.98	0.06	3.04
SEWER								
kilogallons	15,964	11,282	11,869	19,663	23,259	1,950	23,259	25,209
Cost($)	65,920	51,285	58,709	89,802	110,713	9,282	2,093	122,264
Unit($/kgal)	4.13	4.55	4.95	4.57	4.76	4.76	0.09	4.85
NO.2 FUEL OIL								
Gallons(gal)	41,000	31,080	35,005	38,519	41,000	0	41,000	41,000
Cost($)	40,069	34,312	56,163	80,092	84,050	0	2050.00	86,100
Unit($/gal)	0.98	1.10	1.60	2.08	2.05	2.05	0.05	2.10
PROPANE								
Gallons(gal)	0	3,500	2,637	2,954	3,500	0	3,500	3,500
Cost($)	0	4,200	8,124	9,410	5,635	0	10,713	6,300
Unit($/gal)	0.00	1.20	3.08	3.19	1.61	-1.26	3.06	1.80
TOTAL COST($)	2,184,981	2,437,293	3,406,414	4,182,368	5,309,652	299,065	319,274	5,937,126
Wind Power[2]	0	0	19,269	19,269	0			0
Total Cost	2,184,981	2,437,293	3,425,683	4,201,637	5,309,652			5,937,126
Approved Budget	2,290,000	2,786,000	3,548,980	4,310,468	5,710,675			5,937,126
SURPLUS/(DEFICIT)	105,019	348,707	123,297	108,831	401,023			0

NOTES:

1. Projections based upon ICEUM 10/11/2006 Utility Rates
2. FY2007 & FY2008 Electrical Projections include $46,974.00 for Wind Power Purchase

INTERAGENCY COMMITTEE ON ENERGY AND UTILITIES MANAGEMENT

UTILITY RATES

October 11, 2006

FY2007, FY2008

Utilities	ACTUAL FY05	ACTUAL FY06	Budget PROJECTED FY07	PROJECTED FY07	PROJECTED FY08
Electricity	**68.8**	**100.0**	**139.9**	**130.5**	**141.2**
No. 2 Fuel Oil	**$1.60** per gallon	**$2.05** per gallon	$**2.09** per gallon	$**2.05** per gallon	**$2.10** per gallon
Natural Gas	**$1.33** per therm	**$1.86** per therm	**$1.70** per therm	$**1.57** per therm	**$1.57** per therm
Propane	**$1.39** per gallon	$**1.86** per gallon	**$1.67** per gallon	**$1.80** per gallon	**$2.00** per gallon
Water & Sewer	**3%** increase over Actual FY04	**2.5**% increase over Actual FY05	**2.5**% increase over Projected Fy06	**3.0 %** increase over Actual Fy06	**3.0%** increase over Proj Fy07
Motor Fuels:					
Unleaded	$**1.70** per gallon	$**2.30** per gallon	**$2.72** per gallon	$**2.72** per gallon	$**2.85** per gallon
Diesel	$ **1.77** per gallon	**$2.28** per gallon	**$2.80** per gallon	$**2.80** per gallon	$**2.95** per gallon
CNG:	**$1.92** per gallon equivalent	**$2.45** per gallon equivalent	**$2.45** per gallon equivalent	$**2.45** per gallon equivalent	$**2.59** per gallon equivalent
Ethanol	**$1.95** per gallon	**$2.69** per gallon	**$2.61** per gallon	$**2.75** per gallon	$**3.05** per gallon

Notes:

1. **Unit cost or percentage change is a cap. Individual agency unit costs may be below the ICEUM established number, but can not exceed the projection**. Energy cost projections for FY07 and FY08 assume the fuel energy tax at the level established in FY06.
2. Electricity rate projections include the price premium for wind energy.
3. Motor fuels include State tax.
4. CNG rate excludes Federal excise taxes, which the County does not pay.

The Maryland-National Capital Park and Planning Commission

MONTGOMERY COUNTY

DEPARTMENT OF PARK
AND
DEPARTMENT OF PLANNING

RESOURCE CONSERVATION PLAN

Fiscal Year 2008

January 2007

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RESOURCE CONSERVATION PLAN

The Maryland-National Capital Park and Planning Commission

Department of Park and Department of Planning
Montgomery County

I. INTRODUCTION

The Maryland-National Capital Park and Planning Commission was established by the Maryland General Assembly in 1927. The Commission serves the bi-county area of Prince George's and Montgomery Counties. This area has a population of 1.7 million citizens and extends over 1,000 square miles adjacent to the Nation's Capital. The purpose, powers, and duties of the Commission are found in Article 28 of the Annotated Code of Maryland. Pursuant to this Article, the Commission is empowered to:

- acquire, develop, maintain, and administer a regional system of parks and defined as the Metropolitan District;

- prepare and administer a general plan for the physical development in the areas of the two Counties defined as the Regional District; and

- Conduct a comprehensive recreation program.

The Commission's function in Montgomery County is carried out by The Montgomery County Department of Park and Department of Planning under the guidance of The Montgomery County Park and Planning Board.

The Department oversees the acquisition, development, and management of a nationally recognized, award winning park system providing County residents with open space for recreational opportunities and natural resources stewardship. The current system represents more than 30,000 acres and 384 facilities/structures of different sizes, types, and functions, including stream valley, conservation, regional, special, local, and community parks.

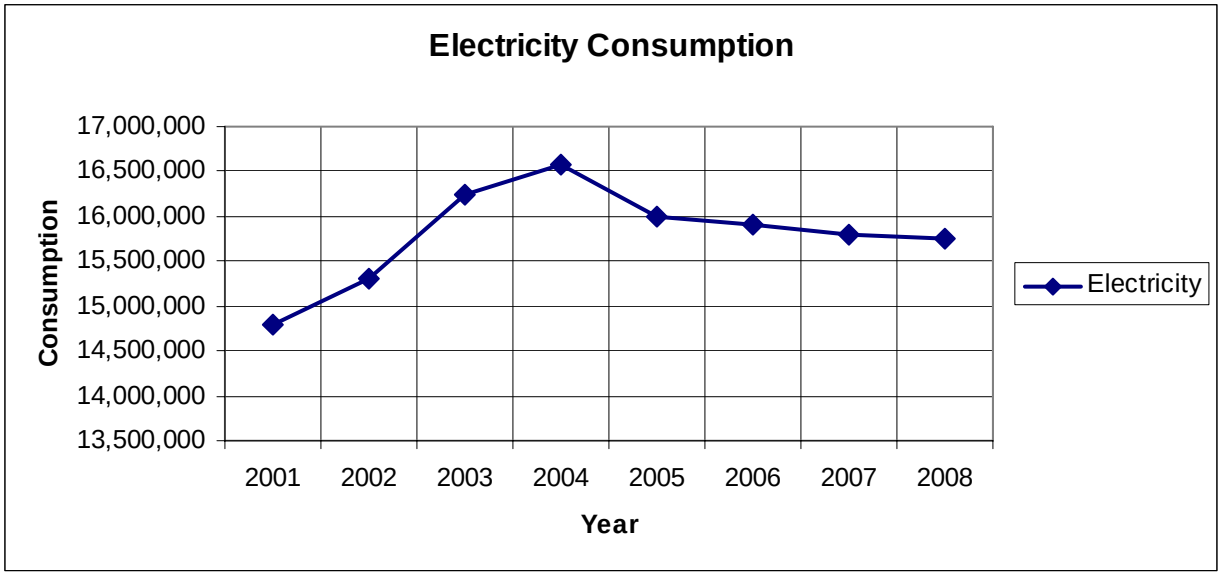
This report presents the accomplishments as of December 2006 and the plans for the 2008 fiscal year of the Montgomery County Park and Planning Commission to conserve energy and water resources as part of a comprehensive Resource Conservation Plan launched July 2003.

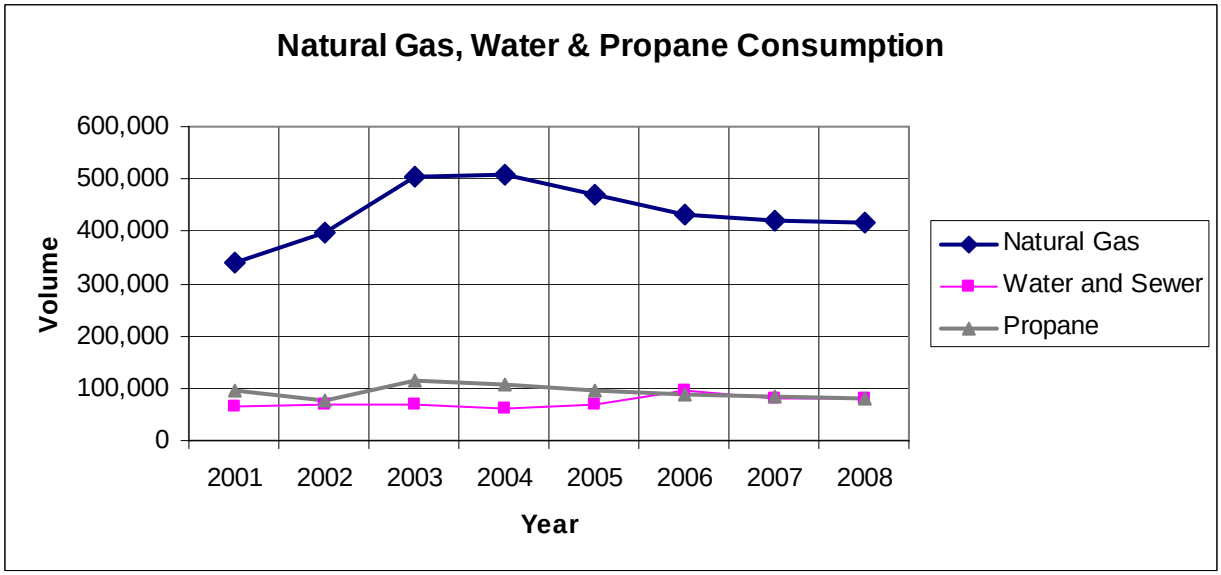
II. RESOURCE CONSERVATION PLAN RESULTS

The overall goal of the comprehensive Resource Conservation Plan is to establish programs and projects that will efficiently use energy and water resources to fulfill the mission of the Commission to serve the citizens and visitors of Montgomery County.

Energy and water are critical components to the day to day operation of the park system. The Resource Conservation Plan strives to improve operations and maintenance practices to efficiently use electricity, natural gas, propane, and water to provide the programs offered by the parks.

Through the implementation of a series of best management practices the Montgomery County Park and Planning Commission was able to continue to reduce consumption in 2007 as shown on the following charts:





The program in Fiscal Year 2007 was focused on the following activities:

- Employee Awareness Program
- Implementation of operations improvements to reduce consumption
- Issue Quarterly Progress Reports
- Implement a series of improvements at the following facilities to reduce consumption.
    - Athletic Field Lighting Operations County Wide
    - Recreation and Community Buildings
    - Golf Course Maintenance Facilities
    - Park Office Buildings and Staff Support Facilities

III. BUDGET – Fiscal Year 2006 (July 1, 2005 through June 30, 2006)

The approved budget for fiscal year 2006 was $3,123,494:

Planning	$146,900
Parks	$1,748,900
Enterprise	$1,227,694

IV. Actual Costs – Fiscal Year 2006 (July 1, 2005 through June 30, 2006)

Energy rates and costs increased again in fiscal year 2006 but remained within the budget estimates established for the budget year.

Even with the projected reductions in consumption for the year the utility budget began this year with an increase due to the changes in electricity market rates of $300,000.

The total costs in fiscal year 2006 were $3,251,819:

Planning	$158,449
Parks	$1,767,965
Enterprise	$1,325,405

The increase of $128,235 was less than the revised projection reported to the MFP Committee in November 2005 and again in February 2006 following the significant increases in prices resulting from Hurricanes Katrina and Rita.

The original projection was for a $179,900 increase.

V. BUDGET – Fiscal Year 2007 (July 1, 2006 through June 30, 2007)

The original approved budget for fiscal year 2007 was $3,531,000:

Planning	$169,700
Parks	$2,010,000
Enterprise	$1,351,300

The budget for the Enterprise Division was revised in July 2006 due to the transfer of the Golf Courses to the County Revenue Authority reducing the Enterprise Divisions costs by $232,000 in 2007.

The revised budget for fiscal year 2007 without the Golf Courses is $3,299,000:

Planning	$169,700
Parks	$2,010,000
Enterprise	$1,119,300

VI. Costs Projection for Fiscal Year 2007 as of December 2006 (July 1, 2006 through June 30, 2007)

The total costs are projected to be $3,277,000 in fiscal year 2007 based on data received as of the November 20, 2006 Fasor Reports:

Planning	$175,800
Parks	$1,998,500
Enterprise	$1,112,700

VII. PLANNED RESOURCE CONSERVATION PLAN – Fiscal Year 2008 (July 1, 2007 through June 30, 2008)

Plans are underway to continue to reduce consumption growth on an annual basis. The objective is to continue to reduce the increase from the average annual growth of 7% per year. The program activities in fiscal year 2008 are:

- Establish employee awareness and participation program to assist the staff reduce their “carbon footprint” at home and work.
- Implement additional operations and maintenance improvements county wide.
- Implement energy retrofit projects at park maintenance centers.
- Implement selected water conservation programs at the major regional parks and park maintenance centers.
- Assess the “heat island effect” of the major buildings in the park system and

report findings to determine actions to be implemented in FY 2009.

- Conduct an assessment of the major facilities to determine steps required to meet LEED Silver Certification requirements for existing buildings. Establish program plan for project improvements starting in FY 2009.

VIII. BUDGET REQUEST – Fiscal Year 2008 (July 1, 2007 through June 30, 2008)

The proposed budget for fiscal year 2008 is $3,587,950:

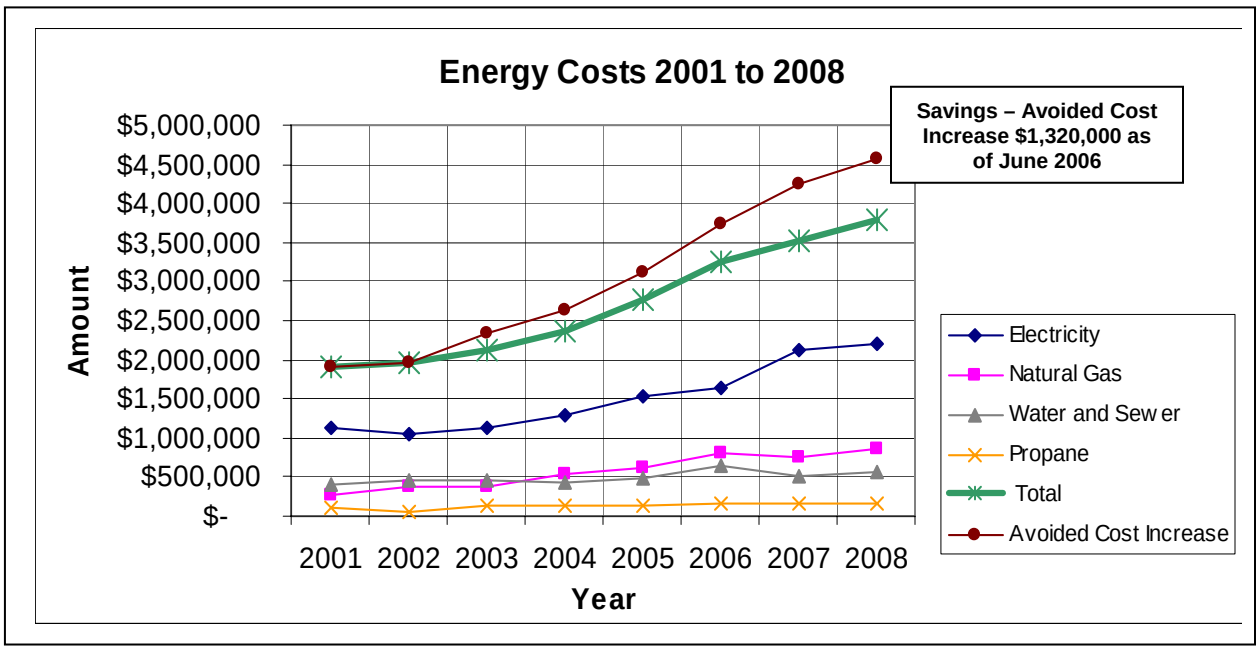
Planning	$182,450
Parks	$2,179,260
Enterprise	$1,226,240

The budget is has changed in 2008 due to the following:

- Transfer of the Golf Courses to the County Revenue Authority reduced the Enterprise Operations costs by $252,600 in 2008
- Split in operating costs between Planning and Parks
- Addition of the Commissions contribution to the Wind Program of $40,900 in 2008

The program has avoided over $1,320,000 in cost increases through to June 2006.

The following chart shows the costs for utilities for the period 2001 to 2008 are as follows:



RESOURCE CONSERVATION PLAN

Summary as of July 2006

Agency	**Maryland-National Capital Park and Planning Commission**		
Number of Facilities	204 Facilities that have utilities	Change in number of facilities	2
Total square feet	779,637	Change in total ft^2	22,000
Average operating hrs/year	Varies	Change in avg. operating hrs/year	None
Other changes effecting energy consumption	The implementation of a comprehensive energy management and water conservation program by the three operating Divisions: North Parks Region, South Parks Region, and Enterprise Operations contributed to additional consumption reductions. Prior to 2003 consumption increased by an average of 7% per year. <u>In 2006 consumption decreased as follows:</u> Electricity -1% Natural Gas -8% Propane -9% Water consumption increased by 29% due to a series of leaks in 2006. <u>Energy Unit Costs variances in 2006 were:</u> Electricity +7% Natural Gas +18% Propane +18% Water +27% MNCPPC implemented a series of actions to reduce consumption and to stay on budget. The results of the program decreased consumption and avoided an additional $300,000 increase.		

Existing Measures

Fiscal Years 2000 to June 2006

Measures - Existing: (implemented from FY 98 to FY 05)	date implemented (mo/yr)	initial cost ($)	annual net impact on maintenance cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($)
Capital Improvement Projects:						
Equipment Replacement Project	FY 2000 to FY 2006	$125,500 est.	$23,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	312,000 kWh, 9,800 therms & 2,900 Pounds	$41,500 est. Annual Cost Avoidance
Equipment Retrofit Projects	FY 2000 to FY 2006	$54,000 est.	$9,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	126,000 kWh, 4,000 therms & 600 Pounds	$19,800 est. Annual Cost Avoidance
Controls Improvements	FY 2000 to FY 2006	$24,900 est.	NA	Electricity	167,000 kWh & 6,600 therms	$22,000 est. Annual Cost Avoidance
Lighting Projects	FY 2000 to FY 2006	$20,800 est.	NA	Electricity	55,000 kWh	$27,000 est. Annual Cost Avoidance
Sub - Total		$225,200 est.			660,000 kWh, 20,400 therms & 3,500 Pounds	$110,300 Annual Cost Avoidance
Operations and Maintenance:						
Operations and Maintenance Best Management Practice and Programs	FY 2000 to FY 2006	$92,500 est.	$5,000	Electricity, Natural Gas, and Propane	230,000 kWh, 13,500 therms & 1,900 Pounds	$42,000 est. Annual Cost Avoidance
Total		**$317,700**			**890,000 kWh, 33,900 therms & 5,400 Pounds**	**$152,300 est. Annual Cost Avoidance** **2.1 Yrs. ROI**

New Measures 2007

This table shows information on resource conservation measures being implemented in FY 07 **(July 1, 2006 through June 30, 2007)**

Measures - Planned: (for FY06)	projected completion date (mo/yr)	projected initial cost ($)	projected annual net impact on maintenance cost ($)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings ($)
Capital Improvement Projects:						
Equipment Replacement Project	First Quarter FY 07	$20,000 est.	$5,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	64,000 kWh, 1,800 therms & 300 Pounds	$7,000 est. Annual Cost Avoidance
Controls Improvements	First Quarter FY 07	$7,500 est.	NA	Electricity	40,000 kWh & 1,500 therms	$5,000 est. Annual Cost Avoidance
Lighting Projects	Third Quarter FY 07	$10,000 est.	NA	Electricity	9,500 kWh	$6,000 est. Annual Cost Avoidance
Sub-Total		$37,500	$5,000			$18,000
Operations and Maintenance:						
Best Management Practices Programs	Entire Year	$10,500	NA	Electricity, Natural Gas, and Propane	25,000 kWh, 1,000 therms & 300 Pounds	$5,000 Annual Cost Avoidance
Employee Training and Participation Programs	Entire Year	$9,500	NA	Electricity, Natural Gas, and Propane	20,000 kWh, 800 therms & 200 Pounds	$4,000 Annual Cost Avoidance
Operations and Maintenance Improvement Programs	Entire Year	$10,000	NA	Electricity, Natural Gas, and Propane	25,000 kWh, 1,000 therms & 300 Pounds	$5,000 est. Annual Cost Avoidance
Sub-Total		$30,000	NA			$14,000
Total		**$67,500**	**$5,000**			**$32,000** **2.1 yr ROI**

Planned Measures 2008

This table shows information on resource conservation measures planned to be implemented in FY 08 **(July 1, 2007 through June 30, 2008)**

Measures - Planned: (for FY08)	projected completion date (mo/yr)	projected initial cost ($)	projected annual net impact on maintenance cost ($)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings ($)
Capital Improvement Projects:						
Equipment Replacement Project	First Quarter FY 08	$20,000 est.	$5,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	64,000 kWh, 1,800 therms & 300 Pounds	$8,000 est. Annual Cost Avoidance
Controls Improvements	Second Quarter FY 08	$10,000 est.	NA	Electricity	42,000 kWh & 2,000 therms	$3,500 est. Annual Cost Avoidance
Lighting Projects	Entire Year FY 08	$20,000 est.	NA	Electricity	12,500 kWh	$9,500 est. Annual Cost Avoidance
Total		$50,000	$5,000			$21,000
Operations and Maintenance:						
Energy Assessment and Best Management Practices Programs	Entire Year	$15,000	NA	Electricity, Natural Gas, and Propane	35,000 kWh, 1,500 therms & 300 Pounds	$5,000 Annual Cost Avoidance
Employee Training and Participation Programs	Entire Year	$5,000	NA	Electricity, Natural Gas, and Propane	15,000 kWh, 500 therms & 200 Pounds	$2,000 Annual Cost Avoidance
Operations and Maintenance Improvement Programs	Entire Year	$15,000 est.	NA	Electricity, Natural Gas, and Propane	25,000 kWh, 1,000 therms & 300 Pounds	$8,000 est. Annual Cost Avoidance
Total		$35,000	NA			$17,000
Total		**$85,000**	**$5,000**			**$38,000 2.2 yrs ROI**

FY 2008 Utility Budgets

THE MARYLAND -NATIONAL CAPITAL PARK AND PLANNING COMMISSION

Utility Budget Projection by Fund /Cost

	1	2	3	4	5	6	7	8	9	10	11
	FY03	FY04 Bud	FY04 Actual	2005 Budget	2005 Actual	2006 Budget	2006 Actual	2007 Budget	2007 Budget		2008 Budget
	ACTUAL	APPROVED	ACTUAL	APPROVED	ACTUAL	APPROVED	Actual	APPROVED	Revised due to transfer of golf courses		Projection
PLANNING											
2220 Electricity	$ 81,411	$ 108,322	**$ 85,336.00**	$ 93,700	$ 110,488	$ 122,400	$ 125,239	$ 140,000	$ 140,000		$ 145,600
2210 Natural Gas	$ 12,554	$ 10,650	**$ 17,093.00**	$ 12,000	$ 17,740	$ 20,000	$ 28,521	$ 25,000	$ 25,000		$ 28,750
2230 Water and Sewer	$ 3,814	$ 4,200	**$ 3,873.53**	$ 3,800	$ 4,227	$ 4,500	$ 4,689	$ 4,700	$ 4,700		$ 6,000
1903 Propane											
Tax Increase					$ 4,399		$ 158,449	Included	Included		Included
Wind Energy Fee					$ 1,065			Included	Included		$ 2,100
Sub Total	$ 97,779	$ 123,172	**$ 106,302.53**	$ 109,500	$ 137,919	$ 146,900	**$ 158,449.42**	$ 169,700	$ 169,700		**$ 182,450**
PARKS											
2220 Electricity	$ 602,151	$ 838,909	**$ 669,121.00**	$ 658,800	$ 865,777	$ 954,300	$ 952,328	$ 1,139,000	$ 1,139,000		$ 1,184,560
2210 Natural Gas	$ 196,156	$ 172,000	**$ 261,238.06**	$ 221,700	$ 262,623	$ 302,300	$ 331,270	$ 360,000	$ 360,000		$ 414,000
2230 Water and Sewer	$ 352,217	$ 249,375	**$ 355,155.94**	$ 382,300	$ 341,052	$ 412,200	$ 399,788	$ 425,000	$ 425,000		$ 467,500
1903 Propane	$ 78,182	$ 57,000	**$ 67,952.00**	$ 46,600	$ 72,709	$ 80,100	$ 84,578	$ 86,000	$ 86,000		$ 90,000
Tax Increase					$ 40,362		$ 1,767,964	Included	Included		Included
Wind Energy Fee					$ 5,152			Included	Included		$ 23,200.00
Sub Total	$ 1,228,706	$ 1,317,284	**$ 1,353,467.00**	$ 1,309,400	$ 1,587,675	$ 1,748,900	**$ 1,767,964.22**	$ 2,010,000	$ 2,010,000		**$ 2,179,260**
Planning & Parks Total	$ 1,326,485	$ 1,440,456	$ 1,459,770	$ 1,418,900	$ 1,725,594	$ 1,895,800	**$ 1,926,413.64**	**$ 2,179,700**	**$ 2,179,700**		**$ 2,361,710**

	FY03	FY04 Bud	FY04 Actual	2005 Budget	2005 Actual	2006 Budget	2006 Actual	2007 Budget	2007 Budget	2008 Budget	2008 Budget
	ACTUAL	APPROVED	ACTUAL	APPROVED	Projection	APPROVED	Actual	APPROVED	Revision	Projection	Projection
ENTERPRISE								*With Golf Cources*	*No Golf Cources*	*With Golf Cources*	*No Golf Cources*
2220 Electricity	$ 485,528	$ 537,700	**$ 532,518.00**	$ 525,600	$ 665,188	$ 751,963	$ 715,805	$ 830,000	$ 630,000	$ 864,000	$ 664,000
2210 Natural Gas	$ 161,473	$ 193,200	**$ 274,390.00**	$ 187,600	$ 284,790	$ 317,925	$ 399,896	$ 360,000	$ 356,200	$ 414,000	$ 410,200
2230 Water and Sewer	$ 100,251	$ 94,100	**$ 64,926.00**	$ 89,700	$ 70,861	$ 75,821	$ 127,719	$ 78,000	$ 63,000	$ 99,840	$ 78,440
1903 Propane	$ 50,278	$ 33,500	**$ 50,907.00**	$ 30,500	$ 54,471	$ 61,683	$ 68,994	$ 62,000	$ 48,800	$ 64,400	$ 37,000
Tax Increase					$ 33,459		$ 1,312,414	Included	Included		Included
Wind Energy Fee					$ 5,849			Included	Included		$ 15,600.00
Sub Total	$ 797,530	$ 858,500	**$ 922,741.00**	$ 833,400	$ 1,114,618	$ 1,207,392	**$ 1,312,414.55**	$ 1,330,000	$ 1,098,000	$ 1,442,240	$ 1,205,240
PROPERTY MANAGEMENT											
2220 Electricity	$ 14,464	$ 10,000	**$ 9,917.00**	$ 15,600	$ 12,839	$ 14,308	$ 7,924	$ 15,500	$ 15,500		$ 15,000
2210 Natural Gas	$ 3,124	$ 4,500	**$ 4,471.00**	$ 3,800	$ 4,640	$ 5,193	$ 4,546	$ 5,800	$ 5,800		$ 6,000
2230 Water and Sewer	$ 1,047	$ 9,500	**$ 686.00**	$ 2,100	$ 749	$ 801	$ 520	$ -	$ -		
1903 Propane											
Tax Increase					$ 589		$ 12,990	Included	Included		Included
Wind Energy Fee					$ 171			Included	Included		0
Sub Total	$ 18,635	$ 24,000	**$ 15,074.00**	$ 21,500	$ 18,988	$ 20,302	**$ 12,990.81**	$ 21,300	$ 21,300		$ 21,000
Enterprise & Pro. Mgt. Total	$ 816,165	$ 882,500	**$ 937,815.00**	$ 854,900	$ 1,133,606	$ 1,227,694	**$ 1,325,405.36**	**$ 1,351,300**	**$ 1,119,300**		**$ 1,226,240**
Overall Totals	$ 2,142,650	$ 2,322,956	$ 2,397,585	$ 2,273,800	$ 2,859,200	$ 3,123,494	**$ 3,251,819.00**	**$ 3,531,000**	**$ 3,299,000**		**$ 3,587,950**
Electricity	$ 1,183,554	$ 1,494,931	$ 1,296,892	$ 1,293,700	$ 1,710,091	$ 1,842,971	$ 1,637,990.58	**$ 2,124,500**	**$ 1,924,500**	Electricity	**$ 2,009,160**
Natural Gas	$ 373,307	$ 380,350	$ 557,192	$ 425,100	$ 588,596	$ 645,418	$ 806,279.64	**$ 750,800**	**$ 747,000**	Natural Gas	**$ 858,950**
Water and Sewer	$ 457,329	$ 357,175	$ 424,641	$ 477,900	$ 416,899	$ 493,322	$ 648,377.67	**$ 507,700**	**$ 492,700**	Water and Sewer	**$ 551,940**
Propane	$ 128,460	$ 90,500	$ 118,859	$ 77,100	$ 131,377	$ 141,783	$ 159,171.18	**$ 148,000**	**$ 134,800**	Propane	**$ 127,000**
Wind Energy Fee					$ 12,237					Wind Energy Fee	$ 40,900.00
Total	$ 2,142,650	$ 2,322,956	$ 2,397,585	$ 2,273,800	$ 2,859,200	$ 3,123,494	$ 3,251,819	$ 3,531,000	$ 3,299,000		$ 3,587,950

		Units	Consumption	Cost per Unit	Consumption	Cost per Unit	Consumption	Cost per Unit		Consumption
	ELECTRICITY	KWH	**16,024,449**	0.107	**15,907,029**	$ 0.103	**16,344,938**	$ 0.139		**15,800,000**
	NATURAL GAS	THER	**469,506**	1.254	**433,696**	$ 1.859	**478,896**	$ 1.950		**455,000**
	WATER & SEWER	GAL	**93,834**	4.443	**95,703**	$ 6.775	**95,710**	$ 6.800		**94,000**
	PROPANE	KGAL	**65,161**	2.016	**86,318**	$ 1.844	**66,464**	$ 2.500		**65,000**
			ACTUAL		BUDGET	ACTUAL	PROJECTED	PROJECTED		PROJECTED

FY 2008

Resource Conservation Plan

Department of Public Works and Transportation
Division of Operations
Engineering and Management Services Section

February 2007

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I. Executive Summary

The Department of Public Works and Transportation (DPWT), Engineering and Management Services Section (EMS) in the Division of Operations has enacted numerous energy efficiency programs and continues to foster activities that enhance efficiency, and reduce utility costs to ensure energy efficient operation of facilities.

The Division of Operations within DPWT has for more than fifteen years, accomplished millions of dollars in energy savings by implementing our Energy Design Guidelines into new and renovation projects to ensure efficient operation and maintainability of mechanical and electrical systems. The Energy Design Guidelines document has been extremely effective in providing basic building design parameters for mechanical, lighting and envelope systems. The document is now being revised to provide specific design guidance for various building types such as libraries, indoor pools, fire stations, community centers, etc.

In response to Electricity Deregulation, which became effective in June 2004, DPWT has pioneered innovative energy purchasing methods including a reverse auction that allows same day bidding and contract award. Prior to March 2006, DPWT has awarded several 14 to 17 months contracts, with various suppliers for a total of $27 M, with total savings of $1.97 M when compared to May 2004 SOS prices and $2.4 M when adjusted for actual SOS costs as published in May 2005. To bring this about, the County enacted in 2004 a new Procurement Regulation that delegates electricity procurement authority from the CAO to the Director DPWT and created a unique procurement document titled "Request for Energy Proposals" (RFEP) to select and qualify potential bidders. See more details in Section II.B. The RFEP also enabled award, at the time of purchase, of the largest clean energy contract for any Municipality. Montgomery County Government and its partners clean energy purchases still rank as the 3rd largest in the nation among members of the U.S. EPA's Green Power Partnership. . Montgomery County including 18 agencies and Municipalities with initial purchase wind energy Renewable Energy Certificates (RECs) starting at 5% of the total yearly energy consumption. Since Sept 06 the contract has been amended to include 10 % of the yearly electricity consumption. Montgomery County is committed to increase amounts within the next three years to eventually purchase 20% of the yearly consumption by 2010.

Montgomery County received a 2005 National Association of Counties (NaCO) Award for its work as the lead procurement agency for an 18 member Aggregation Group.

The DPWT programs has been successful in consistently providing millions in savings by: 1) leading and implementing the electricity procurement program, 2) by promoting energy conscious design practices to ensure the implementation of energy savings opportunities in new designs and retrofit of existing systems and 3) by auditing utility bills resulting in thousands of dollars in cost avoidance payments and obtaining refunds from utility companies and 4) by implementing various Capital Improvement projects.

II. Energy Management

A. Utility Budget and Bill Auditing

The Division of Operations is responsible for tracking and auditing all utility invoices from various utility providers for County facilities to insure accurate budget projections. Due to reorganization, EMS has added new responsibilities to the task of managing utility cost to include the parking district and traffic lights. The new customized utility bill tracking software. has been enhanced to accept electronic billing data in extensible mark-up language (XML) or practically any format. The system undergoes constant upgrading, to keep up with a growing number of utility accounts and to be able to track multiple suppliers for our electricity and gas accounts. The custom software enhances the Division's expertise to recognize billing anomalies and obtain refunds from utility companies. In FY 04-05, E& MS was successful in identifying $197,483 due to incorrect billing charges and incorrect sales tax charges resulting in thousands of dollars in refunds. Obtaining refunds from utility companies is a very tedious and time-consuming process. The Division of Operations has successfully and relentlessly pursued this task.

B. Electricity Procurement

With the advent of electric deregulation there have been drastic changes occurring in the U.S. electricity industry and a greater need to anticipate changes in provision of electricity and related services. Effective June 2004, electricity supply rates have been deregulated allowing commercial customers to choose the electricity supplier. Under current settlements in Maryland, a default Standard Offer Service (SOS) will still be available from the Local Electricity Distribution Company (EDC). The new default rate will not be mandated by regulatory agencies. Initially market forces will establish SOS rates with each EDC holding a series of auctions with its suppliers. In June 2004 the new default service rate increased to an average of 44 % over previous years. In June 2005 SOS rates would also increase, however the average increase was about 15% this time. Another departure from the norm in June 2005 was the vanishing of SOS for large electricity accounts. These rates for these accounts are now computed on an hourly basis (whatever the market rate).
The County agencies are major consumers of utility services spending upward of $53 million annually for 2600 separate accounts on electricity alone.

The County Task Force on Electric Deregulation was established in June 1997 to develop recommendations regarding public policies and strategic actions to be taken by various agencies prior to, during transition to, and under the coming electric utility deregulation. The task force membership represents a broad spectrum of county agencies and townships. The Division of Operations took the leadership role in establishing prospective suppliers and has also lead in

contracting the procurement of electricity for all agencies. Cost effectiveness and reliability being fundamental to the procurement process.

To avoid "default service" rates, and to be a successful player in the volatile energy market Division of Operations has taken several steps to facilitate "same day" bidding and contract award for 17 county agencies and municipalities. This process has now evolved to utilize a larger number of suppliers and to have the ability to conduct .web based reverse auctions. Thus, a regulation was enacted to shift electricity procurement authority from the CAO to the Director DPWT. Concurrently, the Division of Operations took the lead and as a cooperative effort among County Agencies, crafted a procurement document nicknamed "Request for Energy Procurement" or RFEP. This document has now been implemented several times and is responsible for a combined $2.4M in savings. See next page chart for details of electricity bidding and contract awards.

As the old contract was ending, on March 21 and 22, DPWT conducted a reverse auction involving Montgomery County Agencies and 18 Municipalities including Prince Georges, Prince Georges Community College and College Park. The web reverse auction was conducted on March 21st and 22nd. Bids came from six pre-qualified suppliers and awards were made the same day.

As a result we were able to award several contracts to enroll 2407 out of 2598 accounts. The first year contract award of $125M will yield savings of approximately $25 Million, equating to 19.6% savings yearly savings at current default rates. See the following Summary tables

Table 1. Summary of available number of accounts and Load

	Summary		Detail by account Number and Type				Detail by account load and Type			
Participant	**Available Accounts**	**Available KWh**	**No. Accounts SL**	**No. Type I Accounts**	**No. Type II Accounts**	**No. Type III Accounts**	**SL Accounts (kWh)**	**Type I Accounts (kWh)**	**Type II Accounts (kWh)**	**Type III Accounts (kWh)**
Chevy Chase Village	3	315,694	1	1	1	0	208,928	10,706	96,060	0
Chevy Chase Village Section 5	1	44,328	1	0	0	0	44,328	-	-	0
City of College Park	21	1,611,041	1	14	6	0	866,857	158,252	585,932	0
City of Gaithersburg	79	6,532,111	13	50	16	0	2,425,360	625,789	3,480,962	0
City of Rockville	118	14,045,887	3	95	19	1	3,047,681	971,346	5,301,344	4,725,516
City of Takoma Park	19	1,994,932	1	16	2	0	990,558	131,054	873,320	0
Housing Opportunities Commission	146	29,084,262	0	96	50	0	0	1,302,158	27,782,104	0
MCC	44	29,523,672	0	2	41	1	0	27,144	26,001,462	3,495,066
MCPS	269	214,314,030	0	32	230	7	0	5,495,419	182,860,956	25,957,655
MNCPPC	506	54,790,263	4	358	143	1	71,217	6,820,250	41,030,415	6,934,822
Montgomery County Government	986	173,149,704	7	785	192	2	28,242,597	21,452,641	103,386,398	20,068,068
Prince Georges Community College	2	15,858,683	0	0	0	2	0	-	-	15,858,683
Prince Georges County	386	87,700,213	3	282	98	3	25,505,575	3,561,421	44,831,658	13,801,559
Rockville Housing Enterprises	1	721,245	0	0	1	0	0	-	721,245	0
Town of Glen Echo	3	87,737	1	2	0	0	43,487	44,250	-	0
Town of Kensington	9	446,364	1	7	1	0	249,249	36,555	160,560	0
Town of Laytonsville	1	39,194	1	0	0	0	39,194	-	-	0
Town of Somerset	4	196,675	1	2	1	0	101,739	26,860	68,076	0
Totals	**2,598**	**630,456,035**	**38**	**1,742**	**801**	**17**	**61,836,770**	**40,663,845**	**437,180,492**	**90,841,369**

Table 2. Award Results Summary

	Summary		Detail By Account Number & Type				Detail by Account Load and Type			
Participant	Awarded Accounts	Awarded KWh	No. Accounts SL	No. Type I Accounts	No. Type II Accounts	No. Type III Accounts	SL Accounts (kWh)	Type I Accounts (kWh)	Type II Accounts (kWh)	Type III Accounts (kWh)
Chevy Chase Village	3	315,694	1	1	1	0	208,928	10,706	96,060	0
Chevy Chase Village Section 5	1	44,328	1	0	0	0	44,328	-	-	0
City of College Park	21	1,611,041	1	14	6	0	866,857	158,252	585,932	0
City of Gaithersburg	79	6,532,111	13	50	16	0	2,425,360	625,789	3,480,962	0
City of Rockville	118	14,045,887	3	95	19	1	3,047,681	971,346	5,301,344	4,725,516
City of Takoma Park	19	1,994,932	1	16	2	0	990,558	131,054	873,320	0
Housing Opportunities Commission	146	29,084,262	0	96	50	0	0	1,302,158	27,782,104	0
MCC	44	29,523,672	0	2	41	1	0	27,144	26,001,462	3,495,066
MCPS	256	206,383,515	0	20	230	6	0	393,304	182,860,956	23,129,255
MNCPPC	461	52,913,280	2	315	143	1	66,441	4,881,602	41,030,415	6,934,822
Montgomery County Government	933	159,880,558	4	735	192	2	26,240,025	10,186,067	103,386,398	20,068,068
Prince Georges Community College	2	15,858,683	0	0	0	2	0	-	-	15,858,683
Prince Georges County	371	86,698,358	3	267	98	3	25,505,575	2,559,566	44,831,658	13,801,559
Rockville Housing Enterprises	1	721,245	0	0	1	0	0	-	721,245	0
Town of Glen Echo	3	87,737	1	2	0	0	43,487	44,250	-	0
Town of Kensington	9	446,364	1	7	1	0	249,249	36,555	160,560	0
Town of Laytonsville	1	39,194	1	0	0	0	39,194	-	-	0
Town of Somerset	4	196,675	1	2	1	0	101,739	26,860	68,076	0
Totals	**2,472**	**606,377,536**	**33**	**1,622**	**801**	**16**	**59,829,422**	**21,354,653**	**437,180,492**	**88,012,969**

Table 3: Summary of awarded contracts

Total Contract Amounts	12 Months	24 Months	36 Months	Total
Montgomery County Government	$14,878,305	$14,878,305	$10,999,917	**$40,756,528**
MCPS	$18,804,321	$1,541,759	$1,541,759	**$21,887,839**
MCC	$3,071,163	$3,071,163	$3,071,163	**$9,213,489**
MNCPPC	$4,945,052	$4,945,052	$3,588,180	**$13,478,284**
Prince Georges County	$8,067,656	$8,067,656	$5,199,577	**$21,334,889**
Prince Georges Community College	$1,486,408	$1,486,408	$1,447,898	**$4,420,715**
City of Rockville	$1,301,332	$1,301,332	$924,465	**$3,527,128**
Chevy Chase Village	$29,623	$29,623	$8,934	**$68,180**
Chevy Chase Village Section 5	$4,176	$4,176	$0	**$8,351**
City of College Park	$150,691	$150,691	$54,492	**$355,873**
City of Gaithersburg	$609,337	$609,337	$323,729	**$1,542,404**
Housing Opportunities Commission	$2,706,124	$2,706,124	$2,583,736	**$7,995,984**
City of Takoma Park	$186,568	$186,568	$81,219	**$454,355**
Town of Kensington	$41,857	$41,857	$14,932	**$98,646**
Town of Glen Echo	$8,265	$8,265	$0	**$16,530**
Town of Laytonsville	$3,692	$3,692	$0	**$7,384**
Town of Somerset	$18,445	$18,445	$6,331	**$43,221**
Rockville Housing Enterprises	$67,076	$67,076	$67,076	**$201,227**
Totals	**$56,380,091**	**$39,117,529**	**$29,913,406**	**$125,411,026**

Table 4: Summary of savings

Cost Avoidance Savings	12 Months	24 Months	36 Months	Total
Montgomery County Government	$2,674,155	$2,674,155	$2,219,536	**$7,567,845**
MCPS	$5,155,215	$280,455	$280,455	**$5,716,125**
MCC	$765,538	$765,538	$765,538	**$2,296,614**
MNCPPC	$848,763	$848,763	$741,640	**$2,439,166**
Prince Georges County	$1,317,749	$1,317,749	$964,848	**$3,600,345**
Prince Georges Community College	$37,883	$37,883	$33,938	**$109,704**
City of Rockville	$174,215	$174,215	$127,166	**$475,596**
Chevy Chase Village	$4,704	$4,704	$2,121	**$11,529**
Chevy Chase Village Section 5	$521	$521	$0	**$1,043**
City of College Park	$24,947	$24,947	$12,937	**$62,831**
City of Gaithersburg	$112,515	$112,515	$76,860	**$301,890**
Housing Opportunities Commission	$628,708	$628,708	$613,429	**$1,870,845**
City of Takoma Park	$32,435	$32,435	$19,283	**$84,153**
Town of Kensington	$6,906	$6,906	$3,545	**$17,358**
Town of Glen Echo	$1,032	$1,032	$0	**$2,064**
Town of Laytonsville	$461	$461	$0	**$922**
Town of Somerset	$3,015	$3,015	$1,503	**$7,534**
Rockville Housing Enterprises	$15,925	$15,925	$15,925	**$47,775**
Totals	**$11,804,687**	**$6,929,927**	**$5,878,723**	**$24,613,337**

C. Design Review Team

The Division of Operations will eventually inherit maintenance and operation duties for all new buildings under design. Accordingly, the division has a vital interest in design details of new facilities and as such, the Division participates in the design and, construction of County government facilities under the executive branch of Montgomery County Government and supports facilities spanning a wide variety of functions associated with the County Government and public services.

To carry out its mandate of supporting the operation and maintenance of hundreds of buildings, the Division of Operations has available a design review team. The team reviews new building design and renovations to ensure sound engineering practices in selection and sizing of mechanical and electrical components. In addition the team evaluates maintenance and energy consumption characteristics of the equipment and provides recommendations to maximize savings. The Division of Operations Design Team has received the DPWT Team Recognition Award for excellence. The team has been credited with saving millions of dollars in current and future operational costs for its dedication to review and verify the adequacy of mechanical and electrical design parameters.

Under the Division of Operations, the Engineering and Management Services (EMS) sets and enforces the Energy Design Guidelines standards for the Division as a whole, based on simultaneous consideration of energy efficiency, indoor environmental quality and maintainability. EMS prepares the Energy Program of Requirements (EPOR) for all new building designs as well as retrofits and provides technical guidance to the sections as needed on the path to reliable, economical facilities that are free of indoor environmental quality problems. As such, the division has played and it will continue to perform a key role in the energy efficiency of county buildings; assisting the Design Division by enforcing the Energy Design Guidelines to ensure adequate mechanical design and construction of new facilities.

The Division of Operations experience is showing that energy-efficient building design pays immediately and can be successfully enforced. The Division of Operations provides energy engineering and timely review of project plans and specifications for all new and retrofit CIP projects. The Division is also responsible for producing a blue print for envelope and mechanical and lighting systems design to include energy analysis and life cycle costs for all design projects. It is worth while to note that this cost avoidance measure is not easily quanitified but DPWT staff believe this approach has resulted in millions of dollars in savings.

D. Energy Conservation Projects

The Division of Operations implemented several energy conservation programs in FY06 including updating mechanical systems such as hot water pumping systems for the Red Brick courthouse and the upgrade of Energy Management Systems for the Damascus Daycare center Upper County Community Center. Other projects included retrofitting of mechanical time clocks with programmable counterparts, adding photo cell for parking lots, and replacing faulty wiring on fixture ballasts in several facilities to increase bulb life. Other efforts include an energy study

for the Executive Office Building and the Judicial Center. These studies examined the feasibility of retrofitting the Executive Office Building and Judicial Centers electricity fulled heating plant with natural gas and identified capital costs as well as savings due to reduced energy cost. The computer model will also be used to evaluate additional energy saving alternatives.

III. Energy Design Guidelines

A. Background

In 1985 County legislation targeted a roughly 40 percent energy reduction in the design of new county facilities. At that time the Division of Operations began developing comprehensive, integrated design guidelines for new buildings. A series of research grants and projects brought together new technologies, cost control concepts and design process improvements

Mechanical systems typically account about 30% of the total energy consumption in a typical building. Today, with the prospect of ever increasing energy rates due to unregulated energy suppliers and the loss of Standard Offer Service efforts are needed to optimize mechanical systems design to achieve equitable savings in the operation and maintenance of equipment.

B. Overview

The Building Design Guideline and the Division of Operations Energy Design Guideline documents are two documents that reflect our policy on designing new buildings with energy efficient components. The goal of Energy Design Guideline is to improve the design of new facilities to meet low-energy budgets and minimize life-cycle costs. These documents are updated as needed to reflect new technologies. The terms “green building”, “green technology”, “sustainable building” or “sustainable design”, and “energy efficient design” have been used interchangeably. Sustainable Building Design encompasses many different areas only one of which addresses mechanical systems. The Energy Design Guidelines will specifically address energy consuming mechanical and lighting equipment and will facilitate compliance with “Green Building” design practices.

The following components of energy-efficient technology are only part of what the Division of Operations accomplishes by enforcing the Guidelines. Each technology provides a contribution based on implementation of new technology. Following is a list of technologies and estimated percent implementation completion.

Lighting

Historically, lighting was the biggest energy user in county facilities. Due to implementation of new technology, the current cost distribution for lighting is now about 15 %. In the late 1980’s a major revolution occurred in lighting technologies for buildings. New

technology lamps, ballasts, fixtures and sensors entered the market that could provide energy savings of 40 to 90 percent in every office lighting application, from overhead fluorescent toffer fixtures, to compact-fluorescent down-lights, to light emitting diode (LED) exit signs. Virtually every existing light fixture in county facilities had become "economically obsolete".

A 40 % energy savings is achieved by the retrofitting of T12 lighting systems with energy-efficient T8 fluorescent lamps and high-quality electronic ballasts. Likewise, replacing incandescent fixtures with compact fluorescents provides an energy savings of 66 to 75 %. The estimated savings contribution for this technology assumes 15 % total energy consumption for lighting and that the program is now 100 % complete. Further maintenance costs may now be reduced by incorporating new technology that substantially increases longevity of T8 fluorescent tubes. The use of high – output T5 fluorescent lighting systems will be implemented for the replacement of Metal halide bulbs in warehouses and repair garages.

Motors and Variable Fluid Flow

Design Guideline promotes Use of premium efficiency motors and variable frequency drives (VFD). The use of premium efficiency motors in new designs and retrofits is a significant component of our energy conservation program. An assessment program is now underway, however, it is estimated that through the efforts of new design and retrofits, about half of all fans and pumps, 7 1/2 horsepower (HP) or larger in all buildings, have been fitted with premium efficiency motors. In addition, about 15% of all fans and pumps now utilize variable speed drives through new design and retrofits. The combination of VFD and premium efficiency motors is responsible for a sizable energy savings. Premium efficiency motors typically achieve a 4% energy savings over "standard motors. VFDs can reduce fan and pump motor energy usage by 50 % or more**.**

Energy Management System (EMS)

Depending on application and building type, the largest area of energy consumption in County facilities lies in Heating, Ventilating, and Air-Conditioning (HVAC) operations. To control this energy use, the Division of Operations undertook installation of energy management systems (EMS) in all facilities. All HVAC systems are remotely monitored by computer dial-up on a daily basis. A significant additional benefit of the energy management and control systems is improved temperature control in work spaces and faster response to temperature problems in monitored buildings. A retrofit program is now underway to go one step further and actually be able to control equipment operation in addition to just monitoring performance.

The chart below quantifies the net average energy savings for typical building components. The energy savings attributed to each component is the combination of two or three different technologies working together to achieve the desired result.

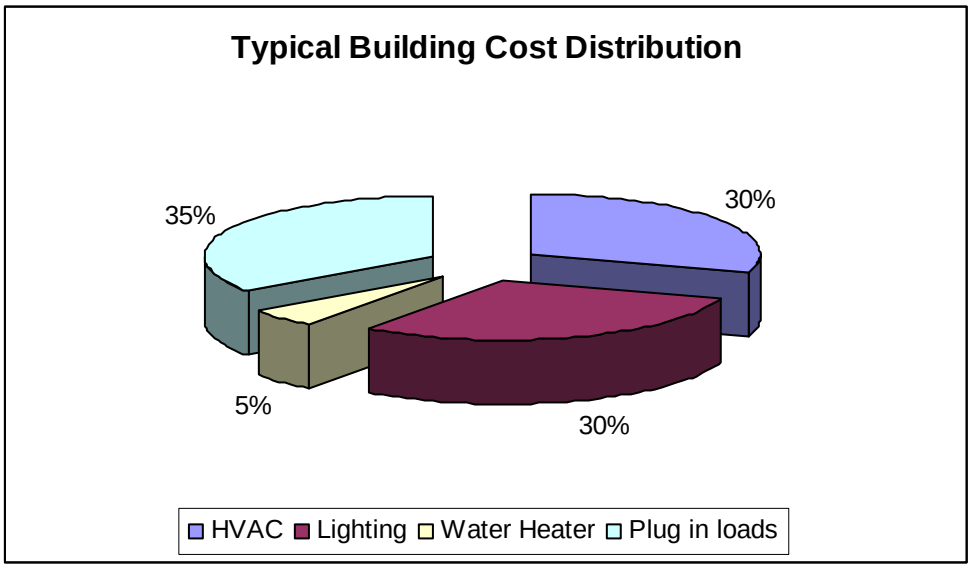

Table 5: Typical energy cost distribution by selected building components.

In the figure above, the total energy savings from component individual contribution include reduced energy consumption by implementation of an energy efficient building envelope.

Pumps and fans: Savings are derived from the use of energy-efficient motors over conventional units in conjunction with VFDs wherever possible enabling pumps and fans to operate at their lowest speed to sustain air/fluid flow requirements resulting in 35-45% energy savings over constant volume machines.

Space Cooling and Heating: Savings are achieved through the careful selection of high-efficiency and properly sized equipment and the use of heat recovery equipment when life cycle costs show economic feasibility. Indoor swimming centers are a prime example. The waste heat from dehumidification equipment is utilized for heating pool water or reheat of indoor air to control humidity. The use of heat recovery air handlers are also extensively promoted to decrease the cost of tempering outside air during heating or cooling season.

Domestic Hot Water: The Division of Operations has been promoting the use of natural gas water heaters and boilers in lieu of electrically operated devices to further enhance savings. The chart below shows the relative cost for the same amount of energy using electricity or natural gas. On the average it would cost twice as much to heat a building with electricity in lieu of natural gas.

The Division of Operations also promotes the use of high-efficiency boilers (90-95% efficient), over conventional boilers and furnaces (75-80% efficient) to achieve even more savings.

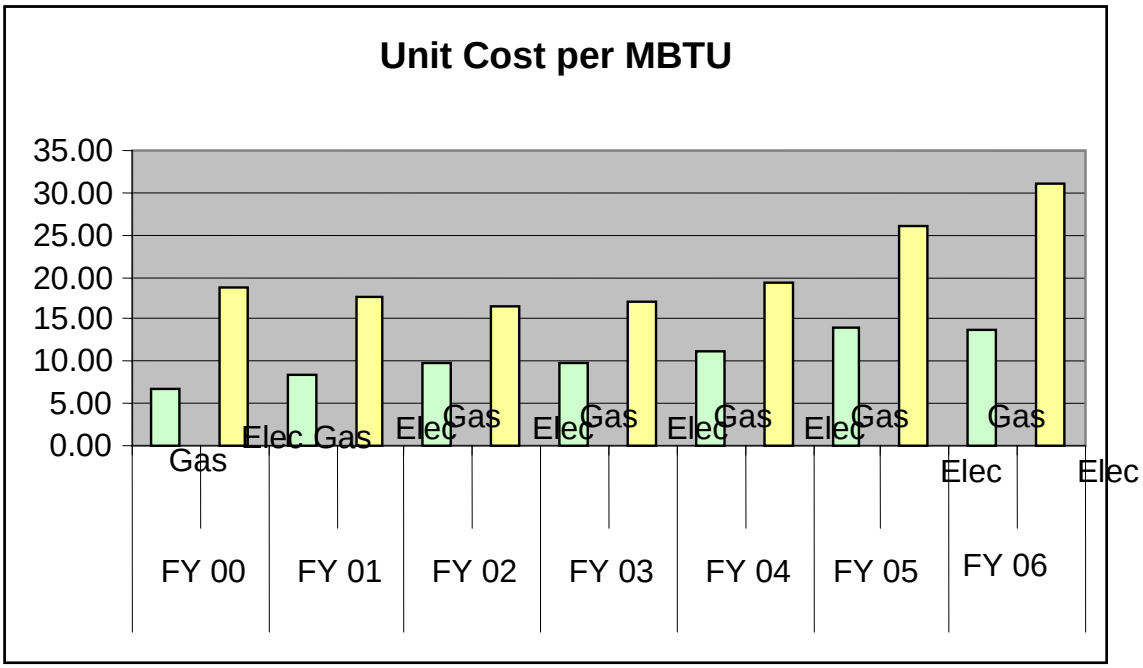

Table 6: Electricity and Natural Gas cost for 1000 BTU units of Energy

<u>The following are not included</u> in the figure above but are worth mentioning:

Energy Source: The use of natural gas in lieu of all-electric provides a savings of approximately forty five cents for every dollar spent in electricity given that the cost of electricity is approximately twice as much as Natural gas, for the same unit (amount) of energy. (see Table 2)
Deregulation: The new electricity supply contract has resulted in an estimated $24.6 M savings in electricity contract procurement through May 2009 for all participants. Th savings for Montgomery County Government is $7.5M
EMS: Energy management systems can reduce operating cost as much as 25% by providing remote monitoring and *control* of HVAC and lighting systems.

Building Envelope

In the past, more special considerations were given to high performance glass or insulation that could enhance the performance of HVAC equipment. All new designs are required to use double-pane energy-efficient glazing and low "E" coatings where analysis shows that there is an economic benefit. Each building is evaluated separately through life cycle analysis to determine if the predicted savings occur at an acceptable break even point. The use of this technology enhances the performance of HVAC equipment. Low "E" type windows can achieve 25% energy savings over conventional single pane type. Day-lighting techniques whenever feasible can provide an additional 5-10% additional savings

Envelope and EMS: Although not mentioned in Table 2 as an energy savings contributor, envelope and EMS enable all other components to operate even more efficiently. Just like energy efficient motors and variable frequency drives are able to provide minimum air/water flows when coupled to fans and pumps as compared to constant flow counterparts, the use of Building envelope also plays a very important role. The use of insulating materials and energy efficient windows can decrease cooling/heating requirement and reduce equipment size, first and operating cost as much as 25 %. The EMS is also responsible for across the board operating cost savings by enabling remote monitoring and operation of all building HVAC components and lighting which may now be programmed to be used only when needed.

IV. Utility Budget

A. Overview

County facilities can be categorized as Regional Service Centers, the Executive Office Building and Judicial Center, libraries, police stations, parking lots, detention centers, transmitter sites, community health centers, day care centers, community recreational and swim centers, and supporting maintenance shops and warehouses. The ages of these facilities vary from new to over 100 years old. The hours of operation vary from about 60 hours a week to continuous 24-hour operation. The end uses of energy are primarily lighting, heating, air-conditioning, computers, and domestic hot water.

Table 7: Utility Budget

UTILITY TYPE	ACTUAL FY05	ACTUAL FY06	ESTIMATED FY07	REQUESTED FY08	FY08 REQUEST / FY07 BUDGET
ELECTRICITY					
COST	$7,528,649	$7,396,728	$10,094,171	$11,406,907	99.19%
kWh's (000's)	84,401,895	79,000,000	82,637,501	83,979,293	
COST/KWH	0.0892	0.0936	0.1222	0.1358	
WATER AND SEWER					
COST	$736,571	$860,550	$940,552	$999,961	106.48%
GALLONS (000's)	90,423	102,569	108,835	112,341	
COST/GALLON	8.1458	8.3900	8.6420	8.9011	
FUEL OIL #2					
COST	$213,798	$140,722	$150,000	$155,000	51.67%
GALLONS (000's)	130,325	0	0	0	
COST/GALLON	1.6405	2.0500	2.0900	2.0900	
NATURAL GAS					
COST	$1,595,328	$2,418,250	$2,120,961	$2,168,000	86.72%
THERMS (000's)	1,114,262	1,300,000	1,350,930	1,380,892	
COST/THERM	1.4317	1.8602	1.5700	1.5700	
PROPANE					
COST	$7,427	$851	$0	$0	0.00%
GALLONS (000's)	4,501	0	0	0	
COST/GALLON	1.6501	0.0000	0.0000	0.0000	
Professional services	$185,888	$98,305	$100,000	$100,000	
Charges from SWS	$225,010	$202,657	$225,000	$225,000	
TOTAL COSTS	$10,492,671	$11,118,063	$13,630,683	$15,054,868	

The Utility budget also includes a premium for the purchase of clean energy. For the last two years starting in July 2004 the county has included 5% of the total use (kWh) to be "green

energy." For FY 07 and FY 08 the County is committed to an additional 5% for a total of 10% through June 2008. The energy type will be energy produced by wind turbines located in the West Virginia and will benefit the County's air shed.

Net changes to electrical usage for new and leased facilities through next fiscal year are demonstrated in tables on subsequent pages for; "Projected Changes in Electrical Usage". This projection includes both increases in electrical costs to cover new and leased facilities. Reductions in costs resulting from current and future energy retrofit projects appear in the "new facilities" table. Additional information on new and leased facilities tables demonstrates "Projected Additions in Natural Gas Usage", and "Projected Additions in Water Usage".

Table 8: New Construction Projects

New Construction Projects - Projected Utility Usage in FY07 and FY08

ELECTRICITY	Net Area (Sq. Ft.)	Energy Use (kWh/SqFt)	Occupied Year	FY07 PrRte factor	FY08 PrRte factor	FY 2007 Change (kWh)	FY 2008 Change (kWh)
Rockville Library	85,975	20.50	FY07	9/12	12/12	1,321,866	1,762,488
Multi-Agency Driver Training	5,410	20.00	FY07	1/12	12/12	9,017	108,200
Germantown Library	43,911	19.50	FY07	7/12	12/12	499,488	856,265
Moneysworth farm	2,000	18.00	FY07	6/12	12/12	18,000	36,000
SS Civic Bldg	43,500	18.82	FY07	6/12	12/12	409,335	818,670
SubTotal	**288,826**					**2,257,705**	**3,581,622**

NATURAL GAS	Net Area (Sq. Ft.)	Therms/Ft2 ESTIMATED	Occupied Year	FY07 PrRte factor	FY08 PrRte factor	FY 2007 New Usage (Therms)	FY 2008 New Usage (Therms)
Rockville Library	85,975	0.45	FY07	9/12	12/12	29,017	38,689
Multi-Agency Driver Training	5,410	0.50	FY07	1/12	12/12	225	2,705
Germantown Library	43,911	0.53	FY07	7/12	12/12	13,576	23,273
Moneysworth farm	2,000	0.50	FY07	6/12	12/12	500	1,000
SS Civic Bldg	43,500	0.35	FY07	6/12	12/12	7,613	15,225
SubTotal	**288,826**					**50,930**	**80,892**

WATER	Net Area (Sq. Ft.)	Gal/Ft2 ESTIMATED	Occupied Year	FY07 PrRte factor	FY08 PrRte factor	FY 2007 New Usage (Gal)	FY 2008 New Usage (Gal)
Rockville Library	85,975	0.015	FY07	9/12	12/12	967	1,290
Multi-Agency Driver Training	5,410	0.017	FY07	1/12	12/12	8	92
Germantown Library	43,911	0.145	FY07	7/12	12/12	3,714	6,367
Moneysworth farm	2,000	0.015	FY07	6/12	12/12	15	30
SS Civic Bldg	43,500	0.019	FY07	6/12	12/12	413	827
SubTotal	**288,826**					**5,117**	**8,605**

Table 9:New Leased Facilities

New Leased Facilities- Projected Utility Usage in FY07 and FY08

ELECTRICITY	Net Area (Sq. Ft.)	Energy Use (kWh/Sq.Ft.)	Occupied Year	FY07 PrRte factor	FY08 PrRte factor	FY 2007 Change (kWh)	FY 2008 Change (KwH)
2729 University Blvd	1,863	15.00	FY07	12/12	12/12	27,945	27,945
17-19 N. Frederick ave. Gaithersburg	1,300	15.00	FY07	1/12	12/12	1,625	19,500
8300 Helgerman Ct.	8,836	16.00	FY07	12/12	12/12	141,376	141,376
701 Dover Rd	33,451	20.00	FY07	12/12	12/12	669,020	669,020
22610 Gateway Center	13,075	17.00	FY07	12/12	12/12	222,275	222,275
8505 Piney Branch Rd.	1,870	17.00	FY07	12/12	12/12	31,790	31,790
2-4 Metropolitan Ct,	12,600	15.00	FY07	12/12	12/12	189,000	189,000
14900 Southlawn Lane	6,451	15.00	FY07	12/12	12/12	96,765	96,765
SubTotal	**79,446**					**1,379,796**	**1,397,671**

NATURAL GAS	Net Area (Sq. Ft.)	Therms/Ft2 ESTIMATED	Occupied Year	FY07 PrRte factor	FY08 PrRte factor	FY 2007 Change Therms	FY 2008 Change Therms
2729 University Blvd	1,863		FY07	12/12	12/12		
17-19 N. Frederick ave. Gaithersburg	1,300		FY07	1/12	12/12		
8300 Helgerman Ct.	8,836	0.45	FY07	12/12	12/12	3,976	3,976
701 Dover Rd	33,451	0.38	FY07	12/12	12/12	12,711	12,711
22610 Gateway Center	13,075	0.50	FY07	12/12	12/12	6,538	6,538
8505 Piney Branch Rd.	1,870		FY07	12/12	12/12		
2-4 Metropolitan Ct,	12,600		FY07	12/12	12/12		
14900 Southlawn Lane	6,451		FY07	12/12	12/12		
Natural Gas Total	**79,446**					**23,225**	**23,225**

WATER	Net Area (Sq. Ft.)	Gal/Ft2 ESTIMATED	Occupied Year	FY07 PrRte factor	FY08 PrRte factor	FY 2007 Change (kGal)	FY 2008 Change (kGal)
2729 University Blvd	1,863	0.015	FY07	12/12	12/12	28	28
17-19 N. Frederick ave. Gaithersburg	1,300	0.015	FY07	1/12	12/12	2	20
8300 Helgerman Ct.	8,836	0.016	FY07	12/12	12/12	141	141
701 Dover Rd	33,451	0.014	FY07	12/12	12/12	468	468
22610 Gateway Center	13,075	0.015	FY07	12/12	12/12	196	196
8505 Piney Branch Rd.	1,870	0.015	FY07	12/12	12/12	28	28
2-4 Metropolitan Ct,	12,600	0.015	FY07	12/12	12/12	189	189
14900 Southlawn Lane	6,451	0.015	FY07	12/12	12/12	97	97
Water Total	**79,446**					**1,149**	**1,167**

FY 2007
Summary
The information on this page reflects the facilities owned or operated by this agency as of the end of FY 06 (June 30, 2006)

Agency	MC Government DPWT Division of Operations		
Number of Facilities	183	Change in number of facilities	10
Total square feet	3,799,884	Change in total ft^2	124,946
Average operating hrs/year	Not available	Change in avg. operating hrs/year	Not available
Other changes effecting energy consumption			

Utilities:	units	total consumption (actual FY 06)	Percent change from actual FY 05	total cost (actual FY 06) $	Percent change from actual FY 05
Electricity	kWh	79,000,000	(-)6.84%	7,396,728	(-)1.78%
Natural Gas (firm)	therms	1,300,000	(+)16.67%	2,418,250	(+)51.60%
Natural Gas (Irate)	therms				
Fuel Oil #2	gallons	68,644	(TBD) %	140,722	(TBD) %
Propane	gallons				
Water/Sewer	gallons	102,569	(+)13.43%	860,550	(+)1.16%
Total				10,816,250	(+)5.63 %

New Measures

This table shows information on resource conservation measures implemented during FY 06
(July 1, 2005 through June 30, 2006)

Measures - New: (Implemented during FY 06)	date implemented (mo/yr)	initial cost (000$)	annual net impact on maintenance cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($)
Capital Improvement Projects:						
HVAC/Elec. Replacement	FY 06	800		Elec.	100,000	6,000
Energy Conservation	FY 06	225	(15,000)	kWh	635,000	50,000
Total CIP		1,025	(15,000)			56,000
Operations and Maintenance:						
Description of Activities:						
Electricity Procurement Savings	FY06					1,559,923
Energy Design Guidelines	FY06			Elec. (kWH)		80,683
Energy Design Guidelines	FY06			Gas (Th.)		37,687
Total Operations & Maintenance		1,025	(15,000)			433,370
Total CIP and Operations & Maintenance		**1,025**	**(15,000)**		**735,000**	**2,223,663**

Existing Measures

This table shows information on resource conservation measures implemented prior to FY 07

Measures - Existing: (implemented from FY 00 to FY 06	date implemented (mo/yr)	initial cost per year ($000)	annual net impact on maintenance cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($) *
Capital Improvement Projects:						
Elevator Modernization	FY 02	1,326	(2,000)	Elec. (kWh)	30,000	8,000
Elevator Modernization	FY 03	937	(6,000)	Elec. (kWh)	30,000	10,000
Elevator Modernization	FY 04	365	(6,000)	Elec. (kWh)	30,000	8,000
Elevator Modernization	FY 05	365	(6,000)	Elec. (kWh)	30,000	8,000
HVAC/Elec. Repl.:MCG	FY00	1518	-	Elec. (kWh)	2,550,400	306,048
HVAC/Elec. Repl.:MCG	FY01	1029	-	Elec. (kWh)	1,728,833	207,460
HVAC/Elec. Repl.:MCG	FY02	1819	-	Elec. (kWh)	3,056,117	366,734
HVAC/Elec. Repl.:MCG	FY02	1500	-	Elec. (kWh)	2,520,158	302,419
HVAC/Elec. Repl.:MCG	FY04	800	-	Elec. (kWh)	1,344,083	161,290
HVAC/Elec. Repl.:MCG	FY05	800	-	Elec. (kWh)	1,344,083	161,290
Energy Conservation	FY98	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY99	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY00	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY01	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY02	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY03	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY04	225	(15,000)	Elec. (kWh)	835,000	65,000
Energy Conservation	FY05	225	(15,000)	Elec. (kWh)	835,000	65,000
Life Safety Systems: MCG	FY01	225	(10,000)	N/A		10,000
Life Safety Systems: MCG	FY02	225	(10,000)	N/A		15,000
Life Safety Systems: MCG	FY03	225	(15,000)	N/A		15,000
Life Safety Systems: MCG	FY04	225	(15,000)	N/A		10,000
Life Safety Systems: MCG	FY05	225	(15,000)	N/A		10,000
Hungerford Office Building DDC	FY00	$157.000		Elec. (kWh)	205,107	$12,450
Council Office Bld DDC	FY99	$73.000		Elec. (kWh)	271,829	$16,500
Gaithersburg Library DDC	FY99	$122.000		Elec. (kWh)	144,152	$8,750
Gaithersburg Maintenance Depot DDC	FY99	$31.000		Elec. (kWh)	228,533	$13,872
EOB -VFD Replacement (2AHUs)	FY 03	$42.499	($ 1.500)	Elec. (kWh)	25,725	$2,595

JC - VFD Replacement (4AHUs)	FY 03	$24.540	($ 1.000)	Elec. (kWh)	18,988	$2,677
Parking lots: install photo cells and time clocks for lighting control	FY 04	$18.000	($2.000)	Elec. (kWh)	15,840	$ 2,950
Upper County Community Center Replace EMS	FY05	$79.598	(5,300)	Elec. (kWh)	222,212	$17,777
EOB/JC Energy Study	FY05	$94.873	(6,300)	Elec. (kWh)	264,850	$21,188
Ballast Retrofits	FY05	$62.261	(4,900)	Elec. (kWh)	173,813	$13,905
Total CIP		$13,862	$-221,505	Elec. (kWh)	20,270,209	$2,192,783
Operations and Maintenance:						
Electricity Procurement savings below SOS	FY00	100				280,000
Electricity Procurement savings below SOS	FY01	100				280,000
Electricity Procurement savings below SOS	FY02	100				280,000
Electricity Procurement savings below SOS	FY03	100				287,000
Electricity Procurement savings below SOS	FY04	200				288,000
Electricity Procurement savings below SOS	FY05	150				297,000
Electricity Procurement savings below SOS	FY06	-				1,559,923
Energy Design Guidelines	FY00			Elec. (kWh)	791,360	39,568
Energy Design Guidelines	FY01			Elec. (kWh)	320,750	19,245
Energy Design Guidelines	FY02			Elec. (kWh)	1,787,300	107,238
Energy Design Guidelines	FY03			Elec. (kWh)	285,033	17,102
Energy Design Guidelines	FY04			Elec. (kWh)	198,450	15,876
Energy Design Guidelines	FY05			Elec. (kWh)	1,104,538	173,384
Energy Design Guidelines	FY00			Gas(Therms)		46,437
Energy Design Guidelines	FY01			Gas(Therms)		28,171
Energy Design Guidelines	FY02			Gas(Therms)		193,651
Energy Design Guidelines	FY03			Gas(Therms)		36,116
Energy Design Guidelines	FY04			Gas(Therms)		27,103
Energy Design Guidelines	FY05			Gas(Therms)		261,747
Total Operations & Maintenance		750		kWh	4,487,431	$2,305,226
Total CIP and Operations & Maintenance		**14,612**		kWh	**24,757,640**	**$6,575,932**

Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 07 (July 1, 2006 through June 30, 2007)

Measures - Planned: (for FY07)	projected completion date (mo/yr)	projected initial cost ($000)	projected annual net impact on maintenance cost ($)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings ($) *
Capital Improvement Projects:						
Elevator Modernization	FY07	500	(1,000)	Elec. (kWh)	12,500	1,000
Energy Conservation	FY 07	225	(8,000)	Elec. (kWh)	462,500	37,000
HVAC/Elect. Replacement	FY 07	800		Elec. (kWh)	75,000	6,000
Total		1,525	(9,000)			71,000
Operations and Maintenance:						
Utility Database Management Bill overcharge & sales tax refund	FY07	10				250,000
Electricity Procurement (savings below SOS)	FY07	0.0				400,000
Energy Design Guidelines	FY07			Elec (kwh)	985,025	$78,802
				Gas(Therms)		$24,370
Total		10				$753,172
Total CIP and Operations & Maintenance		**1,535**				**$824,172**

* Savings based on reduced energy consumption and reduced maintenance