FY22 Operating Budget: Committee Consent Calendar

T&E Committee #2b

April 15, 2021

Department/Office: Utilities Non-Departmental Account (NDA)
Staff: Naeem M. Mia, Legislative Analyst

1. Staff Recommendation

Council staff recommends approval of the FY22 Utilities NDA Budget as submitted by the County Executive.

2. Summary of FY22 Recommended Budget

The County Executive's complete FY22 Recommended Operating Budget for this NDA is attached at ©1-6.

Utilities NDA	FY21 Approved	FY22 CE Recommended	Change from FY21 Approved
General Fund	**$25,245,719**	**$23,716,495**	**-6.1%**
Personnel Costs	$0 0.0 FTEs	$0 0.0 FTEs	0% 0.0 FTEs
Operating Costs	$25,245,719	$23,716,495	-6.1%
Total Expenditures (All Funds)	**$25,245,719** **0.0 FTEs**	**$23,716,495** **0.0 FTEs**	**-6.1%** **0.0%**

3. Summary of FY22 Recommended Changes/Adjustments

General Fund - With Service Impact

- A net increase of $382,546 for the first (FY22) of twenty-five (25) annual power purchase payments to establish a resilient micro-grid at the Brookeville bus depot to provide electric charging capability to the County's fleet of electric buses.
    - The project will be implemented through a public-private partnership (P3) with the vendor providing, installing, and maintaining bus charging equipment, solar generators, natural gas generators, distribution equipment, and cybersecurity services.
    - Phase 1 is estimated for completion by late calendar 2021/early 2022 and will serve up to 24 buses; Phase 2 will become fully operational by calendar 2025 and serve up to 44 buses.
    - The County will commit to purchase power for up to 25 years, at a first-year rate of 12.3 cents per kilowatt-hour (kWh), with annual increases capped at 1.8%.

- Annual payments expected to increase to $2.0M per year by Year 2 (upon completion of Phase 1), to $3.0M per year by Year 5 (upon completion of Phase 2), and up to $4.0M per year by Year 25.

General Fund - No Service Impact

- A net reduction of $597,513 to reflect energy cost savings at County facilities as a result of the actual or planned completion of efficiency projects, partially offset by the opening of new facilities in FY22 (e.g., Grey Courthouse).
  - The budget does **not** include restoration of funds related to reduced utilities usage during the COVID-19 pandemic, including $300,000 reduced as part of the FY21 Approved Operating Budget and $1.9M reduced as part of the FY21 Savings Plan adopted in July 2020. As a result, Council staff notes that there may be unbudgeted utility cost increases if and when County employees return to work at physical locations.
- A net reduction of $1,314,257 due to energy savings realized from the County's ongoing conversion of standard streetlights to more efficient light-emitting diode (LED) streetlights).

4. Other Notes

- Outside Agencies:
  - Utility budget information can be found on ©5-6 for: Transit Services, Recreation, Fleet Management Services, Alcohol Beverage Services, Parking Lot Districts, Environmental Protection and MCPS, College, MNCPPC, and WSSC.
  - Utility expenditures have generally decreased across-the-board (from FY22 to FY21), partly due to the impact of COVID-19 and continued expectations of telework into FY22.
    - Of the total $5.2M of reductions across all agencies (representing a 5.0 percent reduction from the FY21 approved budget), $5.0M is attributable to an expected reduction of electricity usage.
- Outside agencies have submitted their Resource Conservation Plans (RCP) which provide additional information and detail on utility unit costs, facilities, and energy savings projects.
- Unit cost data used by each agency and County Government for the development of the FY22 budget is found here:

FY22 Projected Unit Costs by Agency/Utility Type					
Agency:	**College**	**WSSC***	**MNCPPC**	**MCPS**	**Utilities NDA****
Utility Type					
Electricity ($ per kWh)	$ 0.1133	$ 0.0895	$ 0.1140	$ 0.1125	$ 0.1170
#2 Fuel Oil ($ per gallon)	**N/A**	$ 2.22	$ 3.77	$ 2.50	$ 2.80
Natural Gas ($ per therm)	$ 0.83	$ 0.93	$ 1.15	$ 0.89	$ 0.90
Propane ($ per gallon)	$ 4.06	$ 4.00	$ 1.82	$ 1.75	$ 3.58
Water/Sewer ($ per kilogallon)	$ 12.18	**N/A**	$ 13.05	$ 12.80	$ 19.83
* WSSC electricity costs similar to industrial-use profile					
** Most DGS facilities are under Tier 4 rates					

This report contains:

1. County Executive's Recommended FY22 Operating Budget Publication – Utilities NDA ©1-6
2. Summary Description Sheet for Brookeville Depot Microgrid P3 Project ©7
3. Montgomery County Public Schools (MCPS) – RCP ©8-14
4. Montgomery College (MC) – RCP ©15-79
5. Maryland National Capital Park and Planning (MNCPPC) – RCP ©80-115
6. Washington Suburban Sanitary Commission (WSSC) – RCP ©116-135

Utilities

RECOMMENDED FY22 BUDGET	FULL TIME EQUIVALENTS
$23,716,495	0.00

DAVID DISE, DIRECTOR

MISSION STATEMENT

The goals of the County Government relating to utility consumption are to:

- achieve energy savings by the elimination of wasteful or inefficient operation of building systems;
- continue improvements in energy efficiency in all County operations; and
- obtain required energy fuels at the most favorable cost to the County.

The Department of General Services manages the payment for over 1,500 separately metered utility accounts for these County facilities, streetlights, and traffic control signalized intersections.

BUDGET OVERVIEW

The FY22 Recommended Budget for the tax-supported Utilities NDA is $23,716,495, a decrease of $1,529,224 or 6.1 percent from the FY20 Approved Budget of $25,245,719. Allocation of these utilities expenditures is approximately: electricity, 75.4 percent; natural gas, 10.5 percent; water and sewer, 10.2 percent; fuel oil, 0.1 percent; and propane, 0.1 percent. Renewable energy and other expenses total 3.7 percent.

The FY22 Recommended Budget includes County government utilities expenditures for both tax and non-tax supported operations. Tax-supported utilities expenditures related to the General Fund departments are budgeted in the Utilities NDA, while utilities expenditures related to special fund departments are budgeted in those funds. Some of these special funds, such as Recreation and portions of the Department of Transportation, are tax supported. Other special funds, such as Solid Waste, are supported through user fees or charges for services, instead of through taxes.

Utilities expenditures are also found in the budgets of other County agencies: Montgomery County Public Schools (MCPS), Montgomery College, the Washington Suburban Sanitary Commission (WSSC), and the Maryland-National Capital Park and Planning Commission (M-NCPPC). The total budget request for these outside agencies is $69,080,766, which includes the entire bi-county area of WSSC.

The FY22 Recommended tax supported budget for Utilities Management, including both the General Fund NDA ($23,716,495) and the other tax supported funds ($3,600,772), is $27,317,267, a decrease of $1,884,224 or approximately 6.5 percent below the FY21

Approved utilities budget. The FY22 Recommended Budget for non-tax supported utilities expenditures is $4,576,590, a decrease of $330,502 below the FY21 Approved Budget.

Increased utilities expenditures result primarily from greater consumption due to new facilities or services, increased rates, and in some cases a more precise alignment of budgeted costs with actual prior year expenditures by utility type. Energy conservation and cost-saving measures (e.g., new building design, lighting technology, energy, and HVAC management systems) help offset increased utility consumption and higher unit costs. Reductions in energy consumption at County facilities due to telework also contribute to reduced utility expenditures. Renewable energy includes the purchase of credits to offset fossil fuel purchases.

Unleaded gasoline, diesel, and compressed natural gas fuels are purchased from various providers, and are budgeted in the Department of General Services, Division of Fleet Management Services and not the General Fund Utilities NDA. The General Fund Utilities NDA also includes expenses (under the "Other" category) for consultant support and energy accounting software.

The following is a description of utility service requirements for departments which receive tax or non-tax supported appropriations for utilities expenditures. The utilities expenditures for the non-tax supported operations are appropriated within their respective operating funds but are described in the combined utilities presentation for reader convenience.

TAX SUPPORTED

Department of General Services

The Department of General Services is responsible for managing all utilities for general County operations including all County office buildings, police stations, libraries, health and human services facilities, correctional facilities, maintenance buildings, and warehouses.

Department of Transportation

The Department of Transportation manages all County streetlights, traffic signals, traffic count stations, and flashing school signs. The utilities expenditures for these devices are budgeted here as this Department designs, installs, controls, and maintains them. In addition, minimal utility costs for the Operations Center and Highway Maintenance Depots are budgeted in the Traffic Engineering component of the General Fund NDA.

Division of Transit Services - Mass Transit

The Department of Transportation Mass Transit Facilities Fund supports all utilities associated with the Ride On transit centers and Park and Ride Lots.

Department of Recreation

The Department of Recreation funds all utility costs for its recreational facilities located throughout the County, such as swimming pools, community recreation centers, and senior centers.

NON-TAX SUPPORTED

Fleet Management Services

The Department of General Services - Fleet Management Services utility expenditures are displayed in the Special Fund Agencies - Non-Tax Supported section, to reflect that Fleet Management Services expenditures are appropriated in the budgets of other departments, and are not appropriated in Fleet Services.

The Department of General Services - Fleet Management Services Motor Pool Internal Service Fund supports all utilities associated with the vehicle maintenance garages in Rockville, Silver Spring, and Gaithersburg. Fuel for the County's fleet is also budgeted in that special fund, but these costs are not included in the utilities expenditures displayed in this section.

Parking Districts

The Parking Districts fund utility expenditures associated with the operation of all County-owned parking garages and parking lots.

Alcohol Beverage Services

Alcohol Beverage Services funds utility expenditures associated with the operation of the liquor warehouse, administrative offices, and the County operated retail liquor stores.

Department of Environmental Protection, Recycling and Resource Management

Recycling and Resource Management funds utility expenditures associated with the operation of the County's Solid Waste Management System. Utilities expenditures associated with the operation of the Oaks Sanitary Landfill maintenance building, the County's Recycling Center, the Resource Recovery Facility, and most of the Solid Waste Transfer Station are currently the responsibility of the operators. Only the site office and maintenance depot costs continue to be budgeted as an identifiable utilities expenditure in the Solid Waste Disposal Fund.

Other Agencies

Utilities for MCPS, Montgomery College, WSSC (bi-county), and M-NCPPC are displayed in the charts on the following pages. These are the amounts requested in the budgets of those agencies.

COUNTY PRIORITY OUTCOMES

While this program area supports all seven of the County Executive's Priority Outcomes, the following are emphasized:

- **A Greener County**
- **Easier Commutes**

PROGRAM CONTACTS

Contact Angela Dizelos of the Department of General Services/Utilities Management at 240.777.6028 or Gary Nalven of the Office of Management and Budget at 240.777.2779 for more information regarding this department's operating budget.

BUDGET SUMMARY

	Actual FY20	Budget FY21	Estimate FY21	Recommended FY22	%Chg Bud/Rec
COUNTY GENERAL FUND					
EXPENDITURES					
Salaries and Wages	0	0	0	0	—

BUDGET SUMMARY

	Actual FY20	Budget FY21	Estimate FY21	Recommended FY22	%Chg Bud/Rec
Employee Benefits	0	0	0	0	—
County General Fund Personnel Costs	**0**	**0**	**0**	**0**	**—**
Operating Expenses	23,938,495	25,245,719	23,345,719	23,716,495	-6.1 %
County General Fund Expenditures	**23,938,495**	**25,245,719**	**23,345,719**	**23,716,495**	**-6.1 %**
PERSONNEL					
Full-Time	0	0	0	0	—
Part-Time	0	0	0	0	—
FTEs	0.00	0.00	0.00	0.00	—

FY22 RECOMMENDED CHANGES

	Expenditures	FTEs
COUNTY GENERAL FUND		
FY21 ORIGINAL APPROPRIATION	**25,245,719**	**0.00**
Changes (with service impacts)		
Add: Bus Depot Microgrid [Utilities]	382,546	0.00
Other Adjustments (with no service impacts)		
Decrease Cost: Utilities Savings at County Facilities [Utilities]	(597,513)	0.00
Decrease Cost: Street Light Efficiency Improvement [Utilities]	(1,314,257)	0.00
FY22 RECOMMENDED	**23,716,495**	**0.00**

FUNDING PARAMETER ITEMS

CE RECOMMENDED ($000S)

Title	FY22	FY23	FY24	FY25	FY26	FY27
COUNTY GENERAL FUND						
EXPENDITURES						
FY22 Recommended	**23,716**	**23,716**	**23,716**	**23,716**	**23,716**	**23,716**
No inflation or compensation change is included in outyear projections.						
Restoration of Costs to Pre-COVID-19 Levels	**0**	**598**	**598**	**598**	**598**	**598**
Subtotal Expenditures	**23,716**	**24,314**	**24,314**	**24,314**	**24,314**	**24,314**

EXPENDITURES BY DEPARTMENT/AGENCY							
	ACTUAL FY18	ACTUAL FY19	ACTUAL FY20	APPROVED FY21	RECOMMENDED FY22	CHANGE BUD/REC	% CHANGE BUD/REC
COUNTY GOVERNMENT TAX SUPPORTED OPERATIONS							
NON-DEPARTMENTAL ACCOUNT							
Facilities	16,038,873	16,082,064	15,684,882	17,505,914	17,290,948	(214,966)	-1.2%
Traffic Signals and Streetlighting	8,480,641	8,480,641	8,350,406	7,739,805	6,425,547	(1,314,258)	-17.0%
GENERAL FUND NDA EXPENDITURES	24,519,514	24,562,705	24,035,288	25,245,719	23,716,495	(1,529,224)	-6.1%
OTHER TAX SUPPORTED OPERATIONS							
Transit Services	145,044	136,218	301,264	201,200	201,200	0	0.0%
Recreation	3,661,407	3,618,163	3,062,654	3,754,572	3,399,572	(355,000)	-9.5%
SUBTOTAL	3,806,451	3,754,381	3,363,918	3,955,772	3,600,772	(355,000)	-9.0%
TOTAL TAX SUPPORTED	28,325,965	28,317,086	27,399,207	29,201,491	27,317,267	(1,884,224)	-6.5%
COUNTY GOVERNMENT NON-TAX SUPPORTED OPERATIONS							
Fleet Management Services	1,034,918	1,048,072	902,966	1,630,392	1,630,392	0	0.0%
Parking Districts	2,486,172	2,175,297	1,666,666	2,369,922	2,038,670	(331,252)	-14.0%
Alcohol Beverage Services	715,910	700,605	467,333	725,810	725,810	0	0.0%
Environmental Protection (Recycling and Resource Management)	122,019	122,020	150,693	180,968	181,718	750	0.4%
TOTAL NON-TAX SUPPORTED	4,359,019	4,045,994	3,187,657	4,907,092	4,576,590	(330,502)	-6.7%
SUMMARY - COUNTY GOVERNMENT							
TOTAL TAX SUPPORTED	28,325,965	28,317,086	27,399,207	29,201,491	27,317,267	(1,884,224)	-6.5%
TOTAL NON-TAX SUPPORTED	4,359,019	4,045,994	3,187,657	4,907,092	4,576,590	(330,502)	-6.7%
TOTAL COUNTY GOVERNMENT	32,684,984	32,363,080	30,586,864	34,108,583	31,893,857	(2,214,726)	-6.5%
OUTSIDE AGENCIES TAX AND NON-TAX SUPPORTED OPERATIONS							
Montgomery County Public Schools	38,544,627	37,955,846	33,493,460	39,779,040	39,175,590	(603,450)	-1.5%
Montgomery College	7,533,147	7,461,385	6,287,782	7,467,066	7,155,720	(311,346)	-4.2%
Washington Suburban Sanitary Commission	20,302,204	19,897,561	15,755,410	20,708,411	18,722,358	(1,986,053)	-9.6%
M-NCPPC	3,223,435	3,421,877	2,872,503	4,154,642	4,027,098	(127,544)	-3.1%
TOTAL OTHER AGENCIES EXPENDITURES	69,603,413	68,736,669	58,409,155	72,109,159	69,080,766	(3,028,393)	-4.2%
TOTAL UTILITIES EXPENDITURES	102,288,397	101,099,749	88,996,019	106,217,742	100,974,623	(5,243,119)	-4.9%

EXPENDITURES BY ENERGY SOURCE							
	ACTUAL FY18	ACTUAL FY19	ACTUAL FY20	APPROVED FY21	RECOMMENDED FY22	CHANGE BUDGET/REC	% CHANGE BUDGET/REC
COUNTY GOVERNMENT TAX SUPPORTED OPERATIONS							
NON-DEPARTMENTAL ACCOUNT							
Electricity	20,408,033	19,915,118	18,857,369	19,326,929	17,890,500	(1,436,429)	-7.4%
Water & Sewer	2,122,577	2,122,577	2,145,924	2,455,120	2,412,325	(42,795)	-1.7%
Fuel Oil	6,091	6,091	50,313	33,833	33,833	0	0.0%
Natural Gas	1,962,939	1,962,939	2,259,007	2,491,468	2,491,468	0	0.0%
Propane	19,874	19,874	18,047	16,872	16,872	0	0.0%
Renewable Energy	0	129,936	228,158	228,158	228,158	0	0.0%
Other	0	406,170	476,471	693,339	643,339	(50,000)	-7.2%
GENERAL FUND NDA EXPENDITURES	24,519,514	24,562,705	24,035,288	25,245,719	23,716,495	(1,529,224)	-6.1%
OTHER TAX SUPPORTED OPERATIONS							
Electricity	2,438,611	2,365,068	2,059,053	2,694,340	2,339,340	(355,000)	-13.2%
Water & Sewer	797,245	797,796	511,618	537,079	537,079	0	0.0%
Fuel Oil	11,135	11,135	3,066	9,628	9,628	0	0.0%
Natural Gas	496,852	496,078	12,965	79,600	79,600	0	0.0%
Propane	62,608	62,608	39,819	57,910	57,910	0	0.0%
Renewable Energy	0	0	694,004	533,822	533,822	0	0.0%
Other	0	21,697	43,393	43,393	43,393	0	0.0%
SUBTOTAL	3,806,451	3,754,381	3,363,918	3,955,772	3,600,772	(355,000)	-9.0%
TOTAL TAX SUPPORTED	28,325,965	28,317,086	27,399,207	29,201,491	27,317,267	(1,884,224)	-6.5%
NON-TAX SUPPORTED OPERATIONS							
Electricity	3,832,139	3,515,665	2,637,457	4,233,050	3,897,324	(335,726)	-7.9%
Water & Sewer	204,921	164,938	144,988	185,757	186,231	474	0.3%
Fuel Oil	3,617	3,888	2,904	4,162	4,162	0	0.0%
Natural Gas	318,342	323,037	289,893	354,727	358,727	4,000	1.1%
Propane	0	0	61,577	82,567	82,565	(2)	0.0%
Renewable Energy	0	0	0	0	0	0	0.0%
Other	0	38,467	50,840	46,829	47,581	752	1.6%
TOTAL NON-TAX SUPPORTED	4,359,019	4,045,994	3,187,657	4,907,092	4,576,590	(330,502)	-6.7%
SUMMARY - COUNTY GOVERNMENT							
Electricity	26,678,783	25,795,850	23,553,879	26,254,319	24,127,164	(2,127,155)	-8.1%
Water & Sewer	3,124,743	3,085,311	2,802,530	3,177,956	3,135,635	(42,321)	-1.3%
Fuel Oil	20,843	21,113	56,283	47,623	47,623	0	0.0%
Natural Gas	2,778,133	2,782,055	2,561,864	2,925,795	2,929,795	4,000	0.1%
Propane	82,482	82,482	119,442	157,349	157,347	(2)	0.0%
Renewable Energy	0	129,936	922,162	761,980	761,980	0	0.0%
Other	0	466,333	570,704	783,561	734,313	(49,248)	-6.3%
TOTAL COUNTY GOVERNMENT	32,684,984	32,363,080	30,586,864	34,108,583	31,893,857	(2,214,726)	-6.5%
OUTSIDE AGENCIES TAX AND NON-TAX SUPPORTED OPERATIONS							
Electricity	55,090,789	54,934,996	45,442,336	56,229,955	53,344,160	(2,885,795)	-5.1%
Water & Sewer	6,344,748	6,888,725	5,909,604	8,262,648	8,237,446	(25,202)	-0.3%
Fuel Oil	312,692	218,622	81,994	154,028	178,028	24,000	15.6%
Natural Gas	7,552,826	6,392,977	6,684,781	7,042,359	6,930,431	(111,928)	-1.6%
Propane	302,358	246,965	192,095	322,030	293,965	(28,065)	-8.7%
Renewable Energy	0	54,384	98,345	98,139	96,736	(1,403)	-1.4%
Other	0	0	0	0	0	0	0.0%
SUBTOTAL	69,603,413	68,736,669	58,409,155	72,109,159	69,080,766	(3,028,393)	-4.2%
TOTAL UTILITIES EXPENDITURES							
Electricity	81,769,572	80,730,846	68,996,215	82,484,274	77,471,324	(5,012,950)	-6.1%
Water & Sewer	9,469,491	9,974,036	8,712,134	11,440,604	11,373,081	(67,523)	-0.6%
Fuel Oil	333,535	239,735	138,277	201,651	225,651	24,000	11.9%
Natural Gas	10,330,959	9,175,032	9,246,645	9,968,154	9,860,226	(107,928)	-1.1%
Propane	384,840	329,447	311,537	479,379	451,312	(28,067)	-5.9%
Renewable Energy	0	184,320	1,020,507	860,119	858,716	(1,403)	-0.2%
Other	0	466,333	570,704	783,561	734,313	(49,248)	-6.3%
TOTAL UTILITIES EXPENDITURES	102,288,397	101,099,749	88,996,019	106,217,742	100,974,623	(5,243,119)	-4.9%

Brookville Bus Depot Electrification

Project Overview

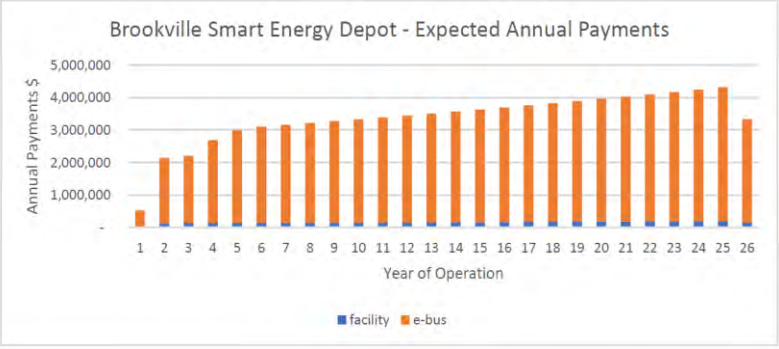
The Brookville Bus Depot Electrification project is a Public Private Partnership (P3) intended to deliver the electrical infrastructure and resilience necessary to support the County's transition to an all-electric transit fleet. The Depot is responsible for the maintenance, servicing, and parking of over 150 County Ride-On buses and is critical for the execution of a long-term transit electrification strategy. This proposed P3 microgrid will provide the long term reliable, resilient, safe, and cost-effective operation of the electric buses at the Brookville Bus Depot, while transferring construction, operational and energy market risks to a third party.

Current Status

- Brookville Depot has 4 chargers currently installed and upgraded basic electrical infrastructure for 10 additional chargers to be installed as part of the proposed project.
- Efforts to date do not ensure that buses would continue to remain in service during an extended grid power outage.

Financial Overview

- Power Purchase Agreement with a 25-year term
- P3 partner responsible for the design, construction, financing, operations and maintenance.
- PPA has two cost components: an energy charge and a resiliency charge.
- The energy charge is equivalent to the current tariff rate of $0.123/kWh, escalating annually at 1.8% over the term of the PPA.
- Electricity escalation rate is less than County would expect if it were purchasing energy directly from utility.
- A resilience payment, an additional annual expense is comparable to the investment costs the County would need to make to support the deployment of an electric bus fleet.
- Obligated to pay, at a minimum, an annual payment equal to 85% of the forecasted energy demand.
- Lost Seller Revenue provisions that through default or curtailment, partner is made whole any revenues that would otherwise have been received.
- Default and termination remedy calculated on the Net Present Value of future cash flows at a 6% discount rate.



Brookville Microgrid Technology Package

2 MW Solar Canopy	**2 MW of Battery Energy Storage Systems**
1.2 MW of Natural Gas Generators	**4 – 60 KW EV Bus Chargers**
10 – 150 KW EV Bus Chargers	**1 – 500 KW Overhead EV Bus Charger**
Medium and Low Voltage Electrical Distribution	**Cyber Security Protection**

Sustainability and Energy

- Valuable solar development opportunity that would be difficult to add at later date.
- Technology and PPA shelter energy market risk.
- Provides critical operation resilience in grid power outages.
- Reduces peak energy consumption provided by fossil fuel plants.
- Reliability is critical to changing transportation and increasing transit utilization.

Timing and Phasing

Phase 1

Operational | late 2021/22

Services up to 24 buses with;

- Bus chargers
- Solar arrays
- Batteries

Phase 2

Operational 2025

Services up to 44 buses with additional;

- Bus chargers
- Generators

Phase 2 dependent on average annual energy load requirements of meeting/exceeding 5GW

Can reassess the requirements and configuration of the system prior to implementation in Phase 2

MCPS UTILITIES - FY18-22

AGENCY
MCPS

JUSTIFICATION/DESCRIPTION:

UTILITY TYPE	Actual FY18	Actual FY19	Actual FY20	Budgeted FY21	Estimated FY21	Projected FY22
ELECTRICITY						
COST	$27,539,019	$27,561,515	$23,811,859	$27,734,588	$22,531,639	$27,384,871
KWH's (000's)	247,626,567	255,008,859	225,150,159	259,222,729	225,742,240	255,878,361
COST/KWH	0.111	0.108	0.106	0.114	0.100	0.113
WATER AND SEWER						
COST	$4,894,547	$5,350,498	$4,376,294	$6,321,463	$4,905,327	$6,273,936
GALLONS (000's)	412,520	433,116	362,791	447,588	339,511	455,942
COST/GALLON	11.86	12.35	12.06	12.95	14.45	12.80
FUEL OIL #2						
COST	$44,742	$69,742	$51,092	$69,628	$45,000	$69,628
GALLONS	17,424	27,009	20,303	27,009	18,000	27,303
COST/GALLON	2.57	2.58	2.52	2.50	2.50	2.50
NATURAL GAS						
COST	$5,993,713	$4,926,485	$5,181,728	$5,560,031	$5,162,444	$5,353,825
THERMS (000's)	6,078,842	5,800,646	5,060,895	5,932,625	5,214,522	5,726,599
COST/THERM	0.99	0.85	1.02	0.93	0.99	0.89
PROPANE						
COST	$72,606	$47,606	$44,739	$93,330	$39,739	$93,330
GALLONS	49,762	53,855	40,377	53,855	36,327	53,877
COST/GALLON	1.46	0.88	1.11	1.75	1.09	1.75
TOTAL COSTS	$38,544,627	$37,955,846	$33,465,712	$39,779,040	$32,684,149	(not yet approved) $39,175,590
Cost/SF	$1.49	$1.45	$1.26	$1.47	$1.21	$1.44
Facilities Square Footages	25,896,622	26,202,517	26,570,293	27,051,949	27,051,949	27,155,009
	FY18	FY19	FY20	FY21	FY21	FY22

FY22 MCPS Resourse Conservation Table

Operating Cost/Consumption Summary Table

Agency	Montgomery County Public Schools, Maryland				
Number of Facilities	235	Change in number of facilities	0		
Total square feet	27,155,009	Change in total square feet	103,060		
Average annual operating hours	3,220	Change in average annual operating hours	Spring of FY20 did have some changes due to Covid19		
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 are on the rise. **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.				
	Units	Total Consumption (Actual FY 2020)	Percent Change from Actual FY 2019	Total Cost (Actual FY 2020) $	Percent Change from Actual FY 2019
Electricity	kWh	225,150,159	-11.7%	$23,811,859	-13.6%
Natural Gas	therms	5,060,895	-12.8%	$5,181,728	5.2%
Fuel Oil #2	gallons	20,303	-24.8%	$51,092	-26.7%
Propane	gallons	40,377	-25.0%	$44,739	-6.0%
Water/Sewer	kgallons	362,791	-16.2%	$4,376,294	-18.2%
Total			-18.1%	**$33,465,712**	-11.8%

Growth and Rate Analysis
FY22 to FY21 Comparison

	Electric	No. 2 Oil	Natural Gas	Propane	Water & Sewer	Subtotal	Total
FY21 budgeted (approved)	**$27,929,704**	**$69,628**	**$5,560,031**	**$93,330**	**$6,321,463**		**$39,974,156**
Growth/Consumption $	$1,055,230	$0	$213,564	$0	$198,638	$1,467,433	$1,467,433
Rate/Other	($979,234)	($1,371)	($644,828)	$955	($159,049)	($1,783,527)	($1,783,527)
Total Change $	**$75,996**	**($1,371)**	**($431,264)**	**$955**	**$39,589**		**($316,095)**
FY22 Requested	**$28,005,700**	**$68,258**	**$5,128,767**	**$94,285**	**$6,361,052**		**$39,658,061**
Percent Increase/Decrease	0.3%	-2.0%	-7.8%	1.0%	0.6%		-0.8%

School	Level	Yr Open	Full/Half Year	Notes	Old Sqft	Proposed SqFt	Difference
Additions - based on average use/sqft---->							
Plum Orchard	CTR	Jul-19	1	**Acquisition**	-	7,312	7,312
Montgomery Knolls ES	ES	Jul-20	1	**Addition**	97,213	109,733	12,520
Pinecrest ES	ES	Jul-20	1	**Addition**	53,778	77,121	23,343
A.Mario Loiederman	ES	Jul-20	1	**Addition**	131,746	148,718	16,972
Pyle MS	MS	Jul-20	1	**Addition**	153,824	209,464	55,640
Takoma Park MS	MS	Jul-20	1	**Addition**	137,348	195,739	58,391
Tilden MS/Rock Terrace HS	MS/CTR	Jul-20	1	**Rev/Ex**	-	244,561	244,561
Seneca Valley HS	HS	Jul-20	1	**Rev/Ex**	-	439,346	439,346
							-
Kennedy HS	HS	Jul-21	1	**Addition**	280,048	332,133	52,085
Whitman HS	HS	Jul-21	1	**Addition**	261,295	312,270	50,975
							-
Maryvale/Sandburg	ES	Jul-20	1	**Rev/Ex**	-	178,625	178,625
Luxmanor	ES	Jul-20	1	**Rev/Ex**	-	99,376	99,376
Potomac	ES	Jul-20	1	**Rev/Ex**	-	86,550	86,550
Portables	All	Jul-20	1	**Estimated**	519,840	533,520.00	13,680

Energy Conservation Measures Cost-Benefit Summary Table

One-Time Projects	Completion Year	Implementation Cost	Annual Cost Savings	Average Simple Payback (Years)
New Measures	FY21	$1,491,866	$1,165,534	1.3
Existing Measures	FY11 - FY20	$20,386,298	$7,167,507	2.8
Planned Measures	FY20	$5,222,389	$2,442,587	3.8
Subtotal		**$27,100,553**	**$10,775,629**	**2.5**
Annual Operations Programs		**Annual Cost**	**Annual Cost Savings**	**Payback**
School Energy and Recycling Teams	FY20	$964,266	$100,000	10%
Peak Load Management	FY20	$5,000	$86,963	
Utility Bill Accounting	FY20	$110,000	$318,331	289%
Solar PV PPAs	FY20	$0	$195,868	
Subtotal		**$1,079,266**	**$701,162**	**65%**
Grand Total MCPS Annual Savings			**$9,034,204**	

FY22 MCPS Resourse Conservation Table

FY20 ECM Cost-Benefit Table (Planned)

Measures - Planned:	Projected Completion Date (mo/yr)	Projected Initial Cost ($) -- After Rebates	Projected Annual Net Impact on Maintenance Cost ($)(-)	Fuel Type(s) Affected And Units	Estimated Units Saved Per Year	Projected Annual Cost Savings ($)
Energy Projects:						
Energy Management Upgrades	Jun-21	$48,466	($50,000)	Elect kWh	42,145	$4,847
				NG Therm	4,946	$569
Lighting upgrades	Jun-21	$18,000		kWh	294,424	$33,859
Subtotal Elec KWH				Elect kWh	42,145	
Subtotal NG Therm				NG Therm	4,946	
FY 2020 Page Totals		$66,466	($50,000)			$39,274
Equipment Operations and Maintenance:						
HVAC Replacement Program		$1,425,400		Elect kWh	9,502,667	$ 1,092,807
				NG Therm	290,898	$ 33,453
Subtotal - Energy Projects plus O & M		$ 1,425,400		Elect kWh	9,835,709	
				NG Therm	295,844	
FY 2020 Page Totals		**$1,491,866**	**($50,000)**			**$1,165,534**

FY22 MCPS Resourse Conservation Table

FY20 ECM Cost-Benefit Table (Existing)

Measures - Planned:	Projected Completion Date (mo/yr)	Projected Initial Cost ($) - After Rebates	Projected Annual Net Impact on Maintenance Cost ($)(-)	Fuel Type(s) Affected And Units	Estimated Units Saved Per Year	Projected Annual Cost Savings ($)
Energy Projects:						
Energy Management Upgrades	Jun-20	$93,549	($50,000)	Elect kWh	81,347	$9,355
				NG Therm	9,546	$2,249
Lighting Retrofits	Jun-19	$2,766,840	($461,140)	Elect kWh	599,857	$68,984
Subtotal Elec KWH				Elect kWh	681,204	
Subtotal NG Therm				NG Therm	9,546	
Totals		$2,860,389	($511,140)			$80,587
Equipment Operations and Maintenance:					44,742 72606	
					4,894,547	
HVAC Replacement Program		$2,362,000		Elect kWh	16,431,304	$ 1,889,600
				NG Therm	482,041	$ 472,400
Subtotal - Energy Projects plus O & M				Elect kWh	17,112,508	
				NG Therm	491,587	
Page Totals		**$5,222,389**	**($511,140)**			**$2,442,587**

FY22 MCPS Resourse Conservation Table

Existing Energy Measures

Existing Measures **Project Types**	Completion Year	Implementation Cost	Annual Cost Savings	Average Simple Payback (Years)
All Types	FY20	$5,222,389	$2,442,587	2.1
All Types	FY19	$1,646,402	$471,388	3.5
All Types	FY18	$1,589,998	$400,200	4.0
All Types	FY17	$1,669,354	$690,233	2.4
All Types	FY16	$2,834,754	$479,314	5.9
All Types	FY15	$1,149,550	$968,907	1.2
All Types	FY14	$1,668,358	$444,599	3.8
All Types	FY13	$832,933	$632,095	1.3
All Types	FY12	$2,302,083	$263,886	8.7
All Types	FY11	$722,743	$126,224	5.7
All Types	FY10	$747,734	$248,074	3.0
Existing Measures		$20,386,298	$7,167,507	2.8

Resource Conservation Plan FY22

Office of Facilities and Public Safety

9221 Corporate Blvd
Rockville. MD 20850

02/19/2021

Website: https://www.montgomerycollege.edu/offices/facilities/index.html


MONTGOMERY
COLLEGE
MAKE YOUR MOVE

Revision#	Description	Date
0	Issued for Use	02/19/2021

Owner's Sustainability Statement

As good stewards, it is Montgomery College's goal to furnish and maintain sustainable facilities, which are safe, reliable, life cycle cost effective, environmentally friendly, resilient and conform to Owner's Project Requirements (OPR). These facilities exist to provide a quality built environment which enhances the learning experience and contributes to student success. To achieve this goal Montgomery College embraces a total quality process which relies on the vision, talents, and collaboration of all individuals involved or affected by this project.

Long Nguyen Kimmy Doung Student Services
Rockville Campus
Opening July 2020

EXECUTIVE SUMMARY

The Resource Conservation Plan (RCP) has been prepared by Montgomery College's Office of Facilities to support the College's Fiscal Year (FY) 2022 Energy Conservation Capital Improvements Program (CIP) and Utility Operating Budget requests for funding. Published annually, this plan provides historical background and discusses FY2020-FY2021 accomplishments and FY2021-2022 plans as mandated by Montgomery County Code Section 18A-9 Interagency Committee on Energy and Utility Management.

This document describes Montgomery College's Resource Conservation Program that includes master planning, utility management, benchmarking, sustainable building design, energy conservation activities, waste stream management, climate change activities and program outreach and awareness. Included are the following descriptions:

- Resource conservation organization.
- Discussion of current and historical utility consumption and costs
- Resource conservation program accomplishments, and plans.

Tables and graphs present information on historical utility consumption and utility budget estimates, while (CIP) Project Description Forms (PDF) that relate to the College's Resource Conservation efforts are discussed and included in the appendix section of this document.
Since 2002, the College has seen a 96% increase in building space as the College continues to expand to meet the demands of its educational programs. The following table summarizes recent and active construction projects in the three campuses.

Campus	Building	Gross Square Feet (GSF)	New (N) Renovated (R) Expansion (E) Demolition (D)	Status	Open	LEED Certification
G	Student Affairs and Science (SA) Phase 1	64,146 +35,502 99,648	R,E	Open	January 2020	Gold Targeted IgCC2012
R	Long Nguyen Kimmy Doung Student Services	127,960	N	Open	July 2020	Gold Targeted IgCC2015
R	Old Student Services (RS)	(10,448)	D	Construction	June 2021	NA
T	Science South (SS)	(23,757)	D	Construction	June 2021	NA
T	Falcon Hall (FH)	(39,063)	D	Construction	June 2021	NA
T	Leggett Math & Science (LB) Center	104,362	N	Construction	June 2022	Silver Targeted IgCC2012
Net Total Increase		194,556				

Historically, all buildings regardless of function have been optimized to meet the project requirements while minimizing environmental impacts. The College will attempt to achieve the U.S. Green Building Counsel (USGBC) Leadership in Energy and Environmental Design (LEED) Gold certification that exceeds the County Legislated LEED Silver as well as surpassing the requirements of the SEC 8-14.A Energy Performance Standards for County Buildings. Currently the College is meeting city of Rockville and Montgomery County International Green Construction Code (IgCC).

The College continues to implement recommendations in the college-wide Master Plans and Utility Master Plans on all three campuses, while at the same time preparing new and expanded master plans for the out-years. Master planning is an important tool using Integrated Lifecycle Management (ILM) practices to ensure that sustainability issues are fully examined and properly integrated into the fabric of the institution.

The College participates in the joint agency procurement of deregulated electricity, natural gas, and wind generated renewable energy certificates (REC). In FY 2021, the College purchased 208% of its electricity in the form of wind REC. Similarly, in FY 2022 the college will buy at least 200% of its electricity from wind RECs.

The College continues to participate as a member of various County sponsored sustainability, climate change, energy, and national engineering and professional society committees. Currently, the College's Energy Manager, Mr. Michael Whitcomb, chairs the legislative mandated Interagency Committee on Energy and Utility Management (ICEUM). In our mission to enrich the lives of our community, the College encourages faculty, staff, student, and public participation in our sustainability efforts via social media, and electronic newsletter articles. The College's sustainability committee, MC Green Team, represents the College stakeholders and addresses green issues. Specifically, MC Green Team's goals are to address climate change, conserve resources, and share stewardship values. The team holds monthly meetings where topics related to energy, sustainability, economics, and community outreach are discussed.

The College offers credit and non-credit academic and continuing education courses in subjects related to green jobs, sustainable design, green business practices, solar trades training, and the LEED Rating System. Montgomery College is requesting $300,000 for the FY 2022 College Energy Conservation Capital Improvements Program (CIP) which funds the Utility Analyst, the Energy Engineer position, and various energy projects. This is a $75,000 increase from previous years. The FY 2022 College operating budget includes funding for one Energy Manager position. Energy and sustainability opportunities are also integrated into various building renovation and equipment replacement projects which are funded by various capital and operating budgets. The FY 2022 utility operating budget request is $7,155,720, a 4.1% decrease from the FY 2021 request. In FY20&21 the College has been operating in a remotely due to the COVID19 pandemic. As a result of the limited occupancy in FY20 the College avoided on average 14% of its energy consumption among the three campuses.

Montgomery College is dedicated to implementing and maintaining a sustainable, 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, measurement and verification protocols are implemented, appropriate databases are maintained, and all buildings are benchmarked. 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.

MONTGOMERY COLLEGE GENERAL INFORMATION

Montgomery College founded in 1946 established its first campus in Takoma Park in 1950. In 1965 and 1978 The College added the Rockville and the Germantown campuses, respectivley. In year 2000 the Takoma Park Campus expanded into the city of Silver Spring. Currently, the College owns and maintains approximately 333 acres of property on three campuses and operates 55 buildings in excess of 2.9 million gross square feet (GSF), which includes three parking garages and four leased sites.

Central Services (CT) was a recent off campuses acquisition of 126,801 GSF, renovated in late FY2017. This building consolidated central administrative functions that were previously scattered throughout various owned or leased space. Campus maps and summaries of space allocations can be found in the Appendix A.

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Buildings

The College buildings consist of classrooms, computer laboratories, offices, science and engineering laboratories, libraries, meeting rooms, gymnasiums, automobile shops, shipping and receiving areas, childcare centers, swimming pools, and greenhouses.

Schedule

The hours of use are from 7:00 a.m. until 11:00 p.m. on weekdays, and at different time of the day on weekends. Summer and winter session classes are offered at all three campuses and The College's administrative and academic offices are open year-round. There are frequently activities in the Physical Education (PE) building, as well as community use (rental) of PE and other spaces on the weekends. 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.

Montgomery College

RCPs

Montgomery College, which began its resource conservation program prior to 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.

IOTC

The College's Information Technology Operations Center (ITOC) is a 4,000 GSF space located in the Cafritz Arts Center on the Takoma Park/Silver Spring Campus, operating 24 hours a day. ITOC accounts on redundant systems and high-density servers which support cloud based computing. The College provides back-up systems to the IOTC infrastructure in the Computer Science Building on the Rockville Campus. Currently, ITOC provides server space to the Maryland-National Capital Parks and Planning Commission (M-NCPPC).

MONTGOMERY COLLEGE

MONTGOMERY COLLEGE

Environmental Stewarship

Since the late 1970s, the College has been a leader in environmental stewardship by implementing energy efficient, environmentally friendly, green, award winning building designs, and creating an award-winning recycling program. The College has an active occupational safety and health program which ensures occupant environmental quality and a hazardous waste management and recycling program which minimizes its hazardous solid waste stream. In FY 2016, the College was awarded a green seal certification for cleaning services, on the Takoma Park/Silver Spring campus.

Sustainability Features Shown: 90 kW PV Solar Generation, Day-lit Atrium Roof, Green Roof, High Albedo (reflective white) Roof, High Performance Day-lit Envelope, On-site Storm Water Management Features (rain garden front & pond rear) and Roof Top Mounted High Performance HVAC System, with Energy Recovery.

Science Center (SC) on the Rockville Campus (top right) LEED Gold Certified, Science East (SE) (middle) LEED Gold Certified, and Science Center West (SW) LEED Gold Targeted (bottom left) Opened January 2017

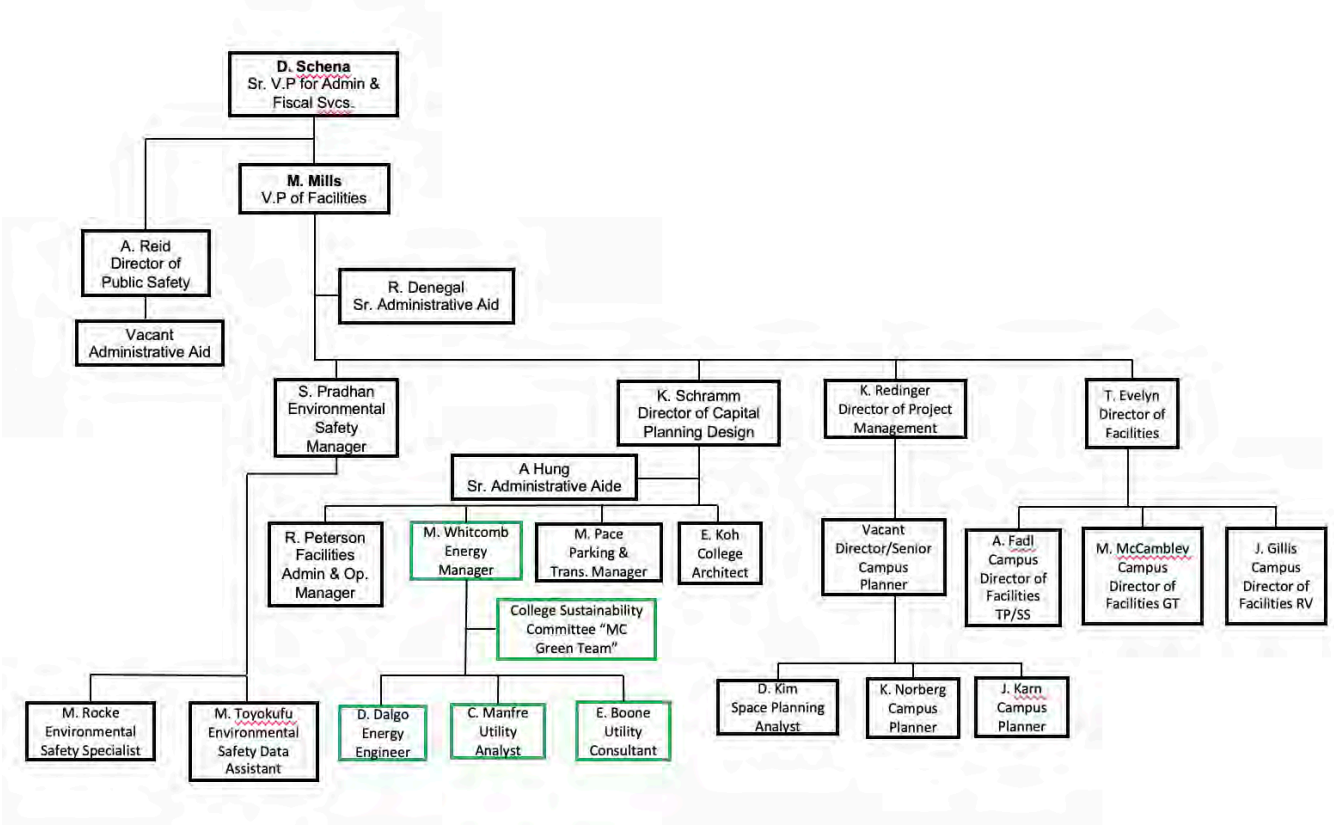
MONTGOMERY COLLEGE

The College Involvement

- Electricity Deregulation Task Force
    - Electricity and Gas procurement with other government agencies
- Environmental Policy Implementation Task Force (EPITF in FY04)
    - First Environmental Policy Issues and Action Report
- Montgomery County Green Building Law (FY06 and FY 07)
- Environmental Sustainability Working Law (FY08 and FY 09)
    - Response to County Council Bill No. 32-07, "Environmental Sustainability - Climate Action Plan"
- County Agency Resource Sharing (CARS) Committee (FY10)
- In-house Print Management Committee (FY10)
- MC Green Team (College Sustainability Committee in FY11)
- Montgomery County Energy Benchmarking since FY13
    - Since FY17 The College individually benchmarks all its buildings
- Montgomery County Climate Emergency workgroups (FY19)
- Building Energy Performance Standards (BEPS) (FY20)
- PJM Emergency Demand Response Program (FY18)
- Student Climate Town Hall by Montgomery County (FY21)
- Wholesale Electricity Procurement (FY22)

RESOURCE CONSERVATION PROGRAM ORGANIZATION

The Office of Central Facilities provides college-wide facilities management services for all three campuses and is responsible for managing resource conservation activities. The organization manages a highly developed integrated resource conservation and sustainability program through integrated planning, program management and operations. The figure below details the organization chart and those individuals directly responsible for influencing the Resource Conservation Program and ensuring program success. The College's Energy Management Team is part of the Office of Facilities under Administrative and Fiscal Services. The Energy Management Team reports to the Director of Capital Planning Design and Engineering.



ENERGY MANAGEMENT TEAM

Energy Manager

The Energy Manager is responsible for implementing the energy and sustainability components of the Resource Conservation Program and is the College's representative on ICEUM. His contact information is:

Mr. J. Michael Whitcomb, P.E.
Energy Manager
Office of Facilities
9221 Corporate Boulevard
Rockville, Maryland 20850
Phone No. (240) 567-7375,
Email: mike.whitcomb@montgomerycollege.edu

Mr. Whitcomb has been a member of the ICEUM committee, representing various county agencies since its formation in 1983. Mr. Whitcomb serves as the **current 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 as well as a Certified Energy Manager. He holds a B.S. in Mechanical Engineering (Energy Conversion) and an Engineering Master's Degree (Energy & Environment) from the University of Maryland.

The energy manager coordinates:

- Utility Master Plans
- Sustainable Design of new and renovated buildings
- Utility consumption
- Utility bills and utility accounting database
- Energy audits and retrofits
- Outreach of the sustainability program
- Co-chair MC Green Team
- Represents The College on ICEUM and other committees on isues related to Resource Conservation and Sustainability

Crissie Manfre, EEP

Utility Analyst

The Utility Analyst, a capital position since FY 2015, is responsible for assisting the Energy Manager with utility management duties related to the capital energy program and assisting in implementing various legislatively mandated capital programs such as Benchmarking. Likewise, the utility analyst manages the College's utility accounting database, EnergyCAP. Ms. Manfre has integrated the benchmarking process with the College's utility database as part of automating utility bill processing. As part of the College's respond to the COVID-19 pandemic Ms. Manfre enabled a complete digital and remote process for handling utility bill processing.

Ed Boone

Utility Consultant

The College contracts a utility consultant services to provide assistance with utility bill management and deregulation issues.

MONTGOMERY COLLEGE

Daniel Dalgo Ph.D.

Energy Engineer

The Energy Engineer, a capital position since FY20, provides engineering support to the Energy Manager and Utility Analyst; as well as projects related to Benchmarking. Specific projects associated with the new energy engineer position are the integration of building sub-metering with the building automation system and EnergyCAP, and building energy audits and retrofits that are critically needed infrastructure improvements. Provide engineering support to the development of Master Plans and Utility Master Plans. Lastly, enable data analytics for energy performance evaluation of buildings.

MORE EXPERTS

The following are positions within the Office of Facilities that provide support to the Resource Conservation and Sustainability Program.

Director of Capital Planning Design and Engineering

Integrates planning and design to the College facilities to ensure that environmental measures are integrated into the life cycle of the College infrastructure.

Director of Project Management

Responsible for construction of new and renovated facilities. Building performance is ensured through persistent quality supervision of building and infrastructure during construction.

Directors of Facilities

Operate and maintain safe, reliable and economical facilities, which contribute to the wellbeing of the College occupants. Likewise, managing the operations and maintenance aspects of their campus sustainability programs including energy efficient operations of facilities and implementing best practices with respect to recycling, building cleaning, and landscape management. In addition, the Director of the Germantown campus coordinates the recycling program for the three campuses as well as the maintenance of the college's vehicle fleet.

Facilities Administrative and Operation Manager

Manages the facilities operating budget accounts including the college-wide Utility Operating budget. Utility bills are received, reviewed and approved for payment. Utility bill data is entered automatically into EnergyCAP database through BillCAPture, an optical character recognition (OCR) program. Audit routines review the data and automatically identify inaccurate bills that need investigated and corrected by the utility analyst.

MONTGOMERY COLLEGE

Director of Public Safety

Ensures safety of the public and the College is preparedness to respond to emergency events in order to safeguard the well-being of the College community, preserve College property, communicate promptly and clearly, and restore College operations after an emergency event.

Parking and Transportation Manager

Manages issues related to college-wide parking and transportation. Transportation management is tasked with providing sustainable transportation solutions for the College community.

Environmental Safety Manager

Manages the college-wide occupational and environmental safety issues, including Occupational Safety and Health Organization (OSHA), asbestos abatement, hazardous waste stream management, occupant awareness, and indoor environmental quality (IEQ). The College's environmental safety web page is: https://www.montgomerycollege.edu/offices/facilities/occupational-and-environmental-safety/index.html.

Based upon their expertise, members of the Facilities organization represent the College on national, regional, and local committees related to the College's Resource Conservation efforts. As the need for sustainability awareness increases, interagency and college-wide management strategies and practices have been modified. The academic programs are now offering credit and non-credit sustainability classes and are working with the Montgomery County Government to offer sustainable training opportunities.

RESOURCE CONSERVATION ACTIVITIES

The following activities summarize the College's Conservation and Sustainability Program.

TAKOMA PARK/SILVER SPRING CAMPUS

Master Planning

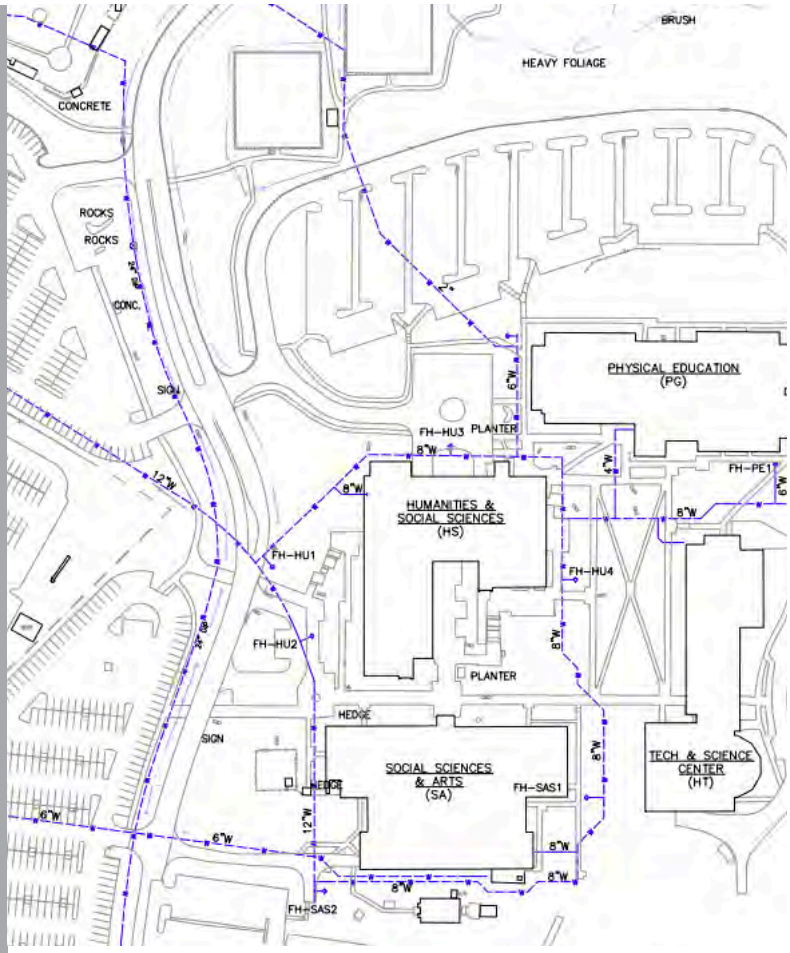
Facility Master Planning is the legislatively mandated process of examining current and future academic programs to determine the space required for these programs and their support services. The master plan establishes the quantity and types of space, where it will be located, and the cost of converting existing or adding new space. Since facility master planning establishes the owner's project requirements (OPR) and is used to support capital budget funding, it is the ideal place to integrate resource conservation opportunities.

ROCKVILLE CAMPUS

Utility Master Planning

Utility master planning is an extension of the facility master planning process, which examines, on a life cycle cost basis, the current and future requirements for utility infrastructure. The utility master planning process examines electrical, natural gas, central hot water and chilled water plants, water, sewer, storm water, and telecommunications systems that are affected by campus buildings.

The current utility master plan is being updated to support the updated master plan. The college-wide Facility Planning CIP No. 886686 is the primary funding source for all College planning activities.



Current Utility Master Plans (UMP)

Germantown UMP

https://www.montgomerycollege.edu/-documents/offices/facilities/energymanagement/germantown-master-plan.pdf

Rockville UMP

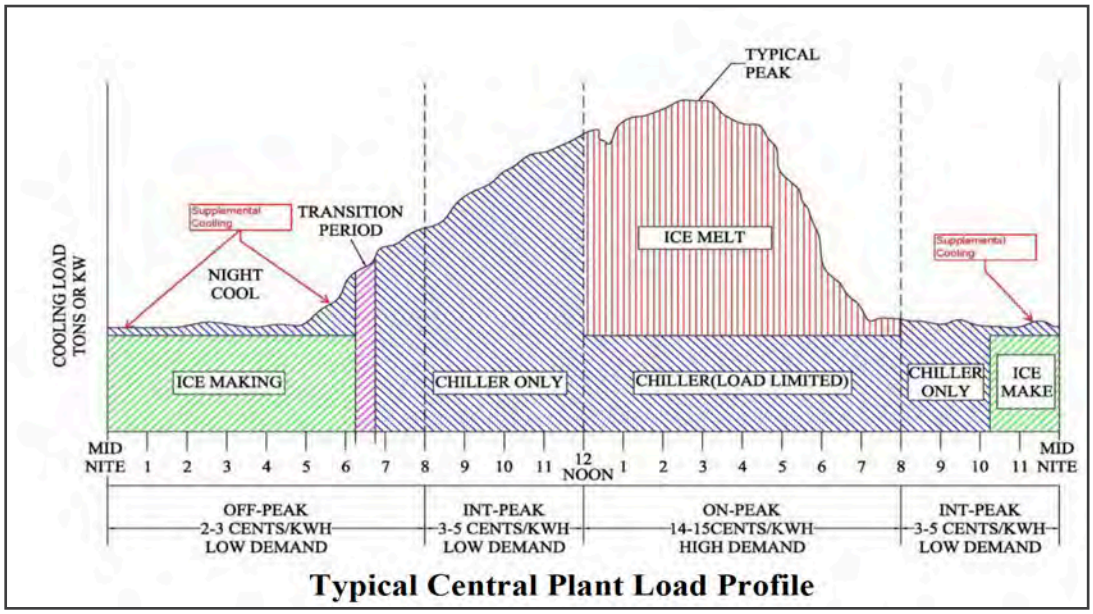
https://www.montgomerycollege.edu/-documents/offices/facilities/energy-management/rockvillemaster-plan.pdf

Takoma Park UMP

https://www.montgomerycollege.edu/-documents/offices/facilities/energymanagement/tpss-mast-plan.pdf

UMP CASE STUDY

MONTGOMERY COLLEGE



Typical Central Plant Load Profile

COLLEGE CENTRAL PLANTS

The College uses high efficiency, environmentally friendly central plant technology that allows consolidation of major heating and cooling equipment into a more life cycle cost effective central plant rather than individual plants in each building.

Consolidation of equipment realizes economies of scale, allows higher diversity, which reduces total equipment costs, provides redundancy, and allows use of smart grid technologies such as ice thermal storage and co-generation.

These environmentally friendly plants use high efficiency, variable speed open drive chillers. The chillers use Ammonia (R-717), a highly efficient, naturally occurring refrigerant that minimizes the Total Equivalent Warming Impact (TEWI) in that it has no Ozone Depletion Potential (ODP) and No Direct Global Warming Potential (GWP).

The chiller and refrigerant cycle is enhanced by using high efficiency plate and frame heat exchangers, and ice thermal storage. The heat exchangers improve refrigerant heat transfer while the ice storage stores cold energy at night when the electricity rates are low for use during the day when electricity rates are high.

Ice thermal storage also improves the overall electrical load profile and positions the College to participate in smart grid demand management activities. Ice thermal storage also reduces the quantity of active rotating mechanical and electrical equipment by half, produces colder water, which reduces the size of distribution system, pumping systems and their associated operation costs.

Ice Thermal Storage Tanks
Bioscience Plant
Germantown Campus

The central plants have been integrated into either new buildings or existing building renovations, and therefore leverage project resources and capital expenditures such that the resource conservation benefits are shared with other buildings on the campus. Currently the College is undergoing an underground piping upgrade project on the Rockville Campus.

As an additional energy and electrical demand strategy, some plants use co-generation/co-processes technology. In these plants, natural gas fired engine driven chillers provide cooling while recovering waste jacket and exhaust heat and returning it to the heating system for space, swimming pool and domestic water heating.

Building Design

The College follows the SEC 8-14.A Energy Performance Standards for County Buildings. As a result, energy design guidelines (EDG) were developed, establishing performance and equipment requirements, and distributed to the Architectural and Engineering (A/E) teams. Compliance, quality control, and sustainability have been and remain the responsibility of College staff. These standards have evolved to include requirements for indoor air quality, storm water management, combined heat and power (CHP), commissioning, and controls.

Long Nguyen Kimmy Doung Student Services
Rockville Campus
Opening July 2020
LEED Gold Targeted

College Code Standards

Year	Requirement	College Target
2007	USGBC LEED Silver Rating	USGBC LEED Gold Rating
2014	Energy Benchmarking	Individually benchmark all the buildings
2017	IgCC 2012	Meet or exceed
2021 Proposed	IgCC 2018	Meet or exceed

A summary of past and on-going projects can be found in Appendix A.

MONTGOMERY COLLEGE

Design, construction, renovation (retrofits & replacement), energy modeling, and enhanced commissioning

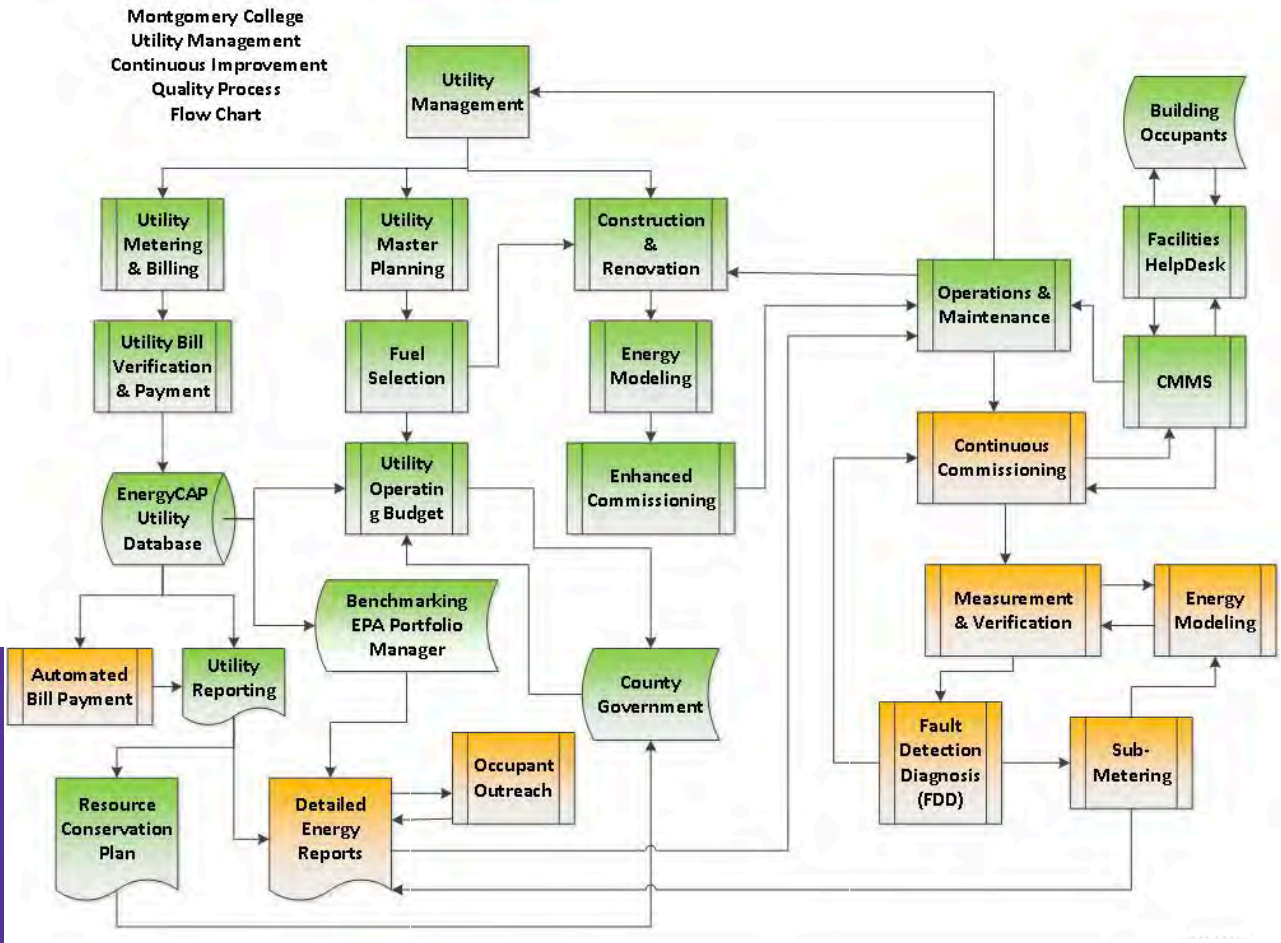
Design, construction, and renovation (retrofits & replacement) are all opportunities to improve efficiency and minimize utility and resource consumption. Energy modelling and life cycle cost analysis are required on new buildings and major renovations to demonstrate compliance with codes, but it is also the opportunity compare efficiency and justify costs. Enhanced commissioning of all building systems and equipment is essential to ensuring that a high-quality building meets the owner's project requirements, code compliance, and obtains additional LEED certification credits.

These are all measures which have been implemented, but changes in technology and operating practices continue to improve their effectiveness. Measures such as these are used to fine tune building operations by confirming design intent, or as proactive recognition of the building system not performing as intended. These measures are intended to ensure building occupant comfort, productivity, and cost savings.

Continuous commissioning, Measurement and Verification, Energy Modeling, Fault Detection Diagnosis (FDD)

Utility Management

Utility management is one of the fundamentals of energy management and resource conservation and is influenced by all aspects of college operations. The figure below shows the activities that contribute to utility management. Objects in green are well developed College utility management activities while those in yellow have been developed but opportunities remain to enhance and improve efficiencies. In FY20, FY21, FY22 the College is installing sub-meters in chilled and hot water loops to improve its benchmarking process.



ENERGY AND FUEL SELECTION

Energy and fuel selection influences our utility distribution systems, building design, and type of equipment we select, and impacts both first and operating cost. The College obtains LEED certification credits based upon energy cost savings and credits onsite renewable energy generation and offsite purchase of RECs. The College has eliminated fuel oil heating applications and all underground fuel oil tanks have been removed.

UTILITY PROCUREMENT

The College's Utility Analyst and Utility Consultant participate in aggregated procurement with other County agencies and coordinate the periodic renewal of deregulated supply contracts for Electricity, Natural Gas, Propane, and RECs. In FY22 The College intends to enter the wholesale electricity market as a strategy to enhance reliability, mitigate higher prices, and explore new and more efficient generation technologies. The College understands the risks associated with the wholesale market and its working with our current consultant, EnelX, in order to mitigate these risks.

- Electricity
- Natural Gas
- Propane
- Water
- Sewer

MONTGOMERY COLLLEGE SUPPLY CONTRACT STATUS

Utility Supply	Vendor	Signed	Start	End	Unit Cost ($/unit of energy)	Contract
Electricity	WGL Energy	1/28/2016	6/2017	6/2019	0.07114/kWh	DGS
Electricity	WGL Energy	9/28/2016	6/2019	6/2020	0.0603/kWh	DGS
Electricity	WGL Energy	10/3/2018	6/2020	6/2021	0.0603/kWh	DGS
N.Gas (Firm)	WGL Energy	9/28/2016	6/2018	5/2020	0.418/therm	FCG
N.Gas (Firm)	WGL Energy	10/3/2018	6/2020	6/2021	0.348/therm	FCG
N.Gas (Firm)	WGL Energy	5/8/2020	7/2021	6/2022	0.339/therm	UMD
Wind (REC)	Renewable Choice	6/29/2017	7/2018	6/2019	0.48/MWh	MCG
Wind (REC)	Scheneider Electric	8/20/2019	7/2019	6/2020	0.89/MWh	MCG
Wind (REC)	Scheneider Electric	8/20/2019	7/2020	6/2021	0.89/MWh	MCG
Wind (REC)	TBD	TBD	7/2021	6/2022	0.89/MWh	TBD

Electricity is purchased from a deregulated supplier who generates and transmits power via PJM, the regional transmission organization (RTO) to Potomac Electric Power Company (PEPCO), the regulated public utility and local distribution company (LDC). The College also generates a small portion of its electricity from College owned and operated on-site solar photovoltaics (PV). The College consumes fossil fuels in the form of deregulated natural gas and propane. High efficiency central plants on the Rockville, Germantown, and Takoma Park/Silver Spring campuses generate and distribute hot and cold water to the buildings for heating and cooling of the occupied spaces.

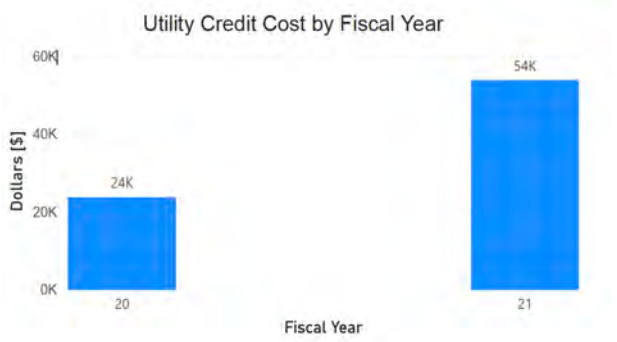
High Performance Hot Water Heating Plant
Long Nguyen Kimmy Doung Student Services Building
Rockville Campus

MONTGOMERY COLLEGE

Utility Metering-Billing Process

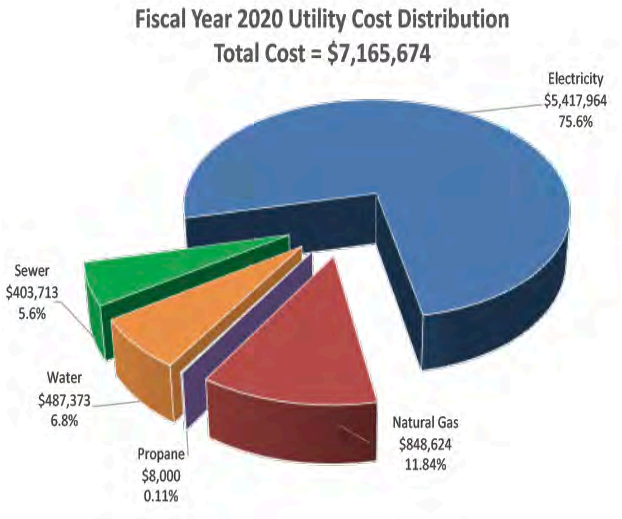
Utility bills are digitally received on a monthly and quarterly basis. Utility bills are automatically entered into the EnergyCAP database, verified, paid on time, errors corrected, and cost and consumption recorded. The Utility Analyst and Utility Consultant assists in bill verification and correcting billing errors.

The utility bill verification process has saved the College approximately $24k in FY20 and, as of Feb 2021, $54k in FY21.



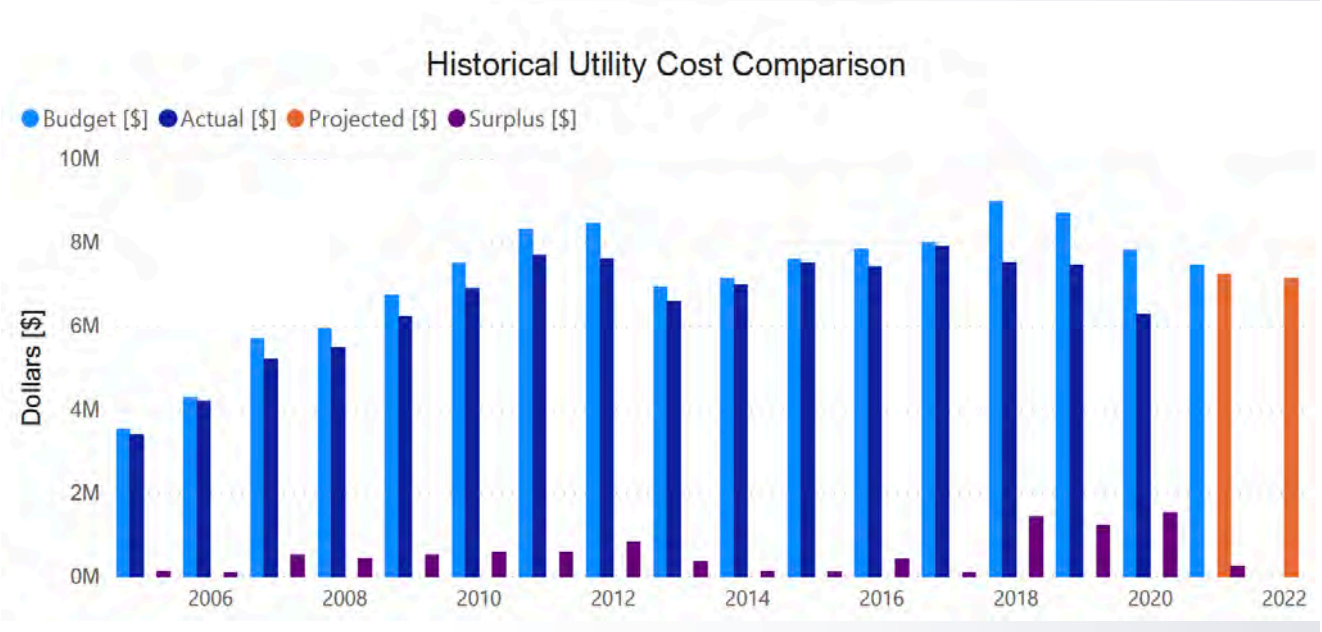
The breakdown of the utility cost distribution for FY 2020 is shown in the figure to the right. A comparison between total utility cost of FY 2019 and FY 2020 shows a reduction of $ 295,711. A significant part of the cost decreased is due to the COVID-19 pandemic that significantly reduced the use of buildings.

Since electricity represents nearly 80% of the total utility consumption, improvements in efficiency in this area are a priority for the college. Proper lighting design is an important tool in ensuring that electricity consumption is minimized as well as the proper use of lighting and daylighting controls and the ice-storage plant for cooling peak load reduction.



MONTGOMERY COLLEGE

COLLEGE HISTORICAL UTILITY DATA



The figure above shows a historical and projected FY21, and FY22 utility cost for the College. As the college has increased in infrastructure, academic programs, students, and staff its utility cost has not significantly fluctuated in for the past 10 years. The stable utility cost is attributed to market prices and more importantly the application of the resource conservation program throughout each campus by the College's staff. The data for this table is located in the Utility Projection Report in Appendix A.

75.6% Electricity

11.8% Natural Gas

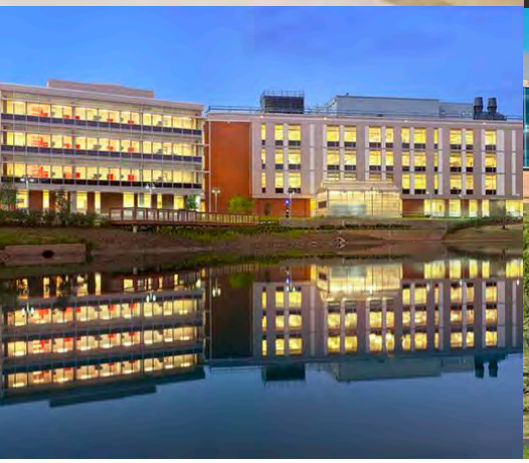
6.8% Water

5.6% Sewer

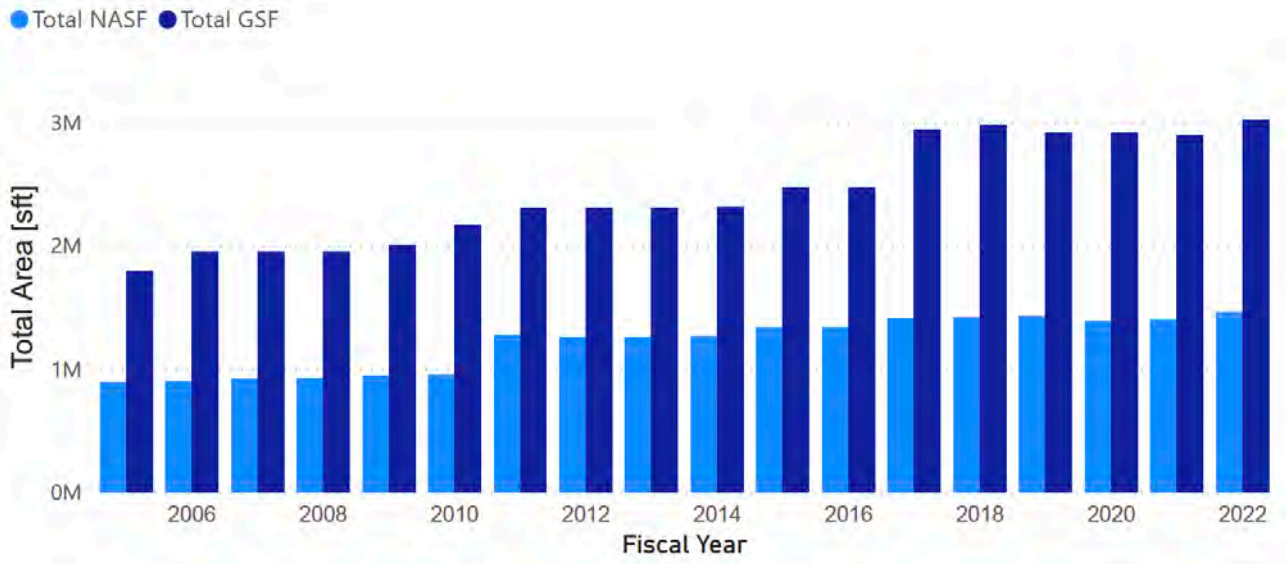
0.1% Propane

MONTGOMERY COLLEGE

MAKE YOUR MOVE



COLLEGE EXPANSION

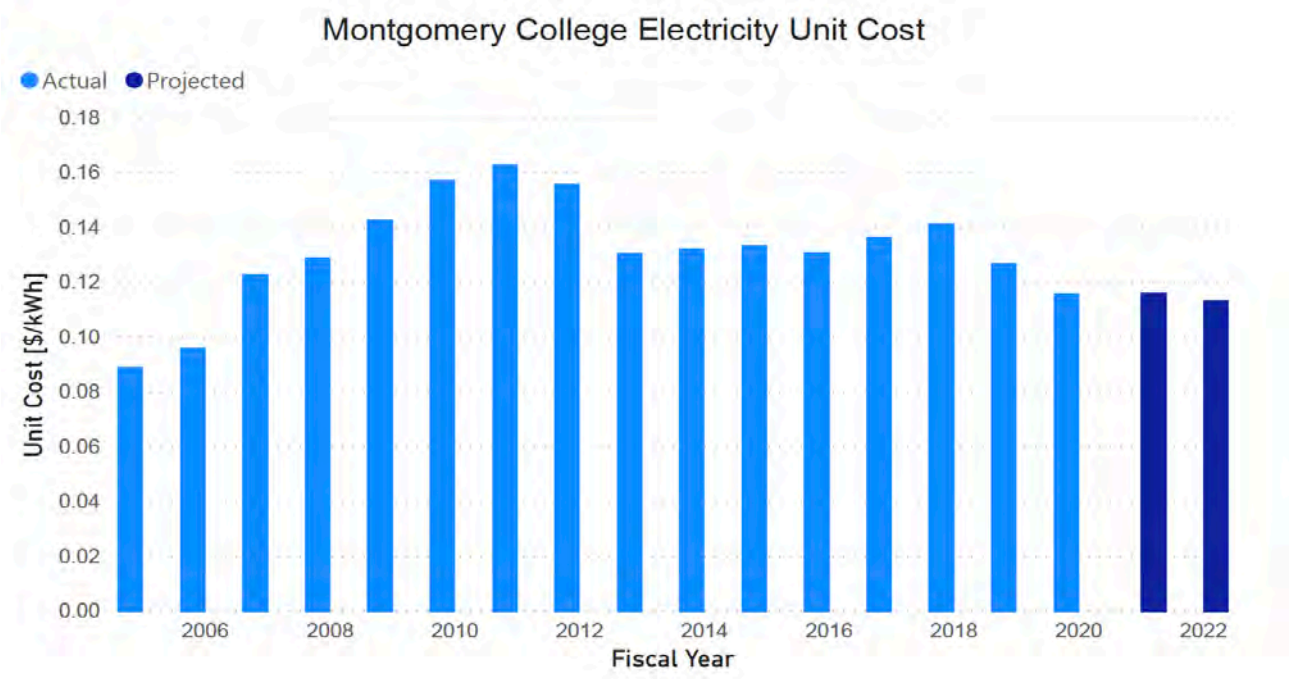


A major factor influencing cost fluctuations are changes in consumption and changes in unit costs for each utility. Addition of building space influences consumption and therefore cost of utilities. A Gross Square Feet comparison indicates the College has increased 96% from 2002 to 2022 with a new Student Services Building in the Rockville Campus open in FY21. The College has plans to continue expanding in future years in order to serve students and the overall community.

96%

The College has expanded since 2002 to present.

UNIT COST



Fluctuations in unit cost, particularly electricity, influences the total cost of utilities.

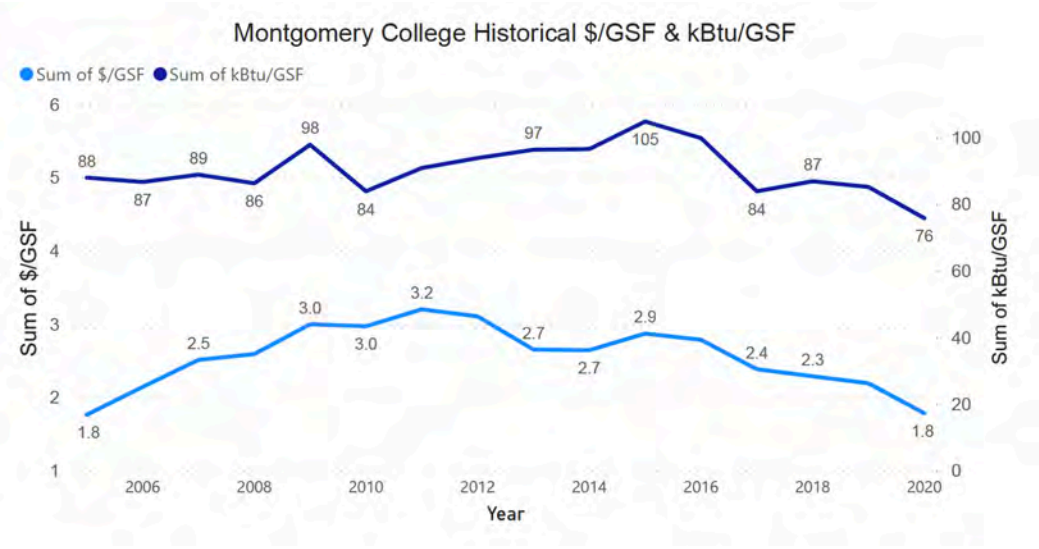
In FY 2001-2003, unit cost dropped due to recovery of windfall profits from the sale of generation assets. After 2003, standard offer price caps were removed and prices steadily increased until the 2007-2008 market recession. Commitments to multi-year supply contracts delayed unit cost reductions until after FY 2012, where the College's unit cost decrease approximately by 3 cents/kWh. For the past 4 years the unit cost of electricity has remainded stable until FY19, where a the electricity unit cost is trending down.

The electricity unit cost projections for FY21 and FY22 will likely change as of March 2020, the College transitions to remote teaching and work in response to the Covid-19 pandemic. The College estimates that the limited occupancy will have a significant reduction in its energy cost and will update the current RCP as more information is available.

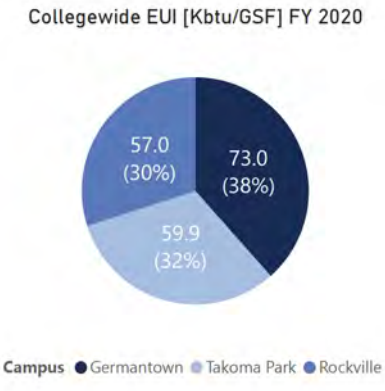
MONTGOMERY COLLEGE

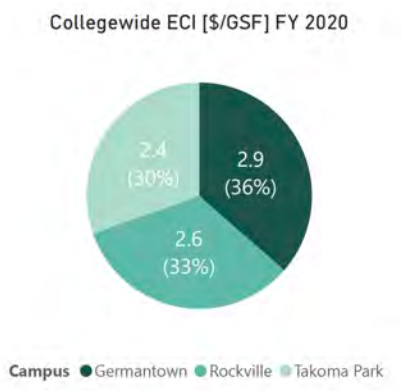
BENCHMARKING

Benchmarking became a legislatively mandated requirement with the passage of Benchmarking Bill 2-14 in May 2014. The College was recognized as an Early Bird Benchmarker, reporting the Campuses' energy use and cost a year earlier than legislatively mandated. Benchmarking is the presentation of energy consumption and cost data in the form of Energy Use Index (EUI), expressed in kBtu/GSF, and as Energy Cost Index (ECI), expressed in $/GSF. These metrics of simplify the comparison among other/similar buildings by converting all energy consumed into common unit of Kilo British Thermal Units (kBtu) and to a cost unit of Dollars ($) and normalizing it by the total area of the building.



The EUI trend indicates that even as the College expanded, the site EUI and the ECI are maintained with low variability. The sharp decrease from FY16-17 can be attributed to the addition of buildings such as North Garage, Science West, and Central Services which opened mid-year and contributed 18% of the total GSF. From FY17 to FY19 the EUI and ECI for the College show a constant EUI and ECI trend, while in FY20-21 there is a sharp decrease in EUI and ECI due to the Covid-19 pandemic and the limited occupancy of buildings.

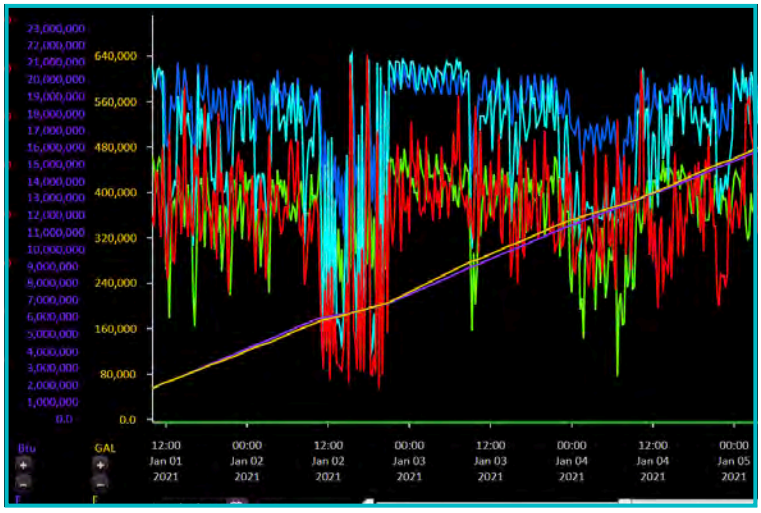




In FY 20 COVID-19 hit the U.S. resulting in limited occupancy of buildings since March 13th, 2020 to the present. The average Energy Cost Index (ECI) and Energy Use Intensity (EUI) for the three campuses are 2.6 [$/GSF] and 63 [kbtu/GSF].

SUB-METERING NET METERING & SMART GRID

Detailed monthly utility billing verification is warranted and benchmarking has become a legislative mandate. Implementation of Smart Electrical meters may improve monthly electrical meter data verification and provide more detailed hourly consumption data. Sub-metering for Chilled and Hot water as well as net metering will also prove valuable as smart grid and demand response practices are introduced.



ASHRAE BACnet System Integration

The College use Direct Digital Controls (DDC) and Building Automation and Control (BAC) with the BACnet communication protocol to enhance the building controls integration. DDC devices orchestrate the operations of the Heating, Refrigeration and Air Conditioning (HVAC) systems, controls the chilled and hot water plants an provides building operator with a user interface to monitor all systems. These systems also provide sub- metering that supports the College's Benchmarking efforts.

MONTGOMERY COLLEGE

MONTGOMERY COLLEGE SOLAR ENERGY

MONTGOMERY COLLEGE

148 KW Solar Capacity

$37k

Annual cost avoidance

The table below shows the historical and current site generated renewable energy systems, where the greay-out rows indicate decommissioned solar capacity. Currently, Science West and Science Center buildings at the Rockville campus have current solar power capacity with space and infrastructure to add more solar photovoltaic panels in the future. Likewise, the SA building in the GT campus has roof supports capable of adding PV in the future

Rockville Campus Science West Photovoltaic Array

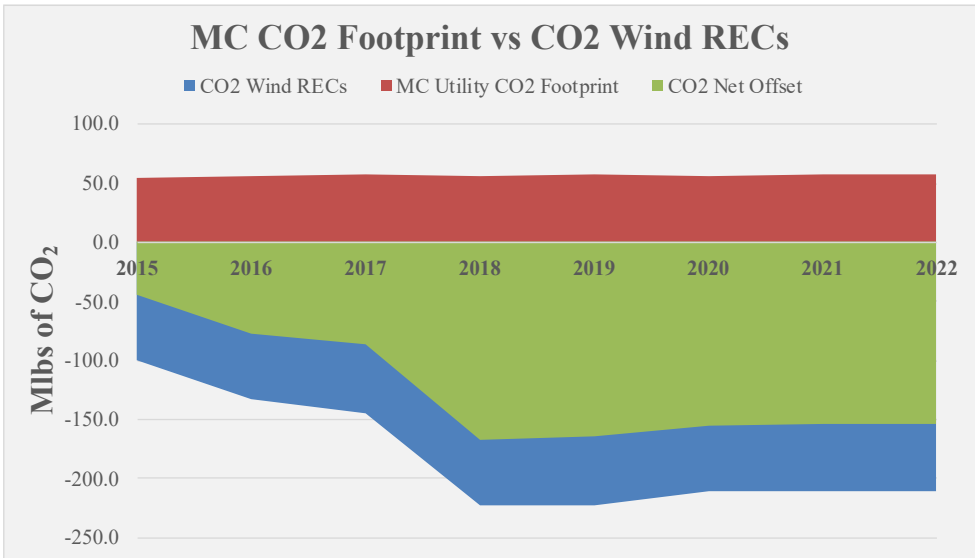
Rockville Campus Science Center Photovoltaic Array

Campus	Building	Year Installed	Solar Array Type	Building Load	Status	Comments
Germantown	Science and Applied Studies	1978	224 Flat Plate Thermal Panels	Thermal Source for WSHP & DHW	Decommissioned 1998	See 1998 Comment
Germantown	Humanities & Social Sciences	1978	282 Flat Plate Thermal Panels	Thermal Source for WSHP, DHW, & Swimming Pool	Decommissioned 2000	See 2000 Comment
Germantown	Science and Applied Studies	1998	26 kW Photovoltaic	Building Electrical Grid	Original thermal array replaced by 26 kW PV	See 2016 Comment
Germantown	Humanities & Social Sciences	2000	24 kW Photovoltaic & 900 Evacuated Tube Thermal	Building Electrical Grid, Thermal Source for WSHP, DHW, & Swimming Pool	PV System and Thermal System have reached end of useful life and are out of service.	Currently evaluating replacement options as part of the utility master plan.
Takoma Park /Silver Spring	Heath Sciences	2004	33 kW Photovoltaic	Building Electrical Grid	Operational	
Rockville	Science Center	2012	25 kW Photovoltaic	Building Electrical Grid	Operational	Represents less than 1% of building electrical. LEED Gold Building
Rockville	Science East	2013	20 kW Photovoltaic	Building Electrical Grid	Operational	Represents approximately 2% of the building electrical.
Germantown	Biosciences Education Center	2014	35 kW Potovoltaic	Building Electrical Grid	Operational	Represents approximately 1% of the building electrical.
Rockville	Science West	2017	35 kW Photovoltaic	Building Electrical Grid	Operational	Represents approximately 2% of the building electrical.
Germantown	Science and Applied Studies	2016	26 kW Photovoltaic	Building Electrical Grid	Decommissioned 2016	Building under renovation/construction. Building has structure for new PV installation. Evaluating new PV installation.
Total KW			148.00			
Annual kWh			290,276.00			
Annual Saving [$]			$ 37,735.88			

MONTGOMERY COLLEGE WIND ENERGY PROCUREMENT

The College collaborates with other County agencies and procures all of its electricity from renewables as legislatively mandated by Montgomery County. In FY20 and FY21, the College purchased 208% and 203%, respectively, of its electricity in the form of wind RECs exceeding the county mandate of 100%. Similarly, in FY22 the College will enter into the wholesale market for its electricity and will work with EnelX to make sure we continue environmental stewardship. The following table shows a year-by-year procurement of wind generated energy certificates. The College has purchased more than the 100% mandate in order to offset emissions from other College sources such as fossil fuels and transportation. A complete RECs table is available in Appendix A.

203% of Elec in RECs



The figure above shows a comparison of the College's CO2 footprint (red), the CO2 offset from wind RECs, and the College's CO2 Net Offset (green). Even though the College continues to grow in number of people, gross square feet, and equipment, it has maintained a stable CO2 footprint due to efficient energy management, operations, and equipment. The College's CO2 net offset, represented in green area, is the difference between the CO2 footprint and CO2 wind RECs offset. As shown in the figure the College has been able to net offset more than double its CO2 footprint in the past three FYs, MC is showing its commitment towards a carbon neutral environment and to comply with County's GHG mandate.

UTILITY OPERATION BUDGET

Utility budget preparation generally begins a year in advance of budget approval taking into account the following:

- Historical records
- Current supply contracts
- Rate increases or fee adjustments
- Space adjustments
- Assumptions of unknown factors

Utility projections may be adjusted periodically as assumptions change or are influenced by budget discussions. Final utility budgets are approved by County Council by May of the current fiscal year. The FY 2021-FY 2022 Utility Rate sheet is located in Appendix A and shows the unit costs and assumptions. The table below shows the budget information for FY20 FY21, and FY22. The budget for FY21 and FY22 are approximately 4.6% less than the budget requested for FY20.

CATEGORY	FY 2020 $	FY 2021 $	Consumption Change FY21-22 $	Unit Change FY21-22 $	FY22 $	Budget Percent Inc./(Decr) %
Budget	7,830,311	7,467,066	-	-	7,155,720	FY20-21 (4.6)
Actual	6,287,782	-				
Projected	-	7,200,366	(9,171)	(115,404)	7,155,720	FY21-22 (4.1)
Surplus	1,542529	266,700				

OPERATION & MAINTENANCE

Operations and maintenance is the period during which buildings are occupied and it is the longest and most expensive period in a building's lifecycle. Building occupants contact the facilities service desk to report various building issues, sometimes serving as the initial indication that the building may not be operating as intended. Computerized maintenance management system (CMMS) is an automated work order database that tracks occupant issues and tracks periodic equipment service requirements.

MONTGOMERY COLLEGE

Operations and Maintenance (O&M) is responsible for operating and maintaining the College's resources in a safe, reliable, and economical manner. Consumption of chemicals is reduced by using environmentally friendly cleaning products and minimizing concentrations. Since FY 2010, the Takoma Park Silver Spring O&M management and staff adopted the Green Seal GS42 (see more below) cleaning program and became certified instructors in order to share their knowledge with the other campus O&M staff.

Montgomery College Takoma Park/Silver Spring became the first community college in the country to be awarded the Green Seal Certification (GS-42) for cleaning services in August of 2015. To earn this certification, an in-depth review of the cleaning service's processes, procedures, and purchasing records is involved. An onsite audit of facilities cleaned by the service is required as well. This institution continues to be at the forefront of sustainability by following a science-based standard through GS-42.

LANDSCAPING

Grounds and landscapes are maintained in an environmentally friendly manner with drought, disease, and insect resistant native species, and use of high efficiency, low emitting, four cycle, grass mulching equipment. As well as composting landscape waste or recycle at county facilities.

PEST

The best practices of integrated pest management are applied to insect and pest treatment programs.

RECYCLING & LIGHTING-CONTROLS

O&M also manages the recycling program on each campus. O&M also does various lighting and controls retrofits in order to improve efficiency and replace obsolete equipment.

Capital Improvement Projects and Operating Budget Sources of Funding

96%

The College has expanded since 2002 to present.

Energy Conservation CIP, No. 816611

$300,000

The College Resource Conservation Program is funded by various capital improvement projects (CIP) and operating budget sources. The Energy Conservation CIP, No. 816611 is the original capital program for which the College is requesting $300,000, this is an increase of $75,000 from FY20. Other CIPs such as Planned Lifecycle Asset Replacement (PLAR), No. 926659 and College Capital Renewal, No. 096600, also contributes to increased efficiency during equipment and infrastructure replacements. CIP PDFs are shown in Appendix A.

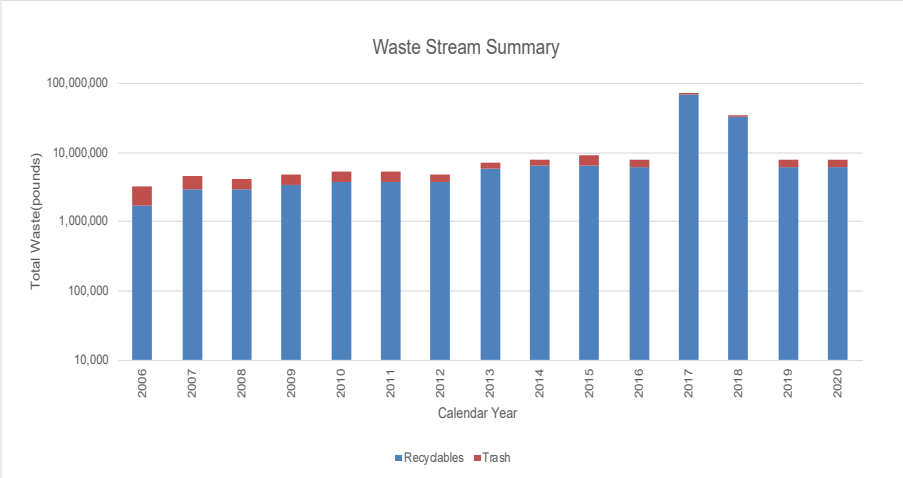
Operating budget funds are also used to replace older less efficient equipment with newer more efficient equipment during routine equipment replacement.

Other sources of funding or fund reimbursement such as grants, and utility rebates are also used when they become available. The table in Appendix A lists existing, new & planned improvement measures and estimated costs related to the Energy Conservation CIP.

The College's operating budget includes funding for one Energy Manager Staff position, while the Energy CIP includes funding for the Utility Analyst and Energy Engineer positions.

RECYCLING & HAZARDOUS WASTE DISPOSAL

The College has a long-standing, proactive recycling and hazardous waste disposal program. The College has received numerous Smart Organizations Reduce and Recycle Tons (SORRT) awards from the Montgomery County Government for exceeding the 50% recycling goal. The following chart shows the historical progression and summary table show the categories and quantities of the College's waste stream management. As shown in the figure below the College has continuously increased its recyclables, while reducing its overall waste.



CY 2017 saw a significant increase in recyclables, and an approximate one million ton decrease in trash. The increase in recyclables is due to the fact that construction data was only recently included in the annual recycling returns. The data shows that in year 2020 the total recycled, and trash returned to a range close to year 2016. Detail data available in Appendix A. Hazardous waste is managed by the Environmental Safety team who ensure that hazardous chemicals are minimized and hazardous waste is properly disposed. The College attempts to reduce the chemical stream by reducing or eliminating chemical inventories. For example, volatile organic compounds used to clean automotive parts, printing equipment, or art equipment have been eliminated and replaced with natural citrus cleaners.

MONTGOMERY COLLEGE PRINTING

The College's print management committee has implemented a pay for print program, reducing the quantity, and cost of print and mailing of material. Other efforts such as digital distribution of materials have reduced paper, distribution cost, and postage. Waste stream reduction is also part of the College's occupant awareness and outreach programs with availability of recycle bins throughout each campus.

MC TRANSPORTATION

Montgomery College manages parking and transportation to support its students, faculty, and staff. Each campus provides parking and public transportation facilities; parking regulations are enforced by campus Security.

The College subsides free Montgomery Ride-on Bus access for College students and participated in the bike share program and installed bike share stations on the Rockville and Takoma Park/Silver Spring Campuses. Since August of 2014, the College has had its own shuttle buses that travel between campuses to allow students, faculty, and staff direct access to all campuses.

The College maintains vehicles to support the various functions of the College. The fleet is maintained by the Director of Campus Facilities on the Germantown Campus. The College also maintains various other specialty vehicles, such as mower, tractors, forklifts, and carts. The College has converted to 4-cycle engines for efficiency and noise reduction. The College improves efficiency by purchasing "right sized" vehicles for their application and primarly uses Electric Vehicle Carts reducing gasoline consumption.

INFORMATION TECHNOLOGY

Similar to other agencies, the College continues to expand its information technology (IT) capabilities. Classrooms have been 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. The College continues to respond to this growth by purchasing new computer equipment that is more efficient and complies with the EPA's Energy Star requirements. IT infrastructure supports telecommuting which allows faculty, staff and students to work and study remotely, both reducing commuting miles and allowing sharing of space, potentially reducing the need for additional building space. Furthermore, IT is currently examining opportunities to share network resources with other county agencies.

Information Technology Operations Center (ITOC) is located in the Cafritz Foundation Arts Center on the Takoma Park/Silver Spring Campus. This 4,000 GSF facility provides needed expansion space for the central network computer equipment, and provides space for operations and the IT Help Desk activities. Primary cooling of the computer equipment is provided by chilled water from the high efficiency West Campus Central Plant which is also located in this building. Redundant cooling is provided by high efficiency cooling systems which are supported by standby emergency generators.

MC IT has played a crucial role in enabling and maintaining the infrastructure for the college community to transition to a remote learning and working environment during the COVID-19 pandemic.

MONTGOMERY COLLEGE OUTREACH

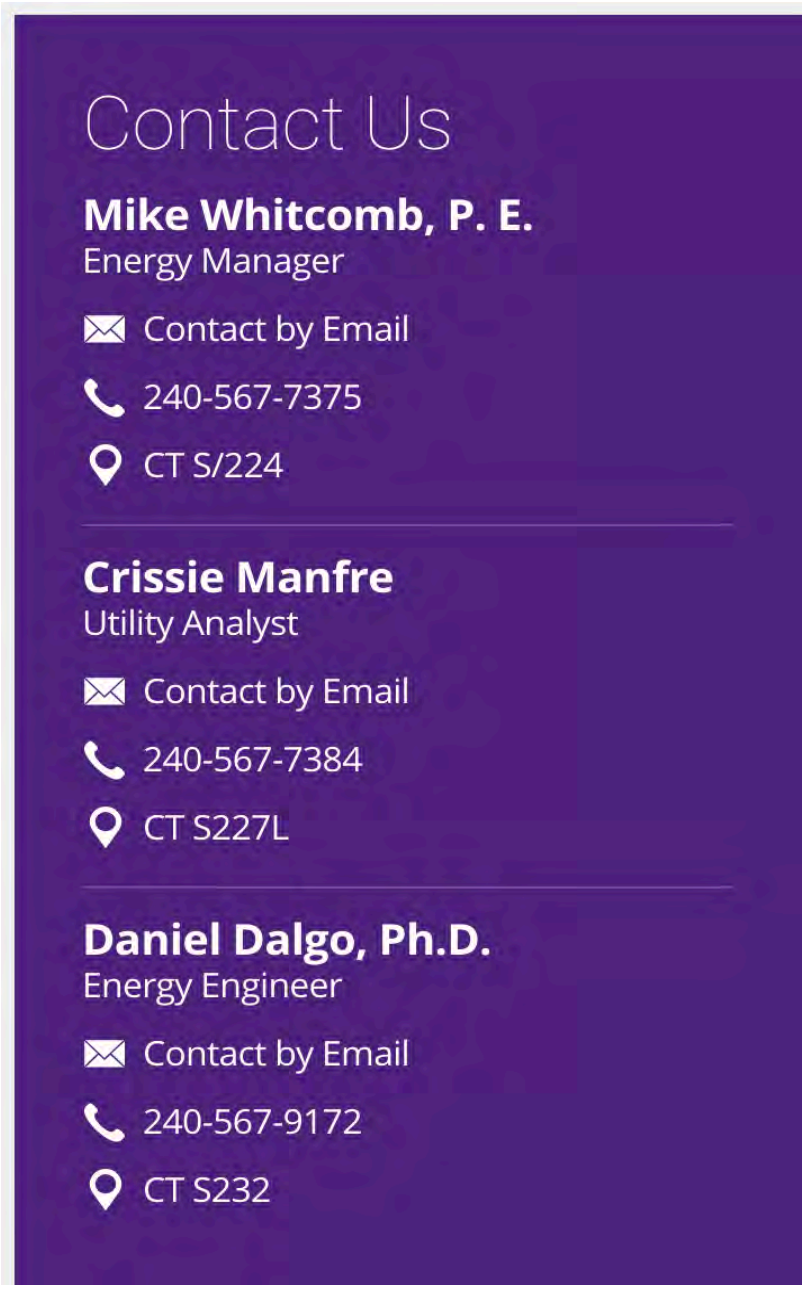
In FY20&21 the College participated in the Climate Change Innitiavite Workgroups organized to prioritize actions and develop strategies and attempt to meet the County's GHG zero emissions by 2035.

The College continues to promote occupant energy awareness. The Office of Facilities publishes content on its public website detailing current activities, programs, energy breakdown of its three campuses, and information about energy management and resource conservation program. For example, the latest earnings from the PJM Emergency Demad Response Program (https://www.montgomerycollege.edu/documents/offices/facilities/energy-management/edrp-program-analysis.pdf).

The College's sustainability committe, MC Green Team, with College faculty, students, and staff provide support and promote energy related programs and developments. Members of MC Green Team meet monthly to discuss and update on their efforts to promote sustainability. Updates from MC Green Team can be found at https://www.montgomerycollege.edu/offices/facilities/energy-conservation/mcgreen/index.html#greenbuildingdesign.

Climate Change Innitiative Workgroups	Montgomery College Staff
Buildings	Eric Koh, Mike Whitcomb
Clean Energy	Crissie Manfre, Mike Whitcomb
Transportation	Mark Pace, Tim McWhirter (RV Faculty)
Public Engagement & Education	Steve Greenfield (Dean WDCE)
Climate Adaptation & Sequestration	Mike Whitcomb

MC ENERGY MANAGEMENT TEAM



MONTGOMERY COLLEGE

APPENDIX

Long Nguyen Kimmy Doung Student Services
Rockville Campus
Opening July 2020

Appendix Content

- Summary of New Buildings and Renovations Energy
- Conservation CIP, No. 816611
- Planned Lifecycle Asset Replacement CIP, No. 926659
- College Capital Renewal CIP, No. 096600
- Facility Planning CIP, No. 886686
- Collegewide Central Plant and Distribution Systems, CIP No. P662001
- Montgomery College FY 2021, Utility Projection Report, August 15, 2020
- Utility Rates, FY21-FY22, August 15, 2020
- ICEUM Utility Rates FY22
- Existing, New & Planned Measure Table
- Trash and Reciclables Data
- Space Summaries & Campus Maps

Summary of New Buildings, Renovations & Projects - RCP FY22

Year	Campus	Building Name	Gross Square Feet	Green Building Certification (1)	Features
2004	TP/SS	Health Sciences Center - New	98,038	BEPS	Classrooms, Offices, Laboratories 33 kW photovoltaic.
2006	TP/SS	Charlene R. Nunley Student Services Center - New	110,504	BEPS	Classrooms, Offices, Bookstore, Cafeteria, East Campus Central Plant, Ammonia Refrigeration, Ice Storage.
2006	GT	Goldenrod Building Purchased/Renovated	68,826	BEPS	Classrooms, Offices on 1st floor, 2nd floor leased by Montgomery County
2007	TP/SS	The Morris and Gwendolyn Cafritz Foundation Arts Center - Redevelopment	134,748	BEPS	Art Labs, Offices, Bookstore, West Campus Central Plant, Ammonia Refrigeration, Ice Storage.
2009	TP/SS	The Cultural Arts Center - New	57,243	BEPS	Performing arts studios, classrooms, Auditorium. Connection to West Campus Central Plant.
2009	TP/SS	The Commons - Renovation	30,235	BEPS	Classrooms, offices. Connection to East Campus Central Plant.
2010	TP/SS	West Garage - New	159,795	BEPS	5 level, 300+ space parking garage. High efficiency lighting, west plant ice modules installed.
2011	RV	Science Center - New	140,700	BEPS and LEED Gold Certified	Classrooms, Laboratories, Offices, satellite plant, frictionless chillers, 25 kW photovoltaic, vegetative roof.
2012	GT	Child Care Center - New	5,000	BEPS	Child care facility. Central plant connection.
2013	TP/SS	Falcon Hall	39063	BEPS	Removal of original equipment, ageing, No. 2 Oil Fueled boilers by connection to central plant hot water distribution system.
2013	TP/SS	Pavilion Four HVAC Renovation	15,837	BEPS	Major HVAC replacement, connection to central plant, removal of underground fuel oil storage tank.
2013	GT	Humanities & Social Sciences, Physical Education	75,700 & 36,770	BEPS	Replaced ageing pulse combustion boilers with high efficiency condensing boilers and new controls. New high efficiency pumps.
2013	GT	Physical Education	36,770	BEPS	Replaced original air handling system in natatorium with high performance dehumidification heat pump w/heat recovery.
2013	GT	High Technology	36,770	BEPS	Replaced ageing pulse combustion boilers with high efficiency condensing boilers and new controls
2013	RV	Parking Lot 1	N/A	BEPS	Parking lot renovation & resurfacing. New lighting design using super pulse start metal halide lighting, replaces low pressure sodium lighting.
2014-2016	TP/SS	Pavilion Three - Renovation	17,000	BEPS & LEED Gold Certified	Classrooms, computer laboratories, & offices. New envelope, lighting, HVAC, etc. Conversion from all electric heating and cooling to central plant connection.

Year	Campus	Building Name	Gross Square Feet	Green Building Certification (1)	Features
2014	GT	Bioscience Education Center – New	145,139	BEPS & LEED Gold Certified	Classrooms, Laboratories, Offices, satellite plant, ammonia refrigeration, ice storage, frictionless chiller, heat recovery. 35kW photovoltaic, 6 kW wind, vegetative roof, bio retention area.
2014	RV	Science East Building – Renovation	53,737 + 7,056	BEPS & LEED Gold Certified	Renovation & addition. Classrooms, computer laboratories, & offices. Envelope, lighting, HVAC & 20 kW photovoltaic.
2014	RV	Parking Lot 5 & 6	N/A	Lighting Replacement	Parking lot renovation & resurfacing. New lighting design using super pulse start metal halide lighting, replaces low pressure sodium lighting. Selection based upon life cycle cost analysis.
2014-2016	RV	Science West Building – Renovation & Addition	35,502	BEPS & LEED Gold Targeted	Renovation & 3rd floor addition. Classrooms, computer laboratories, offices. Envelope, lighting, HVAC, 20 kW photovoltaic.
2014-2017	CW	College-wide (CW)	N/A	PEPCO Rebate Program	Various energy upgrades, i.e. lighting, lighting controls, etc. Involves numerous College buildings.
2014-2016	TP/SS	Falcon Hall	39,063	Equipment Replacement	Major HVAC & lighting multi-year replacements. Replacing ageing HVAC equipment, connection to central plant for heating and cooling. Elimination of No. 2 Fuel Oil fired equipment and fuel oil storage tank.
2014-2016	TP/SS	Resource Center	44,906	Equipment Replacement	Major HVAC & lighting multi-year replacements. Replacing ageing HVAC equipment, connection to central plant for heating and cooling. Elimination of electrical heating and cooling systems.
2015-2016	RV	North Garage - New	N/A	BEPS & Green Parking Targets	New 918 space parking structure. Sustainable design, lighting, photovoltaic evaluation, & 20 electric vehicle charging stations.
2014-2018	GT	Student Affairs and Science (SA)	64,146 +35,502 99,648	BEPS, LEED Silver Targeted IgCC2012	Renovation of 2nd floor and addition. Classrooms, computer laboratories, dry laboratories & offices. Envelope, lighting, HVAC & evaluation of photovoltaic.
2016-2020	RV	Student Services Center – New	127,960	BEPS, LEED Gold Targeted IgCC2015	Classrooms, registration areas, counseling, security office, new high performance central hot water plant which will replace ageing central plant boilers in the existing Humanities Building central plant.
2016-2017	GT	Physical Education	N/A	Envelope Replacement	New higher performance building envelop with drainable Dryvit replacement. Retro-commissioning.
2016	RV	Parking Lot 8 & 9(Partial)	N/A	Lighting Replacement	Super Pulse Start Light retrofit
2016-2017	OC	Central Services	126,801	BEPS	Purchase & renovation of existing OC building. Consolidation of College administration functions.
2019	CW	CW	N/A	N/A	Utility bill verification process savings of $163,000.
2019	CW	CW	N/A	N/A	PJM Demand Management Program w/EnelX

Year	Campus	Building Name	Gross Square Feet	Green Building Certification (1)	Features
2019	RV	MT	11,296	N/A	Lower level replacement of controls, HVAC and Lighting.
2019	RV	Parking Lots 9	N/A	N/A	Lighting Replacement: LED Lighting w/addressable lighting controls. PEPCO incentives of $5400.
2019	CW	Central Plant & Distribution Systems Upgrade	N/A	N/A	Replacement of ageing central plant and distribution system infrastructure.
2019-2022	TP/SS	Leggett Math & Science Center(LB)	134,600	LEED Silver Targeted IgCC2012	New Math & Science building and demolition of existing Science South(SS) & Falcon Hall(FH)
2020	RV	Humanities (HU) Cooling tower	NA	NA	Replaced campus cooling tower
2021	RV	Old Student Services	(10,448)	NA	Demolition
2021	GT	High Technology and Science Center - CHW & HW Plant	75,542	NA	Plant controls upgrade
2021	GT	Paul Peck Building Academic and Innovation	68,826	BEPS	Building Automation System upgrade
2021	CW	Collegewide (CW)	NA	NA	Install and manage BTU meters in all buildings connected to each campus distribution loop.
2021	RV	MT	117,282	BEPS	BAS Upgrapde
2021	RV	MK	42,102	BEPS	BAS Upgrade

Notes

1. SEC 8-14.A Energy Performance Standards for County Buildings, which requires all count agency buildings to meet energy standards and perform energy analysis and life cycle cost. 2007 County Council legislation requires all county agency buildings to meet U.S. Green Building Council (USGBC) LEED Silver rating. Equipment replacements are based upon technical evaluation and life cycle cost analysis.

2. Lighting – All lighting involves selection of the appropriate source based upon national standards and technical evaluation of the application. Analysis is performed to determine lighting layouts and life cycle cost effectiveness.

3. Central Plant – All campuses have central heating and cooling plants which have been determined to be cost effective based upon utility planning and life cycle cost analysis. The plants contain high efficient ammonia refrigeration cooling systems with ice thermal storage for electrical demand management, co-generation/co-process equipment with heat recovery and high efficient natural gas fired boilers.

Energy Conservation: College
(P816611)

Category	Montgomery College	**Date Last Modified**	09/13/20
SubCategory	Higher Education	**Administering Agency**	Montgomery College
Planning Area	Countywide	**Status**	Ongoing

	Total	Thru FY20	Rem FY20	Total 6 Years	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	3,477	2,364	33	1,080	180	180	180	180	180	180	-
Site Improvements and Utilities	26	26	-	-	-	-	-	-	-	-	-
Construction	3,452	2,717	15	720	120	120	120	120	120	120	-
Other	163	163	-	-	-	-	-	-	-	-	-
TOTAL EXPENDITURES	**7,118**	**5,270**	**48**	**1,800**	**300**	**300**	**300**	**300**	**300**	**300**	**-**
FUNDING SCHEDULE ($000s)											
Current Revenue: General	2,870	2,141	33	696	116	116	116	116	116	116	-
Federal Aid	49	49	-	-	-	-	-	-	-	-	-
G.O. Bonds	4,148	3,029	15	1,104	184	184	184	184	184	184	-
State Aid	51	51	-	-	-	-	-	-	-	-	-
TOTAL FUNDING SOURCES	**7,118**	**5,270**	**48**	**1,800**	**300**	**300**	**300**	**300**	**300**	**300**	**-**

OPERATING BUDGET IMPACT ($000s)							
Maintenance	(3,000)	(460)	(480)	(500)	(520)	(520)	(520)
Energy	(7,860)	(1,210)	(1,260)	(1,310)	(1,360)	(1,360)	(1,360)
NET IMPACT	**(10,860)**	**(1,670)**	**(1,740)**	**(1,810)**	**(1,880)**	**(1,880)**	**(1,880)**
FULL TIME EQUIVALENT (FTE)		**2**	**2**	**2**	**2**	**2**	**2**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 22 Request	300	Year First Appropriation	FY81
Cumulative Appropriation	5,618	Last FY's Cost Estimate	7,118
Expenditure / Encumbrances	5,443		
Unencumbered Balance	175		

PROJECT 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 (Germantown, Rockville, Takoma Park/Silver Spring); and waste management studies. Typical payback on lighting, controls, HVAC and solar energy modifications is five to six years. This project includes two staff positions for a utility analyst, and mechanical engineer, which is in response to increased workload associated with the energy and utility functions, but also the design reviews of major projects, planned lifecycle asset replacements, and capital renewals, as well as complying with laws.

LOCATION

Collegewide

COST CHANGE

Cost increases due to addition of FY25 and FY26.

PROJECT 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, LEED certification, etc.

OTHER

FY21 Appropriation: Total - $300,000; $184,000 (G.O. Bonds), and $116,000 (Current Revenue: General). FY22 Appropriation: Total - $300,000; $184,000 (G.O. Bonds), and $116,000 (Current Revenue: General). The following fund transfers have been made from this project: $21,420 to Central Plant Distribution System project (#P886676) (BOT Resolution #90-102, 6/18/90); $70,000 to Fine Arts Renovation (#P906601) (BOT Resolution #94-114, 9/19/94), $7,000 to

Planned Lifecycle Asset Replacement: College
(P926659)

Category	Montgomery College	**Date Last Modified**	09/13/20
SubCategory	Higher Education	**Administering Agency**	Montgomery College
Planning Area	Countywide	**Status**	Ongoing

	Total	Thru FY20	Rem FY20	Total 6 Years	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	8,582	4,755	1,427	2,400	400	400	400	400	400	400	-
Construction	72,460	48,661	2,186	21,613	2,100	2,569	2,617	6,227	4,500	3,600	-
Other	635	513	122	-	-	-	-	-	-	-	-
TOTAL EXPENDITURES	**81,677**	**53,929**	**3,735**	**24,013**	**2,500**	**2,969**	**3,017**	**6,627**	**4,900**	**4,000**	**-**
FUNDING SCHEDULE ($000s)											
Current Revenue: General	1,940	1,940	-	-	-	-	-	-	-	-	-
G.O. Bonds	79,737	51,989	3,735	24,013	2,500	2,969	3,017	6,627	4,900	4,000	-
TOTAL FUNDING SOURCES	**81,677**	**53,929**	**3,735**	**24,013**	**2,500**	**2,969**	**3,017**	**6,627**	**4,900**	**4,000**	**-**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 22 Request	2,969	Year First Appropriation	FY93
Cumulative Appropriation	60,133	Last FY's Cost Estimate	81,646
Expenditure / Encumbrances	57,284		
Unencumbered Balance	2,849		

PROJECT 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 contract 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, and site infrastructure replacement/ improvements. Note: The Life Safety Systems project, (CIP No. P046601), has been merged into this project. This project also provides design and construction funding for the correction of life safety and fire code deficiencies identified in the Collegewide Facilities Condition Audit. The scope of this project includes the installation and/or replacement of fire alarm systems, fire sprinkler systems, smoke control systems, emergency power systems, emergency lighting systems, public address systems, and similar equipment and operations.

LOCATION

Collegewide

COST CHANGE

Costs increase to restore some reductions from the FY19-24 biennial CIP and the addition of FY25 and FY26.

PROJECT JUSTIFICATION

In November 2007 (December 2013 update), the College updated a comprehensive building system/equipment assessment, including site utilities and improvements, that identified deficiencies, prioritized replacements and upgrades, and provided 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 Update (12/13) identified a $152 million deferred maintenance backlog for the three campuses. If additional financial resources are not directed at this problem, facilities will continue to deteriorate leading to higher cost renovations or building replacements. The Collegewide Facilities Condition Audit identified various life safety concerns on all three campuses. This project allows the College to address the concerns, replacing and/or installing appropriate life safety or fire code measures, and ensuring compliance with applicable life safety, fire, and building codes. Other relevant plans and studies include the Montgomery College 2025 Strategic Plan, Collegewide Facilities Master Plan Update (6/18), and the County Council Report of the Infrastructure Maintenance Task Force (3/16).

OTHER

FY21 Appropriation: $2,500,000 (G.O. Bonds). FY22 Appropriation: $2,969,000 (G.O. Bonds).The following fund transfers have been made from this project: $47,685 to Takoma Park Child Care Center (CIP No. P946657) (BOT Resol. #93-106, #94-26 & #941-28); $185,000 to Rockville Surge Building (CIP No. P966665) (BOT Resol. #11-2291 - 1/21/97); $7,000 to Planning, Design & Construction (CIP No. P906605) (BOT Resol. #01-153); $91,175 to the Art

Capital Renewal: College
(P096600)

Category	Montgomery College	**Date Last Modified**	09/13/20
SubCategory	Higher Education	**Administering Agency**	Montgomery College
Planning Area	Countywide	**Status**	Ongoing

	Total	Thru FY20	Rem FY20	Total 6 Years	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	4,846	1,654	1,392	1,800	300	300	300	300	300	300	-
Construction	25,521	9,513	5,250	10,758	1,700	258	700	3,700	2,700	1,700	-
Other	1,079	751	328	-	-	-	-	-	-	-	-
TOTAL EXPENDITURES	**31,446**	**11,918**	**6,970**	**12,558**	**2,000**	**558**	**1,000**	**4,000**	**3,000**	**2,000**	**-**
FUNDING SCHEDULE ($000s)											
G.O. Bonds	31,446	11,918	6,970	12,558	2,000	558	1,000	4,000	3,000	2,000	-
TOTAL FUNDING SOURCES	**31,446**	**11,918**	**6,970**	**12,558**	**2,000**	**558**	**1,000**	**4,000**	**3,000**	**2,000**	**-**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 22 Request	558	Year First Appropriation	FY09
Cumulative Appropriation	20,888	Last FY's Cost Estimate	31,446
Expenditure / Encumbrances	14,979		
Unencumbered Balance	5,909		

PROJECT DESCRIPTION

This project provides funding for the capital renewal and major renovation of College facilities for new and changing College academic programs and student service operations. The major focus of this project is to support programmatic changes to College facilities and operations by allowing the College to continue an on-going building modernization effort where State aid is lacking. With this project, the College will selectively focus State aid requests on high cost projects utilizing these County funds to support an on-going renovation effort on each campus. In conjunction with programmatic improvements and modifications, this project will replace aging building systems, such as heating, air conditioning, electrical, plumbing, etc., provide furniture, fixtures, and equipment; and update facilities to current building codes and regulations.

LOCATION

Collegewide

ESTIMATED SCHEDULE

Planned renovations to the former Rockville Childcare Center and the Rockville Counseling and Advising Building will be deferred from FY22 to FY24 extending the time these buildings will be vacant.

COST CHANGE

Cost increases due to addition of FY25 and FY26 as well as a scope increase to address additional needs. FY22 and FY23 costs have been shifted to FY24 and FY25 when they are most affordable.

PROJECT JUSTIFICATION

Starting FY2009, the County approved funding several renovation projects from the Capital Renewal project. These renovation projects were less likely to receive funding from the State, and as a result five projects at that time were merged into the Capital Renewal project. In November 2007, the College updated 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 $152 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. Related studies include the Montgomery College 2025 Strategic Plan, Collegewide Facilities Condition Assessment Update (12/13), and Collegewide Facilities Master Plan Update (6/18), and Collegewide Utilities Master Plan (Pending 2019).

OTHER

FY21 Appropriation: $2,000,000 (G.O. Bonds). FY22 Appropriation: $558,000 (G.O. Bonds).

Facility Planning: College
(P886686)

Category	Montgomery College	**Date Last Modified**	09/13/20
SubCategory	Higher Education	**Administering Agency**	Montgomery College
Planning Area	Countywide	**Status**	Ongoing

	Total	Thru FY20	Rem FY20	Total 6 Years	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	8,437	6,140	177	2,120	770	270	270	270	270	270	-
TOTAL EXPENDITURES	**8,437**	**6,140**	**177**	**2,120**	**770**	**270**	**270**	**270**	**270**	**270**	**-**
FUNDING SCHEDULE ($000s)											
Current Revenue: General	8,437	6,140	177	2,120	770	270	270	270	270	270	-
TOTAL FUNDING SOURCES	**8,437**	**6,140**	**177**	**2,120**	**770**	**270**	**270**	**270**	**270**	**270**	**-**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 22 Request	270	Year First Appropriation	FY88
Cumulative Appropriation	7,087	Last FY's Cost Estimate	8,437
Expenditure / Encumbrances	6,140		
Unencumbered Balance	947		

PROJECT DESCRIPTION

This project provides funding for campus master plans, and facility planning studies for projects being considered for possible inclusion in the CIP. In addition, facility planning serves as a transition stage for a project between the master plan or conceptual stage, and its inclusion as a stand-alone project, or subproject, in the CIP. Prior to the establishment of a stand-alone project, the College develops a Facility Program/Program of Requirements (POR) that outlines the general facility purpose and need and specific features required on the project. Facility planning is a decision-making process to determine the purpose and need of a candidate project through a rigorous investigation of the following critical project elements: usage forecasts; academic requirements; investigation of non-County sources of funding; and detailed project cost estimates. This project provides for project planning and preliminary design, and allows for the development of a program of requirements in advance of the full programming of a project in the CIP, including the preparation of Part I and II documentation to meet State requirements. Depending upon the results of a facility planning determination of purpose and need, a project may or may not proceed to construction.

COST CHANGE

Cost increases due to the inclusion of an East County Expansion feasibility study in FY21 as well as the addition of FY25 and FY26 .

PROJECT JUSTIFICATION

There is a continuing need for the development of accurate cost estimates and an exploration of alternatives for proposed projects. Facility planning costs for all projects which ultimately become stand-alone PDFs are included here. These costs will not be reflected in the resulting individual project. Future individual CIP projects which result from facility planning may each reflect reduced planning and design costs. Relevant studies include the Montgomery College 2025 Strategic Plan, Collegewide Facilities Condition Assessment Update (12/13), and the Collegewide Facilities Master Plan Update(6/18).

East County is an underserved area with poor accessibility to the College's three existing campuses. The feasibility study will explore potential opportunities to expand the College into this region and which programs are most viable and meet community needs.

OTHER

FY21 Appropriation: $770,000 (Current Revenue: General). FY22 Appropriation: $270,000 (Current Revenue: General). The following fund transfers have been made from this project: $25,000 to the Information Technology: College project (CIP No. P856509) (BOT Resol. #91-56 - 5/20/91); $7,000 to Planning, Design & Construction (CIP No. P906605) (BOT Resol. #01-153 - 10/15/01); $25,000 to Planning, Design and Construction (CIP No. P804064) (BOT Resol. #02-62 - 6/17/02). The following fund transfer has been made to this project: $28,000 from the South Silver Spring Property Acquisition (CIP No. P016602) (BOT Resol. # 03-28 - 4/21/03). By County Council Resol. No. 12-6333, the cumulative project appropriation was reduced by $187,500 in FY92. By County Council Resolution No. 16-1261, the cumulative appropriation was reduced by $171,000 (Current Revenue: General) as part of the FY10 savings plan.

DISCLOSURES

Expenditures will continue indefinitely.

COORDINATION

Collegewide Facilities Master Plan Update, FY20- Utilities Master Plan Update, FY20-Facilities Condition Assessment, FY20 -- Germantown Student Services Center Part I/II as submitted to the State, FY20 - Rockville Macklin Tower Library Renovation Part I/II as submitted to the State.

Collegewide Central Plant and Distribution Systems
(P662001)

Category	Montgomery College	**Date Last Modified**	09/13/20
SubCategory	Higher Education	**Administering Agency**	Montgomery College
Planning Area	Countywide	**Status**	Preliminary Design Stage

	Total	Thru FY20	Rem FY20	Total 6 Years	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	700	100	-	600	100	100	100	100	100	100	-
Construction	7,275	375	-	6,900	900	1,400	900	1,400	900	1,400	-
TOTAL EXPENDITURES	**7,975**	**475**	**-**	**7,500**	**1,000**	**1,500**	**1,000**	**1,500**	**1,000**	**1,500**	**-**
FUNDING SCHEDULE ($000s)											
G.O. Bonds	6,000	-	-	6,000	1,000	1,000	1,000	1,000	1,000	1,000	-
State Aid	1,975	475	-	1,500	-	500	-	500	-	500	-
TOTAL FUNDING SOURCES	**7,975**	**475**	**-**	**7,500**	**1,000**	**1,500**	**1,000**	**1,500**	**1,000**	**1,500**	**-**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 22 Request	1,500	Year First Appropriation	FY20
Cumulative Appropriation	1,475	Last FY's Cost Estimate	7,975
Expenditure / Encumbrances	475		
Unencumbered Balance	1,000		

PROJECT DESCRIPTION

This project provides for the design and construction of new and renovation and expansion of existing central heating and cooling plants on the College's three campuses as recommended in the College's campus utilities master plan (12/12, and 2/13). The plan for a campus central plant, and distribution systems was included in the campus facilities master plan update (6/18). 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 chilled water distribution piping system to new and existing campus buildings.

LOCATION

Collegewide

COST CHANGE

Cost increases due to addition of FY25 and FY26.

PROJECT JUSTIFICATION

This project implements the recommendations of the campus utilities master plan (12/12, and 2/13) and campus facilities master plan update (6/18). 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, each 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. Collegewide Utilities Master Plan (Pending 2019), Montgomery College 2025 Strategic Plan, Collegewide Facilities Master Plan Update (6/18), VFA Facilities Condition Assessment (12/13).

OTHER

FY21 Appropriation: $1,000,000 (G.O. Bonds). FY22 Appropriation: $1,500,000; ($1,000,0000 (G.O. Bonds), and $500,000 (State Aid)). 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 new building construction and the planned renovation of the existing campus buildings.

DISCLOSURES

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

Montgomery College
Office of Facilities and Public Safety
FY 2021
Utility Projection Report
November 10, 2020

	ACTUAL FY2013	ACTUAL FY2014	ACTUAL FY2015	ACTUAL FY2016	ACTUAL FY2017	ACTUAL FY2018	ACTUAL FY2019	ACTUAL FY2020	PROJECTED FY2021 (1)	CONS.CHNG. FY21-22	UNIT.CHNG. FY21-22	Budget FY2022
ELECTRICITY												
kWh	41,050,962	43,235,645	45,311,646	43,841,396	45,666,695	45,591,123	44,840,029	39,813,319	46,729,582	0	46,729,582	46,729,582
Cost($)	5,362,803	5,723,494	6,043,713	5,851,152	6,145,907	5,818,653	5,825,722	4,643,061	5,397,650	0	(103,188)	5,294,462
UNIT($/kWh)	0.1306	0.1324	0.1334	0.1335	0.1346	0.1276	0.1299	0.1166	0.1155	0.1133	(0.002)	0.1133
N.GAS(Firm)												
Therms(thm)	438,338	540,878	623,522	578,337	901,391	984,484	978,263	966,161	1,050,843	(152)	1,050,843	1,050,691
Cost($)	427,246	518,208	634,288	595,355	841,973	878,158	803,071	865,624	861,691	(126)	10,509	872,074
Unit($/therm)	0.97	0.96	1.02	1.03	0.93	0.89	0.82	0.90	0.82	0.83	0.01	0.83
N.GAS(Irate)												
Therms(thm)	371,190	358,797	406,849	349,637	0	0	0	0	0	0	0	0
Cost($)	312,933	278,361	348,925	296,594	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unit($/therm)	0.84	0.78	0.86	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WATER												
kilogallons	34,530	30,903	31,565	39,857	51,634	44,572	41,442	36,762	45,702	(403)	45,702	45,299
Cost($)	242,172	226,908	253,787	373,231	524,694	454,548	449,454	398,076	494,495	(5,074)	80,864	570,285
Unit($/kgal)	7.01	7.34	8.04	9.36	10.16	10.20	10.85	10.83	10.82	12.59	1.77	12.59
SEWER												
kilogallons	25,649	22,133	22,488	30,708	38,081	33,308	32,734	31,190	35,584	(330)	35,584	35,254
Cost($)	198,861	201,888	208,906	293,011	390,213	368,591	375,309	375,831	440,530	(3,845)	(25,906)	410,779
Unit($/kgal)	7.75	9.12	9.29	9.54	10.25	11.07	11.47	12.05	12.38	11.65	(0.73)	11.65
NO.2 FUEL OIL												
Gallons(gal)	9,503	9,563	0.00	0	0	0	0	0	0	0	0	0
Cost($)	30,487	33,850	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unit($/gal)	3.21	3.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROPANE												
Gallons(gal)	2,452	2,926	3,495	2,597	1,465	3,365	1,980	1,277.9	2,000	0	2,000	2,000
Cost($)	7,341	10,279	10,558	7,137	4,661	13,197	7,829	5,190	6,000	0	2,120	8,120
Unit($/gal)	2.99	3.51	3.02	2.75	3.18	3.92	3.95	4.06	3.00	4.06	1.06	4.06
TOTAL COST($)	6,581,843	6,992,988	7,500,177	7,416,480	7,907,448	7,533,147	7,461,385	6,287,782	7,200,366	(9,171)	(35,601)	7,155,720
Wind Power	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	N/A	N/A	(11)
Total Cost	6,581,843	6,992,988	7,500,177	7,416,480	7,907,448	7,533,147	7,461,385	6,287,782	7,200,366	(9,171)	(35,601)	**7,155,720**
Approved Budget	6,940,471	7,139,046	7,613,648	7,840,755	8,009,945	8,978,960	8,714,025	7,830,311	7,467,066			7,155,720
Suplus/(Deficit)	358,628	146,058	113,471	424,275	102,497	1,445,813	1,252,640	1,542,529	266,700			
NOTES:												
1. Projections based upon 8/15/2020 Utility Rates.												
2. FY2013 Electrical includes $7,802.00, 20% Wind Power Purchase @ 0.094 cents/kWh.												
3. FY2014 Electrical includes $9,545.00 for 20% Wind Power Purchase @ $0.115 cents/kWh												
4. FY2015 Electrical includes $55,350 for 100% Wind Power Purchase @ $0.123 cents/kWh												
5. FY2016 Electrical includes $60,000 for 131% Wind Power Purchase @ 0.067 cents/kWh												
6. FY2017 Electical includes $65,000 for 136% Wind Power Purchase @0.071 cents/kWh												
7. FY2018 Electical includes $48,000 for 207% Wind Power Purchase @0.048 cents/kWh												
8. FY2019 Electical includes $48,000 for 200% Wind Power Purchase @0.048 cents/kWh												
9. FY2020 Electical includes $84,550 for 208% Wind Power Purchase @0.089 cents/kWh												
10. FY2021 Electical includes $84,550 for 208% Wind Power Purchase @0.089 cents/kWh												
11. FY2022 No Current Contract												

UTILITY RATES- MONTGOMERY COLLEGE

August 15, 2020

FY2021- FY2022

Utilities	Actual Fy19	Actual Fy20	Budget set 6/18/19 Fy21	Projected 6/6/20 Fy21	Projected 8/5/20 Fy22
Electricity	$0.1299 per kWh	$0.1168 per kWh	$0.1219 per kWh	$0.1200 per kWh	**$0.1133** per kWh
#2 Fuel Oil	no usage	no usage	no usage	no usage	no usage
Natural Gas	$0.82 per therm	$0.90 per therm	$0.78 per therm	$0.82 per therm	**$0.83** per therm
Propane	$3.95 per gallon	$4.06 per gallon	$3.95 per gallon	$3.00 per gallon	**$4.06 per gallon**
Water & Sewer	5.2% increase over Actual Fy18 $11.12/kgal	1.5% increase over Actual Fy19 $11.29/kgal	9.3% increase over Actual Fy19 $12.16/kgal	1.9% increase over Actual Fy20 $11.50/kgal	**7.9%** increase over Actual Fy20 $12.18/kgal
Notes:	Fy20- COVID-19	Fy21- 6 mo remote; 6 mo in- class		Fy22- full in-class	

1. All Utilities except w/s:Unit Cost includes Energy Tax rates set by Montgomery County Council on 5/22/14 and left unchanged May 2015 through May 2020. May 2021 unknown at this time.

2. 2.5% increase (in electricity) to cover charges such as:.
   a.WGLEnergy- PJM- FERC Bal Cong charge- eff 6/1/17;TEC resettlement eff 6/1/18; Incl in Supply rate Fy21
   b.PEPCO- Distribution- rate decrease effective 6/1/18; increase effective 8/13/19; No PSC case pending
   c.PEPCO- Empower- Rate decreased January 2017-2020; Pending Fall 2020 action by PSC
   e.PEPCO- monthly changes in Bill Stabilization Adjustment
   f. Washington Gas- STRIDE (System Improvement fee) increase February 2019; No PSC case pending.
   g.Washington Gas- Empower- rate decrease 1/30/19 and 12/30/19 increase; No PSC case pending
   h. Washington Gas- Distribution rate increases effective 12/11/18 and 10/15/19; No PSC case pending.
   i. Washington Gas- Monthly changes in Distribution Charge Adjustment

3. 200% Renewable Energy Certificates (RECs) wind energy in Fy20/Fy21; No decision for Fy22.

4. Electricity- Supply Contract rate decreases effective 2/2017 thru Fy21; Fy22 change to wholesale market

5. Natural Gas- Supply Contract decreases effective 6/2016 thru 6/30/22;

6. Water/Sewer- WSSC- 5.0% increase in Fy20; 6% increase in Fy21; 7.0 increase (est) for Fy22
   City of Rockville- water- increase of 5.0% in Fy20; 0.0% in Fy21; 7.0% (est) in Fy22;
   sewer- increase of 6.5% in Fy20; 0.0% in Fy21; 8.0 % (est) in Fy22

7. Oil/Propane- No oil used. Propane based upon commodity futures

ICEUM Utility Rates

The Interagency Committee on Utilities Management (ICEUM). ICEUM is responsible for coordinating County government energy conservation efforts, promoting energy efficiency, sharing information among agencies, providing technical assistance, and cooperating on the planning and implementation of energy conservation measures and coordinate energy and utility issues in County Government., established by County Council Resolution 10-167, 1983.

Projected FY2022 - UTILITY RATES - ICEUM- December 2020

AGENCY:	Montgomery College	WSSC	M-NCPPC	MCPS	DGS	Range:
Utilities						
Electricity $ per kWh	0.1133	**0.0895**	0.1140	0.1125	**0.1170**	0.0895 - 0.1170
#2 Fuel Oil $ per gal	**N/A**	2.22	**3.77**	2.50	2.80	2.22 - 3.77
Natural Gas $ per therm	**0.83**	0.93	**1.15**	0.89	0.90	0.83 - 1.15
Propane $ per gal	**4.06**	4.00	1.82	**1.75**	3.58	1.75 - 4.06
Water &	12.18	**N/A**	13.05	12.80	**19.83**	12.18 - 19.83
Sewer $ per kgal						

WSSC Notes
1. Level load profile (similar to industrial)
2. Wholesale PJM sub account procurement
3. PJM account holder (Direct Energy) REC charges to meet MD RPS are passed through at cost; costs are less than what WSSC would pay separately.

DGS Notes
1. Majority of DGS Facilities are Tier 4 WSSC

Exisiting Measures

Resource conservation measures implemented prior to FY 2021 (FY 1998 TO FY 2020)

Measures	Date Implemented (mo/yr)	Cumulative Cost ($)	Annual Net Impact On Maintenance Cost ($)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cumulative Cost Savings ($)
Lighting	Various	411,000	(14,000)	Electricity	1,438,423 kWh Maint.	221,668 14,000
HVAC & Controls	Various	1,268,000	(35,200)	Elect. & N. Gas	917,307 kWh 85,787 therms (Th) Maint.	89,867 97,220 35,200
New Building Design	Various	2,244,000	(29,835)	Elect. & N. Gas	2,160,156 kWh 72,803 Th Maint.	287,777 68,544 29,835
Central Plant Technology	Various	918,000	(32,640)	Elect. & N. Gas	983,155 kWh 20,267 Th Maint.	129,284 19,457 32,640
Total		4,841,000	(111,675)		5,499,041 kWh 178,857 Th	1,025,492 Av.Payback 4.7 yrs
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.						

New Measures

Resource conservation measures implemented during FY 2021 (July 1, 2020 through June 30, 2021)

Measures	Date Implemented (mo/yr)	Cumulative Cost ($)	Annual Net Impact On Maintenance Cost ($)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cumulative Cost Savings ($)
Lighting	Various	18,000	(1,000)	Elect.	32,000 kWh	4,480 1,000
HVAC	Various	18,000	(1,500)	Elect. & N. Gas	10,000 kWh, 16,000 Th Maint.	 1,400 5,600 1,500
Controls	Various	9,000	(1,700)	Elect. & N. Gas	10,000 kWh 800 Th Maint.	 1,400 720 1,700
Total		45,000	(4,200)			17,800
Simple Payback						2.5 yrs

New measures consist of Lighting, HVAC & Controls, which reduce energy cost, reduce energy consumption and reduce maintenance costs.
Participation in the PEPCO rebate program for FY 2020 - FY 2021 will supplement College funds.

Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 2021 (July 1, 2021 through June 30, 2022)

Measures	Date Implemented (mo/yr)	Cumulative Cost ($)	Annual Net Impact On Maintenance Cost ($)	Fuel Type Affected And Units	Units Saved Per Year	Annual Cumulative Cost Savings ($)
Capital Improvement Projects:						
Lighting	Summer 2020	20,000	(1,000)	Elect., 	50,000 kWh 1,000 Th Maint.	 7,000 1,500 2,000
HVAC	Summer 2020	45,000	(2,000)	Elect. & N. Gas	10,000 kWh 14,000 Th Maint.	 1,400 4,900 2,000
Controls	Fall 2020	10,000	(1,500)	Elect. & N. Gas	8,500 kWh 600 Th Maint.	 1,190 210 1,500
Total		75,000	0			22,690
Simple Payback						3.3 yrs

Space Summaries & Campus Maps Revisions

SUMMARY SPACE SUMMARY
TOTAL COLLEGE
For FY 2022 RCP
332.8 Acres
51 Buildings
4 Leased Buildings

Campus		Gross Square Feet (GSF)	Net Assignable Square Feet (NASF)	Bldg
Germantown		514,219	328,731	11
Rockville		1,113,008	709,052	23
Takoma Park/Silver Spring		575,284	363,314	13
	Total	2,202,511	1,401,097	47
TP East Garage		224,310	1,815	1
TP West Garage		159,795	1,369	1
RV North Garage		308,400	2,508	1
	Total w/garages	2,895,016	1,406,789	50
Off Campus Space (CT)		126,801	61,833	1
Leased Space		107,394	34,809	4
	Total	**3,129,211**	**1,503,431**	**55**

Takoma Park/Silver Spring Campus

SPACE SUMMARY
TAKOMA PARK/SILVER SPRING CAMPUS
For FY 2022 RCP
19.5 Acres
15 Buildings
1,656 Parking Spaces

without East and West Garage: 575,284 GSF 363,314 NASF

with East and West Garage: 959,389 GSF NASF

Building	Gross Square Feet (GSF)	Net Assignable Square Feet (NASF)
CATHERINE F. SCOTT COMMONS	30,354	16,606
CHARLENE R. NUNLEY STUDENT SERVICES CENTER	110,504	65,497
CULTURAL ARTS CENTER	57,243	28,389
HEALTH SCIENCES CENTER	98,038	63,689
MATHEMATICS PAVILION	6,942	4,255
MORRIS & GWENDOLYN CAFRITZ FOUNDATION ARTS CENTER	134,748	90,721
NORTH PAVILION	6,942	4,337
PAVILION FOUR	15,873	8,549
PAVILION ONE	7,386	4,468
PAVILION THREE	15,013	10,901
PAVILION TWO	7,385	4,767
RESOURCE CENTER	44,906	34,650
SCIENCE NORTH	39,950	26,484
Subtotal	**575,284**	**363,314**
WEST GARAGE	159,795	1,369
EAST GARAGE	224,310	1,815
Total	**959,389**	**366,498**

Notes:

Falcon Hall and Science South will be demolish in April 2020.
Leggett Building will open in June 2022

Proposed New Buildings

CATHERINE AND ISIAH LEGGETT MATH AND SCIENCE BUILDING	108,238	68,318

Special Facilities/Systems

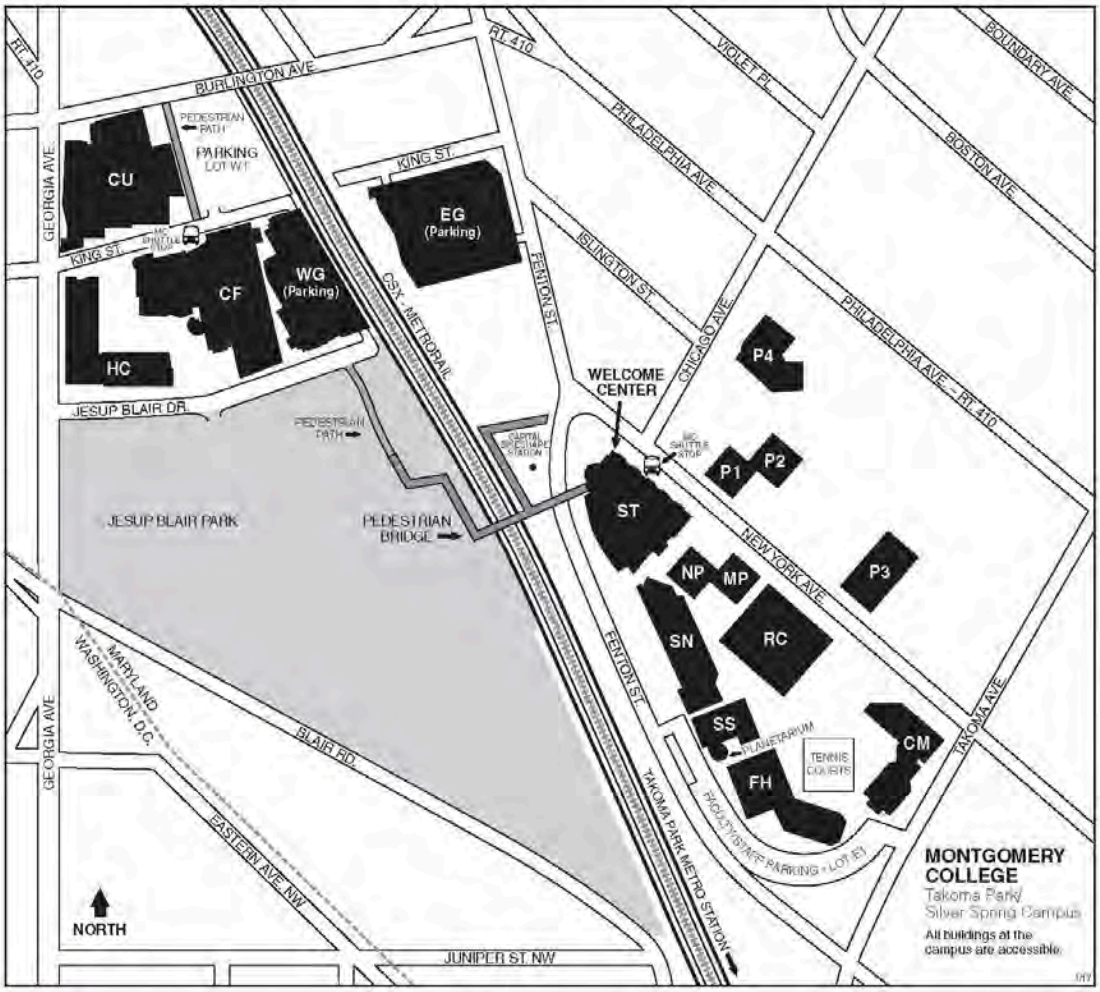
Indoor Swimming Pool
Central Heating and Cooling Plant with ice thermal storage and co-generation system Solar Photovoltaic System for electric power generation

Energy Utilities

Electricity, Wind Energy Purchase
Natural Gas
Solar Energy
Propane

MONTGOMERY COLLEGE

Takoma Park/Silver Spring Campus and Vicinity



MONTGOMERY COLLEGE

Takoma Park/Silver Spring Campus

7600 Takoma Avenue
Takoma Park, MD 20912
240-567-1300; TTY 301-587-7207

montgomerycollege.edu

For updates to campus maps, visit montgomerycollege.edu/maps

Legend of Campus Buildings

(as of January 2017)

- CF The Morris and Gwendolyn Cafritz Foundation Arts Center
  - *Art store/food options*
  - *Educational Opportunity Center*
  - *Refugee Training Center*
  - *Workforce Development & Continuing Education (WD&CE)*
- CM Catherine F. Scott Commons
- CU Cultural Arts Center
- EG East Garage (parking)
- FH Falcon Hall
  - *Physical Education*
- HC Health Sciences Center
- MP Mathematics Pavilion
- NP North Pavilion
- P1 Pavilion One
- P2 Pavilion Two
- P3 Pavilion Three
- P4 Pavilion Four
- RC Resource Center
- SN Science North Building
- SS Science South Building
  - *Planetarium*
- ST Charlene R. Nunley Student Services Center
  - *Cafeteria*
  - *Enrollment Services*
  - *Financial Aid Office*
  - *School Stores*
  - *Public Safety Office*
  - *Student Life Office*
  - *Welcome Center*
- WG West Garage (parking)

Rockville Campus

SPACE SUMMARY
ROCKVILLE CAMPUS
For FY 2022 RCP
84.6 Acres
23 Buildings
4,096 Parking Spaces

without North Garage:	1,113,008 GSF	709,052 NASF
with North Garage:	1,421,408 GSF	711,560 NASF

Building	Gross Square Feet (GSF)	Net Assignable Square Feet (NASF)
CAMPUS CENTER	74,302	50,735
CANOE TRAILER SHED	420	377
CHILD CARE CENTER	2,498	2,350
COMPUTER SCIENCE	20,862	14,581
COUNSELING AND ADVISING BUILDING	17,696	9,890
GORDON AND MARILYN MACKLIN TOWER	117,282	80,064
HOMER S. GUDELSKY INSTITUTE FOR TECHNICAL EDUCATION	64,000	41,635
HUMANITIES BUILDING	73,912	48,822
INTERIM TECHNICAL TRAINING CENTER	9,360	7,871
MAINTENANCE SHOP	4,720	4,220
MANNAKEE BUILDING	42,102	33,880
MUSIC BUILDING	21,050	10,526
PAUL PECK ART BUILDING	25,594	15,809
PHYSICAL EDUCATION CENTER	84,949	62,444
ROBERT E. PARILLA PERFORMING ARTS CENTER	28,000	16,493
SCIENCE CENTER	143,266	84,592
SCIENCE CENTER EAST	61,011	33,427
SCIENCE CENTER WEST	70,508	42,153
SOUTH CAMPUS INSTRUCTION BUILDING	29,900	18,059
SOCCER FIELD CONCESSION BUILDING	2,675	0
LONG NGUYEN KIMMY DUONG STUDENT SERVICES CENTER	127,960	70,960
TECHNICAL CENTER	55,908	39,012
THEATRE ARTS BUILDING	35,032	21,150
Subtotal	**1,113,008**	**709,052**
NORTH GARAGE	308,400	2,508
Total	**1,421,408**	**711,560**

Notes:

Science Center now connected to the renovated Science Ceneter West by a covered bridge.
Science East was connected to Science Center in 2011.

Proposed Demolition		
STUDENT SERVICES BUILDING	10,448	7,374

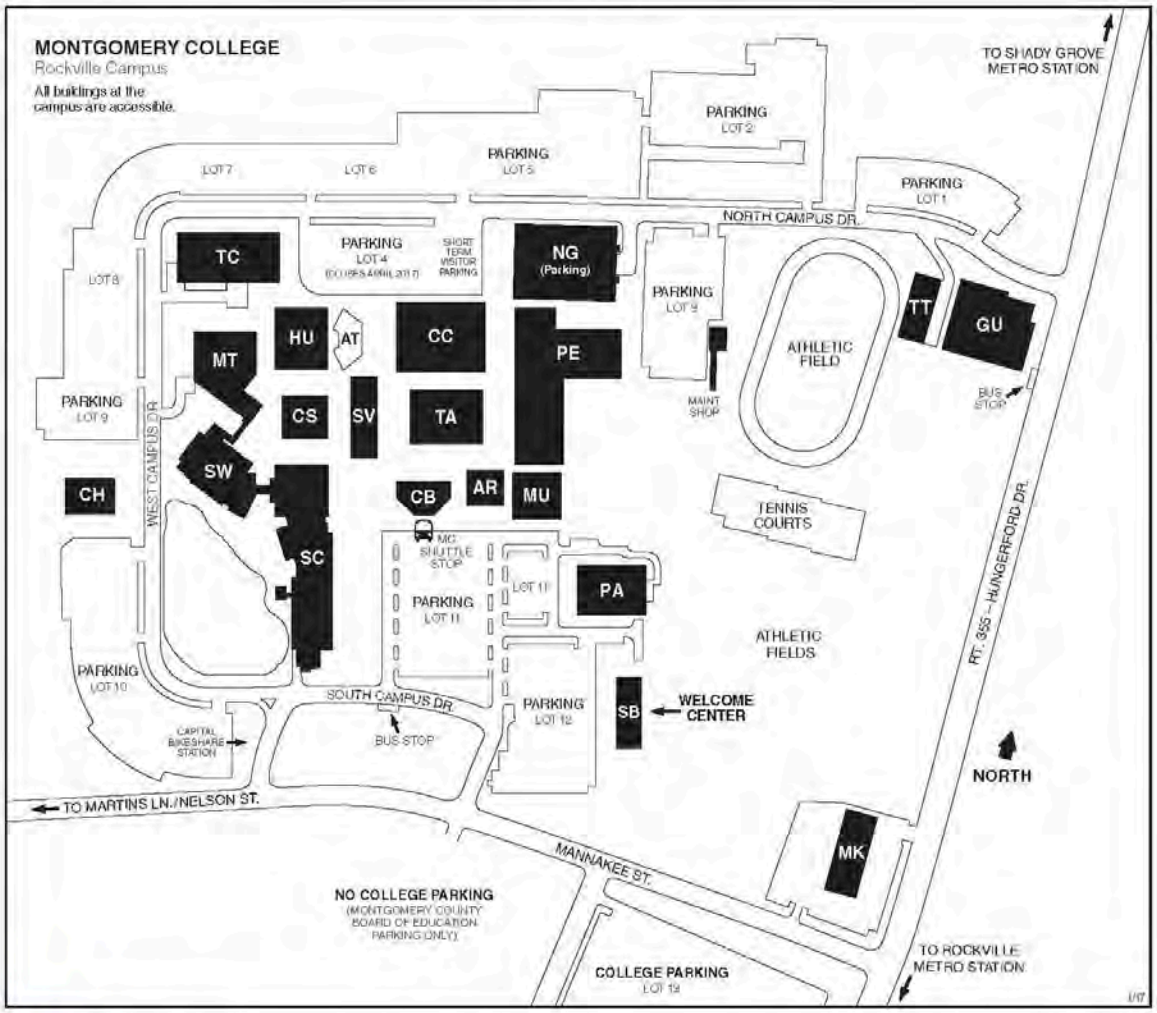
Special Facilities/Systems

Indoor Swimming Pool
Central Heating and Cooling Plant with ice thermal storage and co-generation system Solar Photovoltaic System for electric power generation

Energy Utilities

Electricity, Wind Energy Purchase
Natural Gas
Solar Energy
Propane

MONTGOMERY COLLEGE
Rockville Campus



MONTGOMERY COLLEGE

Rockville Campus

51 Mannakee Street
Rockville, MD 20850
240-567-5000; TTY 301-294-9672

montgomerycollege.edu

For updates to campus maps, visit montgomerycollege.edu/maps

Legend of Campus Buildings
(as of January 2017)

- AR Paul Peck Art Building
- AT Amphitheatre
- CB Counseling and Advising Building
  - *Public Safety Office*
- CC Campus Center
  - *Bookstore*
  - *Cafeteria*
  - *Student Life Office*
  - *Workforce Development & Continuing Education Office (WD&CE)*
- CS Computer Science Building
- CH Child Care
- GU Homer S. Gudelsky Institute for Technical Education
- HU Humanities Building
- MK Mannakee Building
- MT Gordon and Marilyn Macklin Tower
  - *Library*
- MU Music Building
- NG North Garage (parking)
- PA Robert E. Parilla Performing Arts Center
- PE Physical Education Center
- SB South Campus Instruction Building
  - *Welcome Center*
- SC Science Center
- SV Student Services Building
  - *Enrollment Services*
  - *Financial Aid Office*
- SW Science Center West
- TA Theatre Arts Building
- TC Technical Center
- TT Interim Technical Training Center

Note: Parking Lot 4 closes April 2017.

Germantown Campus

SPACE SUMMARY
GERMANTOWN CAMPUS
For FY 2022 RCP
228.7 Acres (Includes 20271 Goldenrod Lane Property)
11 Buildings
1,656 Parking Spaces

Toal: 514,219 GSF 328,739 NASF

Building	Gross Square Feet (GSF)	Net Assignable Square Feet (NASF)
BASEBALL SHED	210	170
BIOSCIENCE EDUCATION CENTER	139,985	80,658
CHILD CARE CENTER	5,535	3,565
GREENHOUSE	4,562	4,390
GROUNDS AND AUTO STORAGE	7,201	6,977
HIGH TECHNOLOGY AND SCIENCE CENTI	75,542	42,673
HUMANITIES AND SOCIAL SCIENCES BUI	75,700	52,234
PAUL PECK BUILDING ACADEMIC AND INNOVATION BUILDING	68,826	52,534
PHYSICAL EDUCATION BUILDING	36,770	29,338
STUDENT AFFAIRS AND SCIENCE	99,648	55,991
TENNIS STORAGE SHED	240	201
Total	**514,219**	**328,731**

Notes:

Proposed New Buildings

Student Services Center	153,660	87,586

Special Facilities/Systems

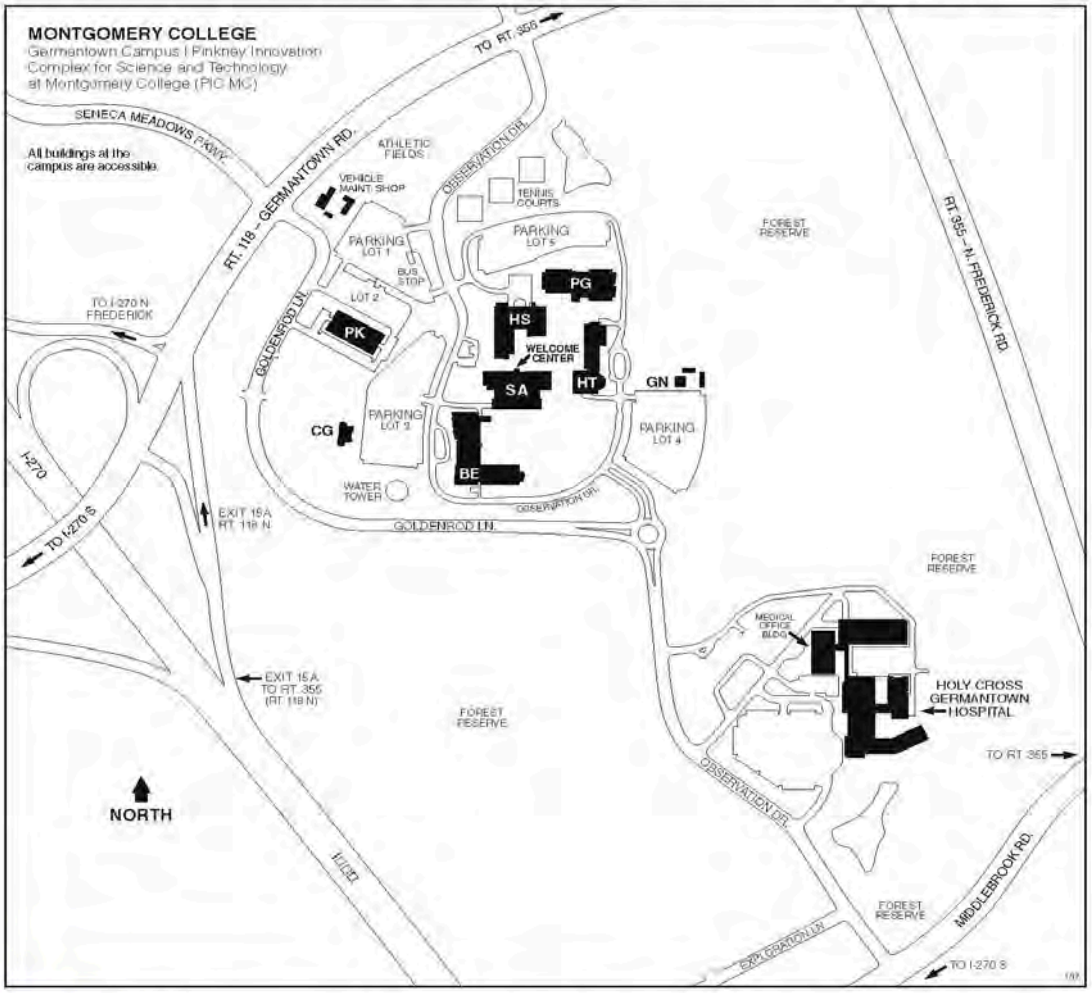
Indoor Swimming Pool
Central Heating and Cooling Plant with ice thermal storage and co-generation system Solar Photovoltaic System for electric power generation

Energy Utilities

Electricity, Wind Energy Purchase
Natural Gas
Solar Energy
Propane

MONTGOMERY COLLEGE

Germantown Campus | Pinkney Innovation Complex for Science and Technology (PIC MC)



MONTGOMERY COLLEGE

Germantown Campus | Pinkney Innovation Complex for Science and Technology at Montgomery College (PIC MC)

20200 Observation Drive
Germantown, MD 20876-
240-567-7700

montgomerycollege.edu

For updates to campus maps, visit montgomerycollege.edu/maps

Legend of Campus Buildings
(as of January 2017)

- **BE** Bioscience Education Center
  - *Conference Center*
- **CG** Child Care Center
  - *Center for Early Education (CEE)*
- **GN** Greenhouse
- **HS** Humanities and Social Sciences Building
  - *Cafeteria*
  - *Library*
  - *School Stores*
  - *Workforce Development & Continuing Education (WD&CE)*
- **HT** High Technology and Science Center
  - *Globe Hall*
- **PG** Physical Education Building
- **PK** Paul Peck Academic and Innovation Building
  - *Germantown Innovation Center*
- **SA** Science and Applied Studies Building
  - *Counseling and Advising*
  - *Enrollment Services*
  - *Financial Aid Office*
  - *Public Safety Office*
  - *Student Life Office*
  - *Welcome Center*

SPACE SUMMARY
LEASED AND OFF-CAMPUS SITES
For FY 2021 RCP

Total: 992,821 GSF 645,465 NASF

Building	Gross Square Feet (GSF)	Net Assignable Square Feet (NASF)	User	Original Occ Date	Leased Term	Expiration Date
Wesflied South 11002 Vers Mill Rd. Silver Spring, MD 20902	13,678	9,886	WDCE	36,373	24 years	44,610
Gaithesburg Business Trainning Ctr. 12 S. Summit Ave., Gaithesburg, MD 20877	14,747	11,293	WDCE	37,104	18 years	43,677
Central Warehouse 7602 Standish Pl., Rockville, MD 20877	10,866	9,766	Procurement, IT, Facilities	39,845	10 years	tbd
Training) 14 Firstfield Road, Gaithesburg, MD 20878	64,273	0	WDCE	37,391	12 years	tbd
Central Services 9221 Corporate Blvd, Rockville, MD 20850	126,801	61,833	Central Services	42,794	N/A	Owned by College
Total	**230,365**	**92,778**				

Notes:

WDCE = Workforce Development & Continuing Education
CT has 360 Parking Space

Energy Utilities
Electricity, Wind Energy Purchase
Natural Gas

Resource Conservation Plan

Fiscal Year 2022

Maryland-National Capital Park and Planning Commission

Montgomery County Department of Parks

Montgomery County Planning Department

January 28, 2021

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Introduction

The Maryland-National Capital Park and Planning Commission (M-NCPPC) in Montgomery County is responsible for the acquisition, development, and management of more than 37,000 acres of parkland, providing residents and visitors with a diverse array of recreational and leisure-time opportunities/activities; clean, safe and accessible facilities; meaningful educational opportunities; and dedication to open space and habitats for conservation and stewardship of our County's precious natural resources.

Developed by the Sustainability Office in the Facilities Management Division of the M-NCPPC Department of Parks, the Resource Conservation Plan report presents the accomplishments of the implemented energy and water-related efficiency projects/initiatives as of December 2020 and the projected plans for the balance FY21. The report also establishes strategies for FY22 to conserve energy and water resources as part of a comprehensive approach to resource management. The Resource Conservation Plan is developed to align with the M-NCPPC – Montgomery County Sustainability Plan, approved and currently implemented for FY20 - FY21.

Due to the COVID-19 pandemic, while work has continued at the Commission, operational changes to promote the health and safety of staff has impacted work programs for FY20 and FY21. Through the pandemic, staff have worked diligently to continue operations as seamless as possible in delivering on the mission of the organization to the community for which it serves.

In 2020, M-NCPPC Montgomery County opened the first government-owned office building that is to be certified LEED Platinum in the State of Maryland. This facility boasts numerous sustainable features including solar panels, high-efficiency fixtures and appliances, advanced insulation and daylighting, a green roof, geothermal heating and cooling, stormwater retention practices, and community walkability/access to public transit. This facility will provide office space for the M-NCPPC Park and Planning Commission as well as a number of other Montgomery County government functions.

The significant and serious challenges posed by global climate change led to the passage of the Montgomery County Council Emergency Climate Mobilization resolution (Resolution 18-974) in 2017. This resolution brought forth accelerated greenhouse gas reduction goals county-wide, calling for an 80% reduction in greenhouse gas emissions by 2027 and 100% elimination by 2035. M-NCPPC – Montgomery County is committed to acting responsibly and collaboratively with all local government agencies, organizations, community members, and other stakeholders toward achievement of these reduction goals. Working together will be critical to our success in battling climate change and ensuring a healthy and safe environment for future generations.

A county-wide Climate Action Plan will serve as the strategic framework for establishing the recommended actions needed to achieve the greenhouse gas reduction goals. Currently in development with input from agencies, organizations, and the public, the final Climate Action Plan will be issued in the spring/summer of 2021. M-NCPPC – Montgomery County is motivated to utilize the final Climate Action Plan as strategic guidance in reducing the carbon footprint of the organization.

In the spirit of collaborative work county-wide, the M-NCPPC Department of Parks participates in the Interagency Committee on Utilities Management (ICEUM) and works with numerous other participating agencies to share information and ideas on energy conservation, energy efficiency and other conservation measures related to utility consumption by the individual organizations. This committee meets regularly throughout the calendar year. Annually, the Committee compiles projected unit cost per utility data for each agency. While several factors impact utility unit costs for each agency, including differences in tariffs, account-type and volume pricing differences, and other factors, it is a valuable exercise to assist with the budgeting process. Utility unit cost projections for FY22 have been included on page 28 of this document for each of the participating agencies in ICEUM.

Utility Cost and Projections

The Department of Parks and the Planning Department established a comprehensive utilities management program beginning in July 2003. Utility resource consumption has been reduced as a result of the projects and programs implemented by Commission staff. M-NCPPC manages a utility program consisting of over 500 utility meters across the county (water, sewer, electricity, natural gas, propane, oil).

Beginning in 2019, significant work to verify all utility meter locations and associated accounts was initiated. This process should help address meter and account validation which will lead to reduction in billing errors across the system.

Utility Cost and Projections FY16 to FY22

The actual utility costs for FY16 through FY20, the budgeted utility costs for FY21, and the proposed FY22 budget are noted in the table below. Utility costs for the new Wheaton Headquarters building have been factored into the FY21 budget and onward.

	FY16 Actual	FY17 Actual	FY18 Actual	FY19 Actual	FY20 Actual	FY21 Budget	FY22 Proposed Budget
PARKS DEPARTMENT	$1,719,843	$1,880,681	$1,989,338	$2,298,460	$1,857,023	$2,284,322	$2,263,077
PLANNING DEPARTMENT	$206,349	$185,092	$183,332	$193,786	$146,595	$52,897	N/A
ENTERPRISE	1,144,540	$1,027,069	$948,832	$852,379	$781,438	$965,900	$910,186
PROPERTY MANAGEMENT	$14,973	$16,192	$29,957	$31,108	$35,636	$35,700	$35,700
BI-COUNTY	$80,777	$73,761	$71,996	$73,844	$64,120	$82,464	$84,776
WHEATON HQ	N/A	N/A	N/A	N/A	N/A	$764,659	$764,659
TOTAL:	**$3,166,482**	**$3,182,795**	**$3,223,455**	**$3,449,577**	**$2,884,811**	**$4,185,942**	**$4,058,398**

Data obtained from M-NCPPC General Ledger and includes renewable energy credits (RECs) beginning FY19 forward

Utility Cost and Projections FY21

The current estimate for utility costs, as of January 4, 2021, for the following Funds within the Department of Parks, Planning Department, and the shared Bi-County are depicted below. A projection for the fiscal year and approved FY21 budget are also included.

	FY21 Cost as of 1/4/2021	FY21 Projection	Budget FY21
PARKS DEPARTMENT	$763,021	$1,995,254	$2,284,322
PLANNING DEPARTMENT	$51,341	$56,924	$52,897
ENTERPRISE	$379,625	$825,886	$965,900
PROPERTY MANAGEMENT	$21,103	$39,032	$35,700
BI-COUNTY	$28,272	$73,100	$82,464
WHEATON HQ	$108,162	$660,000	$764,659
TOTAL:	**$1,351,523**	**$3,650,195**	**$4,185,942**

Data obtained from M-NCPPC General Ledger
FY21 Cost includes renewable energy credit (REC) costs

The following table shows, per commodity, utility consumption and cost as of January 4, 2021. The cost projection depicted is for FY21. Utility consumption and cost data for each commodity is obtained from the General Ledger as well as the M-NCPPC EnergyCAP (ECAP) system.

FY21 Consumption as of 1/4/2021	Units	Utility	FY21 Cost as of 1/4/2021	Projection	Budget FY21
5,888,024	KWH	Electric	$726,640	$1,873,700	$2,613,965
75,480	THERMS	Natural Gas	$67,484	$335,800	$365,728
8,719	GAL	Propane	$14,152	$186,000	$191,000
33,936	KGAL	Water/Sewer	$413,304	$920,200	$960,960
~150*	GAL	Heating Oil (#2)	$519	$9,400	$9,400
1,446,949	KWH	Solar PV	$105,658	$280,000	$0**
15,500	REC	Wind REC	$13,795	$13,795	$13,589
N/A	N/A	Other Utilities***	$9,971	$31,300	N/A
		TOTAL:	**$1,351,523**	**$3,650,195**	**$4,185,942**

*The volume of heating oil purchased was not posted to EnergyCAP and has been estimated for this report
**FY21 Budget for Solar PV is nested in the electric budget
***The "Other Utilities" category includes those utility costs incurred at facilities shared with other entities

The following table shows the solar energy produced and cost per the power purchase agreements for the two solar fields located at Rock Creek Regional Parks and South Germantown Recreational Park.

Location	Metric	FY19	FY20	FY21 as of 12/21/20
Rock Creek Regional Park	Production	1,506,646 kWh	1,756,284 kWh	753,102 kWh
	Cost	$106,686	$127,592	$54,703
[redacted]				
South Germantown Recreational Park	Production	1,736,005 kWh	2,006,199 kWh	693,848 kWh
	Cost	$125,806	$147,709	$50,995

Data obtained from M-NCPPC EnergyCAP

Utility Cost and Consumption Changes FY21

Facility renovations, upgrades, and improvements of existing locations and parks included in the FY21 approved budget that will increase utility costs, resulting in operating budget impact across both the Department of Parks and the Planning Department, are shown in the tables below.

FY21 Utility Cost Changes – Operating Budget Impact – Montgomery Parks		
FY21 Adopted Budget	**Amount**	**Comment**
Columbia Local Park	$240	Water Fountain
Josiah Henson Historic Park	$10,000	Adds balance of funding; $7,083 for electric; $2,917 for water/sewer
Ken-Gar Palisades Park	$10,820	Water – Irrigation System
Total:	**$21,060**	

FY21 Utility Cost Changes – Operating Budget Impact – Wheaton HQ ISF – Montgomery Parks/Montgomery Planning/Montgomery County		
FY21 Adopted Budget	**Amount**	**Comment**
Wheaton Headquarters	**$764,659**	$578,679 for electric; $185,980 for water/sewer

Utility Cost and Consumption Changes FY22

Facility renovations, upgrades, and improvements of existing locations and parks included in the FY22 proposed budget that will increase utility costs, resulting in operating budget impact across both the Department of Parks and the Planning Department, are shown in the tables below.

FY22 Utility Cost Changes – Operating Budget Impact – Montgomery Parks		
FY22 Proposed Budget	**Amount**	**Comment**
Martin Luther King Recreational Park - Irrigation	$5,410	Water for irrigation
Northwest Branch Ballfields Irrigation	$8,500	Water for irrigation
Piedmont Woods Local Park	$1,300	Water for drinking fountain; Parking lot lights
Total:	**$15,210**	

FY22 Utility Cost Changes – Operating Budget Impact – Wheaton HQ ISF – Montgomery Parks/Montgomery Planning/Montgomery County		
FY22 Proposed Budget	**Amount**	**Comment**
Wheaton Headquarters	**$764,659**	$528,679 for electric; $50,00 for gas; $185,980 for water/sewer

Renewable Energy Resources

With the accelerated greenhouse gas reduction targets passed in 2017 (Montgomery County Council Resolution 18-974), a greater focus on local renewable energy generation has taken priority. However, purchase of renewable energy certificates (REC) has also served an important role in supporting the renewable energy market and the renewable energy portfolio for M-NCPPC – Montgomery County for many years.

Renewable Energy Certificate Purchase

M-NCPPC is committed to a clean energy purchase policy and for each year since FY16, M-NCPPC – Montgomery County has purchased wind-based renewable energy certificates (REC) equal to 100% of the total electricity consumption for the organization. The below table outlines historical wind REC purchase details for the organization since FY16.

Renewable Energy Certificate Purchase – M-NCPPC - Montgomery County					
Fiscal Year	**REC Volume**	**Cost per REC**	**Total Cost**	**Vendor**	**Contract**
16	52,000*	$0.67	$34,840.00	Renewable Choice Energy	Montgomery County
17	52,000*	$0.71	$36,920.00	Renewable Choice Energy	Montgomery County
18	54,300**	$0.48	$26,064.00	Renewable Choice Energy (Schneider Electric)	Montgomery County
19	54,000**	$0.48	25,920.00	Renewable Choice Energy (Schneider Electric)	Montgomery County
20	15,500	$0.89	$13,795.00	Schneider Electric	Montgomery County
21	15,500	$0.89	$13,795.00	Schneider Electric	Montgomery County

*Agency-wide purchase to include both M-NCPPC Montgomery & Prince George's Counties

**Program overcommitment

Solar Panel Installation

A major effort to reduce organizational greenhouse gas emissions includes transition to local renewable energy generation to support the energy needs of operating the Department of Parks and the Planning Department.

To add to the growing portfolio of solar photovoltaic (pv) installations on parkland, between FY20 - FY21, a 17.4 kW rooftop solar pv system was installed at Maydale Nature Classroom located within Maydale Conservation Park. This site is Montgomery Parks' first facility designed to be net-zero. The solar panels powering this building are one part of a larger effort to incorporate sustainable building design and practices at this site.

Pictured Left: Maydale Nature Classroom building profile Pictured Right: Maydale Nature Classroom solar rooftop array

The main building structure for this facility is a repurposed double-wide trailer that was once used for staff offices at a different location. By repurposing this structure, Montgomery Parks was able to keep about 24,000 lbs. of material from entering the waste stream. The building also features a rainwater harvesting system used for toilet flushing, low-flow toilets and sinks for water conservation, interior and exterior high-efficiency LED lighting, and installation of a trombe wall that provides passive heating.

Between FY20 – FY21, a small scale 1.8 kW rooftop solar pv system was installed on top of a restroom facility at Black Hill Regional Park. This system will provide heat and power for the restrooms which operate year-round.

To further reduce the environmental footprint of this facility, an underground rainwater harvesting system was also installed at this site. Rainwater is collected off the roof of the restroom facility and is utilized for toilet flushing.

Pictured Left: Solar panels on restroom building at Black Hill Regional Park

Energy Utilization & Consumption Allocations

The total square footage of conditioned buildings/facilities that consume electricity and natural gas are as follows:

TOTAL CONDITIONED BUILDING SQ.FT.						
Energy	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**
Electric	1,145,150	1,145,150	1,145,150	1,145,150	1,145,150	1,203,409
Natural Gas	482,170	482,170	482,170	482,170	482,170	545,049

Values currently under review and subject to change

FY21 values include the addition of M-NCPPC-controlled square footage at Wheaton HQ and removes Parkside HQ, Hillandale Offices and Montgomery Regional Office (MRO)

The energy consumption for FY17, FY18, FY19, FY20, and estimated figures for FY21 and FY22 are as follows:

TOTAL ENERGY CONSUMPTION						
Energy	**FY17**	**FY18**	**FY19**	**FY20**	**FY21 Projection**	**FY22 RECOMMENDATION**
Electric - kWh	14,240,045	14,916,755	14,635,012	11,770,351	16,320,285	19,010,976
Natural Gas - therms	306,052	293,530	287,277	248,144	296,135	337,671

ENERGY CONSUMPTION - FACILITIES						
Energy	**FY17**	**FY18**	**FY19**	**FY20**	**FY21 Projection**	**FY22 RECOMMENDATION**
Electric - kWh	10,140,045	10,529,775	10,390,859	8,356,949	11,587,402	13,497,793
Natural Gas - therms	306,052	293,530	287,277	248,144	296,135	337,671

ENERGY CONSUMPTION - ATHLETIC FIELDS & EXTERIOR POLE LIGHTS						
Energy	**FY17**	**FY18**	**FY19**	**FY20**	**FY21 Projection**	**FY22 RECOMMENDATION**
Electric - kWh	4,100,000	4,387,000	4,244,153	3,413,402	4,732,883	5,513,183

Data from FY17, FY18, FY19, and FY20 are obtained from the M-NCPPC EnergyCAP (ECAP) system

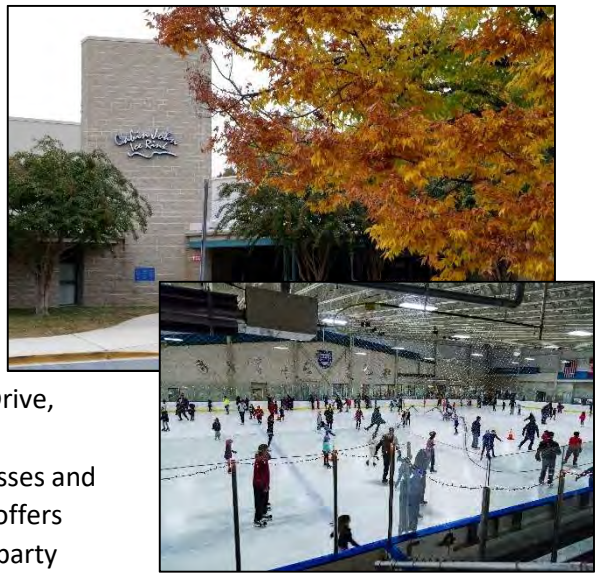
Energy Procurement, Contract Status, & Purchasing Policy

M-NCPPC has implemented a procurement program that has contracted fixed cost energy supply of electricity and natural gas service to provide long-term budget stability. Upcoming renewals are anticipated to be renegotiated six months prior to the current contract expiration dates.

Energy Procurement – M-NCPPC Montgomery County		
	Current Rate	**Contract Term**
Electricity		
Baltimore Gas & Electric Company (BGE)	$0.0701/kWh	June 2019 – June 2021
PEPCO	$0.06714/kWh	June 2019 – June 2021
PEPCO: SOLAR (capacity/transmission pass through)	$0.052/kWh	June 2019 – June 2021
Potomac Edison – 1st Energy Corp	$0.0580/kWh	June 2019 – June 2021
Natural Gas		
Washington Gas	$0.4210/therm	June 2018 – July 2021

Building Benchmarking

Beginning in 2014, Montgomery County government adopted a building benchmarking law and in 2015 amended Bill 35-15 (Environmental Sustainability – Benchmarking Amendments) requiring benchmarking of energy use at nonresidential buildings 50,000 square feet and greater. Utilizing Energy Star Portfolio Manager, these data are reported to Montgomery County government for public disclosure.



Exterior of Cabin John Ice Rink (above)
Skaters enjoying the ice rink (below)

Cabin John Ice Rink is the only M-NCPPC, Montgomery County facility that currently meets the County reporting requirements for building benchmarking. This facility, located at 10610 Westlake Drive, Rockville MD 20852 is a 78,000 square foot public facility. Originally constructed in 1969, this facility offers ice skating and ice hockey classes and camps, as well as special events and skating exhibitions. The facility offers three ice rinks (NHL, Olympic, and Studio) as well as a dance studio, party rooms, a pro shop, and café.

Summarized building benchmarking data for Cabin John Ice Rink from calendar year (CY) 2016 through 2019 is depicted in the tables below. Between CY 2016 and 2019 the facility saw steady reductions in both grid electric and natural gas consumption.

Energy Type	2016	2017	2018	2019	% Difference (current vs baseline)
Grid Electricity (kWh)	2,621,590	2,742,129	2,547,612	2,067,409	↓ -21.14%
Natural Gas (therms)	84,366	76,648	73,290	60,155	↓ -28.70%

Source and Site Energy Use Intensity (EUI) for Cabin John Ice Rink have been provided in the table below for CY 2016 through 2019, including weather normalized (WN) values for each. The Site EUI is a measure of the amount of direct energy the facility has consumed per square foot per year. Source EUI additionally accounts for energy lost due to production, transmission, and delivery to the site. The facility has operated with steady reductions in both Site and Source EUI since 2016. Given these savings, as anticipated, associated greenhouse gas emissions have also decreased nearly 24% since 2016. Over the next year, the recent facility upgrades should further reduce energy consumption and greenhouse gas emissions from the Cabin John Ice Rink.

Metric	2016	2017	2018	2019	% Difference (current vs baseline)
Site EUI (kBtu/ft2)	222.9	214.4	205.4	167.6	↓ -24.8%
Site EUI – WN (kBtu/ft2)	222.5	214.4	203.8	167.6	↓ -24.7%
Source EUI (kBtu/ft2)	453.3	434.0	410.7	334.2	↓ -26.3%
Source EUI – WN (kBtu/ft2)	434.8	434.0	406.1	334.2	↓ -23.1%
Total GHG Emissions (MTCO2e)	1305.5	1285.0	1221.2	994.7	↓ -23.8%

Efficiency Projects on M-NCPPC, Montgomery County Parkland

Throughout the year, projects are completed to improve the efficient use of water and energy resources while still providing an exceptional level of service to the public. The overarching goals of this program include:

- Implementing projects focused on heating and air conditioning system replacements for equipment in operation for over 20 years.
- Continued expansion of building automation controls and energy management systems capabilities in primary staff office, support, and maintenance buildings.
- Exterior lighting retrofit program to utilization of LED technology.
- Making progress on programs and initiatives included in the M-NCPPC – Montgomery County Sustainability Plan.
- Continued comprehensive audit of the utility bills being tracked by EnergyCAP to validate data entered and reported for primary locations.
- Installing small-scale rooftop solar photovoltaic systems to reduce our need and dependence on traditional electrical power and lower our organizational carbon footprint

Efficiency Projects - Fiscal Year Results, FY20

In FY20 projects were completed in support of the program to efficiently utilize water and energy resources at parks and facilities. The below table depicts specific project locations and types of improvements/upgrades completed.

Projects Completed: FY20

Project Location	Description	Efficiency Standard	Primary Shop/Team
Black Hill Regional Park: Bathhouse #2	• Installed 1.8 kW rooftop solar photovoltaic system to provide heat and power • Installed 500-gallon rainwater harvesting system for toilet flushing	Solar Panel Installation, High Efficiency Water-Saving Unit	Carpentry/Electric Plumbing
Blair Local Park	Installed automated control and monitoring of athletic field lighting	Improved energy efficiency through automation	Athletic Field Team, Park Development Division
Brookside Gardens: Visitors Center	Installed new variable frequency drive (VFD) grinder pump	Energy Efficient Unit	Plumbing
Cabin John Regional Park: Athletic Fields	Install automated control and monitoring of athletic field lighting	Improved energy efficiency through automation	Athletic Field Team, Park Development Division
Cabin John Regional Park: Cabin John Ice Rink	Replacement of R-22 refrigeration system for NHL and Studio Rinks with ammonia system. The ammonia system has zero global warming potential and zero ozone depletion potential	High Efficiency Appliance	Contractor led by Enterprise and Park Development Division

Project Location	Description	Efficiency Standard	Primary Shop/Team
Camp Seneca Special Park: Seneca Day Camp	Park Offices: • Upgraded the HVAC to a 95% efficient unit • Reconfigured system and moved duct work to conditioned space • Installed ductless heat pump • Remove old grease interceptor • Replaced kitchen sink faucet to low-flow fixture	High Efficiency Appliance, High Efficiency Water Fixtures	HVAC, Plumbing
Camp Seneca Special Park: Seneca Lodge	Installed new variable frequency drive (VFD) grinder pump	Energy Efficient Unit	Plumbing
Capital View Homewood	Retrofitted 4 exterior pole lights	LED Fixtures	Electric
Colesville Local Park	Replaced terracotta sewer line with PVC	Infrastructure Upgrade	Plumbing
Darby Historical Cultural Park: Darby Store	Installed new variable frequency drive (VFD) grinder pump	Energy Efficient Unit	Plumbing
Dewey Local Park	Retrofitted 9 exterior pole lights	LED Fixtures	Electric
Jesup Blair Local Park	Install upgraded/relocated exterior drinking fountain	Maintenance Efficiency	Plumbing, Heavy Equipment
Ken-Gar Local Park	Install automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	Athletic Fields Team, Park Development Division
Olney Mill Neighborhood Park	Basketball and tennis court lighting upgrades	LED Fixtures	Electric
Maydale Nature Classroom	M-NCPPC's first net-zero facility: • Sustainably-sourced materials (Cementitious Siding, Bamboo flooring) • Ceiling material R-43 and wall material R-30. Trombe wall installed. • LED interior and exterior lighting • 17.4 kW rooftop solar photovoltaic system • Ductless HVAC system • 275-gallon rainwater harvesting system • Two 1.6 gpf toilets • 2 wall mounted low-flow sinks • Low-flow kitchen sink faucet	Solar Panel Installation, High Efficiency Water Fixtures, LED Fixtures, Improved Temperature Modulation, High Efficiency Appliance	Carpentry, Electric, Heavy Equipment, Plumbing, HVAC

Project Location	Description	Efficiency Standard	Primary Shop/Team
Meadowbrook Maintenance Facility	Installation of charging infrastructure for electric mowers and electric vehicles	Electric Charging Station	Electric
Meadowside Nature Center	Exterior and interior lighting upgrades	LED Fixtures	Electric
MLK Recreational Park: Field #3	Installed automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	Athletic Fields Team, Park Development Division
Nolte Local Park	• Installed upgraded/relocated exterior drinking fountain • Replace 400' of galvanized water line to poly-pipe in support of Community Garden	Maintenance Efficiency, Infrastructure Improvement	Plumbing
North Four Corners Local Park	Installed automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	Athletic Fields Team, Park Development Division
Pinecrest Local Park	Park Activity Building: • Retrofit building interior and parking lot lighting • Install ductless heat pump • 2 toilets retrofit from 3.5 gpf to 1.6 gpf • 2 wall mounted low-flow sinks • Low-flow kitchen sink faucet • Efficient electric hot water heater	LED Fixtures, High Efficiency Water Fixtures, High Efficiency Appliance	Electric, HVAC, Plumbing
Quebec Terrace Neighborhood Park	Parking lot and park area retrofit	LED Fixtures	Electric
Ridge Road Recreational Park	Installed automated control and monitoring of athletic field lighting	Improved energy efficiency through automation	Athletic Fields Team, Park Development Division
Rock Creek Maintenance Facility	• EcoBee thermostats installed • Installed new variable frequency drive (VFD) grinder pump	Improved temperature modulation and energy savings, Energy Efficient Unit	HVAC, Plumbing
Rock Creek Regional Park	Installed new variable frequency drive (VFD) grinder pumps at Bathhouse #2, #3, #4, and Boathouse	Energy Efficient Unit	Plumbing

Project Location	Description	Efficiency Standard	Primary Shop/Team
Saddlebrook Park Police Headquarters	Interior renovation for patrol and dispatch, including new restrooms: • Addition of R-19 insulation to concrete/masonry walls, furred over with gypsum wallboard • LED lighting fixtures with occupancy sensors • Install variable refrigerant flow (HVAC) to allow for heat transfer between spaces with heat recovery (more efficient than constant volume and variable air volume systems) • Install 4 low-flow toilets (1.6 gpf) • Install 1 high-efficiency urinal. • Install low-flow kitchen sink faucet	Insulation for energy efficiency, LED Fixtures, High Efficiency Appliance, High Efficiency Water Fixtures	Carpenters, Electric, Heavy Equipment, HVAC, Plumbing
Seneca Landing Special Park: Poole's Store	• New R-13 insulation added to building envelope • Full electric upgrade. Interior lighting upgraded to LED • Installed electric heat pump • Added bathroom with 1.6 gpf toilet • Installed new mop sink, low-flow hand sink, and a 3 compartment sink with grease-trap • Replaced 1,000-gallon septic tank • Installed new variable frequency drive (VFD) grinder pump	Insulation for energy efficiency, LED Fixtures, High Efficiency Appliance High Efficiency Water Fixtures, Energy Efficient Unit	Carpenters, Electric, Heavy Equipment, HVAC, Plumbing
South Germantown Recreational Park	Installed new variable frequency drive (VFD) grinder pumps at Adventure Playground bathhouse, Miracle Field, near Aquatic Center and at Maintenance Yard	Energy Efficient Unit	Plumbing

Project Location	Description	Efficiency Standard	Primary Shop/Team
Wheaton Regional Park: Athletic Bathhouse	Complete building replacement: • Standing seam metal roof with 2" insulation • Double-glazed windows with 1" infill and thermal barriers • Thermal insulation throughout exterior walls • Lighting fixtures: partial LED • Occupancy Sensors on all fixtures • Hot water heater is more efficient than previous model • Low-flow toilets (1.6 gpf) • No HVAC, but designed for future addition of heat	Insulation for energy efficiency, LED Fixtures, High Efficiency Appliance, High Efficiency Water Fixtures	Contractor Managed by Park Development Division
Wheaton Regional Park: Athletic Lighting	• Installed automated control and monitoring of athletic field lighting • LED fixture retrofit	Improved energy efficiency through automation and LED fixtures.	Athletic Fields Team, Park Development Division
White Oak Recreation Center	Installed automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	Athletic Fields Team, Park Development Division

FY20 Projects Summarized by Type

The follow table summarizes the projects detailed above by project type. In cases where multiple measures have been taken under a single project, the various measures have been spread across the listed categories.

Project Type/Category	Completed
Energy Efficient Appliance/Unit	13
Energy Efficiency via Automation	4
EV Charging Station	1
LED Light Fixtures	11
Solar Panels	2
Maintenance Efficiency/Infrastructure Improvement	6
Water Efficiency/Advanced Water Management	11

Utility Budget Results for FY20:

	FY20 Cost	FY20 Budget	Difference
PARKS DEPARTMENT	$1,857,023	$2,249,533	$392,510
PLANNING DEPARTMENT	$146,595	$211,590	$64,995
ENTERPRISE	$781,438	$934,000	$152,562
PROPERTY MANAGEMENT	$35,636	$20,864	($14,772)
BI-COUNTY	$64,120	$92,072	$27,952
TOTAL:	**$2,884,811**	**$3,508,059**	**$623,248**

Data obtained from M-NCPPC General Ledger

Expenditures for FY20:

Projects Local:	$37,000
Projects Non-local:	$40,000
Water Projects Non-local:	$25,000
Water Projects Local:	$25,000
Total in FY20:	$127,000

Efficiency Projects - Results to Date, FY21

The results of the current program year as of December 2020 are as follows:

Goals:

- Continue to expand the exterior lighting retrofit program to use LED technology.
- Continue executing programs and initiatives included in the M-NCPPC – Montgomery County Sustainability Plan.
- Implementation of small-scale solar photovoltaic opportunities.
- Exploration of additional opportunities for stormwater and graywater harvesting for reuse (e.g. operations, irrigation, toilet flushing, other identified uses).
- Continued comprehensive audit of the utility bills being tracked by EnergyCAP to validate data entered and reported for primary locations.
- Continue updating building square footage for all facilities into the Department's Enterprise Asset Management (EAM) system as well as EnergyCAP. These data will be vital in prioritizing the implementation of energy efficiency and conservation projects as well as to help guide renewable energy projects on facilities in parkland.

In FY21 several projects have been planned, are in process, or have been completed in support of the program to efficiently utilize water and energy resources at parks and facilities. The below table depicts the details and status of specific projects, including locations and types of improvements for FY21.

Project Status to Date: FY21

Project Location	Description	Efficiency Standard	Planned, In Process, or Complete	Primary Shop(s)/Team
Argyle Park Activity Building	Replace plumbing fixtures, replace lighting fixtures	Water Efficiency; LED Lighting	In process (to be completed in spring 2021)	Electric, Plumbing, Park Development Division
Arora Hills Local Park	Install waterless public restroom building	Water Conservation	In Process	Facilities Management Team
Bauer Local Park	Court Lighting Replacement	LED Lighting	Planned	Park Development Division
Black Hill Regional Park: Park Police	Replace propane tank with electric tankless hot water heater	High Efficiency Appliance	Planned	Plumbing
Cabin John Regional Park	Replace water line	Infrastructure Upgrade	In Process	Park Development Division
Centerway Local Park	Install solar pv flower for public cell phone/device charging	Solar Panel Installation	Complete	Facilities Management Team
Cloverly Local Park	Replace and upgrade water fountain to frost free system	Maintenance Efficiency	Planned	Plumbing

Project Location	Description	Efficiency Standard	Planned, In Process, or Complete	Primary Shop(s)/Team
Kemp Mill Estates Park Activity Building	Replace plumbing fixtures, replace lighting fixtures	Water Efficiency, LED Lighting	In Process (to be completed in spring 2021)	Electric, Plumbing, Park Development Division
Meadowbrook Local Park	Install solar pv flower for public cell phone/device charging	Solar Panel Installation	In Process	Facilities Management Team
Meadowbrook Maintenance Facility	Upgrade to new tube heaters in the work bays	Infrastructure Upgrade	Complete	HVAC
Meadowbrook Stables Restroom Renovation	Replace plumbing fixtures and lighting fixtures	Water efficiency, LED Lighting	In Process (to be completed in summer 2021)	Park Development Division
Meadowood Local Park	Court Lighting Replacement	LED Fixtures	Planned	Electric, Park Development Division
Meadowside Nature Center	• Replace plumbing fixtures and lighting fixtures • Upgrade sewer line	Water Efficiency; LED Lighting	In process (to be completed in spring 2021)	Electric, Plumbing, Park Development Division
MLK Recreational Park: Field #3	Install automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	Complete	Athletic Fields Team, Park Development Division
Norwood Local Park	Water and sewer line replacement	Infrastructure Upgrade	In Process	Park Development Division
Rock Creek Maintenance Facility	Conversion of unit heaters to tube heaters for more functional heating of space	High Efficiency Appliance	In Process	HVAC
Sligo Avenue Park Activity Building	Replace plumbing fixtures, replace lighting fixtures	Water efficiency, LED lighting	In Process (to be completed in summer 2021)	Park Development Division
Sligo-Dennis Local Park	Court Lighting Replacement	LED Lighting	Planned	Electric, Park Development Division

Project Location	Description	Efficiency Standard	Planned, In Process, or Complete	Primary Shop(s)/Team
Wheaton Claridge Local Park	Park Activity Building: • 3 toilets retrofit from 3.5 gpf to 1.6 gpf. • 2 wall mounted low-flow sinks. • Low-flow kitchen sink faucet and drain replacement from galvanized to PVC.	High Efficiency Water Fixtures	Complete	Plumbing
Wheaton Headquarters Building	Construction of the first government owned office building that is to be certified LEED Platinum in the State of Maryland	Designed for LEED Platinum	Complete	Park Development Division
Wheaton Regional Park: Brookside Nature Center	Replace plumbing fixtures and lighting fixtures	High Efficiency Water Fixtures; LED Fixtures	In Process (to be completed in summer 2021)	Electric, Plumbing, Park Development Division
Wheaton Regional Park: Shorefield Restroom Renovation	Replace plumbing fixtures and lighting fixtures	High Efficiency Water Fixtures; LED Fixtures	In Process (to be completed in summer 2021)	Park Development Division

FY21 Projects Summarized by Type

The follow table summarizes the projects detailed above by project type. In cases where multiple measures have been taken under a single project, the various measures have been spread across the listed categories.

Project Type/Category	Completed	In Process	Planned
Energy Efficient Appliance/Unit	1	1	1
Energy Efficiency via Automation	1		
EV Charging Station	1		
LED Light Fixtures	1	7	3
Solar Panels	2	1	
Maintenance Efficiency/Infrastructure Improvement	2	2	1
Water Efficiency/Advanced Water Management	3	8	

Utility Budget Projection for FY21:

	FY21 Budget	Cost as of 1/4/2021	FY21 Annual Projection	Difference (FY21 Budget-Projection)
PARKS DEPARTMENT	$2,284,322	$763,021	$1,995,254	$289,068
PLANNING DEPARTMENT	$52,897	$51,341	$56,924	($4,027)
ENTERPRISE	$965,900	$379,625	$825,886	$140,014
PROPERTY MANAGEMENT	$35,700	$21,103	$39,032	($3,332)
BI-COUNTY	$82,464	$28,272	$73,100	$9,364
WHEATON HQ	$764,659	$108,162	$660,000	$104,659
TOTAL:	**$4,185,942**	**$1,351,523**	**$3,650,195**	**$535,746**

Data obtained from M-NCPPC General Ledger

Budgeted expenditures for FY21:

Projects Local:	$37,000
Projects Non-local:	$40,000
Water Projects Non-local:	$25,000
Water Projects Local:	$25,000
Total in FY21:	**$127,000**

Efficiency Projects - Planned Measures, FY22

The proposed program for FY22 is as follows:

Goals:

- ➢ Assess building envelopes and improve insulation where applicable.
- ➢ Continue lighting retrofit program to use LED technology inside facilities, in parking lots, along walkways and at ballfields/sports courts.
- ➢ Determine additional potential small-scale solar applications. Investigate opportunities for geo-thermal technology for heating and cooling.
- ➢ Begin prioritizing projects to eliminate on-site fossil fuel burning (natural gas, propane, heating oil) with the ultimate goal of electrifying these functions with renewable energy resources.
- ➢ Continue maximizing HVAC and water heater efficiency through appliance and equipment upgrades.
- ➢ Continue retrofitting plumbing fixtures to low-flow, low consumption units.
- ➢ Maintain existing and implement appropriate new opportunities stormwater and graywater harvesting for reuse (e.g. operations, irrigation, toilet flushing, other identified uses).
- ➢ Utilize ArcGIS collector to gather locational data for all utility meters on parkland. Address meter and account issues as appropriate with the utility.
- ➢ Continue to implement the comprehensive audit of the utility bills being tracked by E-CAP to validate data entered and reported for primary locations.

For FY22 several projects have been planned in support of the program to efficiently utilize water and energy resources at parks and facilities. The below table depicts the details and status of a limited number of specific projects, including locations and types of improvements for FY22.

While a few capital improvement program (CIP) projects have been identified below, due to the nature of the work in the M-NCPPC Facilities Management Division, this list is kept truncated to ensure balance between maintenance tasks that arise through the year, which have a budgetary impact, along with planned, proactive efficiency upgrades. When maintenance tasks arise for specific sites, opportunities are often taken for mobilization of staff and resources to install or upgrade appliances or equipment. This practice effectively improves efficiency and a more holistic approach to maintenance and upkeep of facilities on parkland.

Planned Measures FY22

Project Location	Description	Efficiency Standard	Funding	Primary Shop(s)/Team
Agricultural History Farm Park	Install fresh air exchangers and heat pumps.	High Efficiency Appliance	To be determined	HVAC
Calverton-Galway Local Park	Install rooftop solar photovoltaic system with power backup to shelter/restroom building	Solar Panel Installation	CIP: LP Energy	Electric
Damascus Recreational Park: Restroom C Renovation	Replace plumbing and lighting fixtures	High Efficiency Water Fixtures; LED Fixtures	PLAR - NL	Electric, Plumbing, Park Development Division

Project Location	Description	Efficiency Standard	Funding	Primary Shop(s)/Team
Laytonia Recreational Park	Install automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	To be determined	Athletic Fields Team, Park Development Division
Meadowbrook Local Park	Replace water/sewer line	Infrastructure Upgrade	PLAR LP - MR	Plumbing, Park Development Division
Meadowbrook Local Park: Park Activity Building	Replace plumbing and lighting fixtures	High Efficiency Water Fixtures; LED Fixtures	PLAR LP – PAB	Electric, Plumbing, Park Development Division
Norwood Local Park: Park Activity Building	Replace plumbing and lighting fixtures	High Efficiency Water Fixtures; LED Fixtures	PLAR LP – PAB	Electric, Plumbing, Park Development Division
Olney Manor Recreational Park: Maintenance Yard	Replace existing shed structure with pre-engineered building with solar panels on roof.	Solar Panel Installation	PLAR – NL	Electric, Park Development Division
Saddlebrook Park Police Headquarters	Replace through-the-wall A/C units with variable flow refrigerant (VFR) system and a fresh air heat exchanger in old administrative section of building	High Efficiency Appliance	Pending Funding	HVAC
South Germantown Recreation Park: Cricket Field	Install automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	To be determined	Athletic Fields Team, Park Development Division
Spencerville Local Park: Mildred Pumphrey Recreation Center	Upgrade HVAC with high efficiency heat pump with fresh air heat exchange	High Efficiency Appliance	CIP: LP Energy	HVAC
TBD	Installation of 60kW United Therapeutics donated rooftop solar pv system	Solar Panel Installation	Installation funding to be determined	Electric
Waters House Special Park: Waters House	Upgrade existing HVAC equipment	High Efficiency Appliance	Pending Funding	HVAC
Wheaton Regional Park	Replace water line to Sports Pavilion	Infrastructure Upgrade	PLAR NL-MR	Plumbing
Wheaton Regional Park: Fields 1,2,3	Install automated control irrigation with advanced water management	Improved water conservation on irrigated site through automation	To be determined	Athletic Fields Team, Park Development Division

FY22 Projects Summarized by Type

The follow table summarizes the projects detailed above by project type. In cases where multiple measures have been taken under a single project, the various measures have been spread across the listed categories.

Project Type/Category	Planned
Energy Efficient Appliance/Unit	4
LED Light Fixtures	3
Solar Panels	3
Maintenance Efficiency/Infrastructure Improvement	2
Water Efficiency/Advanced Water Management	6

Utility Budget Proposal for FY22:

	Proposed Budget FY22
PARKS DEPARTMENT	$2,263,077
PLANNING DEPARTMENT	N/A
ENTERPRISE	$910,186
PROPERTY MANAGEMENT	$35,700
BI-COUNTY	$84,776
WHEATON HQ	$764,659
TOTAL:	**$4,058,398**

Proposed budget expenditures for FY22:

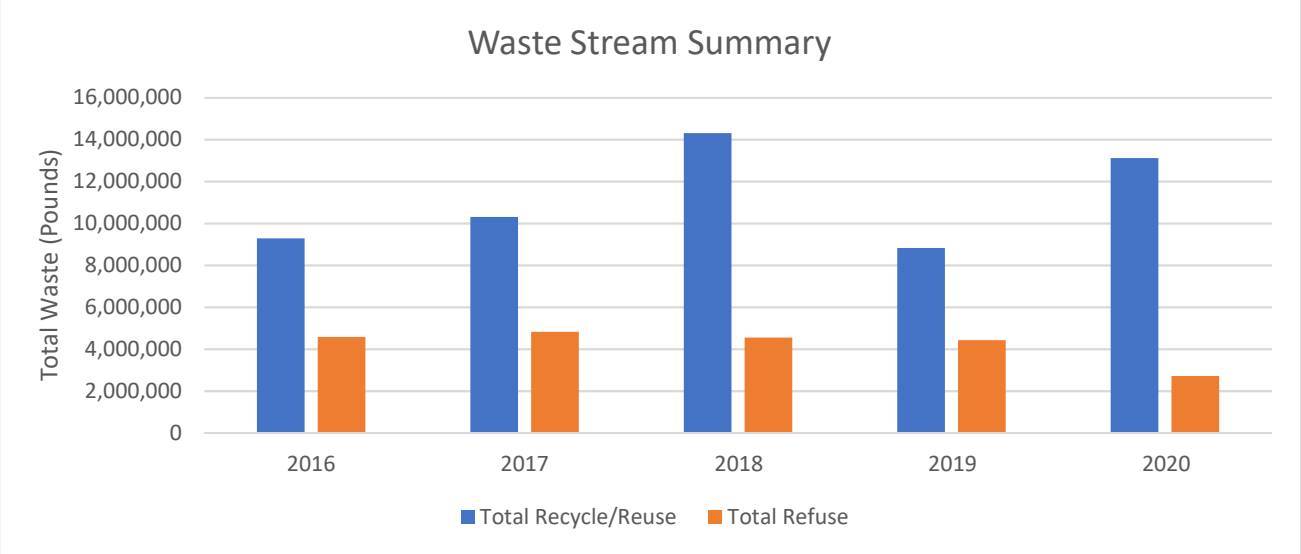
Projects Local:	$37,000
Projects Non-local:	$40,000
Water Projects Local:	$25,000
Water Projects Non-Local:	$25,000
Total in FY22:	**$127,000**

Waste Reduction and Recycling

M-NCPPC – Montgomery County operates a comprehensive and proactive waste reduction and recycling program, adhering to the business/commercial recycling standards and reporting requirements established by the Montgomery County Executive and the Recycling and Resource Management Division.

In 2020, the Montgomery County Recycling and Resource Management Division recognized Montgomery Parks as a business with an outstanding recycling and waste reduction program. This recognition is awarded to businesses or organizations that excel in their efforts to provide a high level of training and education to their customers and/or employees in an engaging manner that increases awareness and participation in their recycling and waste reduction program. The success of the recycling program relies on effective communication, education, and monitoring practices.

M-NCPPC – Montgomery County recycles mixed paper/cardboard, commingled materials of aluminum, glass, plastic, steel/tin, scrap metal and green waste (e.g. vegetation/plant material). In addition to these materials, the M-NCPPC - Montgomery County further reduces the waste stream by recycling numerous voluntary products including tires, motor oil and other hazardous waste, electronics, light bulbs, batteries, as well as construction debris including concrete and asphalt. The below graph depicts the past five years of waste stream data for the organization. Total Recycle/Reuse includes both the mandatory and voluntary recycling materials.



M-NCPPC – Montgomery County works to divert as much waste out of trash and into an appropriate recycling stream. Montgomery County has established a goal of recycling 70% of the waste stream by 2020 and the organization has worked diligently to try to achieve this goal. In 2016 and 2017, the total waste diversion rates were 67% and 68% respectively. In 2018, M-NCPPC in Montgomery County successfully surpassed the 70% goal with 73% total waste diversion and in 2019 total waste diversion for the organization dropped back to 67%. For 2020, the organization surpassed the Montgomery County goal with a total waste diversion rate of 83%.

Waste removed by volunteers from parkland.

Efforts are taken to reduce waste within our operations, however, as a public land agency, a portion of the organizational waste stream is a result of illegal dumping of various types of waste, including household trash, on parkland. These volumes become part of the total waste stream of the organization. This waste is often removed by volunteers through stream and park cleanups. Each year, on average, more than 10,000 volunteers dedicate time to removing trash and recyclables from streams and parks. Since FY16, through this valuable support, over 450,000 pounds of trash and recyclables have been removed. In 2020, even through the COVID-19 pandemic, eager volunteers still wanted to help clean up parks through stream and park cleanups. However, due to the need to provide for safety and social distancing, larger-scale cleanup events were canceled. Volunteers still participated in cleanups on a smaller or individual basis, however, data collection on those events was more difficult to gather in 2020. The volunteer base continues to be supportive and active and the agency is committed to providing for safe opportunities to spend time on parkland.

In 2020, to further hold ourselves accountable for reducing waste and increasing diversion of recyclable materials to proper recycling streams, Montgomery Parks Facilities Management Division kicked off a new waste audit initiative. Select employees within the agency now conduct unannounced waste audits at various parks/maintenance yards to review waste sorting operations and to identify and quantify missed opportunities to recycle. Reports are generated for the site manager(s) and supervisors to help communicate findings and provide support, as needed.

To enhance communication with the public about recycling opportunities, new and improved decals were created to affix to our trash and recycling containers out in the parks. These decals were designed to be simple and eye-catching and are currently being assessed for effectiveness at several park sites county-wide.

Pictured Left: New decals developed for trash and recycling containers out in the parks. Pictured Right: The staff that operate the Montgomery Parks recycling truck take extra steps to monitor recycling dumpsters for contamination before materials are transported to the Montgomery Transfer Station.

Fleet and Equipment

M-NCPPC – Montgomery County operates and maintains a park and planning system that offers a wide range of services and amenities for recreation and leisure, as well has habitat and natural resources for the benefit of the community. A diverse array of vehicles and equipment are required to support the operations and maintenance of this system. Vehicle types range from small sedans, to light-duty pickup trucks, to large dump trucks and specialized vehicles which serve as the backbone of our maintenance commitment.

In the FY21 Resource Conservation Plan report, it was noted that an extensive review of the Department's vehicle fleet had been conducted as an effort to improve efficiency and cost effectiveness without compromising the safety of employees or jeopardizing the standards for excellence set forth by the Department.

This review looked at vehicle type and aspects of vehicle use, including annual mileage, types of trips etc. At the time of completion of the analysis and report, M-NCPPC – Montgomery County maintained a vehicle fleet of about 600 light duty vehicles, including the M-NCPPC Park Police fleet.

From this analysis, a listing of potentially underutilized vehicles was generated for further review by senior management. Forty-three vehicles were identified as potentially underutilized, with 19 recommended for disposal and 24 for redeployment to other areas of need within the Department. Long-term total savings for disposed vehicles was estimated at over $820,000 which accounts for avoided replacement costs, avoided maintenance costs, and proceeds from trade-in. Redeployed vehicles identified from this study will allow for savings in new vehicle purchase avoidance in an amount over $810,000.

The implementation of many of these recommendations has been delayed due to the ongoing COVID-19 pandemic and the need to maximize the number of vehicles available to staff in order to support social distancing for travel to worksites. As operations return to normal, implementation of these recommendations will be prioritized. Currently underway are strategies and procedures designed to better right-size vehicles for the job at the time of purchase.

Beginning in 2020, the Department began a second similar review of large, heavy equipment to identify efficiencies and cost savings while promoting employee safety. The review will help the Department determine the types of heavy equipment in the inventory and their physical locations, characterization of the use of the equipment, and what opportunities might be available for more efficient use this equipment inventory.

The Department continues to prioritize hybrid and electric vehicles and equipment where feasible. As electric vehicle and equipment technology advances and more types become electrified, the organization expects to further increase this inventory during the vehicle and equipment replacement process. This aligns with the organization's Sustainability Plan and the forthcoming county-wide Climate Action Plan, and will be an important strategy in reducing greenhouse gas emissions.

Resource Conservation Plan Charts

Agency Unit Cost – FY22 Projections

FY22 utility unit cost projections for the participating agencies of the Interagency Committee on Utilities Management (ICEUM) are included in the table below. A variety of factors may impact the unity costs for each of the participating agencies and include differences in tariffs, account types, utility consumption volumes for individual accounts etc.

Agency	Montgomery College	WSSC	M-NCPPC	MCPS	DGS	Range
Utility						
Electric (kWh)	$0.1133	$0.0895	$0.1140	$0.1125	$0.1170	$0.08595 – $0.1170
#2 Fuel Oil (gal)	$0.0000	$2.220	$3.770	$2.500	$2.797	$0.0 – $3.770
Natural Gas (therms)	$0.830	$0.930	$1.153	$0.890	$0.895	$0.830 – $1.153
Propane (gal)	$4.060	$4.000	$1.818	$1.750	$3.578	$1.750 – $4.060
Water & Sewer (kgal)	$12.1800	$0.0000	$13.0500	$12.8000	TBD	$0.0 – $13.0500

Unit cost data for M-NCPPC is estimated based on data in EnergyCAP and general projected commodity cost increases.

Summary and Montgomery Parks Green Tree Report

Agency	Maryland-National Capital Park and Planning Commission		
Number of Facilities	396 Facilities that have utilities	Change in number of facilities	-2*
Total square feet active and leased:	1,232,614	Change in total ft^2	+58,279
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 for the Department of Parks by the following Divisions: Facilities Management, Northern Parks, Southern Parks, Enterprise, and Park Development contributed to additional consumption reductions at park facilities. The Montgomery Parks Green Tree Report (below) provides insight into available park amenities, facilities, and other park system highlights.		

*Upon opening Wheaton HQ, 3 staffed locations have been taken out of the M-NCPPC inventory
Active square footage is subject to change as it is currently under review by the organization

MONTGOMERY PARKS, M-NCPPC
Parks Information Line: 301-495-2595
www.MontgomeryParks.org

OUR MISSION

Protect and interpret our valuable natural and cultural resources; balance the demand for recreation with the need for conservation; offer a variety of enjoyable recreational activities that encourage healthy lifestyles; and provide clean, safe, and accessible places for leisure-time activities.

PARK SYSTEM HIGHLIGHTS

Total number of parks: 424	Stream Length: 490 miles
Total owned or managed acres of parkland: 37,072	Total Park Boundary: 961 miles

TYPES OF PARKS

Conservation: 22	Neighborhood: 96	Special: 24
Local: 154	Neighborhood Conservation Area: 41	Stream Valley: 36
Miscellaneous Recreation/ Non-Recreation Facilities: 5	Recreational: 11	Urban: 30
	Regional: 5	

PARK FACILITIES

Archery: 2	Event Centers: 4	Park Activity Buildings: 28
Athletic fields: 363	Exercise Stations: 48	Picnic Shelters – Non-Permitted: 48
Basketball courts: 229	Formal Botanical Gardens: 2	Picnic Shelters – Permitted: 88
Boating Facility – Rentals: 2	Golf Courses: 4	Playgrounds: 276
Boating Landing Ramps: 3	Gymnasiums: 1	Skate Parks: 3
BMX Track: 1	Historic Sites: 43	Splash Playground: 1
Campgrounds – Full Service: 1	Historic Structures: 111	Tai Chi Courts: 1
Campgrounds – Primitive: 2	Ice Rinks: 2	Tennis Centers – Indoor: 3 (20 courts)
Campsites: 102	Lakes: 4	Tennis Courts – Outdoor: 303
Carousel: 1	Large Group Picnic Areas: 2	Trails – Canoe: 5.4 miles
Community Gardens: 11	Miniature Golf: 1	Trails – Natural Surface: 201 miles
Cricket Fields: 7	Miniature Trains: 2	Trails – Paved: 68.6 miles
Dog Parks: 6	Nature Centers: 4	Volleyball: 21
Driving Range (Stand Alone): 1	Outdoor Rope Courses: 1	
Equestrian Centers: 6	Overlay football/soccer fields: 41	

PARK BUDGET

Adopted Operating Budget FY2020	$122.0 million
Capital Improvements Program FY2019-2024	$76.0 million for acquisition
Capital Improvements Program FY2019-2024	$167.7 million for development

As of May 2020
Source: EAM, GIS, and the Parks Acquisition Ledger

CIP: Energy Conservation – Local Parks

Energy Conservation - Local Parks
(P998710)

Category	M-NCPPC	**Date Last Modified**	10/04/18
SubCategory	Development	**Administering Agency**	M-NCPPC
Planning Area	Countywide	**Status**	Ongoing

	Total	Thru FY18	Rem FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	130	35	35	60	10	10	10	10	10	10	-
Construction	365	107	96	162	27	27	27	27	27	27	-
TOTAL EXPENDITURES	**495**	**142**	**131**	**222**	**37**	**37**	**37**	**37**	**37**	**37**	**-**
FUNDING SCHEDULE ($000s)											
M-NCPPC Bonds	495	142	131	222	37	37	37	37	37	37	-
TOTAL FUNDING SOURCES	**495**	**142**	**131**	**222**	**37**	**37**	**37**	**37**	**37**	**37**	**-**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 20 Request	37	Year First Appropriation	FY99
Cumulative Appropriation	310	Last FY's Cost Estimate	495
Expenditure / Encumbrances	150		
Unencumbered Balance	160		

PROJECT DESCRIPTION

This project provides funds to modify existing local park buildings and facilities to control fuel and utilities consumption. The project scope encompasses planning, identifying, implementing and monitoring effective energy conservation measures at each major local park facility. Emphasis is placed upon positive and proven measures to remedy heat losses and gains through modifications to building envelope systems and through improvement and retrofit of building support systems, and modification of electrical and mechanical systems and equipment and their associated control and distribution systems.

COST CHANGE

In FY19, added FY23 and FY24 to this ongoing level of effort project.

FISCAL NOTE

Prior year partial capitalization of expenditures through FY16 totaled $531,000.

DISCLOSURES

Expenditures will continue indefinitely.

CIP: Energy Conservation – Non-Local Parks

Energy Conservation - Non-Local Parks
(P998711)

Category	M-NCPPC	**Date Last Modified**	10/01/18
SubCategory	Development	**Administering Agency**	M-NCPPC
Planning Area	Countywide	**Status**	Ongoing

	Total	Thru FY18	Rem FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Planning, Design and Supervision	40	10	-	30	5	5	5	5	5	5	-
Construction	350	57	83	210	35	35	35	35	35	35	-
TOTAL EXPENDITURES	**390**	**67**	**83**	**240**	**40**	**40**	**40**	**40**	**40**	**40**	**-**
FUNDING SCHEDULE ($000s)											
G.O. Bonds	390	67	83	240	40	40	40	40	40	40	-
TOTAL FUNDING SOURCES	**390**	**67**	**83**	**240**	**40**	**40**	**40**	**40**	**40**	**40**	**-**

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 20 Request	40	Year First Appropriation	FY99
Cumulative Appropriation	190	Last FY's Cost Estimate	390
Expenditure / Encumbrances	67		
Unencumbered Balance	123		

PROJECT DESCRIPTION

This project provides funds to modify existing non-local park buildings and facilities to control fuel and utilities consumption. The project scope encompasses planning, identifying, implementing and monitoring effective energy conservation measures at each major non-local park facility. Emphasis is placed upon positive and proven measures to remedy heat losses and gains through modifications to building envelope systems and through improvement and retrofit of building support systems; and modification of electrical and mechanical systems and equipment and associated control and distribution systems.

COST CHANGE

In FY19, added FY23 and FY24 to this ongoing level of effort project.

FISCAL NOTE

Prior year partial capitalization of expenditures through FY16 totaled $792,000.

DISCLOSURES

Expenditures will continue indefinitely.

Existing Measures FY00 – FY20

Existing Measures FY00 to FY19	Initial Cost	Annual Net Impact on Maintenance	Energy Type(s)	Units Saved Per Year	Annual Cost Savings
Capital Improvement Program (CIP)					
Equipment Replacement Projects Local & Non-Local	$595,930 est.	$123,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	834,000 kWh, 49,600 therm & 6,100 Pounds	$158,000 est. Annual Cost Avoidance
Equipment Retrofit Projects Includes MEA Grant in 2010 and DOE Grant in 2012	$378,482 est.	$10,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	190,200 kWh, 11,500 therm & 600 Pounds	$47,600 est. Annual Cost Avoidance
Control Improvements	$140,000 est.	N/A	Electricity and Natural Gas	284,000 kWh & 21,000 therm	$85,000 est. Annual Cost Avoidance
Lighting Projects Includes MEA Grant in 2010 and DOE Grant in 2012	$501,000 est.	N/A	Electricity	489,800 kWh	$208,000 est. Annual Cost Avoidance
Sub Total:	**$2,035,376 est.**			1,798,000 kWh, 82,100 therm & 6,700 Pounds	$498,600 est. Annual Cost Avoidance
Operations and Maintenance					
Operations and Maintenance Best Management Practice and Programs FY00-FY19	$551,400	$5,000 annual	Electricity, Natural Gas, and Propane	764,000 kWh, 39,500 therm & 6,800 Pounds	$155,000 est. Annual Cost Avoidance
Overall Total:	**$2,586,776**			2,562,000 kWh, 121,600 therm & 13,500 pounds	$653,600 est. Annual Cost Avoidance 2.7 yrs. Return on Investment (ROI)

New Measures FY21

New Measures FY20	Projected Initial Cost	Annual Net Impact on Maintenance	Energy Type(s)	Estimated Units Saved Per Year	Projected Annual Cost Savings
Capital Improvement Program (CIP)					
Equipment Replacement Projects Local & Non-Local	$70,000 est.	$5,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	79,000 kWh, 11,600 therm	$10,800 est. Annual Cost Avoidance
Control Improvements	$20,000 est.	N/A	Electricity	30,000 kWh	$4,200 est. Annual Cost Avoidance
Lighting Projects Local & Non-Local	N/A	N/A	Electricity	39,000 kWh	$5,300 est. Annual Cost Avoidance
Sub-total:	**$90,000 est.**	**$5,000**			**$20,300**
Operations and Maintenance					
Best Management Practices and Sustainability Programs	$29,500	N/A	Electricity, Natural Gas, and Propane	21,000 kWh, 400 therm	$3,000 est. Annual Cost Avoidance
Operations and Maintenance Improvement Programs	$24,500	N/A	Electricity, Natural Gas, and Propane	9,000 kWh, 300 therm & 100 Pounds	$3,000 est. Annual Cost Avoidance
Sub Total:	**$54,000**	N/A			**$6,000**
Overall Total:	**$259,000**	**$5,000**			**$26,300 5.0 yr. Return on Investment (ROI)**

Planned Measures FY22

Planned Measures FY21	Projected Initial Cost	Projected Maintenance Cost	Energy Type(s)	Estimated Units Saved Per Year	Projected Annual Cost Savings
Capital Improvement Program (CIP)					
Equipment Replacement Projects Local & Non-Local	$42,000 est.	$2,000 on Annual Service Costs	Electricity, Natural Gas, and Propane	10,300 kWh, 5,000 therm	$7,500 est. Annual Cost Avoidance
Control Improvements	$15,000 est.	N/A	Electricity (Solar)	30,000 kWh	$4,200 est. Annual Cost Avoidance
Lighting Projects Local & Non-Local	$35,000 est.	N/A	Electricity	47,000 kWh	$7,000 est. Annual Cost Avoidance
Sub-total:	**$92,000 est.**	**$2,000**			**$18,700**
Operations and Maintenance					
Best Management Practices and Sustainability Programs	$29,500	N/A	Electricity, Natural Gas, and Propane	21,000 kWh, 500 therm & 100 Pounds	$3,300 est. Annual Cost Avoidance
Operations and Maintenance Improvement Programs	$24,500	N/A	Electricity, Natural Gas, and Propane	14,000 kWh, 400 therm	$2,200 est. Annual Cost Avoidance
Sub Total:	**$54,000**	N/A			**$5,500**
Overall Total:	**$146,000**	**$2,000**			**$24,200** **6.2 yrs. Return on Investment (ROI)**

Proposed Utility Budget by Fund/Cost - FY22

DEPARTMENT OF PARKS	
Electricity	$853,340
Water and Sewer	$714,484
Natural Gas	$216,000
Propane	$167,015
Heating Oil (#2)	$5,400
Other Utilities	$21,300
Solar PV (PPA)	$277,538
Wind REC	$8,000
Sub Total	**$2,263,077**

DEPARTMENT OF PARKS - ENTERPRISE	
Electricity	$703,000
Natural Gas	$114,200
Water and Sewer	$76,800
Propane	$12,000
Wind REC	$4,186
Sub Total	**$910,186**

DEPARTMENT OF PARKS - PROPERTY MANAGEMENT	
Electricity	$17,000
Natural Gas	$2,700
Heating Oil	$4,000
Propane	$1,000
Water and Sewer	$1,000
Other Utilities	$10,000
Sub Total	**$35,700**

WHEATON HEADQUARTERS	
Electricity	$528,679
Natural Gas	$50,000
Water and Sewer	$185,980
Sub Total	**$764,659**

BI-COUNTY	
Electricity	$80,594
Water and Sewer	$4,182
Sub Total	**$84,776**

Overall Total	**$4,058,398**


MONTGOMERY PARKS
M-NCPPC

FY 2022
RESOURCE CONSERVATION PLAN

Rob Taylor
Energy Manager

February 2021

FY 2022
RESOURCE CONSERVATION PLAN

Summary

The information on this page reflects the facilities owned or operated
By WSSC as of the end of **FY 20 (June 30, 2020)**

Number of Facilities	225	Change in number of facilities	+3
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 20)	% change from actual FY 19	total cost $ (actual FY 20)	% change from actual FY 19
Electricity	kWh	208,446,000	-2%	$15,726,000	-2%
Natural Gas (firm)	therms	332,000	-3%	$331,000	4%
Natural Gas (Irate)	therms	0	N/A	$0	N/A
Diesel Fuel (generators)	gallons	N/A	N/A	N/A	N/A
Fuel Oil #2	gallons	7,000	-49%	$17,000	-36%
Propane	gallons	1,300	-45%	$2,000	-54%
Water/Sewer	gallons	N/A	N/A	N/A	N/A
Total				**$16,076,000**	

FY 2022
RESOURCE CONSERVATION PLAN

Existing Measures- Prior to FY'20

This table shows information on resource conservation measures implemented prior to FY 20
(July 1, 2009 through June 30, 2019)

Measures - Existing: (implemented from FY 09 to FY 19)	date implemented (mo./yr.)	initial cost ($)	annual net impact on maint. cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($)
Capital Improvement Projects:						
Energy Performance Project- Phase IIB	9/09 Anac. II WWPS	$2,000,000 New Pumps	($20,000)	Electricity	3,100,000 kWh 1,000 kW	$350,000
Energy Performance Project- Phase IID (Potomac Pump Upgrade)	11/13 6 pumps	$6,200,000	$0	Electricity	5,900,000 kWh	$650,000
Total, CIP		$8,200,000	($20,000)	Electricity	9,000,000 kWh 1,000 kW	$1,000,000
Operations and Maintenance:						
Load Curtailment (PLC)	FY 06	$0	$0	Electricity	5,000 kW	$500,000
Pump Turbine Utilization (Rocky Gorge)	FY 06	$0	$0	Electricity	2,000,000 kWh	$200,000
Solar PV PPA- Seneca & Western Branch	10/31/13	$0	$0	Electricity	0 kW	$157,000
Total, O&M		$1,000,000	($200,000)	Electricity	2,000,000 kWh 5,000 kW	$857,000
Page Total		**$9,200,000**	**($220,000)**	**Electricity**	**11,000,000 kWh 6,000 kW**	**$1,857,000**

FY 2022
RESOURCE CONSERVATION PLAN

Existing Measures- FY'20

This table shows information on resource conservation measures implemented during FY 20
(July 1, 2019 through June 30, 2020)

Measures - New: (Implemented during FY 20)	date implemented (mo./yr.)	initial cost ($)	annual net impact on maint. cost ($)	fuel type(s) effected and units	units saved per year	annual cost savings ($)
Capital Improvement Projects:						
Total, CIP		$0	$0	Electricity	0 kWh	$0
Operations and Maintenance:						
PJM Emergency Response Program	FY'20	$0	$0	Electricity	5,000 kW load shedding	$300,000
Soar PV PPA- Old New Windsor		$0	$0	Electricity	0 kW	$170,000
Total, O&M		$0	$0	Electricity	5,000 kW	$470,000
Page Total		**$0**	**$0**	**Electricity**	**5,000 kW**	**$470,000**
Description of Activities:						
See narrative						

New Measures

FY 2022
RESOURCE CONSERVATION PLAN

This table shows information on resource conservation measures planned to be implemented in FY 21 **(July 1, 2020 through June 30, 2021)**

Measures - Planned: (for FY 21)	projected completion date (mo./yr.)	projected initial cost ($)	projected annual net impact on maint. cost ($)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings ($)
Capital Improvement Projects:						
Energy Performance Project- Phase IIF		$8,500,000	($25,000)	Electricity	7,778,000	$700,000
Total, CIP		$0	$0	Electricity	0 kWh	$0
Operations and Maintenance:						
Solar PV PPA- Ph. 2 Old New Windsor		$0	$0	Electricity	0 kWh	$120,000
Total, O&M		$0	$0	Electricity	0 kWh	$120,000
Page Total		**$0**	**($25,000)**	**Electricity**	**7,778,000 kWh**	**$820,000**
Description of Activities:						
See narrative						

FY 2022
RESOURCE CONSERVATION PLAN

Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 22 **(July 1, 2021 through June 30, 2022)**

Measures - Planned: (for FY21)	projected completion date (mo./yr.)	projected initial cost ($)	projected annual net impact on maint. cost ($)	fuel type(s) effected and units	estimated units saved per year	projected annual cost savings ($)
Capital Improvement Projects:						
Total, CIP		$0	$0	Electricity	0	$0
Operations and Maintenance:						
Solar PV PPA- Ph. 2 2 sites	12/30/20	$0 to WSSC	$0	Electricity	0	$240,000
Total, O&M		$0	$0	Electricity	0	$240,000
Page Total		**$0**	**$0**	**Electricity**	**0**	**$ 240,000**
Description of Activities:						
See narrative						

FY 2022
RESOURCE CONSERVATION PLAN

MAJOR INITIATIVES:

General Purchasing Strategy

Washington Suburban Sanitary Commission (WSSC) is projected to purchase approximately 210,000 MWh of electricity in FY'21. Towards that goal, the WSSC strategy is to purchase electricity supply in a reasoned manner subject to its overall risk parameters and goals. WSSC purchases electricity strategically in a wholesale PJM Sub-Account, which provides direct, wholesale access to the electricity markets. This structure is an enhancement the a block and index structure that was previously employed but provides more flexibility to purchase from better quality power producers and lower overall costs. Block purchases are still targeted to higher cost risk periods. Blocks are defined as products normally traded by major Electric Wholesale Trading Counterparties. Generally, these products include round-the-clock which is 7x24 (7 days by 24 hours), on-peak which is 5x16 (5 weekdays x 16 on-peak hours), or off-peak which is all weekend hours plus 5x8 weekday off-peak hours. For load which is not covered by a corresponding block purchase the load requirement is obtained by settling at the "Index". The Index for the WSSC accounts is the PJM Locational Marginal Price "LMP" in the zone where the account is located. The LMP is the instantaneous price of electricity integrated for any given hour. It represents the price at which all demand for electricity clears at the price which suppliers are willing to provide. In this wholesale PJM Sub-Account, only accounts belonging to WSSC are settled and all wholesale costs are passed through directly to WSSC at the wholesale market cost without markup.

A wholesale PJM Sub-Account approach is appropriate for WSSC for several reasons:

- It gives WSSC access to the wholesale market on a transparent basis. All block purchases are made through a transparent open market bidding mechanism where Direct Energy, executes on WSSC's behalf at the selected Wholesale Market Price.

- It provides WSSC the ability to easily integrate the physical delivery of renewable purchases, like the recent wind purchase from Sandy Ridge Wind Farm to supply approximately 30% of WSSC's annual volume of electricity with zero carbon, renewable energy.

- An advantage to PJM Sub-Account purchasing is that it apportions risk properly to where it is created. It is similar in nature to our previous block and index purchasing strategy but without the retail mark-up often found in that program. By entering a cost-plus contract directly into the wholesale electric market, which provides a clearly stated supplier fee and no other markups, WSSC can participate directly in the PJM wholesale market. WSSC can selectively mitigate extreme hourly price risk while sharing in the benefit of generally lower average index prices. Block purchases allow WSSC to lock in prices and thereby insulate itself from major prices

swings due to extreme and prolonged weather impacts such as excessive hot or cold weather durations as well as the effect of hurricanes, regulatory changes, environmental compliance issues, and changes associated with market structural changes. Generally, over the course of recent years, average index prices have tended to be somewhat less than block purchases. By having a percentage of WSSC's load on this variable mechanism allows WSSC to participate in the wholesale market at generally lower average prices. A PJM Sub-Account wholesale purchasing methodology provides a wholesale approach to energy procurement which ensures that WSSC is able to access the PJM market, integrate renewable purchases easily and pay a transparent fee for these services.

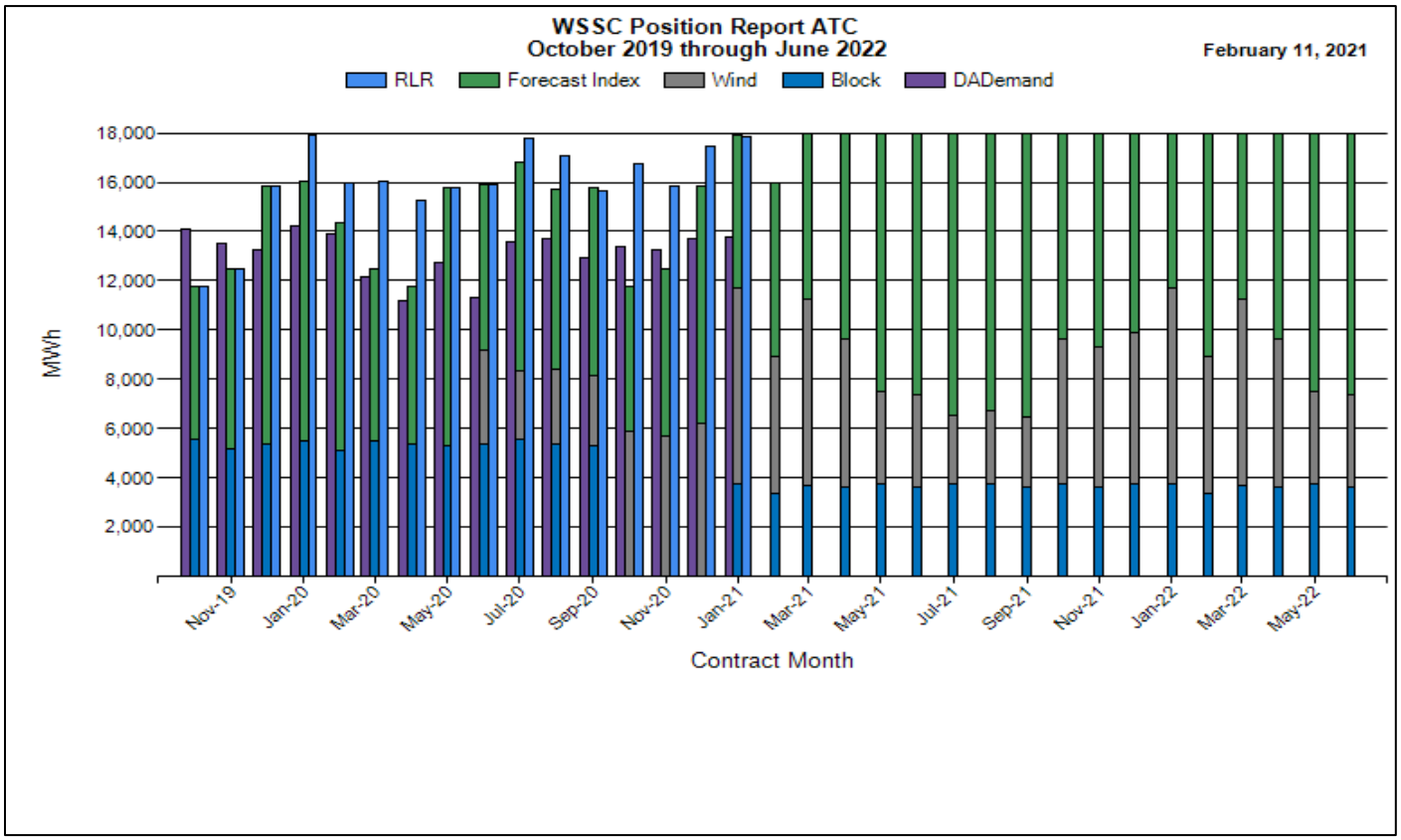
WSSC Block Purchases

Below are the active block hedges that are in place for WSSC. In this PJM wholesale account, WSSC has reduced the number of block purchases because integration of the physical renewable energy wind project also acts as a block purchase.

PurchaseDate	DeliveryPt	PeriodGroup	HrlyType	Start	End	MW	Price
3/6/2020	Sandy Ridge WF	Wind	DA	6/1/2020	5/31/2030	varies	$43.50
10/20/2020	Western Hub	ATC	DA	1/1/2021	12/31/2023	5	28.78

To view graphically the WSSC energy block purchases as well as the anticipated wind energy purchases see the chart below. The graph summarizes the block purchase timing, MW size and duration of the block purchase relative to average monthly load (called RLR). The graph provided below is for Oct 2019 through the 2022 Fiscal Year. The graph reflects actual loads through Jan '21 as well as the volumes scheduled in the PJM Day-Ahead wholesale market, which allows WSSC to mitigate its ancillary costs.

FY 2022
RESOURCE CONSERVATION PLAN



Wind/REC Purchases

Beginning in Apr '08, WSSC began purchasing wind power or "green hedges" to replace traditional "brown power" energy sources. WSSC contracted with CEPS to purchase power from Edison Mission's 29.4 MW wind farm that was constructed in Stoystown, PA and began commercial operations in April 2008. WSSC's arrangement involved paying a fixed price ($64 per MWh) for approximately 10 years for 85% of the farm's wind output. WSSC, therefore, had consistent, predictable costs for approximately 30% of its annual electric power generation. Unlike most green power purchases that include retail renewable energy credits on paper, WSSC's agreement involved the physical wholesale purchase from a specified wind farm.

The first wind contract expired on Dec.31, 2017, and was replaced with 100% Renewable Energy Credits from Renewable Choice Energy. A new wind contract for the 10-year period beginning June 1, 2020-May 31, 2030 was awarded in March 2020 to Direct Energy at a fixed price of $43.50 per MWh. WSSC is purchasing 40% of the output, but no more than 70,000 MWh in any 12-month period under this new agreement. This arrangement is for the physical wholesale purchase delivered to the PJM Sub-Account for energy and the associated renewable energy credits of Sandy Ridge Wind Facility, a 50 MW wind farm located in Blair and Centre County, PA. This wind power purchase again supplies WSSC with consistent, predictable costs for approximately 30% of its annual electric power generation.

Fiscal Year Energy Price Trends – Electricity

Energy prices are expected to remain relatively stable for commercial users in 2021 despite record investments by utilities on upgrading aging infrastructure, digitizing and securing the grid against natural disasters and cyber-attacks. WSSC Water electricity prices for FY '21 are estimated to be $97.50 per MWh (all-in) which represents an increase from the FY '20 projection of $91.60 (all-in). This level is higher than the previous year primarily due to the increased Renewable Portfolio Standard (RPS) set by the MD State Legislature in 2019. Through the Clean Jobs Act, by 2030, Maryland aims to source 50 percent of its electricity from renewable energy sources, including a 14.5 percent carve-out for solar energy. It also requires Maryland to examine ways to reach 100 percent clean energy by 2040.

Future electric energy prices are going to be driven by numerous factors including the price of natural gas, the overall balance between supply and demand resources as well as changes in the overall scope and dynamics of the marketplace. Long term, there have been early retirements of coal generation being replaced by natural gas generation throughout the nation and there is projected to be a continuing trend of this initiative. The trend of using gas for electric generation will place a floor under both gas and electric prices going forward. Another factor supporting natural gas and electricity prices is beginning to emerge with the development of LNG export facilities (such as the Dominion facility in Cove Point in MD as well as Sabine Pass). There are numerous other applications still pending at the DOE and the effect could be a change in the Natural Gas

Market such that it will no longer be a totally U.S. centric commodity but a more international product where prices can be significantly higher especially in the seasonal months. On the positive side, Natural gas production continues to set records and is now expected to average 90.5 Billion cf (cubic feet) per day. Factors causing electric rates to rise in the near future (5 years) are as follows:

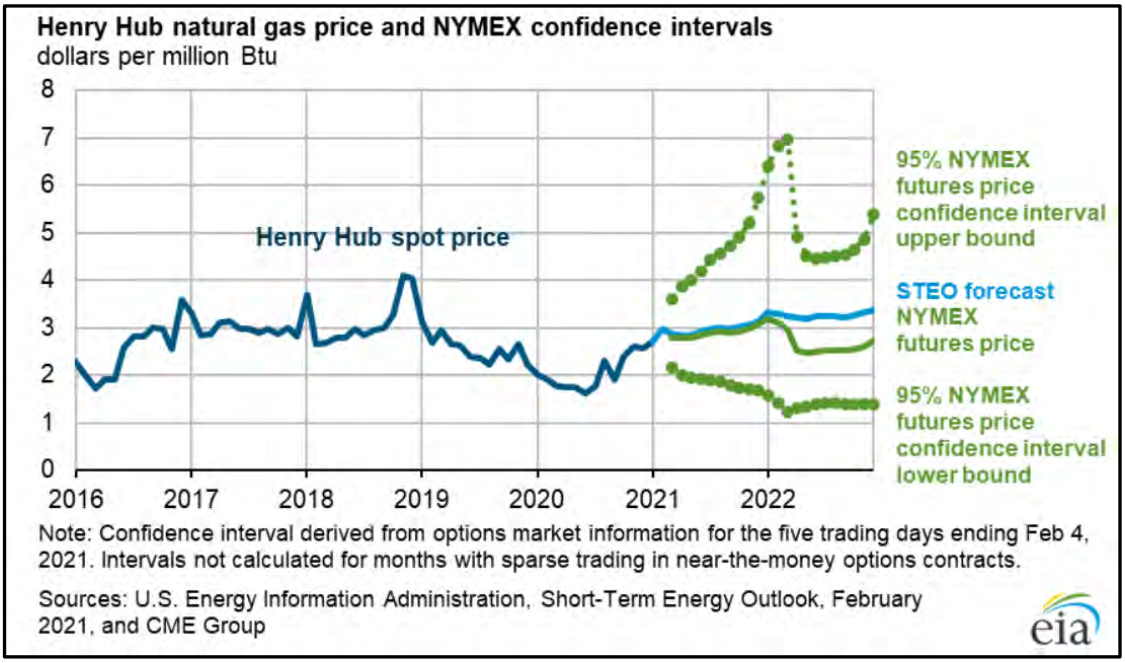
1. The 12/19 FERC minimum offer price rule (MOPR) Order seriously disadvantages renewable assets with respect to the capacity market, which will, likely lead to a scarcity of renewables. Note Tier 1 REC prices have increased 80% in the past 2 years;
2. The FERC Order noted above will also remove or cause a significant amount capacity to offer higher prices into the PJM market because of others being excluded by operation of the Order;
3. LNG exports continue to rise with expected 8.5-9.5BCF daily in 2021, though the first few weeks have topped 11 Bcf on several days in 2021. While there appears to be abundant gas the ability to move such gas will be limited without additional infrastructure. This combined with the clear trend and support by FERC of natural gas as the best marginal fuel will increase demand for gas and the corresponding power prices.

In FY'20, WSSC began purchasing electricity on the wholesale market, under a PJM Sub-Account format. Under this format, WSSC Water can operate just like a PJM member, and contract directly with energy block wholesalers and PJM. WSSC Water receives a monthly PJM invoice, with all PJM charges itemized. The total charge is then allocated to approximately 220 accounts according to PLC values and kWh. The PJM Sub-Account method of purchasing is expected to save WSSC Water an estimated $700,000/year.

Fiscal Year Energy Price Trends – Natural Gas (NG)

EIA expects the natural gas spot price for the U.S. benchmark Henry Hub will average $2.95 per million British thermal units (MMBtu) in 2021, about 92 cents higher than the pandemic-plagued 2020 average of $2.03/MMBtu. Following a year of decline, EIA expects 2021 natural gas prices to rise by 45% because of upward pricing pressure from increasing demand from the commercial and industrial sectors as economic activity growth in natural gas production.

Generally, gas prices are forecast to rise but the timing of cost increases will rely largely on how fast economic activity increases from their current diminished levels. Should overall demand outpace production, gas supplies will decrease and force prices higher. Additionally, there are now 6 LNG export facilities approved by DOE and in service with export authorizations held by 7 more projects. Despite the approximate 2.5% year-on-year global natural gas demand decline seen in 2020 due to COVID, global LNG trade still expanded 2% and has quintupled since 2016. This expansion will support higher natural gas prices. In 2022, EIA forecasts LNG exports will average 9.2 Bcf/d and will surpass the amount of natural gas exported via pipeline for the first time.



Peak Load Capacity Reduction

PJM capacity costs have risen dramatically from $9.25/MW-Day in Capacity Year '06. Additionally, there is a reasonable level of volatility in capacity prices from year to year. Capacity costs are determined by PJM several years in advance through their Capacity Planning Model and reflect the supply and adequacy of capacity. Current prices include the recent addition by PJM for the "Capacity Performance." The weighted average prices for capacity for WSSC are as follows:

Fiscal Year	Price
2011	$174 / MW-Day
2012	$110 / MW-Day
2013	$133 / MW-Day
2014	$230 / MW-Day
2015	$140 / MW-Day
2016	$163 / MW-Day
2017	$154 / MW-Day
2018	$152 / MW-Day
2019	$157 / MW-Day
2020	$200 / MW-Day
2021	$274 / MW-Day

To minimize the impact of these relatively high costs, WSSC has been committed to peak- shaving at several of its major facilities where possible. Through these actions WSSC reduces its Peak Load Contribution (PLC) which in turn reduces the overall level of capacity costs.

Load reductions at the Western Branch and Seneca sites in the past were driven by engine-generators and have been recently affected by recent EPA regulatory changes while peak shaving at the Potomac WTP and Patuxent WTP are done through an orchestrated pump operations and water storage carefully synchronized with the Water Distribution Systems requirements during high demand periods. The table below summarizes the history of the WSSC PLCs since 2010.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Proj. 2020
Patuxent WFP	1,237	1,072	952	726	610	1209	956	968	813	799	795
Potomac WTP	9,438	10,518	9,706	7,895	5,971	11,391	9,031	7,851	8529	7,333	7,000
Seneca WRRF	1,571	624	588	869	1,950	1,046	917	1,053	930	662	660
Western Branch WRRF	2,700	2,771	2,245	1,979	2,798	1,707	1,909	1,541	2221	2,026	2,000
	14,945	14,985	13,491	11,469	11,330	15,353	12,814	11,412	12,493	10,820	10,455
All WSSC Accounts	24,253	22,627	20,476	19,640	18,689	23,723	20,476	19,498	19,500	17,450	17,200

The analysis indicates that since 2010, overall PLC allocation has declined significantly by over 7.1 MW (29%). Relative to growing water demands this overall reduction is very significant. Much of the success in reducing the PLCs is the result of managing peak loads at the Potomac WTP (40%). These results are very dramatic and indicate a significant cost savings has been achieved by proactively managing peak demands on the hottest and costliest days on the PJM System.

The current budget (FY'22) reflects the most recent year's actual assigned Peak Load Contributions for each account. These PLCs are those that are currently used for billing purposes (In total 17.2 MW).

Energy Billing and Tracking System (EIS):

WSSC's energy billing and tracking system- EIS (Energy Information System), was upgraded to accommodate a new solar PV generation contract with Aggregated Net Metering:

- Automated retrieval of solar PV generation data for invoice verification
- Import and verification of the new PV electronic invoice files
- Stage I of EIS features to incorporate net metered PV generation into invoice verification for a designated set of BGE electric accounts.

Modifications needed to accommodate changed ownership of WSSC's solar PPA generation:

- The data access to the PV generation data was changed, so EIS was modified to be able to retrieve generation data for invoice verification via a new API (application programming interface).

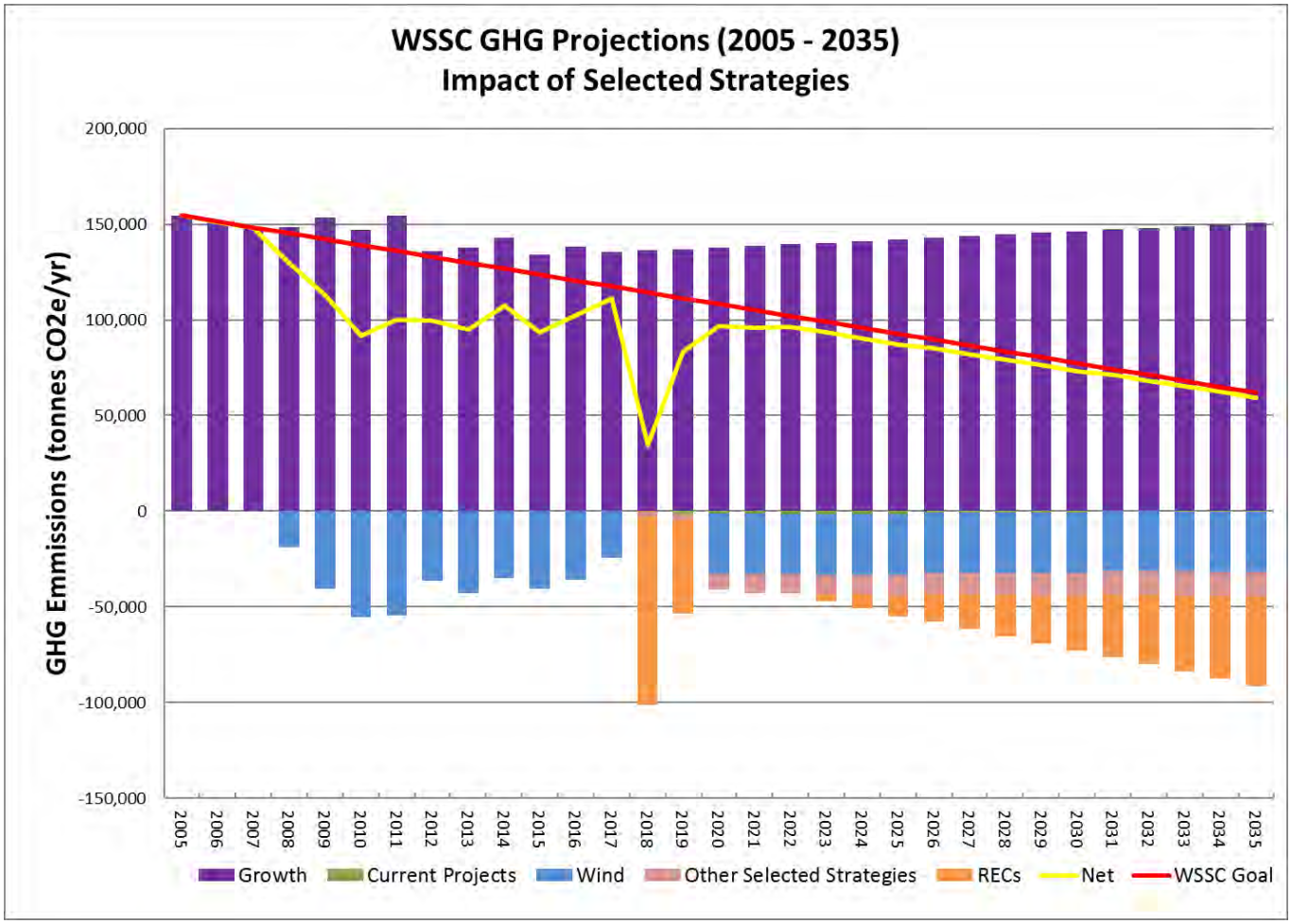
Energy Performance Program (Energy Efficient Equipment Upgrades)

Phase IF and IIF (Piscataway, Parkway, Potomac, WPS, WWPS, FO):
In February 2021, work was completed on an Energy Performance Contract (Phase IIF) by ESG including an engineering feasibility study to analyze and develop a scope of work for energy efficient equipment upgrades at HQ, field offices, WWTP, WTP, WPS and WWPS, detailed design, construction, monitoring & verification, and guaranteed energy savings. The project includes lighting retrofits with high efficiency LED fixtures, HVAC modifications and building envelope upgrades. The capital cost is $8.5 million, with $700,000 in annual estimated energy savings.

Greenhouse Gas Action (Reduction) Plan

WSSC has developed inventories of annual greenhouse gas (GHG) emissions for all Commission operations for the calendar years (CY) 2005 through 2019. GHG emission inventories are being prepared for CY 2020 and should be completed by 6/15/21. The 20-yr plan of action is being updated through CY 2020 which outlines strategies to reduce future GHG emissions at WSSC by 10 percent every 5 years through the year 2035 using demonstrated technologies and practices available now. The objective is to ensure that we are on target to meet the reduction goals and to update the mitigation measures (projects and programs) that will help achieve these objectives.

The strategies selected, in conjunction with the renewed wind contract, will result in a reduction of 90,00 tonnes of CO2e in annual GHG emissions by the year 2035. This represents 100 percent of the reduction needed to meet the stated goal of ten percent reduction every 5 years compared to the 2005 inventory. The largest component of the GHG reduction total is the implementation of a renewed wind contract (effective 7/1/20), which at 42,720 tonnes CO_2e per year is 49 percent of the total proposed reduction. Implementing the proposed strategies will have an estimated total life-cycle cost of $40 million by 2030. The figure below shows the GHG projections with the proposed strategy reductions. The figure identifies in different categories the impact of the renewed wind contract, the solar PV projects and Anaerobic Digestion/CHP. All the other strategies combined are shown under the “Other Selected Strategies” category.



Solar PV PPA – Phase 2 Project

On April 2018, WSSC Water awarded the Solar Phase 2 Project- an additional 6 MWac of solar PV power- to Standard Solar. The project includes the development of 2 sites at 2 MWac capacity each. The first site to be completed was the Old New Windsor site in Carroll County, which began operation in December 2019. Each site will be aggregate net metered, that is, the output will be exported to the Pepco and BGE grids and credited to other WSSC Pepco and BGE electric accounts. Development (engineering and construction) of the two remaining 2 MW (each) sites in Prince George's County is underway and should be completed in FY'22.

Piscataway Bioenergy Project

WSSC plans to save costs and benefit the environment by implementing the Piscataway Bio-Energy Project, employing Anaerobic Digestion/Combined Heat and Power" (AD/ CHP) that will create energy out of sewage. Based on a conceptual plan completed in 2011 funded by a $570,000 DOE grant, a new AD/CHP facility will be constructed at the Piscataway Wastewater Treatment Plant in Southern Prince George's County that will convert biosolids from several WSSC wastewater treatment plants into electricity and heat. This AD/ CHP facility will use two technologies called mesophilic anaerobic digestion and thermal hydrolysis to generate the synthetic gas that will run engine generators. The engine generators in turn will generate heat and power for the plant's use as well as export. A Program Manager/Bridging Consultant was awarded a contract in February 2016 and completed conceptual design in March 2016. A Progressive Design Build Contractor was awarded a contract in May 2018. The design is now 90% completed and construction is underway. The entire $250 million project is projected to be on-line by Spring 2023.

ACTIVITY ANALYSIS: FY'22 Budget

Energy Component	Units Estimated	Unit Type	$ Requested
Electricity	204,398,000	kWh	$18,289,000
Natural Gas	344,000	Therms	$322,000
Fuel Oil #2	45,000	Gallons	$99,000
Propane	5,000	Gallons	$13,000
			$18,723,000

Montgomery County Energy Tax (electricity) rate remained at $.020225/kWh for FY'21, and is assumed to be at that level for FY'22. Prince George's County Energy Tax (electricity) rate was $.0099/kWh in FY'21 and is assumed to be at that level for FY 22. Both these tax projections are included in the Electricity cost line item in the above table.

FY 2022
RESOURCE CONSERVATION PLAN

Historical Data	FY '14 Actual	FY '15 Actual	FY '16 Actual	FY'17 Actual	FY'18 Actual	FY'19 Actual	FY'20 Actual.	FY'21 Proj.	FY'22 Proj.
Office Sq. Ft.	509,133	509,133	509,133	509,133	509,133	509,133	509,133	509,133	509,133
Water Treated (MG)	58,612	59,469	60,028	59,519	59,860	59,860	59,156	59,860	59,900
Water Pumped- Boosted (MG)	13,916	13,865	14,000	13,900	13,900	14,000	14,000	13,870	13,500
Waste Water Pumped (MG)	31,933	31,039	37,900	37,900	35,458	38,008	24,232	28,293	29,350
Waste Water Treated (MG)	71,741	75,536	78,900	78,971	75,646	73,365	69,929	71,328	72,300

1. Water Pumped, Treated, Waste Water Pumped, Treated:
   Historical kWh/MG indices have been applied to projected treatment and pumping efficiencies (MG/kWh), based on WSSC-Budget Group's projected FY'21 and FY'22 flows for water treatment and wastewater treatment plants; $/kWh projected rates for FY'22 were based on actual and/or forward electricity block bid or market prices, adjusted for PJM generation capacity production prices and then applied to each category of facilities (WTP, WWTP, WPS, etc.) to estimate total projected cost.

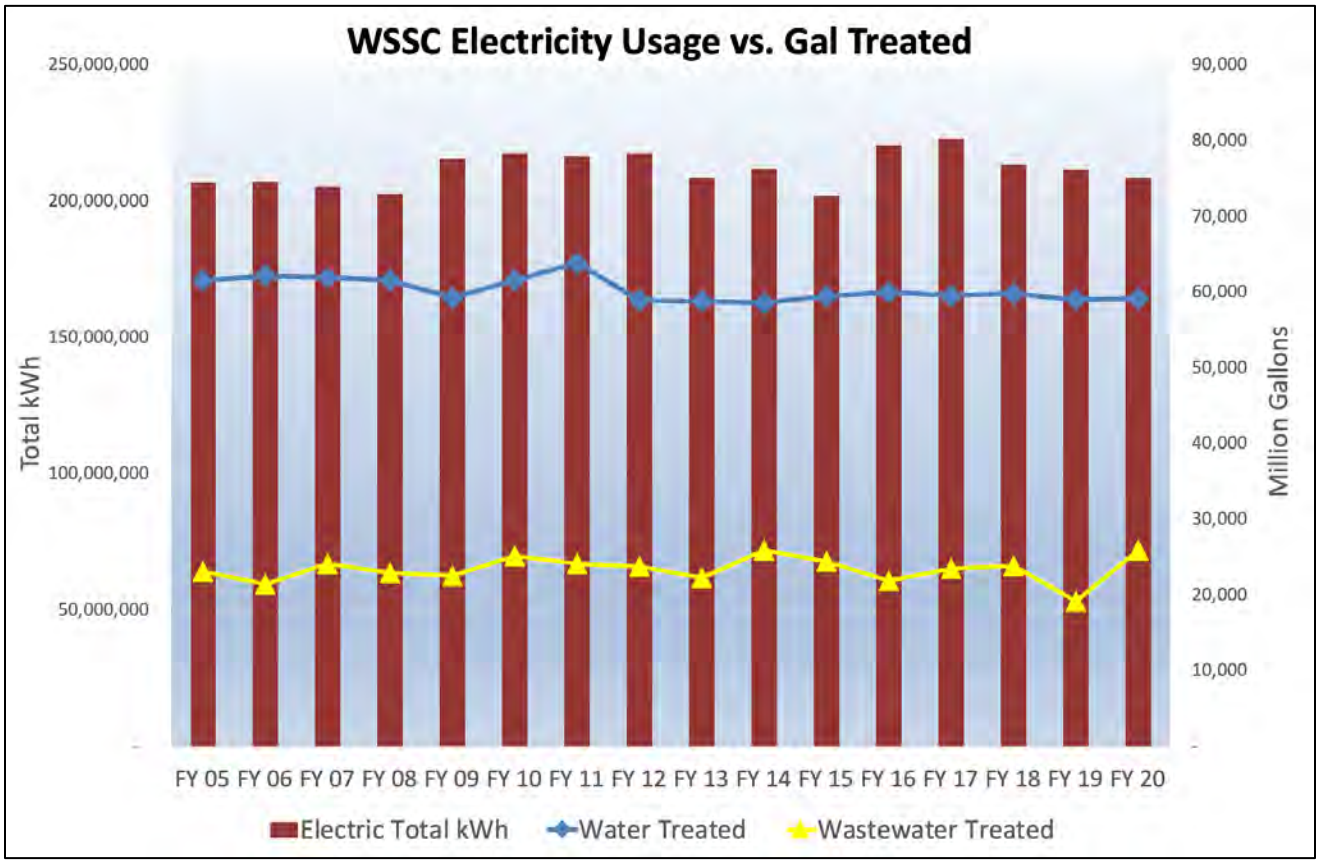
2. Field Offices:
   Historical kWh/SF indices have been applied to projected SF to determine projected FY'22 kWh; kWh were adjusted for changes in efficiency and creep in energy usage per square foot; $/kWh projected rates for FY'22 were based on Standard Offer Service (SOS) rate projections from Pepco and BGE and forward block rates taken from the electricity market, adjusted for PJM generation capacity auction prices and applied to total SF to estimate total cost.

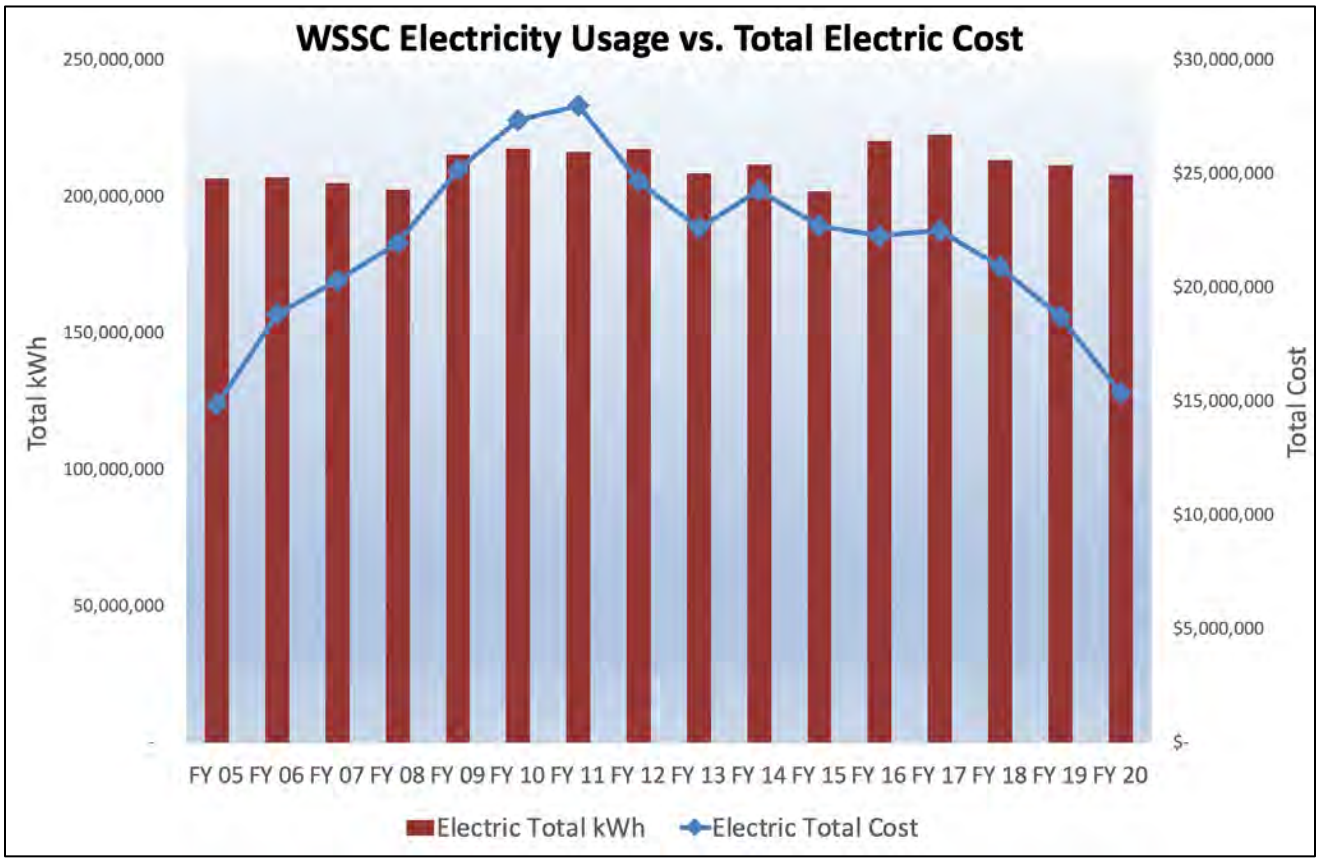
3. Dams, WWMVs, PRVs and Tanks:
   Electric consumption was projected based on kWh 5-year historical averages; kWh total was applied to latest $/kWh SOS rate projections to estimate total cost. FY'22.

   FY'22 requested energy budget is $18,723,000, $1,985,000 or 10% less than the FY'21 approved budget.

FY 2022
RESOURCE CONSERVATION PLAN

APPENDIX A




WSSC Electricity Usage vs. Total Electric Cost
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
-
Total kWh
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$-
Total Cost
FY 05 FY 06 FY 07 FY 08 FY 09 FY 10 FY 11 FY 12 FY 13 FY 14 FY 15 FY 16 FY 17 FY 18 FY 19 FY 20
Electric Total kWh
Electric Total Cost

APPENDIX B

FY 2022
RESOURCE CONSERVATION PLAN

APPENDIX C