Executive Order 01.01.2019.08
Energy Savings Goals for State Government

# Annual Report

For the period covering July 2019 - June 2020

Prepared by the Department of General Services
Office of Energy & Sustainability
August 2020

Maryland
DEPARTMENT OF GENERAL SERVICES

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# BACKGROUND

On June 25, 2019, Governor Hogan issued Executive Order 01.01.2019.08, *Energy Savings Goals for State Government*, which created a new energy savings initiative and goal for State-owned buildings. The "Maryland Leads by Example" initiative, to be developed and managed by the Department of General Services (DGS) and the Maryland Energy Administration (MEA), has a goal to reduce the energy consumption of State-owned buildings 10% by the year 2029, compared to a fiscal year 2018 baseline. The Executive Order (EO) provides State government an opportunity to display both fiscal and environmental responsibility to the rest of Maryland by making government buildings more energy efficient, thereby reducing costs and environmental impacts.

The EO requires DGS, at the end of each fiscal year, to submit an Annual Report to the Governor on the State's progress towards meeting the goal. This first Annual Report covers the time period between the release of the EO in June 2019, and the end of the fiscal year in June 2020. During the first year DGS laid the groundwork for investments in efficiency, and this report covers the initial strategies, and the steps undertaken, to address the 10% savings goal outlined in the EO. The Annual Report also provides an opportunity for the Top 20 Agencies/campuses that consume 90% of the energy used in State-owned buildings to contribute narrative reports on their energy reduction strategies.

DGS has several specific tasks outlined in the EO that will be reported in this and subsequent Annual Reports. The tasks include:

- Annually, analyze the entire inventory of State-owned buildings in order to identify and prioritize the least energy efficient buildings in the State.
- Annually, perform energy audits on the buildings identified, and present the audit report with recommendations to the buildings' owner(s).
- Measure post-installation energy use for one year following the installation of the measures identified in the audit reports.
- Report to the governor annually.

This report was compiled by the DGS Office of Energy and Sustainability (OES) and relies heavily on data from the State Energy Database. The DGS Office of Energy and Sustainability takes the lead role in coordinating with agencies and tracking progress towards meeting the ten percent savings goal. OES operates the State Energy Database, manages the State's Energy

Performance Contracting (EPC) program, Chairs the statewide Green Purchasing Committee, partners with the University System to purchase over $200 million of electricity and natural gas used by state agencies, and is active in initiating energy saving projects throughout the State. The Office also functions as the go-to resource for client agencies for all energy-related matters.

## SUMMARY OF STATEWIDE BUILDING ENERGY USE

Tracking the energy use of Maryland State government buildings is made possible through the Maryland State Energy Database https://app.energycap.com/app/dashboards/user/2211, which is the most comprehensive database of State government energy use in the country. Begun in 2008, the database has grown to include 15,400 utility accounts with 1.9 million invoices paid through 120 State agency accounts payable offices. In more recent years, DGS staff has updated the database with information on buildings to include their size, build date and primary use, and the database is currently being configured to accept building level submetered data. The constant updating, maintenance and improvements in the database make the current Statewide energy savings goal possible. We cannot manage what we cannot measure.

This report includes energy usage data from more than 7,000 State-owned buildings across forty-one State agencies and University campuses. Maryland State-owned buildings range in age from 1643 to the present, with an average age of about 50 years. Much of the heating and cooling equipment in these buildings is ten to twenty years beyond its useful life expectancy. Fortunately, however, older buildings with old equipment provide a great opportunity to increase efficiency in order to save on utility bills and reduce environmental impact. Newer heating and cooling equipment, as well as lighting, is much more efficient than older units, and the financial paybacks are often attractive.

A goal to reduce the energy use of approximately 97 million square feet of State-owned buildings owned by dozens of agencies and university campuses required prioritizing a list of candidates to work with. Through polling the database, DGS discovered that in FY2018 twenty State agencies and university campuses consumed 91.37% of the State's energy in owned buildings. These agencies and campuses became DGS' primary partners in working towards the 10% savings goal (see page 8, Agency Engagement). **The ongoing efforts of these institutions and others in the State resulted in an FY18 to FY19 decrease of 2.27% in the State's Energy Use Intensity (EUI)[1], saving the State over $7 million.** Energy data for FY20 is being compiled and will be included in next year's Annual Report.

The baseline year of the EO is FY 2018, and the baseline data below is based on energy use and existing buildings as of FY18. The following non-building energy consuming entities were excluded from the report:

- Traffic lights, streetlights, transportation, and other structures that do not meet the definitions of "Independently Metered Buildings" or "Campuses" established above
- Buildings that are not owned by the State as of FY2018

[1] Measured by energy consumption in MMBTUs per square foot per year.

- Buildings that were demolished prior to FY2018
- New construction after FY2018

Entire State Government Energy Usage and Cost in State-Owned Buildings:

| | Utility Cost ($) | Energy Usage (MMBtu) | Floor Area (SqFt) | Change in Floor Area | EUI (kBtu per SqFt) | Change in EUI |
|---|---|---|---|---|---|---|
| FY18 | $190,706,502 | 9,604,812 | 96,743,507 | | 99.3 | |
| FY19 | $183,563,083 | 9,379,356 | 96,666,631 | < -1% | 97.0 | -2.27% |

Top 20 Agencies using 91.37% of the energy in the State:

| | Energy Usage (MMBtu) | Floor Area (SqFt) | Change in Floor Area | EUI (kBtu per SqFt) | Change in EUI |
|---|---|---|---|---|---|
| FY18 | 8,776,030 | 87,160,787 | | 100.7 | |
| FY19 | 8,558,576 | 87,083,911 | < -1% | 98.3 | -2.39% |

Rest of the State:

| | Energy Usage (MMBtu) | Floor Area (SqFt) | Change in Floor Area | EUI (kBtu per SqFt) | Change in EUI |
|---|---|---|---|---|---|
| FY18 | 828,782 | 9,582,720 | | 86.5 | |
| FY19 | 820,780 | 9,582,720 | 0% | 85.7 | -0.97% |

## COVID19-RELATED ENERGY USE

This Annual Report does not cover the period of time affected by the COVID-19 pandemic. How the State's and Universities' energy consumption is affected by the telework and virtual campus responses to the pandemic will be covered in next year's Annual Report. However, our early analysis is that the State will initially experience a reduction in energy use and cost due to these policies, but may see a dramatic rebound in energy use if, when buildings are eventually repopulated, a policy is adopted to bring more outside air into buildings as a means to dilute pathogens. Other COVID-related effects on energy use are less certain.

## STRATEGIES FOR ACHIEVING A 10% ENERGY REDUCTION

OES is pursuing a three-pronged approach to achieve the energy savings goal of the EO; 1) energy audits, 2) EPCs, and 3) agency engagement. In addition to these three primary strategies, OES is working on large LED lighting installations and energy savings pilot programs, such as "smart" motor installation, chiller optimization, and building retro-commissioning. OES is working closely with Maryland utilities on all efficiency projects to take advantage of their technical resources and rebate opportunities. OES is also coordinating with DGS Facilities Engineering division on replacement HVAC systems to ensure that DGS, and DGS' client

agencies, are installing efficient, cost-effective systems that not only meet the goals of the EO but meet the State's GHG reduction efforts as well.

## Energy Audits

The auditing program is described in detail in Sections 3&4 below.

## Energy Performance Contracting (EPC) Program

EPCs are large projects dedicated to reducing the energy costs of a facility, in which the savings, guaranteed by the company performing the work, covers the cost of the project. OES drafts and issues the master contract for the EPC program, advises and assists agencies with individual projects, and coordinates with the State Treasury Office on financing. There are currently 27 active EPCs, with a total contract value of more than $265 million, annual guaranteed savings of nearly $25 million, and annual GHG reductions of 111,000 tons of CO-2.

In the 2020 session of the General Assembly, DGS introduced a bill, that was subsequently passed by the legislature, to increase the reliability and value of future EPC projects. Each EPC going forward will require DGS' review and approval before going to the Board of Public Works and will require DGS to review each annual Measurement and Verification Report to assure that the annual guaranteed savings have been met.

In May 2019, OES partnered with the MD Clean Energy Center to host a Lunch-n-Learn event that was attended by nearly 50 representatives of State agencies, that sparked a renewed interest in the EPC program. Since the event, five separate agencies have contacted OES to begin the EPC process. OES continues to promote EPCs to agencies through personal contacts, and through formal gatherings.

Where EPCs are viable projects, they will become a major source of savings, and will play a significant role in achieving the goal of the EO. However, EPCs typically require up to two years of design and development before energy saving measures are installed, and another year before those savings are accounted for and attributed. Therefore, significant savings from new EPC projects will only begin to show up during the fourth or fifth year of the EO.

## Agency Engagement

The Executive Order recognizes that the tasks outlined for DGS will not on their own achieve the 10% savings goal, and the EO states that "*All units of State government shall, in support of their core missions, implement projects and initiatives to conserve energy and reduce consumption*". In light of this, and in an effort to collaborate and coordinate on energy savings activities throughout State government, OES initiated quarterly meetings of the Working Group on Reducing Energy use in State Operations. The Working Group, Chaired by DGS OES, includes representatives of the 20 agencies and university campuses that consume 92% of the energy used in State operations.

Members of the Working Group include:

| Rank | Agency | Floor Area (SqFt) | FY18 Energy Use (MMBtu) | % of State Total MMBtu |
|---|---|---|---|---|
| 1 | University of Maryland College Park (UMCP) | 14,622,653 | 1,756,193 | 18.28% |
| 2 | Public Safety & Correctional Srvcs, Dept of (DPSCS) | 15,374,567 | 1,385,819 | 14.43% |
| 3 | University of Maryland Baltimore (UMB) | 5,950,069 | 904,967 | 9.42% |
| 4 | University of Maryland Baltimore County (UMBC) | 4,467,954 | 580,472 | 6.04% |
| 5 | General Services, Dept of (DGS) | 6,498,791 | 575,501 | 5.99% |
| 6 | Maryland Aviation Administration (MDOT-MAA) | 2,920,577 | 567,330 | 5.91% |
| 7 | Towson University (TU) | 6,036,906 | 463,915 | 4.83% |
| 8 | Health, Maryland Dept of (MDH) | 3,208,181 | 382,122 | 3.98% |
| 9 | Morgan State University (MSU) | 3,476,635 | 342,866 | 3.57% |
| 10 | Maryland Transit Administration (MDOT-MTA) | 1,562,344 | 340,403 | 3.54% |
| 11 | Frostburg State University (FSU) | 1,547,381 | 207,429 | 2.16% |
| 12 | Salisbury University (SU) | 2,217,621 | 182,154 | 1.90% |
| 13 | Stadium Authority, MD | 4,274,000 | 168,040 | 1.75% |
| 14 | University of Maryland Eastern Shore (UMES) | 1,093,365 | 154,368 | 1.61% |
| 15 | Bowie State University (BSU) | 1,332,563 | 153,917 | 1.60% |
| 16 | State Highway Administration (MDOT-SHA) | 2,276,739 | 139,194 | 1.45% |
| 17 | Maryland Port Administration (MDOT-MPA) | 6,513,833 | 134,714 | 1.40% |
| 18 | Coppin State University (CSU) | 1,096,489 | 125,809 | 1.31% |
| 19 | Maryland Transportation Authority (MDTA) | 1,082,817 | 113,602 | 1.18% |
| 20 | Military Dept | 1,607,302 | 97,215 | 1.01% |

The Working Group met four times between September 2019 and June 2020 in order to coordinate the development of the FY18 energy baseline, to inform each other about ongoing and future energy projects, and to educate the members on new technologies and opportunities in the energy field. One or two private sector firms were invited to each meeting to give presentations on energy efficiency opportunities, utility rebates, and emerging technologies.


*1The inaugural meeting of the Working Group on Reducing Energy use in State Operations, held September 12, 2019.*

# PROGRESS ON DGS TASKS OUTLINED IN THE EXECUTIVE ORDER

## 1. Determine FY 18 Baseline

In order to accurately measure progress towards the 10% energy reduction goal, a baseline of usage was established. Over several months in 2019 and 2020, the data team at OES requested and received utility bill data from agencies, which was analyzed using the State Energy Database to determine the FY18 baseline and confirm its completeness. The database is the most comprehensive resource of State facility energy use and cost in the nation and is continually improved through gathering and uploading agency supplied data. Since the database also includes data attributes of the facilities themselves, such as building size, age and primary use, it enables the State to establish an agency specific, and statewide baseline of usage, and to track and report on progress for each project.

The OES manages a longstanding and ongoing comprehensive data collection campaign to collect from agencies any missing utility bills and any missing building data attributes, including building size (gross square footage), building age, primary use and energy meters serving each facility. For the EO, the data team collaborated with agencies to identify the portion of their portfolio that falls under the scope of the Executive Order (i.e. state-owned buildings) in order to confirm that their energy use is accurately attributed. Energy use associated with leased facilities, and from non-buildings (for example, mass transit, traffic lighting, highway lighting, signage, etc.) are excluded from the baseline and the goal of the Executive Order, but energy reductions and current projects on non-buildings will be reported by select individual agencies in the

Annual Report. A more detailed description of data reporting methodology is included in Appendix 1.

### 2. Identify savings opportunities

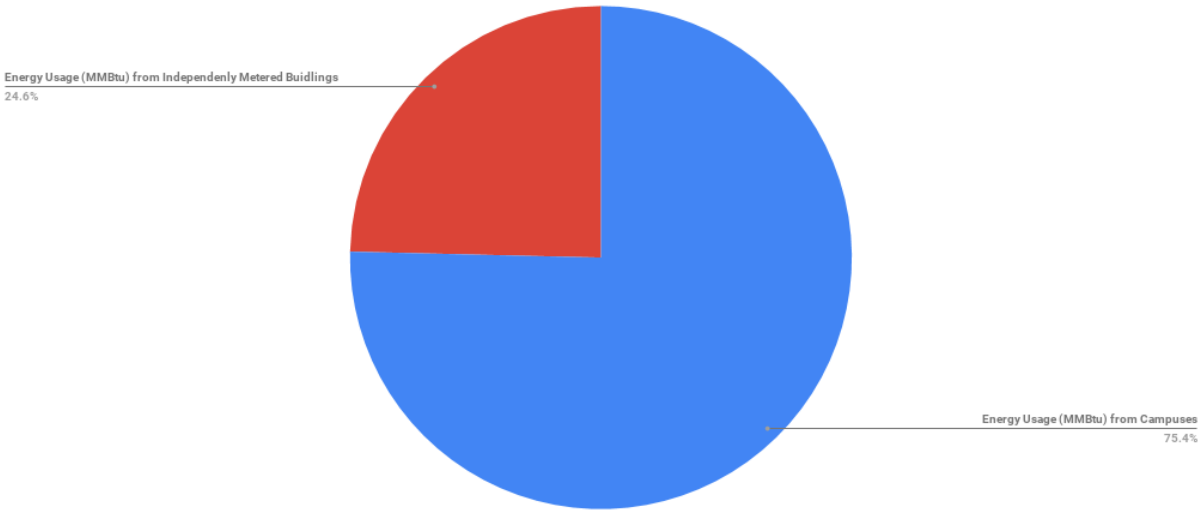
Energy professionals at OES have developed several strategies to identify buildings to retrofit. Initially, in an effort to reduce the State's costs, OES is working with BGE, SMECO, PEPCO and Delmarva utilities to identify groups of buildings that are qualified for various rebate programs. Each group of buildings will have projects addressed through the audit, procurement and implementation phases depending on the type of rebate available, and the associated utility guidelines. Concurrently, OES will use the database to identify and prioritize buildings to be audited that lie outside of standard utility rebate programs, which will include the master metered campuses.

Some of the buildings audited under the Executive Order will be good candidates for an Energy Performance Contract (EPC), but many will not. There are several agencies that own buildings, but do not spend enough annually on energy to be feasible for an EPC. Some examples include:

| Agency | Owned Buildings (square feet) | FY19 Spend in Owned Buildings ($) |
|---|---|---|
| **MD Public Television** | 140,497 | $761,450 |
| **Veterans Affairs** | 358,048 | $1,002,510 |
| **Food Center Authority** | 63,600 | $7,744 |
| **Dept. of Planning** | 103,285 | $175,234 |

Other agencies, such as DNR (FY19 energy spend $1,607,222) have widespread facilities that offer good one-off opportunities but are poor candidates for an EPC. There are also several agencies that are currently under an EPC that began years ago, that have new savings opportunities due to improved lighting and other technological advancements in efficiency that have become available over the last 5-10 years. Non-EPC projects will be addressed in the manner described in Section 4 below.

Using data to identify potential buildings for improvement will be advanced over the coming years through DGS' building-level submetering project. Most buildings in the State portfolio are on master-metered campuses and are consequently not individually metered. Submetering at the building level will provide a window to energy use that DGS can use to identify poor performers, be alerted to increases in energy use, track energy savings of individual projects, and inform the "right sizing" of HVAC replacements.




*2 State Energy Usage from Campuses vs Independently Metered Buildings*

Over 2019 and 2020, OES solicited submeter installation firms, developed a Meter Plan for the Annapolis Capitol Complex, entered into an MOU with MEA to access federal grant funds, and will move forward with pricing out submeters for Annapolis in the fall of 2020. All data from the submeters will be automatically uploaded to the State Energy Database.

3. Perform onsite energy audits

The EO requires DGS to conduct an energy audit on at least 2 million square feet of State-owned buildings annually. In March 2019, DGS signed an MOU with Small and Smart Thermal Systems Laboratory (S2TS) at the University of Maryland, College Park to perform audits on State-owned buildings throughout the state. S2TS is comprised of a team of graduate mechanical engineering students, with oversight from faculty and professional engineers, who have experience performing energy audits at the College Park campus. OES has a full-time energy auditor on staff to oversee the effort.

Per the EO, audits will concentrate on finding low-cost measures for increasing energy efficiency that will result in energy cost savings within five years that meet or exceed the costs of the measures themselves. The auditors have been instructed to evaluate all measures at each site assigned to them and to blend the savings of the suite of measures in order to achieve an overall five-year payback period per project. Initial assessment forms and a facility staff questionnaire have been developed with site visits planned for mid-summer 2020.

4. Present audit reports to building owners

After each building is audited, the Final Audit Report is presented, in person, to the agency that owns the building. At this time a decision will be made regarding how to address the identified measures. According to the EO, "*each unit of State government that occupies the space audited*

*shall, to the fullest extent practicable, implement the measures identified in the audit*". Some buildings will be good candidates for an Energy Performance Contract, while others will be addressed using other procurement and financing methods. Each project will maximize all available utility rebates, and OES will help agencies manage the efficiency projects, from initial design to implementation and through post-retrofit measurement and verification of savings.

In late CY 2020, DGS will issue an Indefinite Quantity Contract (IQC) for energy contractors to make these firms available to address the measures identified in the audits. In an effort to take advantage of utility rebates, a minimum requirement of the contractors participating in the IQC will be that they are approved utility partners. The contractors will compete against each other for each project in their assigned area of the state.

The primary means of financing projects identified through the audits will be through agency funds, utility rebates, and/or MEA loans.

## PROGRESS ON MEA's TASKS OUTLINED IN THE EXECUTIVE ORDER

The Maryland Energy Administration helps fund the activities of DGS OES, and, per the Executive Order, works with the Department of Information Technology (DoIT) and the Department of Budget and Management (DBM) to design and staff other cost-effective initiatives.

MEA supports the Executive Order in several areas of interest: (1) development of agency cross-cutting initiatives, (2) employee engagement, and (3) project finance for energy-efficiency related capital improvements. All are intended to convey a combination of benefits to State agencies, including reduced utility expenses, increased employee comfort and productivity, and opportunities for workplace leadership development. Below, MEA presents three proposals. Experience elsewhere suggests that these proposed initiatives will be most effective if they are developed cooperatively with participating agencies, rather than imposed without agency buy-in.

### Proposal 1: Cross cutting initiatives

MEA's initial recommendation is to update the energy cost-control measures established in the Policies and Procedures Handbook for Facilities as published by DGS in January 2016:

https://dgs.maryland.gov/Documents/StateFacilities/FOM_Handbook.pdf)

As a whole, the Policies and Procedures handbook presents no- or low-cost energy-saving measures to be implemented by employees in their workspace. Generally, these measures describe conservation opportunities for computers, cubicle appliances, and natural daylight management. MEA proposes amendments to the current handbook.

### Proposal 2: Employee engagement

MEA is cooperating with DBM to develop an energy-awareness training video for State employee consumption much like the IT security video series. Content will closely match the updated Policies and Procedures handbook perhaps emphasizing measures of take-home interest. Employees would be engaged by video no more than once or twice per year. MEA will present a draft to the Working Group for reaction prior to final development.

### Proposal 3: Project Finance

MEA's Jane E. Lawton Loan Program provides zero-interest loans to State agencies to finance energy-efficiency upgrades. Typical projects are some combination of lighting, HVAC, building automation controls, water heating, and building shell improvements. Loan availability is subject to annual appropriation via first-come-first-served applications. The next funding availability starts July 1, 2020 (FY21 appropriation). It is MEA's perennial mission to ensure State agency awareness of this finance opportunity. Appetite for this finance varies highly across agencies.

## ACTIVITY REPORTS FROM THE TOP 20 ENERGY USERS

The sections below include detailed information on the top 20 energy-using agencies and university campuses in the State, all of whom are members of the Working Group on Reducing Energy use in State Operations. Below the heading for each agency is a snapshot of energy usage and data compliance compiled by data analysts at OES. All energy usage data is that which is reported by each agency to the State Energy Database.

The Executive Order recognizes that data compliance is critical to accurate reporting for each agency and states that, "*Each unit of State government shall, each month, or upon request, provide DGS with access to available data about its facility and copies of the unit's utility bills*". Therefore, DGS is also reporting on the data compliance of each Agency, in terms of the number of utility bills still missing from the State Energy Database and the estimated value of those bills, based on historical trends.

The Energy Data and Compliance Snapshot is followed by a self-report of energy efficiency activities, submitted by the agency or university campus.

### I. University of Maryland College Park (UMCP)

The University of Maryland at College Park contributed significantly to the energy reduction of State-owned buildings between FY18 and FY19. Due to campus-wide energy saving measures, usage decreased 2.6% from FY2018 to FY2019. After significant efforts this past year, the agency is now reporting over 96% of their buildings' floor area for inclusion in the State Energy Database.

## Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | Change in usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 14,689,819 | 1,756,193 | | 18.28% | 120.1 |
| **FY19** | 14,689,819 | 1,710,660 | -2.6% | 18.24% | 116.9 |

## Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 96.17% | 117 | $62,924 |
| **FY19** | 96.17% | 161 | $183,427 |

## Agency report:

The University of Maryland, College Park is the state's flagship university and one of the nation's preeminent public research universities. A global leader in research, entrepreneurship and innovation, the university is home to more than 41,000 students, 14,000 faculty and staff, and 377,000 alumni all dedicated to the pursuit of Fearless Ideas. We discover and share new knowledge every day through our renowned research enterprise and programs in academics, the arts and athletics. And we are committed to social entrepreneurship as the nation's first "Do Good" campus.

The University of Maryland became a charter signatory of the American College and University Presidents Climate Commitment in 2007 and put itself on the path of greater environmental stewardship and sustainability. Since that time, the university adopted a Strategic Plan in 2008, a Climate Action Plan in 2009, a Facilities Master Plan in 2011, a Sustainable Water Use and Watershed Report in 2014, and several other guiding documents that together paint a vivid picture of a SustainableUMD. In 2019, UMD achieved a 50% reduction of our greenhouse gas emissions one year ahead of schedule. UMD's net emissions today are about 175,000 metric tons of carbon dioxide (or its equivalent) below those of 2005—similar to taking 37,000 cars off the road or 21,000 American homes becoming carbon-neutral each year.

In collaboration with and agreement from DGS, UMD is basing its report utilizing site energy data, not its utility bills. The reason for this methodology is due to the large Combined Heat and Power (CHP) plant at UMD. As it reached its 20-year equipment life span, the CHP has been unreliable in the past few years and fluctuations in operating hours year over year has a very significant impact on total MMBtus, which is the metric for this report. Utilizing utility bills does not account for the inherent efficiency of a CHP plant which, when operating at capacity, provides approximately half of the campus electricity consumption and all of its steam for heating needs. Reporting the gas MMBtus associated with the CHP would be the equivalent of a

source energy resource which is then co-mingled with other site energy resources such as grid purchased electricity. It would not be comparable to what other state agencies are reporting since they do not have any distributed generation capabilities. It also would not be representative of the energy efficiency improvements that UMD has implemented over the years as the campus physical footprint continues to grow with the addition of new buildings to meet programmatic needs. Because of its extensive building sub-meter network, UMD is able to provide the site energy use data, which is comparable to what other state agencies are reporting. Using this methodology, UMD has reduced its energy consumption by 2.6% in FY19 over FY18 baseline.

As part of its Climate Action Plan to achieve carbon neutrality by 2050, UMD recognized that reducing energy consumption was a big part of the strategy to reduce emissions. Since 2008, UMD has invested over $48 million in energy performance contracts to holistically reduce energy consumption in over two million square feet of campus space including research facilities, administrative buildings, academic space, mixed use facilities, as well as a dining hall and athletic facilities. Energy efficiency improvements included upgrading lighting and lighting controls, upgrading building automation controls, steam trap replacement and maintenance, air handling unit replacements, building envelope improvements and equipment and operations optimization.

In the same time frame, UMD implemented over a dozen energy efficiency projects by obtaining over $7 million in grants from the Maryland Energy Administration. These projects include upgrading general campus lighting as well as specialty lighting in our performing arts facilities, reducing lab ventilation rates while maintaining safety standards via building automation controls, installation of VFDs and cold box retrofits. UMD has also self-funded many other energy efficiency or energy related upgrades such as lighting and lighting controls in McKeldin Library, installation of wireless mesh network to facilitate meter data into central database, investment in PI Vision to establish an operational data warehouse for energy information, creation and support of a campus dashboard called TerpFootprints that tracks consumption and performance of all campus buildings.

There have been other initiatives such as Carbon Neutral New Development which seeks to mitigate any emissions associated with new construction on campus. All new facilities are designed to meet or exceed Maryland's High Performance Green Building Program requirements. The program offers three options for compliance; they are minimum LEED Silver standards, International Green Construction Code and Green Globes. Each option requires meeting or exceeding minimum energy efficiency standards. The Brendan Iribe Center for Computer Science and Engineering is the first facility to fall under the Carbon Neutral New Development initiative and followed guidelines for the International Green Construction Code. The Iribe Center reached substantial completion in January 2019 with an opening ceremony in April 2019. Carbon offsets were purchased to address the thermal component of its energy consumption for 2019 while the electricity portion was addressed through renewable energy. There are several projects currently under design that must comply with this initiative.

Another energy initiative adopted by UMD is to have 100% of its purchased energy come from renewable sources by 2020. UMD has a 27 MW dual fuel combined heat and power (CHP) plant. When operating at capacity, the CHP plant produces approximately half of the campus electricity

consumption and 100% of the campus steam consumption. The CHP plant also provides steam for several steam chillers used for peak loads and peak shaving. With several off-site renewable power purchase agreements (in partnership with several University System of Maryland institutions and the Maryland Department of General Services) and over 3 MW of on-site solar generation, strategic management of our Renewable Energy Credits (RECs) have allowed us to make significant progress toward this goal at no to low cost. However, as the reliability of the CHP plant decreases forcing greater volumes of purchased electricity to meet campus needs, as well as accelerating Renewable Portfolio Standards compliance needs, UMD will still be able to achieve this goal by 2020 but at greater cost than before. In 2019, UMD achieved 95% of its purchased electricity coming from renewable sources.

UMD is proud to participate in the EPA's Green Power Partnership. Since 2014 UMD has consistently placed on the EPA's list of Top 30 Colleges and Universities list of largest green power users. For the first time in 2014, UMD also placed in EPA's National Top 100 list with a ranking of #80. For the latest reporting period of 2019, UMD is ranked #1 within the Big 10 Conference, #5 among colleges and universities and #63 on the National Top 100 list.

In November 2019, UMD was spotlighted by Pepco as one of its most active and successful commercial and industrial customers in the EmPower Maryland program. We were featured online and in bill inserts and presented with a big check for $1,488,700 which represented payments between April 2017 and October 2019. We continue to work closely with Pepco to development incentive programs that are mutually beneficial. All incentives received from the EmPower Maryland program is re-invested in additional energy efficiency improvement projects.

UMD has plans for pursuing additional energy performance contracts and other self-funded energy efficiency projects; however, given the current coronavirus crisis and its related financial implications, it is unclear how much funding can be devoted to such endeavors in the near future.

## II. Department of Public Safety & Correctional Services (DPSCS)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 15,374,567 | 1,385,819 | | 14.43% | 90.1 |
| **FY19** | 15,297,691 | 1,304,948 | -5.8% | 13.91% | 85.3 |

## Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 80.19% | 12 | $135,492 |
| **FY19** | 80.19% | 9 | $652 |

## Agency report:

The Department of Public Safety and Correctional Services (DPSCS) is one of the largest departments in Maryland. Public Safety operates over 20 detention and correctional institutions throughout the state. The Department also has numerous supporting services and buildings, staff offices and other resources. Ex.: firing ranges, K-9 kennels, centralized kitchens, warehouses, farm for retired horses, wastewater treatment plants, Parole and Probation offices and the Criminal Justice Information System that is operated by Information Technology and Communication Division Data Center.

There are approximately 20,724 inmates utilizing 500 buildings on nearly 4,000 acres of land. The most recent facilities built are:

- Dorsey Run Correctional Facility (DRCF), opened 2014 and 2016
- Youth Detention Center (YDC), opened 2017

Modernization of existing and providing new energy efficient facilities is a major goal in order to provide humane living conditions for all individuals under the jurisdiction of this Department. The Department is taking on the challenge of providing efficient energy by:

- Replacing deteriorating equipment,
- development of preventive maintenance programs,
- providing efficient equipment for all utilities, and
- the training of staff and inmates.

The Department is committed to following Maryland's sustainability leadership through viable strategies such as, but not limited to: water efficiency, energy efficient power and renewable energy technology, waste and storm water reduction/management, building envelope (highly insulated and moisture protected building envelopes and high performance glazing systems), indoor environmental quality (increase daylight) and energy efficiency (high performance HVAC systems), installation of Energy Star appliances and energy efficient lighting systems.

In Baltimore City there is a major demolition project underway, where nine buildings are being removed from the inventory. Older buildings with outdated equipment present a huge amount of wasted energy. The depopulation of the Pretrial Detention facilities resulted in the initial savings of 11% in cost.

On the eastern shore in Westover Maryland, there is another project that will replace the failing steam system at Eastern Correctional Institution. This system serves a population of 2,841 medium security inmates and 834 staff members.

Over the years, the Department has engaged in several Energy Performance contacts at the following locations:

Jessup Correctional Complex, which involves six (6) facilities serving over 4,268 inmates. It is in the measurement and verification phase of the project and has saved the department a considerable amount of energy.

Cumberland Correctional Complex, which serves 2,923 inmates has an EPC that has just completed the construction phase. The project has indicated an overall savings of 8% savings since the project started and is now operating with a 15.5% improvement over the last 12 months.

Due to the utility improvement projects that have been on-going involving replacement of lighting, plumbing fixtures windows and steam lines the Department has reduced its energy use (across the board) over the last 11 years by 22%.

## III. University of Maryland Baltimore (UMB)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 5,950,069 | 904,967 | | 9.42% | 152.1 |
| **FY19** | 5,950,069 | 891,677 | -1.5% | 9.51% | 149.9 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 0 | $0 |
| **FY19** | 100% | 0 | $0 |

### Agency Report:

The University of Maryland at Baltimore brought on-line a new 429,900 Gsf Health Sciences Research Facility (aka "HSF3") in 2018. Its impact on the campus energy portfolio has been significant (overall campus EUI increased +3.4% in 2018 to 221,871 Btu/Gsf). Over the years to

come, we will improve HSF3's EUI through optimization strategies that will match building energy services with actual building loads/demands.

In 2019 and over the near term UMB will continue to focus on the following energy measures:

1. Continue upgrading T8 Fluorescent Lighting with T8 LED tube and LED fixture replacements.
2. Continue converting all building energy systems (fresh air, fume hood exhaust air, domestic water, hydronic heating, etc) from constant volume to variable volume/on-demand via VFD upgrades of motor starters and BAS setpoint resets.
3. Improve building envelope via window and roof replacements.
4. Improve Air Handler efficiencies via cooling coil steam cleaning.
5. Optimize campus chilled water loops via BAS demand flow modeling.

## IV. University of Maryland Baltimore County (UMBC)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBtu | EUI (kBtu/SqFt) |
| FY18 (baseline) | 4,467,954 | 580,472 | | 6.04% | 129.9 |
| FY19 | 4,467,954 | 579,017 | -0.3% | 6.17% | 129.6 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| FY18 | 100% | 0 | $0.00 |
| FY19 | 100% | 0 | $0.00 |

### Agency report:

Although Governor Hogan's Executive Order establishes FY 2018 as the baseline year for reducing energy consumption in State-owned buildings 10% by 2029, it is important to recognize previous milestones and energy initiatives that were successfully implemented along the way.

For UMBC, there are two key baseline years, FY 2007 and FY 2018. UMBC's Climate Commitment established FY 2007 as the baseline year for UMBC's carbon footprint. Governor Hogan's Executive Order established FY 2018 as the baseline year for UMBC's energy use.

Therefore, the following report categorizes UMBC's energy initiatives into three time periods: 1990 through 2007, 2008 through 2018, and after 2018.

**1990 through 2007**

As energy-saving technologies have evolved, so has UMBC. Even before climate change and sustainability were mainstream issues, UMBC leveraged technology to conserve energy and reduce its impact on the environment. In the years prior to UMBC's 2007 Climate Commitment, UMBC implemented the following energy initiatives:

- Upgraded pneumatic controls with Direct Digital Controls connected to a Building Automation System for better control of HVAC systems.
- Upgraded exterior lighting for roadways, walkways, and parking lots to more efficient metal halide lamps.
- Upgraded interior lighting from T12 to more efficient T8 lamps & ballasts and replaced incandescent bulbs with compact fluorescent lamps (CFLs).
- Utilized Energy Performance Contracting (EPC) to convert air distribution systems in campus buildings from constant air volume to energy-efficient variable air volume (VAV) systems.
- Retrofitted cooling/heating systems in the Central Plant with high-efficiency chillers, boilers, and hot water pumps. These hydronic systems provide cooling and heating for two-thirds of the campus.
- Installed Thermal Energy Storage system at the Central Plant with 1.6 million gallon tank. Chilled water is produced at night, stored, and then used during the day. This reduces campus electric load during peak daytime hours, improving the reliability and efficiency of the region's electric grid.
- Constructed Satellite Plant with high-efficiency chillers, boilers, and pumps to provide more efficient and reliable heating/cooling for residence halls and the dining hall.
- Installed variable frequency drives (VFDs) on large fan motors and large pump motors for more efficient operation, improved control, and extended motor life.

Energy initiatives implemented prior to 2007 generated annual savings of over 10 million kWh of electricity and 600,000 Therms of natural gas. This proactively reduced UMBC's 2007 carbon footprint baseline by approximately 8,500 MTCO2e.

Instead of it being over 97,200 MTCO2e, UMBC's 2007 carbon footprint baseline was 88,710 MTCO2e. The breakdown of greenhouse gas emissions by source shows 60.8% attributed to energy (46.2% from electricity and 14.6% from stationary combustion), 37.6% attributed to

transportation, and the remaining 1.6% attributed to other sources (solid waste, refrigerants, and agriculture).

**2008 through 2018**

With energy being the largest contributor to UMBC's carbon footprint, there was a renewed and continual focus on reducing energy consumption and greening the energy supply. There are two ways to reduce carbon footprint attributed to energy: use less and get more from renewable sources. UMBC has done both, with a focus on energy conservation.

The greenest kilowatt is not from wind or solar. The greenest kilowatt is not generated at all; it's the kilowatt that is no longer needed due to conservation efforts. Conservation is defined as any reduction in energy consumption. Conservation can be achieved in many ways, ranging from complex technological upgrades that improve the efficiency of electrical/mechanical systems to simple behavioral changes such as turning off the lights.

Conservation is not glamorous, and most conservation efforts are invisible. Few ever see the high-efficiency chillers, boilers, and HVAC systems that have been installed to provide the air conditioning and heating for the campus. This equipment is safely out-of-sight in mechanical rooms, underground, on rooftops, or in ceilings.

From 2008 through 2018, UMBC implemented the following energy conservation initiatives:

- LEED Construction – Leadership in Energy and Environmental Design (LEED) is the most widely used green building rating system in the world. LEED provides a framework that project teams apply to create highly efficient, green buildings. UMBC is committed to designing new buildings and major renovations to meet or exceed LEED Silver standards.

- Patapsco Hall Addition (LEED Gold)

- Apartment Community Center (LEED Silver)

- Performing Arts and Humanities Building (LEED Gold)

- Central Plant Boiler Upgrades – Replaced two hot water generators with high-efficiency units and stack economizers. The high-temperature/high-pressure hot water system provides heating for two-thirds of the campus.

- Green Office Program – The GO Program is a voluntary, sustainability certification program that provides resources to assist campus offices/departments in reducing waste, conserving energy, and promoting a culture of sustainability.

- Energy Performance Contracting – EPC is a means for implementing energy-saving projects that essentially pay for themselves over time via the associated energy

savings. An array of energy conservation measures were carefully evaluated, and the following projects were selected based upon operational needs and cost-effectiveness.

- Chilled Water Optimization upgraded chilled water distribution system that provides cooling for two-thirds of the campus. This project also included upgrades that enable the Thermal Energy Storage system to provide emergency chilled water distribution for critical cooling during a power outage. Completed in June 2013, this project generates annual savings of 5.7 million kWh and 3,100 MTCO2e.

- Lighting Upgrades retrofitted interior lighting fixtures throughout campus with more efficient lamps and ballasts, added occupancy sensors in many areas to automatically turn off lights, and upgraded lighting fixtures in all three parking garages with ultra-efficient LED fixtures. Completed in May 2015, this project generates annual savings of 6 million kWh and 3,200 MTCO2e.

From 2008 through 2018, the campus building square footage increased by 19% (more space to heat, cool, light, etc.) and student enrollment increased by 18% (more equipment plugged in, more students living on campus, more EVs being charged on campus, etc.). Based on this campus growth, it would have been reasonable for annual electricity consumption to increase by 12 million. However, thanks to UMBC's focus on efficiency and energy-related investments, annual electricity consumption decreased by 12 million kWh (i.e., 24 million kWh less than unmitigated growth would have required).

- 2007: Campus used 77 million kWh of electricity with 3.5% from renewable sources.

- 2018: Campus used 65 million kWh of electricity with 33.3% from renewable sources.

From 2008 through 2018, UMBC reduced campus electricity consumption by 15% despite campus growth of 19%. Normalized to account for campus growth, UMBC's electricity consumption per gross square foot (kWh/GSF) was 29% less in 2018 than in 2007. Furthermore, using less electricity and getting a greater percentage from renewable sources, greatly reduced UMBC's 2018 carbon footprint.

UMBC's 2018 carbon footprint was 70,816 MTCO2e. The 2018 breakdown of greenhouse gas emissions by source shows 54.4% attributed to energy (33.5% from electricity and 20.9% from stationary combustion), 44.4% attributed to transportation, and the remaining 1.2% attributed to other sources (solid waste, refrigerants, and agriculture).

**MTeCO2**

| Source of Emissions | FY 2007 | FY 2018 |
|---|---|---|
| Electricity | 42,029 | 35,549 |
| Stationary Combustion | 12,965 | 14,826 |
| Student Commuters | 14,342 | 15,013 |
| Faculty/Staff Commuters | 6,619 | 6,278 |
| Air Travel | 11,653 | 9,322 |
| University Fleet | 722 | 786 |
| Solid Waste | 865 | 171 |
| Refrigerants | 565 | 717 |
| Agriculture | 2 | 3 |
| Total Emissions | 89,761 | 82,665 |
| Offsets via RECs | (1,051) | (11,850) |
| Net Emissions | 88,710 | 70,816 |

**Percent of Total Emissions**

| Source of Emissions | FY 2007 | FY 2018 |
|---|---|---|
| Electricity | 46.8% | 43.0% |
| Stationary Combustion | 14.4% | 17.9% |
| Student Commuters | 16.0% | 18.2% |
| Faculty/Staff Commuters | 7.4% | 7.6% |
| Air Travel | 13.0% | 11.3% |
| University Fleet | 0.8% | 1.0% |
| Solid Waste | 1.0% | 0.2% |
| Refrigerants | 0.6% | 0.9% |
| Agriculture | 0.0% | 0.0% |

**Percent of Net Emissions**

| Source of Emissions | FY 2007 | FY 2018 |
|---|---|---|
| Electricity* | 46.2% | 33.5% |
| Stationary Combustion | 14.6% | 20.9% |
| Student Commuters | 16.2% | 21.2% |
| Faculty/Staff Commuters | 7.5% | 8.9% |
| Air Travel | 13.1% | 13.2% |
| University Fleet | 0.8% | 1.1% |
| Solid Waste | 1.0% | 0.2% |
| Refrigerants | 0.6% | 1.0% |
| Agriculture | 0.0% | 0.0% |

* Electricity Usage - RECs

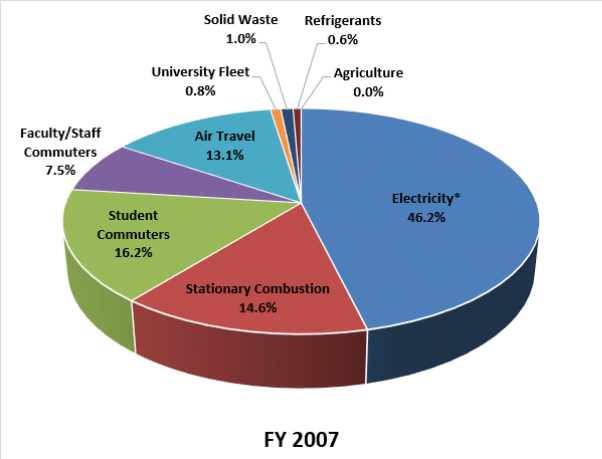
<----- **Comparing 2018 to the 2007 Baseline, UMBC reduced its Carbon Footprint by 20%.**

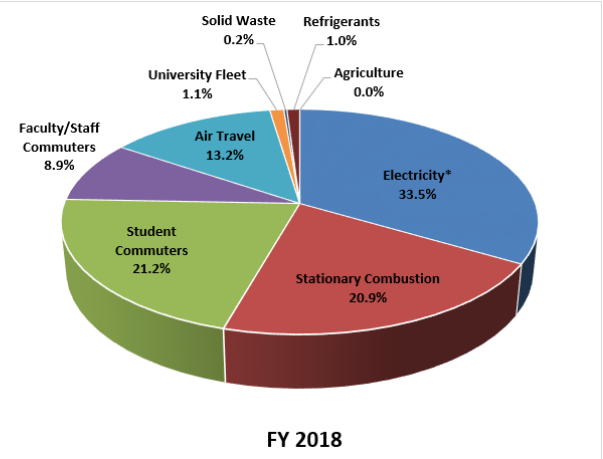
Over the same period, building square footage increased by 19% and student enrollment increased by 18%.
Normalized to account for campus growth...
- UMBC's carbon footprint per gross square foot (MTeCO2/GSF) was 33% less in 2018 than in 2007.
- UMBC's carbon footprint per full-time equivalency (MTeCO2/FTE) was 32% less in 2018 than in 2007.

Comparing 2018 to the 2007 baseline, despite significant campus growth, UMBC's reduced its carbon footprint by 17,894 MTCO2e, a reduction of 20%. Normalized to account for campus growth, UMBC's carbon footprint per gross square foot (MTCO2e/GSF) was 33% less in 2018 than in 2007.

By using less electricity and getting more from renewable sources, UMBC's energy footprint has been reduced by 15,418 MTCO2e. Successful energy initiatives were responsible for 86% of UMBC's carbon footprint reduction through 2018.

It's worth noting that as one piece of the carbon footprint pie chart is successfully reduced, the other pieces of the pie chart increase proportionally. Although the carbon footprint associated with electricity has been significantly reduced, electricity is still the single biggest piece of UMBC's carbon footprint, and energy (electricity + stationary combustion) is still more than half the total.




## FY 2018 Energy Use Intensity (EUI) Baseline and Annual Progress

UMBC most commonly refers to the UMBC Campus. However, as a State agency, UMBC consists of three sites included in the Executive Order: UMBC Campus, BW Tech South, and Columbus Center. Excluded from the Executive Order are leased properties and buildings added after 6/30/2018 (the end of FY18).

**UMBC Campus** is a research university, located at 1000 Hilltop Circle, Baltimore, MD 21250. For the EO, UMBC Campus consist of 73 buildings that total 4,033,191 SqFt. This building count and square footage excludes two buildings that currently have no utility services. Also excluded from the EO are two buildings added after FY18:

- UMBC Event Center (effective date 7/1/2018; 178,517 SqFt)
- Interdisciplinary Life Sciences Building (effective date 7/1/2019; 133,267 SqFt)

UMBC Campus FY18 EUI Baseline = 495,724 MMBtu / 4,033,191 SqFt = 122.9 kBtu/SqFt

**BW Tech South** is a research park and technology incubator, located at 1450 South Rolling Road, Baltimore, MD 21227. The complex is primarily used by tenants for R&D operations. BW Tech South consists of six buildings that total 170,826 SqFt, and all are included in the EO.

BW Tech South FY18 EUI Baseline = 26,422 MMBtu / 170,826 SqFt = 154.7 kBtu/SqFt

**Columbus Cente**r is an office building, located at 701 E Pratt Street, Baltimore, MD 21202. The building is primarily occupied by USM's Institute of Marine & Environmental Technology. Columbus Center is a 263,937 SqFt building, and it is included in the EO.

Columbus Center FY18 EUI Baseline = 58,325 MMBtu / 263,937 SqFt = 221.0 kBtu/SqFt

**UMBC Agency** refers to all three sites combined. For the EO, UMBC Agency consists of 80 buildings that total 4,467,954 SqFt.

UMBC Agency FY18 EUI Baseline = 580,472 MMBtu / 4,467,954 SqFt = 129.9 kBtu/SqFt

**Annual Energy Use (MMBtu)**

| | FY18 Baseline | FY19 | FY20 | FY21 | FY22 | FY23 | FY24 | FY25 | FY25 | FY27 | FY28 | FY29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UMBC Campus | 495,724 | 495,108 | | | | | | | | | | |
| BW Tech South | 26,422 | 27,784 | | | | | | | | | | |
| Columbus Center | 58,325 | 56,214 | | | | | | | | | | |
| **Agency Total** | **580,472** | **579,016** | | | | | | | | | | |

**Annual EUI (kBtu/SqFt)**

| | FY18 Baseline | FY19 | FY20 | FY21 | FY22 | FY23 | FY24 | FY25 | FY25 | FY27 | FY28 | FY29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UMBC Campus | 122.9 | 122.7 | | | | | | | | | | |
| BW Tech South | 154.7 | 162.6 | | | | | | | | | | |
| Columbus Center | 221.0 | 213.0 | | | | | | | | | | |
| **Agency Total** | **129.9** | **129.6** | | | | | | | | | | |

**Energy Conservation Plans for FY 2019 and Beyond**

Since 2000, UMBC has already implemented a vast array of energy conservation initiatives, resulting in the FY18 EUI baseline being 10-25% lower than it would have been.

Since many big energy projects—those with the best payback—have already been implemented, the future challenge becomes identifying and implementing additional large-scale energy projects as future technological advances provide even greater efficiencies. Funding such projects will also be challenging, especially after the COVID-19 crisis has decimated the State's budget for the foreseeable future.

Consequently, starting in FY19, UMBC is focusing on no-cost/low-cost initiatives. Many of the initiatives will be enhancements of ongoing energy conservation efforts, such as the following:

- HVAC Equipment Scheduling – Setup and maintain HVAC equipment schedules in BAS to better match the actual occupancy of each building, lecture halls, AHU zones, etc. Setup and maintain HVAC equipment schedules in BAS for campus holidays and shutdowns. Set vacant rooms in resident halls and vacant apartment units to unoccupied mode during winter/spring/summer breaks.

- Set Point Standards – Space temperature set points to be no higher than 70 for heating mode and no lower than 76 for cooling mode. Reheat valves to remain closed until space is below heating set point.

- Setback for Unoccupied Mode – AHUs off unless space gets below 60 or above 80.

- Improved Preventive Maintenance for HVAC Equipment – Include a renewed focus on energy efficiency, such as changing filters and cleaning coils to improve fan efficiency and heat transfer; water treatment to improve pump efficiency and distribution capacity; finding/fixing leaks; and finding/fixing valves, dampers, and terminal units that are wasting energy. Proactive versus reactive. Integrate energy conservation into O&M culture so the "extra work" becomes routine.

- See Something, Do Something – Improve work order process for campus community to report energy waste, such as building/room too warm when it's cold outside, building/room too cold when it's hot outside, exterior lights on during the day, and too many interior lights on at night.

- Lighting – Upgrade to LED lighting when cost-effective to do so. Utilize new stickers to remind people to turn off the lights.

- Green Office Program – Rollout to more offices and departments. Implement a periodic verification and recertification.

- Office of Sustainability – Leverage the Office of Sustainability (established in FY20) to get greater buy-in and cooperation from all parts of the campus community (admin, faculty, researchers, staff, students, and residents) and compliance support from campus leadership. Provide user-friendly resources to promote sustainability and energy conservation.

## V. Department of General Services

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | Change in usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| FY18 (baseline) | 6,498,791 | 575,501 | | 5.99% | 88.6 |
| FY19 | 6,498,791 | 560,793 | -2.5% | 5.98% | 86.3 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| FY18 | 100% | 7 | $15,167 |
| FY19 | 100% | 16 | $36,029 |

### Agency report:

DGS serves as the lead agency in all Lead by Example state government energy reduction initiatives. In addition to heading up and coordinating the State's energy reduction and data tracking efforts, DGS is also taking steps to reduce its own energy usage and cost within its building portfolio.

DGS is actively pursuing energy efficiency projects to make DGS-owned buildings more energy efficient. In 2008, DGS entered into a $23 million Energy Performance Contract (EPC) with annual savings of approximately $2 million. The scope of the EPC includes 38 DGS-owned buildings, including all of the MSC-District Courthouses, several buildings in Baltimore City, and most of the Annapolis Capital Complex. The OES is monitoring the EPC to assure the savings guarantee is met every year.

In addition to the EPC, OES has begun work on several projects expected to have positive energy, financial and environmental impacts for the coming years.

1. Building level submetering. The majority of State-owned buildings are on centrally metered campuses, which leaves us unable to measure the energy use of individual buildings. In response, DGS has embarked on a program of installing building level submeters for each State-owned building that does not have its own utility meter. The first submetering project, using federal grant dollars, is slated for the twenty buildings of the Annapolis Capitol Complex, with meter installation occurring in the summer of 2021. Once these buildings are metered, DGS will have the ability to analyze the energy use of each building to determine the poorest performing, which will guide our energy auditing program towards the buildings with the greatest potential. Submetering also allows us to track the energy use of buildings in real time to gauge the effectiveness of energy retrofits, and to alert us to unusual increases in energy use. It empowers the State to verify that utility billing is correct, which in other submetering projects has garnered utility refunds which have helped pay for the project. Submetering can also be a valuable resource to ensure that replacement HVAC equipment is right sized.

2. Lighting. DGS has initiated two lighting replacement projects in Annapolis totaling $1.5 million to upgrade existing fluorescent tubes with efficient LED fixtures. A substantial portion of the costs will be recovered through the EMPOWER-BGE lighting rebate program. The balance of the project's costs will be funded by an MEA zero interest loan, and through the current EPC with Johnson Controls.

3. Pilot Projects. DGS has designed Chiller Optimization, Retro-commissioning and Smart Motor technology pilots with implementation in mid-2020. Each pilot introduces technologies and procedures that, if proven cost-effective, will be rolled out to DGS-owned and other State agency buildings.

In addition to the efforts of OES, The Office of DGS Facilities Engineering is taking a new holistic approach to designing and installing replacement heating and cooling systems in DGS and other State-owned buildings. Facilities Engineering, as the division of DGS responsible for building upgrades, recognizes the importance of utilizing energy efficient equipment in conjunction with enhanced control of the system to increase overall utility savings as well as improve tenant comfort within the building. Facilities Engineering has a policy in place to ensure that when HVAC equipment is replaced, it is done in the most cost-effective manner to maximize energy efficiency and life-cycle cost considerations. In support of this approach, building loads are analyzed to ensure that new equipment is "right-sized", and all associated connected components, from building automation systems to variable air flow devices are working effectively and efficiently. See DGS Procedure Manual for Professional Services, Chapter 5 - Energy Conservation Guidelines:
https://dgs.maryland.gov/Documents/ofp/Manual.pdf

## VI. Maryland Aviation Administration (MDOT-MAA)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 2,920,577 | 567,330 | | 5.91% | 194.3 |
| **FY19** | 2,920,577 | 570,231 | +0.5% | 6.08% | 195.2 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 0 | $0 |
| **FY19** | 100% | 28 | $19,582.02 |

### Agency report:

The BWI airport terminal ends the decade with an impressive accomplishment of reducing energy use. The terminal represents over 92% of the total energy use of the airport complex. Over the past three years the energy use on an absolute basis has remained constant, however the airport traffic has steadily increased. When evaluating energy consumption based on an energy use index (EUI) of energy/SqFt/# of passengers we see a rather dramatic decrease over the past decade. In 2010 the EUI was 13.2 and at the end of 2019 this had dropped to 8.5 representing an almost 35 % drop in energy use per passenger served. Another important aspect of energy use is the demand capacity for the airport has decreased from 18.4 MW to 15.1 MW. This has been achieved over the years through installing LED lights, lighting controls, high-efficient gas boilers, building control systems, PV solar and water conservation.

Activities and projects that were implemented during 2019 that will result in improved energy usage include:

**Install Efficient Lights** - Continuous program to replace fluorescent, incandescent, and metal halide lights with LEDs, this program is being conducted through both maintenance and capital programs and includes buildings, airfield, roadways and parking lots. The airport has over 35 small accounts, mostly parking lots, that are eligible for the BGE small business lighting retrofit program. These facilities are under evaluation for conversion to LEDs.

**Capital Projects –** All capital projects include energy efficiency technologies unless cost prohibitive. Two major capital projects are underway where energy efficiency is being incorporated into the designs.

*Relighting the passage arrival roadway* – this will involve a more pleasing environment and transition form daylight with less glare. This will be accomplished through utilizing the latest in LED technology.

*Expansion of the AB connector in terminal* – this will increase space in the gate area for passengers and commercial activities. The design objective is to achieve and energy cost savings of 24%. This is to be accomplished through lighting, chiller replacement, hot water heating, building design and control systems, water conservation and some other design measures under consideration.

**Maintenance and Operation –** the airport staff are constantly evaluating operations for the means to reduce energy cost. One of the more significant changes in operations was the sequence of operation to the air recycling fans in the terminal. These fans were scheduled off during late night operations to reduce energy costs, however measurements indicated the energy consumption was increasing due to increased outside air intake requiring larger volumes of air to heated or cooled. Changing this practice reduced the energy use.

## VII. Towson University

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 6,036,906 | 463,915 | | 4.83% | 76.9 |
| **FY19** | 6,036,906 | 468,144 | +0.9% | 4.99% | 77.6 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 0 | $0 |
| **FY19** | 100% | 0 | $0 |

### Agency report:

Towson University became a signatory of the American Colleges and Universities Presidents' Climate Commitment (ACUPCC) in 2007. By signing the ACUPCC, TU pledged to reduce Greenhouse Gas Emissions 20% by 2020 and 50% by 2030 with a goal of carbon neutrality by 2050. This signing was a major milestone for TU; it was during this time that the University took the first steps into implementing greenhouse gas reduction measures with a strong focus on energy efficiency.

Some of these early actions included the formation of the ACUPCC Committee in 2010, the development of an energy team in 2011, and completion of the first LEED (Leadership in Energy & Environmental Design) Certified Building in 2011. Since 2011 all new buildings and major renovations are constructed with a target of LEED Silver minimum with six buildings obtaining LEED Gold Certification. TU began taking steps towards becoming a green campus and strengthening its efforts in applying more efficient and sustainable practices.

In 2011, TU also became part of the Maryland Efficiency Act known as EmPOWER Maryland. When EmPOWER Maryland was enacted by the Maryland Energy Administration and the State, it enabled institutions such as TU to take advantage of financial incentives offered by utilities (such as BGE) for the design and implementation of energy savings projects and systems. To date, TU has completed over 90 energy efficiency projects that qualified for utility incentives through BGE's Energy Saver's Rebate Program. These financial incentives received by TU have totaled over $2.5 million with additional projects in process. According to BGE, TU has become one of the largest recipients of the BGE Energy Savers Rebate Program in the entire BGE region.

In 2013, TU signed the Department of Energy's (DOE) Better Buildings Challenge (BBC). This is a voluntary commitment by TU to reduce energy (annual btu/sq.ft.) 20% by 2020 from a baseline year of 2010. This commitment requires TU to submit monthly consumption data to DOE and provide quarterly project and activity reports. In addition, TU must share their energy consumption details with other institutions across the country. This allows for continuous benchmarking and sharing of processes and best-practices. Signing the BBC was not mandatory but is another example of TU's commitment to energy reduction and environmental stewardship. TU reached its BBC 20% energy reduction goal in 2017, three years early and became one of the first ten universities in the country to reach its goal three years early.

Once TU reached its DOE goal of 20% energy reduction, a new voluntary goal of 25% energy reduction was set by the University. This goal is being set during a time of unpresented campus growth with the total number of energy intense buildings continuing to increase. In addition, the Maryland Governor has recently signed an Executive Order requiring all state agencies and universities to reduce energy consumption an additional 10% by 2028 from a baseline year of 2018. TU will meet this challenge and will continue to demonstrate environmental leadership as we move into the next decade.

Examples of Towson University Energy Efficiency Projects and Initiatives:

- Completed $7 Million Energy Performance Contract in 2012 comprising of lighting, automation and controls upgrades across 35 buildings throughout the campus. This project included installing over 34,000 T5/T8 fluorescent & LED fixtures, over 10,500 occupancy & daylighting sensors, and expanded building automation into several buildings. The annual reduction in kWh was over 8,200,000 saving the University over $650,000 per year. The BGE rebate back to the University was $1.7 Million.

- Constructed 6 LEED Gold Buildings
    - West Village Commons LEED Gold 2011
    - SECU Arena LEED Gold 2014
    - Marshall Hall LEED Gold 2017
    - Carroll Hall LEED Gold 2017

    - Burdick Expansion LEED Gold 2018
    - Residence Tower LEED Gold 2019

- Constructed 5 LEED Silver Buildings
    - Barton House LEED Silver 2012
    - Douglas House LEED Silver 2012
    - Public Safety Building LEED Silver 2013
    - College of Liberal Arts LEED Silver 2013
    - Health & Counseling Center LEED Silver 2017

- Installed a comprehensive smart electric metering network across nearly every building on campus which included over 200 electric sub-meters across 54 buildings and connecting to a central energy management system. This allows detailed energy data analysis and real-time trending using key energy metrics/analytics to identify and address energy savings opportunities across campus.
    - This sub-metering effort is on-going and will continue to expand as TU implements additional electrical, steam, chilled-water and domestic water measurement systems throughout the campus.

- Implemented Commissioning and Retro-Commissioning. All TU capital construction projects require 3rd party Commissioning of all HVAC, Building Envelope, and Lighting Systems. In addition, TU has conducted Retro-Commissioning and Re-Commissioning across multiple buildings reducing energy usage and improving operations & occupant comfort. TU has also recently begun an on-going Continuous Commissioning process identifying and correcting building HVAC opportunities in real-time using building automation and energy analysis.
    - New building Commissioning, Retro-Commissioning & Re-Commissioning, and Continuous Commissioning will continue to be a key focus in TU's overall energy strategy.

- In 2017 TU installed a 1.3 MW, 4000 panel Solar PV System across 5 structures on campus. These systems were installed on the Union Garage, University Union Rooftop, General Services Building, Barton House and Douglas House. This system has helped lower utility demand charges during the hottest days when utility rates are the highest. In addition, the Solar PV System helps reduce overall regional carbon emissions and is another demonstration of TU's commitment to the environment throughout the community.
    - TU will continue to study and evaluate additional on-site/off-site Solar PV systems.

- In 2017 TU developed an enhanced building scheduling process taking advantage of building automation and technology to optimize building equipment operations based on occupancy and activity. This included developing a temperature set-point policy for residence halls and academic buildings, implementing Chiller and HVAC optimization, fine tuning air-handler & pump speeds, and adjusting lighting schedules based on demand.

- Enhanced building scheduling and equipment optimization through automation will continue to be a priority for TU and will continue to expand as building technology and automation is built-out across the campus.

- Combined Heat and Power (CHP). In 2019 TU was awarded a grant from the Maryland Energy Administration in the amount of $500,000 towards the construction of an on-site Combined Heat and Power Plant. In addition, BGE pre-approved a financial incentive in the amount of $1.3 million.
  - TU is currently evaluating the feasibility of installing a 2.5 MW Engine Driven CHP.

- TU's list of smaller to mid-size energy savings projects are on-going and will continue. Below are a few examples of energy upgrades that have been implemented over the past several years:

  - upgraded 28 building transformers to premium efficiency in all 4 Glen Towers
  - installed Variable Frequency Drives on HVAC Pumps and Air Handlers across campus
  - installed high efficiency magnetic bearing chillers in SECU Arena and West Village Commons
  - installed energy recovery and VRF systems in several academic buildings and residence halls
  - replaced multiple large inefficient hot water tanks with instantaneous on-demand hot water systems improving efficiency by more than 50%
  - upgraded both major sports arenas, SECU and Towson Center, from HID lighting to LED lighting with occupancy controls and automation reducing lighting energy by 60% and saving the University over $120,000 annually
  - replaced several thousand CFL light fixtures in multiple buildings with LED reducing lighting energy by 50% to 70%

The above list of energy accomplishments are examples of Towson University's commitment to reducing energy consumption and greenhouse gases across campus. TU will continue to lead in this effort and will continue to take additional steps to meet the Governors new Executive Order to reduce energy consumption an additional 10%.

## VIII. Maryland Dept of Health (MDH)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 3,208,181 | 382,122 | | 3.98% | 119.1 |
| **FY19** | 3,208,181 | 387,688 | +1.5% | 4.13% | 120.8 |

## Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 2 | $7,100 |
| **FY19** | 100% | 31 | $28,309 |

## Agency report:

The Maryland Department of Health (MDH) is a cabinet level agency of Maryland State Government that is responsible for the promotion and improvement of the health of all Maryland residents. The Department's mission is to work together with the community to promote and improve the health and safety of all Marylanders through disease prevention, access to care, quality management, and community engagement. As a public health agency, the goal of MDH is to improve the health status of every Maryland resident and to ensure access to quality health care.

In order to assist in facilitating its mission, MDH operates eleven health care facilities in various locations throughout the State for individuals with chronic physical impairments, developmental disabilities, or psychiatric conditions. These facilities provide services on a twenty-four hour basis, every day throughout the year.

In addition to the eleven health care facilities, MDH also provides services to the State through operation of the Maryland Forensic Medical Center (Office of the Chief Medical Examiner) and the Maryland Public Health Laboratory, which are MDH facilities for which energy consumption is monitored. The Forensic Medical Center is a 120,000 square foot facility (completed in 2008) that provides autopsy and medical laboratory services for the State on a continuous twenty-four hour basis each day during the year. The Maryland Public Health Laboratory is housed in a 235,000 square foot building (completed in 2014) located in the Johns Hopkins Bio-Park.

MDH leases space from the Maryland Department of General Services (DGS) for the needs of the Department's headquarters at the State Center Complex at 201 W. Preston Street, and also holds leases from the private sector for administrative programs and storage space.

With a total of approximately 3.2 million square feet of space at MDH's eleven operating facilities, as well as additional locations such as the Maryland Forensic Medical Center, the Maryland Public Health Laboratory, and MDH leased facilities, energy consumption is a significant operating expense for the Department. In order to address rising energy costs and provide more effective and efficient operations, MDH has been proactive in pursuing and implementing various energy conservation efforts for more than twenty years to control utility costs; and as part the Department's mission to promote health and wellness for Marylanders through the reduction in the need for supplied energy and the negative effects energy production can have on the environment.

MDH has utilized Energy Performance Contract (EPC) projects to reduce agency wide energy consumption since 2000. EPC projects provide value to the State on multiple levels: contracted vendors install new energy efficient equipment that is warranted for the duration of the EPC; contract vendors perform all required maintenance and repair, up to and including replacement of failed equipment for the duration of the EPC; and the financing model guarantees minimum energy utility savings that fund the repayment the contract.

To date, MDH has engaged in ten EPC projects and numerous Facility Renewal Projects focused on the reduction of energy use. Prior to FY 2010, EPC projects were initiated at Deer's Head Hospital Center, Thomas B. Finan Center, Holly Center, Rosewood Center, and Springfield Hospital Center. Between FY 2010 and FY 2018, which is the baseline for energy reporting, one additional EPC project was initiated at Spring Grove Hospital Center, and another EPC project was initiated at Springfield Hospital Center.

MDH engaged with DGS to initiate two additional EPC projects that were completed after the FY 2018 baseline, that are currently in the measurement and verification stage. These projects include a stand-alone project at the Thomas B. Finan Center, and a combined EPC project benefiting the Clifton T. Perkins Hospital Center and the Holly Center. Both projects included installation of natural gas distribution and conversion of heating from fuel oil to natural gas, as well as other energy saving measures. Both projects will significantly reduce energy consumption beyond the FY 2018 baseline.

In addition to the EPC projects undertaken, MDH has worked with DGS, the Department of Budget and Management, and MEDCO to plan and construct two new modern highly efficient buildings now housing the Maryland Forensic Medical Center and the Maryland Public Health Laboratory. While these facilities are high-use in terms of energy consumption, they represent a concerted and directed effort on the part of MDH to control and minimize energy usage.

MDH is currently engaged with DGS to explore additional energy conservation projects at RICA Baltimore, John L. Gildner RICA, Eastern Shore Hospital Center, and the Office of the Chief Medical Examiner as this facility has been in service more than ten years. MDH is also actively engaged with the DGS Office of Real Estate to implement energy saving measures in leased locations as well as part of the initiation of new leases and lease renewals.

MDH is currently in the process of completing a Facilities Master Plan (FMP) for the agency. The completed FMP will include a comprehensive facility assessment, and gap analysis of the future needs for the health services provided or funded by the Department. The FMP will assess the need for health care related services over the next 20 years against the Agency's current capacity, and capacity of the private sector or potential public private partnerships. The FMP will also provide recommendations that may include various capital expenditures to renovate existing facilities, construct new modern energy efficient facilities, consolidate buildings or operations, expand facilities or operations, and provide cost estimates for necessary modernization of existing facilities for energy conservation.

Energy conservation will continue to be a priority for MDH, as it has been for more than twenty

years. For implementation and monitoring of continued energy reduction efforts, the Department maintains an active agency energy management team within the Office of Facilities Management and Development. Through implementation of additional Energy Performance Contract projects, energy focused DGS funded Facility Renewal projects, and through conservation measures managed at the facility level, MDH is confident the Department will continue, contributing cumulatively with other State Agencies, to meet Governor Hogan's and the State of Maryland's goals for energy conservation.

## IX. Morgan State University (MSU)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 3,476,635 | 342,866 | | 3.57% | 98.6 |
| **FY19** | 3,476,635 | 342,913 | +0.01% | 3.66% | 98.6 |

### Missing bill and data report:

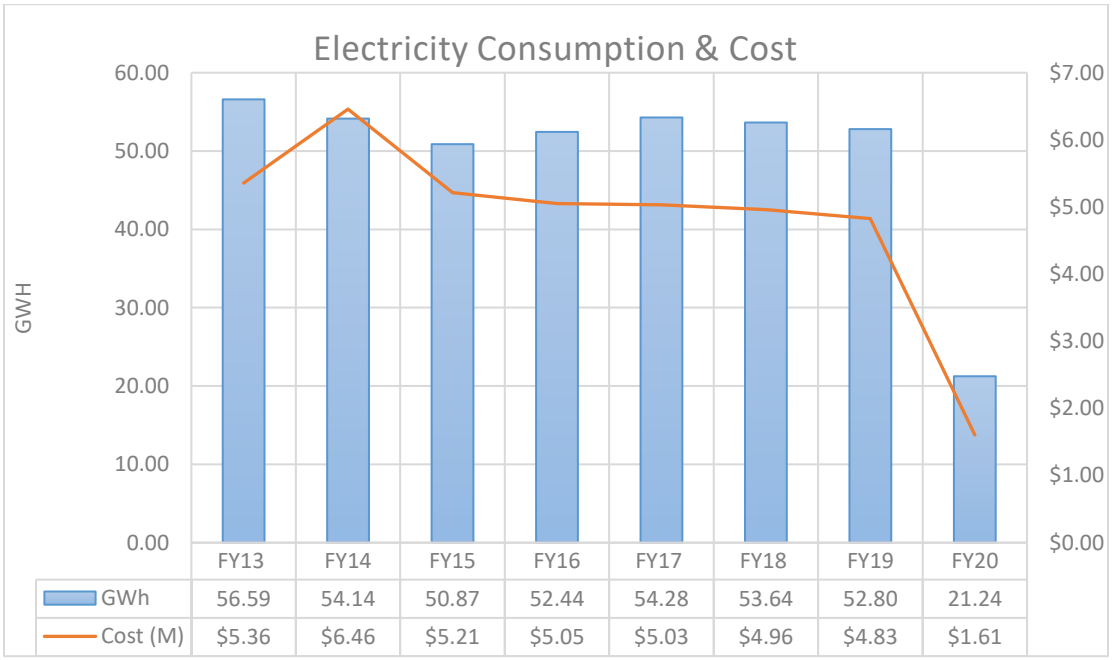
| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 0 | 0 |
| **FY19** | 100% | 0 | 0 |

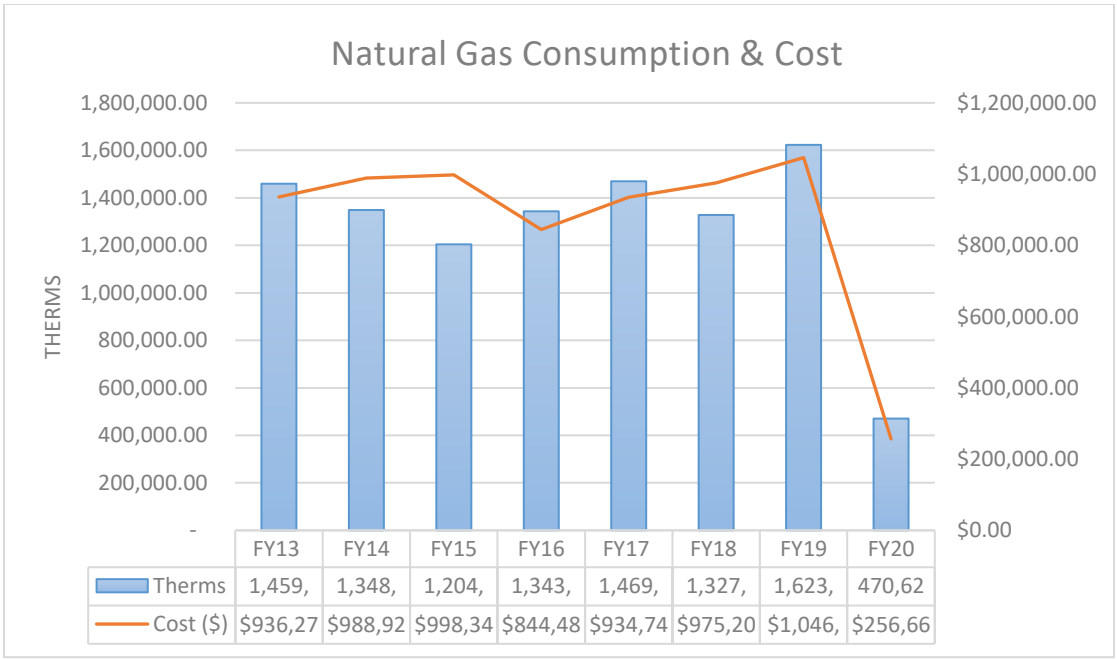
### Agency report:

Morgan State University is committed to actively participate in accomplishing the Governor's mandate of reducing the State's energy consumption by 10% - by fiscal year 2029 - utilizing the baseline of fiscal year 2018. That said, the University is partnering with Maryland Clean Energy Center (MCEC) to evaluate our facilities and develop a comprehensive energy conservation & sustainability plan. The emphasis of the plan would include the following initiatives:

- Maintain sustainability and carbon neutrality of a growing campus
- Perform an energy audit to identify potential projects
- Upgrade and expand the existing energy management system
- Maximize energy conservation by being more efficient
- Ensure a safe, comfortable and healthy environment for all occupants
- Reduce the deferred maintenance backlog by funding projects with energy savings dollars

Morgan State University has been using its Building Automation Systems to consistently conserve energy through the years. The following charts summarize our consumptions and savings from fiscal year 2013 to current.




While MSU's electricity consumption continues to go down, gas consumption is not going down because of increasing heat load and operational deficiencies. Fortunately, the University has recently funded the replacement of about fifty defective steam straps which should improve our efficiency significantly.

Some of the curtailment strategies which Morgan State University has been using are as follows:

- Turn off lights in unused common areas such as copy rooms, break rooms, conference rooms and rest rooms
- Replace failed fixtures with LED lights
- Replace failed exit signage with LED exit signage
- Use the automatic setting on thermostats to turn on fans only when heating or cooling is needed
- Lower heating settings on thermostats from 72 to **69** degrees F. It is estimated that every degree (down) is equivalent to 3% saving on heating bills.
- Adjust the summertime setting of un-occupied spaces from the occupied set-point of 72-degree F to 85 degrees F.
- Utilize heating and cooling setbacks 2 hours before the end of the day. Setback temperatures are 80 degrees in the summer and 65 degrees in the winter
- Reset boiler settings from **180 to 120** degrees. When the temperature outside is 55-degree F the set-point is 120-degree F and when it is below 32-degree F, the set-point is 180-degree F.
- Install dual technology occupancy sensors and timers on light switches. Use photocells to automatically switch lights on and off in little used areas
- Close all windows and doors during the heating and cooling seasons
- Remind housekeeping crew to turn ON lights only for the areas they are cleaning and to turn OFF all lights before they leave.
- Use only the building heating system for heating; space heaters are not allowed
- Close outside air (OA) dampers during un-occupied hours and during morning warm-up periods. Fresh air is critical while the building is occupied, but heating OA when it is not needed increases energy costs
- Confirm that all adjustable speed drives (ASDs) are running properly. If they are operated constantly at 100% ("high") speed, they use more energy than the directly connected motor. A motor running at 50% ("medium/low") speed uses 1/8 the energy of a motor running at 100% speed
- Inspect control schedules and zones so that only the occupied sections of each building are heated or cooled
- Ensure that air vent grills are not blocked by plants, books or furnishings
- Keep all thermostats free from drafts to prevent inaccurate readings and not placing heat generating office equipment under thermostats
- Dust or vacuum radiator surfaces frequently to ensure a free flow of heat
- Stagger start times of HVAC equipment to help reduce demand, especially during peak demand times

- Replace failed exterior sodium/mercury vapor bulbs and ballasts with LED bulbs (wall packs, field and parking lot lighting)
- Confirming that OA (Outside Air) economizers are functioning properly to take advantage of free cooling
- Making sure simultaneous heating and cooling does not occur.
- Regularly measure the carbon dioxide level of flue gas to maximize combustion efficiency
- Monitor the stack temperatures of fossil fuel boilers and take appropriate actions
- Change Air Handling Unit filters every 3 months
- Clean the coils of outdoor condensing units and indoor heating and cooling units as necessary.
- Clean the air conditioning refrigerant condensers to reduce compressor horsepower
- Check the control sequencing for multiple chillers and boilers. For light load operation, use the smallest and most efficient chiller or boiler available to avoid short-cycling.
- Verify that the building control system is going into the night setback mode during unoccupied hours
- Turn off circulation pumps during unoccupied times if no freeze conditions exist
- For new buildings, install variable speed drives and variable air volume (VAV) systems in lieu of constant volume HVAC systems
- Update HVAC controls by replacing pneumatic and time clock controls with direct digital controls (DDC)

In Fiscal Year 2019, MSU approved the following energy curtailment projects which are in various stages of completion:

1. Upgrading of the University's tennis court lighting with energy efficient LEDs.
   *This project is complete, and it is expected to save 400,507 kWh annually.*

2. Replacing approximately 50 steam traps of the steam distribution system.
   *The University's natural gas consumption has been increasing over the past several years and defective steam traps have been identified as the main culprit. This project is expected to be completed in the summer of 2020.*

3. Upgrading the DDC controls of approximately twenty one (21) buildings.
   *The controls of these buildings are grossly malfunctioning. The devices and servers are obsolete and parts for repairs & maintenance are no longer available. This project is expected to be completed before 2021.*

4. Upgrading of the chilled water system of the Academic Quad.
   *Two 500 ton (R11) and one (1) 40 ton chillers, located in Spencer Hall, were replaced with two (2) 700 ton (R134) chillers, one(1) 300 ton (R123) chiller, and one(1) 60 ton ( R134) air-cooled chiller. These new chillers along with an existing 500 ton (R123)*

*chiller will provide cooling for the buildings (12) of the Academic Quad. This project is about 80% complete.*

## Potential Projects

MSU is considering the following energy curtailment and sustainability projects in the near future:

1. Retro-commissioning the controls of approximately ten (10) buildings
   *These building have DDC controls which are not preforming satisfactorily. A simple tune-up and minor repairs, or retro-commissioning could restore their functionality. Funding has not yet been identified for this project.*

2. Upgrading of parking lot and streets lights with energy efficient LEDs
   *Phase I of this project is complete, and the University is planning to proceed with phase II in the near future. Funding has not yet been identified for this phase.*

3. Automation of McKeldin Center's HVAC system
   *The McKeldin Center has approximately sixteen (16) Air Handling Units which are running excessively because of defective pneumatic controls. Upgrading to DDC, controlling the occupancy, and maintaining a comfortable temperature & humidity in each space would certainly boost savings. Funding has not yet been identified for this upgrade*

4. Sub-metering
   *Most of the University's electricity is distributed via two (2) sub-station meters. Consequently, it is almost impossible to know the actual consumption of each building and if performance enhancements are needed. Additionally, sub-metering would be augmented to include steam, chilled water, and hot water systems. Funding has not yet been identified for this project.*

5. Mechanical Repairs / Replacements
   *The University is replacing a major Air Handling Unit (#14) of Key Hall. This aged unit has rotted flooring, ducting, dampers, and housing. The fans are unbalanced and noisy, bearing are worn and noisy, and the control devices are malfunctioning. In short, the unit is extremely inefficient and replacing it will certainly boost our energy savings. Furthermore, there are many more units on campus in the same condition and the University plans to use its recent deferred maintenance funding to either repair or replace those units. The energy savings would be significant.*

6. On-site renewables
   *With the likelihood of acquiring a nearby High School, the University is planning to curb its purchasing of electricity by the* ***inclusion*** *of photovoltaic arrays & battery storage*

*systems and Combine Heat & Power into its comprehensive energy plan. These projects would directly impact the sustainability and resiliency of our campus*

Morgan State University clearly has the potential to curtail its energy consumption and contribute significantly to the State of Maryland energy conservation goal. A 10% reduction in energy consumption by 2029 is certainly achievable. A comprehensive energy audit and continued funding would be the key to maximizing our efficiency and effectiveness. In the past, attempts to grow our energy conservation program have been muted because of a lack of funding. Hopefully, this hurdle would be successfully crossed in the near future and a number of curtailment & sustainability strategies would be implemented.

## X. Maryland Transit Administration (MDOT-MTA)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 1,562,344 | 340,403* | | 3.54% | 217.9 |
| **FY19** | 1,562,344 | 337,921 | -0.7% | 3.60% | 216.3 |

*FY18 MMBtu will be amended after missing fuel oil bills are submitted by MTA. The amended figure will be used as MTA's adjusted baseline for future Annual Reports.

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 16 | $86,663 |
| **FY19** | 100% | 4 | $18,927 |

### Agency report:

Maryland Department of Transportation – Maryland Transit Administration (MDOT-MTA) or MTA strives for energy efficiency and sustainability. Exceeding prior State of Maryland mandated energy reduction goals, MTA has completed several energy conservation projects. These energy reduction projects have contributed towards establishing a lower EUI for MTA. MTA's past energy conservation projects are briefly discussed below. MTA also plans to develop new energy conservation projects and measures to exceed State of Maryland's 2019 mandate of 10% energy consumption by 2029.

## I. Energy Performance Contract (2010-2012)

MTA signed an Energy Performance Contract (EPC) in November 2010. The following Energy Conservation Measures (ECMs) were part of the EPC.

- ECM-1: Energy-Efficient Lighting
- ECM-2: Occupancy Sensors
- ECM-3: Daylight Harvesting
- ECM-4: Photovoltaic System

All these four ECMs were implemented by June 2012. Close to 15,000 inefficient metal halide, high pressure sodium, and low efficiency fluorescent light fixtures were replaced with energy efficient light fixtures. Occupancy sensors were installed and day light harvesting methodology implemented to maximize energy savings. Besides lighting upgrades a 500-kW roof mounted Solar PV was installed at MTA's North West Bus Division building.

## II. Energy Performance Contract (2017-2019)

The original EPC was amended to implement additional energy efficiency projects. Following were the additional projects.

- LED lighting upgrades
- Wayside Energy Storage System

As part of LED lighting upgrades, high intensity discharge (HID), metal halide, mercury vapor, high pressure sodium, and fluorescent lighting systems were upgraded with new high efficiency light emitting diode (LED) lighting systems.

A Wayside Energy Storage system was also installed at MTA's West Cold Spring metro station as part of this energy upgrade. The Wayside Energy Storage System (ESS) is designed to capture regenerative braking energy from braking trains entering the station and return this energy to the system as trains accelerate away from the station. These systems allow for a reduction in energy consumption which reduces operating costs and in addition provides ancillary benefits such as energy resiliency and support to the electric grid. In addition to representing a major opportunity for improving the efficiency and sustainability of public transportation systems, the ESS is an ideal solution to provide voltage support, reduce peak power demand from rectifiers, and increase traction capacity of the substation. This ESS installation is first of its kind in State of Maryland.

Figure. Wayside Energy Storage System (ESS) Illustration:

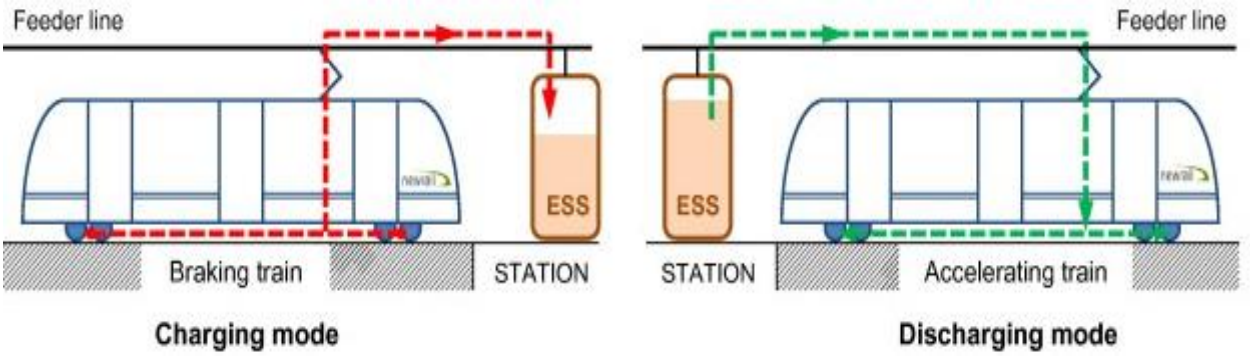



Figure. ESS at MTA West Cold Spring Metro station:

## III. Summary of Energy Savings

Annual energy savings from EPC (2010-2012) projects are around 16,000 MMBTU. The annual energy savings from implementation of LED lighting and Wayside Energy Storage system projects equal 10,000 MMBTU. Total annual savings from these energy reduction projects are close to 26,000 MMBTU. The most recent EPC was completed in 2019 so these additional 10,000 MMBTU savings will help MTA meet 10% energy reduction goal when compared with FY2018 baseline.

MTA has reduced its energy use by 142,000 MMBTU over last ten years by completing energy efficiency projects and implementing energy conservation measures. These energy savings have resulted in Green House Gas Emissions reduction by 29,000 Metric tons.

## IV. Present and Upcoming Energy reduction efforts

Besides above-mentioned energy reduction projects, MTA is taking initiatives and implementing other measures to reduce energy and be more sustainable. MTA recently constructed LEED certified MARC Camden station building in partnership with Maryland Stadium Authority.

MARC Camden station building project was the winner of MDQI-Awards of Excellence for sustainability and modal award for projects above $5 million.

Bus Wash Reclaim systems across MTA are being installed or upgraded. Reuse of reclaimed water will reduce water use across MTA. Efforts are underway to implement an agency wide sub-metering program. Submetering traction power and station power will help us understand our energy usage in a better way. Submetering will help us identify energy waste so new energy efficiency efforts can be implemented.

MTA is working with DGS to develop a new EPC. The potential projects to be considered in this new EPC will be LED lighting, Wayside Energy Storage Systems, Infrared heating, Track Switch heaters upgrades, and building automation system upgrades.

Through implementation of previous and upcoming energy reduction projects MTA will be exceeding 10% energy reduction as required by State of Maryland's June 2019 Executive Order.

## XI. Frostburg State University (FSU)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 1,547,381 | 207,429 | | 2.16% | 134.3 |
| **FY19** | 1,547,381 | 213,837 | +3.1% | 2.28% | 138.2 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 59 | $5,065 |
| **FY19** | 100% | 14 | $9,225 |

### Agency report:

Energy Saving Initiatives at Frostburg State University:

1) Dunkle Hall Window Replacements - Replacing the original windows from the 1960's should lower the utilities significantly and improve the appearance of the building.

Cost - $487,229

2) Sowers Hall - Replaced all the public area light fixtures with LEDs to lower the utilities and increase the light level. CLEAResult reduced our costs.

Cost - $10,000

3) Frost Hall - Replacing the light fixtures in this building from 1919 will reduce costs, improve the appearance and increase the light level. CLEAResult helped to reduce the cost.

Cost - $12,000

4) Allen Hall- Replaced all the public area lighting fixtures with LEDs. This improves the appearance, lowers the costs and improves the light levels. CLEAResult helped reduce the cost.

Cost - $10,000

5) Ort Library- Replaced the exterior light fixtures with LEDs. This improved the light level, increased the evening safety and lowered costs. Willdan helped to reduce costs. Cost - $23,272
6) PE Center-We have a project to replace the existing light fixtures in the main arena and the practice gym with LEDs. When completed, we will have the ability to dim the main arena lighting for special events, increase the light level and save energy. Willdan deigned the installation and will reduce the cost.

Cost - $15,000

7) Pullen Boiler - We replaced and older boiler with a more efficient unit.

$112,578

8) Annapolis Hall - We replaced two older, unreliable boilers with more efficient units.

Cost - $37,100

9) Guild Center - We installed hot decks to reduce the humidity when the A/C is operating in order to eliminate mold issues which will improve the indoor air quality. Should be able to operate the building more efficiently.

Cost - $127,565

10) Compton A/C Tower Controls - We replaced a couple of faulty VFDs and added DOC_ controls to reduce operating costs.

Cost - $20,808

11) Press Box - We installed DDC controls to help monitor the building and operate it more efficiently.

Cost- $17,963

12) Chesapeake -We replaced the food service freezers and coolers to reduce maintenance and save energy.

Cost - $169,526

13) Chesapeake Boiler Replacement - We replaced 19070s vintage equipment with more efficient boilers.

Cost - $65,735

14) Lane Center- Replaced non-functioning VFDs with new units to lower operating costs. Cost - $19,995
15) CCIT/Gira -We replaced non-functioning VFDs with new equipment to lower operating costs. Cost - $15,547
16) Guild Center- We are replacing the chiller because one circuit failed and replacing it with a more efficient unit.

Cost - $115,907

17) Compton HVAC- Replaced failed equipment with new to operate the building more efficiently. Cost - $16,998

18) Compton - Replaced chiller components to operate more efficiently. Cost - $12,196
Total of all energy projects - $1,289,279

## XII. Salisbury University

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 2,217,621 | 182,154 | | 1.90% | 82.1 |
| **FY19** | 2,217,621 | 172,156 | -5.5% | 1.84% | 77.6 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 6 | $1,314 |
| **FY19** | 100% | 10 | $1,978 |

### Agency report:

Maryland has been "Leading by Example" in energy conservation for years and Salisbury University exemplifies these efforts. Energy conservation and energy efficiency has been a major goal of Salisbury University for many years. From the introduction of a building automation system in 1985 to entering into a performance contract in 2007 as well as becoming a signatory of the American College and University President's Climate Commitment and more recently requiring new construction and building renovations to meet a minimum LEED Silver standard, Salisbury University has continued to focus on reducing our energy consumption.

Salisbury University understands the importance and value of the responsible use of energy and has been implementing energy conservation and efficiency measures for years. We have found success with a strategy of requiring energy efficient newly constructed and renovated buildings, continuing a comprehensive preventive maintenance program, being proactive in the replacement of aging equipment with high efficiency systems while also exploring new technologies and opportunities.

Here are some examples of the actions taken on the campus of Salisbury University that have contributed to the establishment of our 2018 base-line:

Participated in Energy Performance Contract (2007-2008)
The work completed through the identified Energy Conversation Measures resulted in an annual reduction of 7,440 MMBTU and 11,000,000 gallons of water.

Completed Comprehensive House Renovation Plan (2009-2013)
While updating a number of the residence halls on campus, Salisbury University was able to undertake mechanical renovations in a majority of our student housing buildings resulting in an annual reduction of 3,388 MMBTU. As well as achieving LEED Gold or Silver in six of the residence halls.

Chester Hall: LEED Silver
Choptank Hall: LEED Silver
Manokin Hall: LEED Gold
Nanticoke Hall: LEED Gold
Pocomoke Hall: LEED Gold
Wicomico Hall: LEED Gold

New Construction (2008-2016)

Salisbury University has been fortunate to be in the position to construct five new buildings in the past decade. Each of these buildings were designed and constructed with energy conservation in mind as well as building performance.
These projects resulted in high performing LEED Gold and Silver additions to the campus.

Conway Hall Completed 2008: LEED Silver 99,961 BTU/GSF
Sea Gull Square Completed 2011: LEED Silver/ 42,410 BTU/GSF
Perdue Hall Completed 2011: LEED Gold/ 67,636 BTU/GSF
Sea Gull Stadium Completed 2016: LEED Silver/ 65,543 BTU/GSF
Academic Commons Completed 2016: LEED Gold/ 70,485 BTU/GSF

Mechanical Renovation/Equipment Replacement

Salisbury University has been proactive in the replacement of aging equipment with high efficiency systems. For example, the University has successfully completed chiller, cooling tower, boiler and air handler replacements all with the goal of increasing building performance and energy efficiency.

Participant in Delmarva Power Energy Efficiency Incentive Program (2010-2018)
The lighting and mechanical projects completed through this program have resulted in an estimated Annual Reduction of 10,376 MMBTU as well as earning Salisbury University $750,000 dollars in incentive payments.

Establishment of the Green Fund (2013)
The Student Government Association (SGA) established a student financed Green Fund which places a priority on funding projects and/or research which would support the goals of the Climate Action Plan and lead to a reduction of the carbon footprint of the campus.

Construction of Photovoltaic Parking Canopy (2017)

Through a Power Purchase Agreement, a ground mount solar array was constructed on Lot H of West College Avenue producing approximately 750 MWh per year and a reduction of 560 metric tons of Green House Gas Emissions.

As a result of these actions and strategies, Salisbury University has seen significant success in reducing our energy consumption. From the original Senate Bill 267 baseline year of 2005, SU has reduced our BTU/Gross Square Foot compared to the target year of 2010 by 23,870 or a 21% reduction. From the adjusted baseline year of 2008 to 2015 measuring period our BTU/GSF decreased by over 21,000, which equated to a more than 20% reduction. From the baseline year of 2010, our BTU/GSF has decreased by 11,583, when compared to 2018, which equates to a more than 13% reduction in energy use based on BTU/GSF. The efforts and strategies employed by Salisbury University have resulted in effectively and efficiently reducing our campus wide energy consumption.

Salisbury University Continuing and Future activities supporting the Executive Order

Delmarva Power Energy Efficiency Incentive Program. Salisbury University will continue to participant in Energy Efficiency Programs taking advantage of not only the incentive payments but the realized energy savings. One example of such a project is the proposed relamping of the Outdoor Tennis Court lighting with an LED system.

Campus wide Facility Audit. Salisbury University is working toward hiring a consultant to evaluate our facilities to identify buildings that present opportunities for enhanced performance as well as energy conservation.
Mechanical Renovations/Equipment Replacements. For Fiscal Year 2019, Salisbury University has upgraded laboratory exhaust controls and in the near future will be removing 4 inefficient boilers from service and replacing them with high efficiency condensing boilers.

Energy Efficient New Construction. Salisbury University will continue to design and build to a minimum of a LEED Silver standard and will target higher standards when applicable.

Construction of an On-Campus Photovoltaic Array. In an effort to continue to reduce our carbon footprint, Salisbury University through the Green Fund program plans to construct a 102 kW roof mount solar array at Henson Science Hall.

## XIII. Maryland Stadium Authority

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 4,274,000 | 168,040 | | 1.75% | 39.3 |
| **FY19** | 4,274,000 | 169,545 | +0.9% | 1.81% | 39.7 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 0 | $0 |
| **FY19** | 100% | 0 | $0 |

### Agency report:

The Maryland Stadium Authority continues to move forward and advance this new decade, as we have diligently in the past, with a facility operational mindset and culture of best practices related to utility usage and costs reductions. We continue to maintain and/or recertify our prestigious LEED certifications for the stadiums and Warehouse.

Recent notable projects include submetering throughout the campus to allow us to be more granular with our monitoring and decision making, the HVAC system in the Warehouse is in process of being replaced with more efficient equipment accompanied by new robust BAS controls, and following suit with M&T Bank Stadium Oriole Park is installing waterless urinals ( approximately 70% complete).

Specifics regarding the success of these projects and others will be detailed in our 2020 annual report to be prepared later this year.

## XIV. University of Maryland Eastern Shore (UMES)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 1,093,365 | 154,368 | | 1.61% | 141.2 |
| **FY19** | 1,093,365 | 108,220 | -29.9% | 1.15% | 99.0 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 94% | 2 | $422 |
| **FY19** | 94% | 4 | $130 |

## Agency report:

The University of Maryland Eastern Shore (UMES) is a land grant, historically black college, originally founded in 1886 as the Delaware Conference Academy, eventually joining the University of Maryland system in 1988. Residing over 1.8 million square feet across 88 buildings on Maryland's scenic Eastern Shore, the institution places significant focus on teaching, research, extension learning, and engagement opportunities for approximately 3,200 students. The bulk of these talented students come from diverse communities across the MidAtlantic, as well as numerous countries abroad, representing an extraordinarily ethnically diverse environment. As a research institution with a uniquely diverse make-up of students, faculty and staff, UMES focuses on developing human potential, enriching cultural expressions, and sharing its expertise with the wider community.

In 2008, the University of Maryland Eastern Shore signed the American College and University Presidents' Climate Commitment, joining hundreds of other leading higher education institutions in pursuing climate neutrality. A Climate Action Plan committee (CAP) was formed to provide credible assessment of UMES' current energy usage reality and advise University leadership. Under this Plan, the University has been taking an aggressive approach to mitigating its climate impact by including new strategic energy savings measures in its most recent Master Plan, with a view towards creating a more sustainable campus.

Critically, the CAP committee helped facilitate the creation of a 2.2 MW solar power on campus which has contributed tremendously to reducing the peak demand from the regional power utility grid. In addition to the zero-emission power generation from this innovative solar farm, other positive energy-saving measures have been implemented across the campus plant. Targeted locations include University research facilities, administrative buildings, academic spaces, mixed use facilities, athletic facilities. Energy efficiency improvement projects implemented in these locations include upgrades of lighting and lighting control systems, upgrading building automation controls, air handling unit replacements, building envelope improvements, as well as equipment & operations optimization.

Further, UMES has been a committed participant in the EPA's Green Power Partnership. The aforementioned 2.2MW solar farm generates about 14% of the institution's energy needs as a renewable resource. This is in addition to the 15% in renewable energy sources already purchased by the institution, as required by the state. As a result, approximately 29% of all electric energy consumed by the University comes from renewable sources.

The UMES 2016-2025 Master Plan mandated sustainability guidelines for all campus operational and capital projects. All projects initiatives and execution are geared toward enhancing energy efficiency across our plant. Below are several examples of successfully executed sustainability projects:

- Light and motion sensor (occupancy sensors) monitoring systems were installed in 80% of the campus academic buildings
- Automated plumbing fixtures have been installed in 35% of all buildings
- Adopted an appliance purchasing policy requiring Energy Star certified products in all areas where such ratings exist

- Energy efficient HVAC equipment upgrades and replacements (ASHRAE Standard)
- A geothermal system was used as part of the HVAC system in the Wicomico Hall renovation project
- Upgrade of the Building Automation System (Johnson Metasys Control)
- Retrofitted Student Apartment parking lights (from 400W Metal Halide to 100 Watts LED)
- Retrofitted the University Terrace parking lights (from 400W Metal Halide to 100 Watts LED)
- Retrofitted the William P. Hytche Athletic Center Lighting system (from 82 X 1000W Metal Halide to 100 Watts LED)
- The newly constructed Engineering Aviation Science Complex Building is a LEED GOLD building with 230 geothermal wells

In addition to aforementioned projects, UMES has embraced a number of key energy curtailment strategies that reduce overall campus energy usage, including:

- Adjusting scheduling of custodial working hours in order to extend unoccupied hours in all buildings.
- Installation of lighting control sensors in 80% of all buildings.
- Gradually replacing all CFL bulbs to LEDs across campus.
- Participation in the PJM Demand Response program.
- Adjusting boiler settings from 180F to 120F based on outside temperature.
  - If outside temperature is 55F the set-point is 120F.
  - If outside temperature falls below 32F, the set-point is 180F.
- Lowered heating settings on thermostats from 72F to 69F in order to achieve 3% savings on heating.
- Increased the summertime setting of un-occupied spaces from the occupied set-point of 72F to 85F.
- Utilized heating and cooling setbacks two (2) hours before the end of the day. Setback temperatures are now 80 degrees in the summer and 65 degrees in the winter.

Potential Energy Savings Project

UMES currently relies on #4 fuel to power its Steam Plant. There is an ongoing project to convert the #4 fuel to natural gas, as well as conversion of all individual boilers powered by #2 fuel across 18 buildings to natural gas. This will help reduce the institution CO2 emission by about 55%. Project completion is anticipated for August 2021.

Additionally, UMES is projected to have all exterior lighting to be retrofitted to LED by the end of 2021 Fiscal Year. This includes lighting of parking lots, roadways, pathways, pedestrian walkways, and exterior building lights.

UMES is contemplating additional energy saving measures, including possible expansion of the Solar farm from 2.2MW to approximately 4MW. The University is also currently studying the possibilities of having a wind turbine on campus as an additional renewal energy source

In line with the State of Maryland's energy conservation goals, UMES is projecting a ten-percent overall reduction in energy consumption by the year 2028. Achieving this further level of reduction would require additional funding in order to conduct a comprehensive energy audit for all existing buildings. In prior years, a Tier-2 audit was conducted fir two buildings (as part of a program sponsored by MEA). This second-tier audit was so successful that it was used as a template which was for analysis of replicated other buildings. The outcome of this audit was a significant and measurable improvement on the energy savings. Investments in future energy savings measures are anticipated to further the University's 10% goal.

One example of how this funding could be obtained and successfully used towards overall energy usage improvements is the EmPOWER Maryland program. In 2014, UMES tapped into the Maryland Efficiency Act, known as EmPOWER Maryland, which provided financial incentives towards energy efficiency. Some of these incentives were used to implement relatively low-cost energy savings projects that netted measurable energy savings, such as installation of occupancy sensors in all historical buildings. In fact, it is currently a UMES best practice that all HVAC and lighting projects on the campus take advantage of the EmPOWER incentives and/or rebates, where they exist.

## XV. Bowie State University (BSU)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 1,332,563 | 153,917 | | 1.60% | 115.5 |
| **FY19** | 1,332,563 | 136,643 | -11.2% | 1.46% | 102.5 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 9 | $12,082 |
| **FY19** | 100% | 0 | $0 |

### Agency report:

Bowie State University places a high priority on energy efficiency and on implementing energy conservation strategies. Since 2013 all new construction on campus had been completed to a minimum LEED silver standard. The Student Center achieved LEED Gold and the Center for Natural Sciences Mathematics and Nursing achieved a LEED Platinum certification.

The following are examples of activities completed on campus:

- The University is in year of an Energy Performance Contract resulting in an cost avoidance over $3 million during the first five years of the project.
- The University has embarked on a boiler replacement program.
- The University has converted 90% of the exterior lighting to LEDs.
- The University continues to upgrade and convert interior lighting to LEDs.
- The Student Government Association (SGA) and Graduate Student Association (GSA) agreed to establish a student supported green fund to help provide funding for student led green initiatives and projects on campus.
- The University has installed seven photovoltaic/solar arrays on campus with a total generating capacity of 2.2MW.
- The University is signatory to American College and University President's Climate Commitment.
- The University has implemented a reduced parking fee structure for faculty, staff and students driving energy efficient vehicle.
- Renovate aging mechanical systems campus wide.

Bowie State University will continue to explore opportunities for energy savings and reductions. We will continue to partner with our suppliers such BGE and the BGE Rewards program which provide significant rebates for energy efficient projects. Our new construction projects will be built to a minimum LEED Silver requirement or higher or will be constructed to meet the Maryland Green Building Standard.

## XVI. State Highway Administration (MDOT-SHA)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 2,276,739 | 139,194 | | 1.45% | 61.1 |
| **FY19** | 2,276,739 | 147,567 | +6.0% | 1.57% | 64.8 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 103 | $75,155 |
| **FY19** | 100% | 97 | $73,090 |

## Agency report:

MDOT State Highway Administration has many energy users beyond buildings. Facilities are 43.5% of the energy usage for the agency for FY 2018. In order to facilitate meeting the energy reduction goals established by previous legislation, SHA entered into an Energy Performance Contract (EPC) with Energy Services Group in late 2010. Because the DGS database was still incomplete and accounts attributed to SHA were still unidentified, the contract was not based on actual usage but on calculated savings. SHA touched every facility with this EPC by: doing building envelope improvements such as caulking and weather stripping; night setback of conditioned buildings that did not previously have night setback by installing programmable thermostats to replace existing thermostats; replacing all existing lighting fixtures with more energy efficient fixtures or rebuilding the existing fixture with new ballasts and lamps that used less power; adding lighting controls in the interior of buildings controlled by occupancy sensors; and by identifying and providing lighting controls to modify site lighting to use only minimal security/critical lights at night and converting the remaining site lighting to non-critical/working lights that would be energized by a programmable lighting control timing system when needed. The working lights were not replaced with more energy efficient lighting because of insufficient payback due to new operating hours. However, as these fixtures fail, they are replaced with LED fixtures. Calculated as-built savings for this effort (facilities) resulted in a savings of 7,730,611 kwh/yr.

Additionally, under this same EPC, highway sign lighting was replaced with LED lighting. Some of this lighting replacement was eliminated during construction due to problems within the power and structural supports of some of the lighting. Construction of this EPC occurred between early summer 2011 through October of 2013. Since the highway sign lighting was mainly unmetered, the energy savings did not appear until negotiations with the utilities occurred and billing was modified beginning in March of 2014. Calculated as-built savings for this effort (sign lighting) resulted in a savings of 8,191,250 kwh/yr.

Total as-built energy savings from the EPC per the measurement and verification report is 15,921,861 kWh/yr plus 104,114 therms/yr plus 35,629 gallons of number 2 fuel oil/yr and 7,781 gallons of propane/yr. *This equates to 70,464 MMBtu ($1,473,543) of total as-built energy savings provided by the EPC.*

In addition to this effort, work was already on-going to convert all traffic signals to LED. This effort is at 95% complete and was held up by insufficient funding. Savings for this portion of the effort are difficult to calculate as changes to signal quantities have not been tracked. Signal quantities generally have increased with safety improvements such as additional signaled turn lanes and additional intersections being signalized. An intersection with 8 signals with incandescent lights would have theoretically used 25.92 kwh/day and if these signals were converted to LED they would theoretically use 8.06 kwh/day. Of course, any actual usage and savings varies greatly from intersection to intersection.

In addition to the EPC, MDOT-SHA continues to take action to limit or reduce energy usage. All new signals and highway/roadway lighting are constructed with LED lighting. SHA is currently converting all existing highway lighting to LED; as they are replaced due to accident

or adjacent roadways undergoing major construction. Some of this lighting may be unmetered and savings will need to be addressed on a case by case basis. This is the largest untapped pool of savings and will result in the biggest impact to further use reduction.

Facilities are a relatively small portion of the overall SHA usage and cannot provide enough contribution by any small projects left to achieve, to greatly reduce energy consumption. Additionally, we continue to have many unfunded needs for our facilities that absorb any available capital funds and to bypass those funds into strictly energy reduction projects would not be practical or feasible. However, energy use is considered in all facility projects as they are designed. When new facilities are constructed or undergoing major upgrades they are designed to meet or exceed the latest building energy code.

HVAC systems gain efficiency each time they are replaced. We are still catching up on replacing systems that have run beyond their normal average service life. During roof replacements insulation is added to the extent possible that doesn't affect the building structure (parapet and weight issues). Some doors and windows have been replaced due to problems with leakage, or in the case of doors failure due to salt corrosion. Each time a replacement occurs, more energy efficient replacements are installed.

Due to lack of funding for all needs and insufficient paybacks to cover the cost of replacements, windows are not being targeted for capital replacement projects unless they are causing water infiltration. However, individual locations have been replacing a few windows as needed to improve performance and comfort each year and most overhead garage doors have been replaced over the last 8-10 years.

Obviously, these small ongoing improvements will result in energy savings, but not in significant numbers. There is another issue that needs to be addressed and that is keeping the improvements previously constructed properly operational. This is especially needed for the facility lighting control systems. Unfortunately, there are a lack of resources available to identify issues with these systems and to work to get them addressed and corrected. Verification of the site lighting would be best done at night and existing resources are already stretched too thin to allow for this extensive overtime.

MDOT-SHA has begun work on several projects expected to have positive energy, financial and environmental impacts for the coming years.

I. The 450 ton 2 stage centrifugal chiller at our headquarters building is currently being replaced with a new 350 ton magnetic bearing centrifugal chiller. The existing chiller was rated at .615 kw/ton when newly installed and the new chiller is rated at .590 kw/ton.

II. As mentioned above, MDOT SHA has untapped savings potential in its highway lighting infrastructure. It's estimated that MDOT SHA has upgraded approximately 80% of its highway lighting fixtures to LED (roughly 24,000 of an approximate 30,000 fixtures); however, energy cost savings have not been fully realized due to the prevalence of unmetered lighting. MDOT SHA is actively working with BGE to obtain GIS-based account information for its highway lighting inventory within BGE's jurisdiction. This

has been a lengthy process due to BGE's internal discussions of appropriate information sharing through non-disclosure agreements. Progress is being made and similar efforts will have to commence with other utility companies to execute energy cost savings.

There may also be cost savings potential in the highway lighting infrastructure itself, via ballast replacement, control panel upgrades, and other non-fixture-related upgrades. Lighting reduction is another potential energy-reduction measure. MDOT SHA is currently evaluating the potential of entering into an Energy Savings Performance Contract (ESPC) or Energy as a Service (EaaS) Contract whereby a concessionaire would perform a capital investment and/or maintain the highway lighting infrastructure for energy savings and improved performance. To grasp energy savings potential, MDOT SHA first needs a complete geospatial lighting inventory, which it does not currently have. MDOT SHA is currently determining whether to perform inventory collection in-house or via contract mechanism.

III. Another area that could use resources to identify locations where highway lighting is on when it should not be and to work to address repairs to photocells. This lighting is generally designed to fail on for safety. These savings in operating hours could be more beneficial than conversion of the lighting from a return on investment viewpoint. However, there is no current data on the extent of photocell failures nor resources to collect such data to provide a reasonable calculation to determine the return on investment or potential savings.

## XVII. Maryland Port Administration (MDOT-MPA)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 6,513,833 | 134,412 | | 1.40% | 20.7 |
| **FY19** | 6,513,833 | 128,266 | -4.8% | 1.37% | 19.7 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 57% | 0 | $0 |
| **FY19** | 57% | 15 | $15,324 |

Note that due to a lack of complete data, the above numbers reflect the entire agency's energy usage and square footage, which may include leased facilities and non-building energy usage.

## Agency report:

Maryland Department of Transportation– Maryland Port Administration facilities consist of a diverse array of energy consumers; office buildings, shops, cargo buildings, area and roadway lighting are a few. MPA's environmental stewardship has been a leader amongst the Port of Baltimore and MPA understands the value of energy efficient and sustainable facilities. MPA's initiatives to meet past and current regulations and efficient sustainable facilities are described herein.

A. Energy Performance Contract.
In May 2009, MPA entered an energy conservation project led by the Engineering department and a team of representatives from other departments. The contract consisted of an audit of all MPA owned facilities, investigating areas of improvement as directed by Engineering and discovery of additional conservation measures. The majority of MPA owned facilities are leased for cargo shipping and handling. Due to the terms of the leases, MPA focused on buildings and measures, which MPA could control. However, MPA worked with the tenants to identify conservation measures they could apply.

In July 2011, MPA entered a $17.2 million energy performance conservation contract (EPC) to implement the conservation measures, generating an annual energy savings of approximately 138,118.472 MMBtu and 29,149K gallon of water. Twelve energy conservation measures (ECMs) were implemented and completed across MPA on facilities ranging from education to major heating and air-conditioning equipment replacement. The following is a summary of the ECM's: lighting retrofits with high efficiency/low power lamps and ballast; lighting occupancy sensors; daylight harvesting; building envelope improvements; window replacements; programmable thermostat with lockout features; optimization of existing building HVAC automated control systems and the application of new HVAC controls replacing systems that reach their end of life; modifying existing air handler's with variable speed drive in economizers using cold outside air to cool spaces without air-conditioning equipment and control the intake of excess outside air; heating and fuel system conversions to high-efficiency low-pressure hot water generators using natural gas; air-conditioning chilled water system improvements and chiller replacements; replacement of air handlers and split system air-conditioning equipment that reached end-of-life with high-efficiency equipment and economizer controls; replacement of oil-fired radiant heaters with high-efficiency gas-fired radiant heaters; installation of a wireless web-based area high mast lighting control system; 755KW photovoltaic system; water and electric submetering; solar powered trash compactor receptacles using website monitoring; and Energy Awareness training that includes two portable programmable information kiosks.

In 2009, MPA completed a water conservation project that converted six MPA cargo shed fire pumps to recirculate the pump discharge water rather than pumping discharge water on the ground during weekly testing required by the State Fire Marshall. This conservation project produced an annual water reduction of more than 13.9 million gallons per year with an initial annual water and sewer charge savings of $75,758. This conservation measure also helps improve the Bay Conservation initiative with the reduction of chlorinated water entering the Bay waters.

B. Current and Future Plans:
In addition to the EPC, the MPA Engineering, Facilities Maintenance and Environmental departments have begun several energy reduction projects and studies. MPA has replaced entrance and roll-up doors due to corrosion and failure on several buildings with more energy efficient products. MPA has begun LED lighting conversions in cargo sheds; working with BGE to convert contracted street and security lighting to LED technology; LED conversions on the ground Floor of the World Trade Center, Baltimore (WTC). MPA engineering has completed design and started constructing modifications to the existing chilled water system to provide chiller water cooling in the building without the use of chillers during winter months.

The WTC was constructed in 1976 as an iconic office building. The age and design of the building presents unique cooling issues with architectural constructed air handlers and single pane glass design for a panoramic view. The MPA had contracted with engineering consultants to evaluate the 43-year-old air handlers. It was determined to renovate the air handler's to extend their useful life another 20 years and improve operations and Energy efficiency. MPA performed a WTC window study that investigated various methods to reduce the solar heat gain common with single pane glass. Various methods were investigated to resolve heat gain. However, these projects produce savings insignificant enough for a reasonable payback or the maintenance costs are too high to make measures feasible. The windows are not targeted for capital replacement at this time but MPA will be implementing the air handler renovations. MPA is performing an audit to replace existing high mast lighting with LED technology luminaires and overhaul pole mechanical apparatus. This project is estimated to cost MPA $3.5 million with an estimated annual savings of $224,000. Additional savings in maintenance and rebate incentive will be realized, improving the return on investment.

MPA properties are on a centrally metered power distribution system. MPA has established a policy that all new construction of State or tenant owned buildings on an MPA central power supply will be equipped with utility submeters. In addition, to account for energy and water usage, MPA plans to expand the submetering program to all State and tenant owned buildings. And we are possible, the installation of multiple submeters in mixed use buildings. MPA will be pursuing a wireless network metering system to remotely monitor and record energy and water usage. The use of submetering will provide MPA the ability to analyze the energy use of each building and guide our energy conservation program toward buildings with high potential. Submetering will allow MPA to track energy use of building, gauge strategies and effectiveness of energy retrofits and alert us to unusual increases in energy use. MPA will be pursuing possible federal grant dollars as an alternative phone source to implement this program.

MPA plans to expand the existing 755KW photovoltaic system in FY 2021 using the MDOT-TSO Renewable Energy Power Purchase Agreement program. The system is planned to be installed on selected rooftops on MPA marine terminals. The application of solar power will improve the State's and MDOT-MPA's environmental footprint.

MPA is confident that the Executive Order goal of 10% energy reduction by 2029 can be achieved through the implementation of current and future efforts. MPA's goals for all projects is to improve the safety, security and comfort of the workplace while reducing the budget,

modernizing & upgrading energy consuming infrastructure and improving the Ports Environmental footprint.

## XVIII. Coppin State University (CSU)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 1,096,489 | 125,809 | | 1.31% | 114.7 |
| **FY19** | 1,096,489 | 125,123 | -0.5% | 1.33% | 114.1 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 0 | $0 |
| **FY19** | 100% | 0 | $0 |

### Agency report:

Coppin State University is committed to and focused on energy conservation and environmental responsibility. Coppin has partnered with Energy Systems Group and Maryland Clean Energy (MCE) in the development and implementation of an Energy Performance Contract (EPC) for the campus. This EPC bundles critical infrastructure upgrades and replacements with the newest advances in technology integrated with renewable components to reduce CSU's energy uses. The EPC project has resulted in the following capital improvements to Coppin.

- Upgraded Lighting and Associated Controls
  - Light fixtures were converted to T8 25 Watt and T5 54-Watt high output (HO) lamps with electronic ballasts.
  - Four-foot linear lamps were converted to new high efficient ballasts and lamps.
  - U-bend lamps were converted to more efficient two-foot 17-Watt straight lamps with centering kit and reflector.
  - Incandescent lamps were replaced with compact fluorescent and LED technology.
  - All exit signs that were equipped with incandescent lamps or compact fluorescent lamps were retrofitted to LED.
  - Occupancy sensors were installed in all offices, break rooms and common areas throughout campus.
  - Outdoor lightning was replaced with LED lights.

- Upgraded Vending Machine Operation
    - A vendingmiser which is a passive infrared sensor was installed in the vicinity of the 28 vending machines. These sensors put the vending machines in a standby mode if there is no activity within a set time period.
- Installed High Efficiency Transformers
    - Eight (8) standard-efficiency transformers were replaced with new, energy-efficient units of the same size.
- Installed Electrical Submetering for all Buildings
    - Sub- meters were installed in 10 buildings.
- Installed New Boiler Controls
    - The Existing combustion controls systems on the boilers were replaced with a Honeywell's Control Links linkage-less system to improve performance.
- Installed New Motors
    - Several motors located throughout CSU were replaced with newer premium efficient motors, this includes pumps and fan motors.
    - Installation of variable speed drives (VSDs) on specific mechanical systems to control the speed of pumps.
    - Installation of VFDs on chilled water and dual-temperature pumps.
- Upgraded Building Envelope
    - Upgraded the building envelope of twelve (12) buildings to create a more comfortable interior condition and reduce energy usage.
- Installed Solar Thermal Systems for the Residence Halls
    - Installed solar thermal systems at the Daley and Dedmond Residence Hall to provide domestic hot water. The installed system provides approximately 77% of the combined existing consumption for the two residence halls.
- Upgraded Kitchen and Lab Hoods
    - Kitchen hoods and serving line hoods were constant volume flow and controlled by a manual switch on the wall. A variable hood flow control system was installed vary the exhaust flow based on the actual temperature within the hood. This ECM reduces the exhaust fan and make-up air fan motor electricity consumption as well as reducing the amount of preheating requirement during winter months.to monitor the temperature within the hood.
- Implemented Demand Side Response Program
    - Coppin has partnered with ENERNOC to participate in the PJM demand response program. During periods of peak electricity demand Coppin will reduce electricity requirement from the grid by activating the use of our existing emergency diesel generators. CSU receives a rebate for from ENERNOC for participating in this program.
- Upgraded HVAC Controls
    - Retro-commissioning of existing systems.
    - Upgraded fan coil and unit ventilator controls.

Future Plans:

- Covert the remaining 50% of campus indoor lighting to LED
- Continue to evaluate and upgrade building controls as necessary

## XIX. Maryland Transportation Authority (MDOT-MDTA)

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| FY18 (baseline) | 1,082,817 | 113,602 | | 1.18% | 104.9 |
| FY19 | 1,082,817 | 112,840 | -0.7% | 1.20% | 104.2 |

### Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| FY18 | 100% | 20 | $4,127 |
| FY19 | 100% | 20 | $12,646 |

### Agency report:

The Maryland Transportation Authority (MDTA) has been committed to the State's energy conservation and environmental responsibility programs and efforts since the past baseline year of 2008. Our commitment to the Governor's then EmPower Maryland program goals resulted in the MDTA partnering in an Energy Performance Contract (EPC) with Energy Systems Group (ESG) in 2009. This EPC would allow for the opportunity to apply new and renewable technology while saving energy, avoiding capital expenditures, reducing operating costs and ultimately improving the environment. The areas targeted to achieve the goals included interior lighting, green initiatives (fuel and solar-Francis Scott Key (electric) and William Preston Lane (hot water) bridges, mechanical/controls, water, building envelopes, and sign and roadway lighting. The intended goal was to implement projects to reduce utility and operating costs in these areas of facilities, sign lighting, and roadway lighting to include the Ft. McHenry Tunnel lighting conversion to LED lighting. The goal was to reduce facility related energy costs by thirty (30) percent (overall cost savings of fifteen (15) percent), and sign and roadway lighting by seventy (70) percent. The projects would reduce the MDTA energy costs by eighteen (18) percent and save more than $750,000.00 annually. The overall positive impact on the carbon footprint for the MDTA would be equivalent to the following:

Decreased emissions of 4676 metric tons of carbon dioxide which equates to:

- 856 cars removed from the roadways,
- 648 homes eliminated from the electric supply grid,
- 119,882 tree seedlings grown for 10 years.

Based on energy data from the State Energy Database in 2013, our energy expenditures at the end of FY 2012 were reduced by 15.85% from our baseline year of FY 2008. Our energy expenditure had decreased from $4,695,211 to $3,950,916. The goal was to reduce energy consumption by 15% by FY 2013. This reduction was achieved even though the Ft. McHenry Tunnel lighting project conversion to LED lighting had not been completed. The MDTA EPC concluded during the middle of 2011 and the energy savings results were very evident.
The MDTA continued to employ energy savings measures and reported under the *2014 Maryland Energy Cup* program some items in place and/or planned was as follows:

1. ENERGY EFFICIENCY:

- Roofing specifications will be written requiring COOL ROOFS with a Solar Roof Index (SRI),
- Improve HVAC efficiency by requiring variable frequency drives on pumps and fans,
- Install energy management control systems (EMCS) and Economizers to allow greater use of outside/fresh air,
- Improve the efficiency of office equipment to include computers, monitors, and servers,
- Continue to convert lighting (interior and exterior) to light emitting diode (LED) types,
- Continue working on the Ft. McHenry Tunnel lighting conversion to LED type,
- Prohibit the use of personal 1200/1500 watt heaters and standardize on 200 watts depending on the work location and approval,
- Convert to tankless hot water heaters where possible,
- Solar window film has been installed at several Point Breeze offices to test and reduce energy issues.
- Continually educate and remind employees on energy conservation practices,
- Work with utility companies on peak-load management.

2. RENEWABLE ENERGY

- Several solar powered traffic signs and lights are installed at ramps and toll booths,
- The Intercounty Connector (ICC)/MD 200 Eastern Operations Center has geothermal HVAC installed,
- The Francis Scott Bridge facility (Bldg 304) has a 22kW solar system for electricity to offset lighting and cooling loads,
- A solar hot water heating system is installed at the William Preston Lane Jr. Memorial (BAY) Bridge,
- Exploring WIND ENERGY possibilities at a few locations,
- Working with Department of General Services (DGS) on solar projects.

The MDTA continues to complete and schedule energy savings projects across the State of Maryland at our facilities. With our nearly one hundred (100) facilities, many miles of roadways, several tunnels, and bridges, we still have a distance to go to maximize our energy savings projects. Also, the new technology in lighting, HVAC, and motors to name a few areas has made

it possible to realize even further energy savings. Some recently completed and planned energy savings projects are as follows:

1. Lighting LED conversions that have occurred or are planned are at locations as follows:
- Ft. McHenry Tunnel (FMT) lighting: recently completed in 2018, the results are a yearly savings of nearly $500,000.00 and 6,000,000 kWh in energy. Lighting has also been changed from fluorescent to LED in the fresh air and exhaust plenums with a decrease in energy consumption of ninety (90) percent,
- Baltimore Harbor Tunnel (BHT) Toll Booths Canopy lighting: completed in 2019, LED results are a fifty (50) percent (%) reduction in energy costs and greatly increased visibility for travelers,
- Baltimore Harbor Tunnel lighting: the plans are underway to change the inductively coupled electrode-less (ICETRON) lighting to LED's. The projected energy savings is in the area of forty (40) to fifty (50) in energy costs and usage per year,
- Intercounty Connector (ICC)/MD 200: project plans are underway to change all the signage and roadway lighting to LED with a projected energy and cost savings of forty (40) to fifty (50) percent a year,
- John F. Kennedy (JFK) Memorial Highway I-95: off ramp lighting has been converted from High Intensity Discharge (HID) lighting to LED with an estimated savings of forty (40) percent in energy and costs per year,

- Parking lots around the MDTA are slated to be converted from HID lighting to LED to realize at least a forty (40) percent decrease in energy and costs,
- Office building fluorescent lighting will be scheduled in the coming years to be converted to LED. These projects will be extensive and will be completed by way of the DGS energy program direction through our local utility companies. The local utility companies will pay as much as seventy (70) percent (%) of the costs of the projects. BGE has this as part of their SMART ENERGY SAVERS PROGRAM which also includes lighting controls, HVAC equipment, chillers, and variable frequency drives

2. HVAC upgrades have occurred at several facilities to include the BHT 1200 Administration building, the FMT 2301 East Ventilation building, the FMT 3800 Mechanical building, and the Authority Operations Center (AOC) 2330 building to name in few. The HVAC systems were upgraded (new at building 2330) to be more energy efficient and operate at lower energy costs,

3. COOL ROOFS have been installed at buildings 2310, 2330, 2301, 4000, 3990 and several others in the past three (3) to five (5) years. This process will continue as our roofs are replaced,

4. SOLAR projects are planned for the future. The MDTA will utilize the DGS statewide contract to find and install solar systems at feasible locations such as parking lots, roofs, open areas, etc,

5. CHILLER OPTIMIZATION programs will be employed feasible to maximize the operating parameters of these systems. We will work with the DGS on this effort as a continuing means to save energy,

6. SUBMETERING will be employed to better analyze building energy usage. This will allow the exact building energy usage to be measured and to be better able to institute the best energy saving projects,

7. SMART MOTORS are being reviewed to realize the potential for energy savings. These motors (up to a certain horsepower) operate at a thirty-five (35) percent less energy consumption level, and last many times longer,

8. The MDTA reply to the request to Fiscal Note HB0662- Department of General Services- Energy Consumption Goals and Energy Performance Contracts (EPC) resulted in an estimated six (6) year cost of $1,000,000.00. These costs included funds for HVAC Chiller upgrades, optimization, and controls, solar PM to existing systems, lighting changed to LED (interior and exterior), and ENERGY AUDITS. This work will be crucial in aiding our energy program,

9. FUEL conversion from #2 fuel oil to natural gas and propane (if more feasible) has occurred at JFK, and FSK facilities to name some. More locations are planned to not only reduce costs, but also to lower the CARBON FOOTPRINT. This has also allowed for some aged boilers to be upgraded to more energy efficient units,

10. Our ENGINEERING AND CONSTRUCTION divisions will continue to award and oversee contracts that result in the maximum Leadership in Energy and Environmental Design (LEED) certification level for our facilities. Such awards and oversight will aid our efforts in achieving the Governor's energy goals.

The above represents much of what the MDTA has accomplished and plans to employ to not only realize, but also surpass the Governor's energy goals for 2029 under the Executive Order 01.01.2019.08, Energy Savings Goals for State Government. We will continue to work with the DGS and Maryland Energy Administration (MEA) to best refine our FY 18 Baseline as needed, identify savings opportunities, perform onsite energy audits, and present audit reports to all as needed.

## XX. Military Department

### Agency Energy Usage Snapshot:

| ENERGY USAGE | | | | | |
|---|---|---|---|---|---|
| | Square Feet of Buildings | MMBTU | % Change in Energy Usage | % of State Total MMBTU | EUI (kBtu/SqFt) |
| **FY18 (baseline)** | 1,607,302 | 97,215 | | 1.01% | 60.5 |
| **FY19** | 1,607,302 | 90,388 | -7.0% | 0.96% | 56.2 |

## Missing bill and data report:

| DATA COMPLIANCE | | | |
|---|---|---|---|
| | % Floor Area Reported to DGS | Number of Missing Bills | Est $ Value of Missing Bills |
| **FY18** | 100% | 10 | $9,872 |
| **FY19** | 100% | 6 | $2,956 |

## Agency report:

The Maryland Army National Guard (MDARNG) has been actively involved in energy conservation for about two decades. Initial efforts centered on the development and use of in-house databases with energy usage and cost data for all our facilities (a total of about 103 conditioned buildings). We implemented an Energy Savings Performance Contract (ESPC) which was completed in Fiscal Year 2008 at a total cost of over $1.3 million. The ESPC covered 16 of our facilities. Recommendations included boiler & burner replacements, lighting retrofits and HVAC controls. Projected annual energy saving for the ESPC was 270,769 kWh of electricity, 22,433 therms of natural gas and 5,440 gallons of heating oil.

In the years that followed, we continued to enjoy yearly energy reduction associated with the ESPC and began to identify facilities for retrofits to help reach energy goals. We received a State energy efficiency grant and Federal funding which we expended on lighting retrofits with occupancy sensors in more than eight- (8) of our buildings. This led to a further reduction of our energy usage. Other energy efficiency actions taken by the MDARNG include the use of Ground Source Heat Pumps (GSHPs) at four- (4) of our buildings – Olney Readiness Center, Salisbury Field Maintenance Shop, Salisbury Readiness Center and Easton Readiness Center.

In addition, several of our newer buildings were constructed to meet LEED standards. The Army Aviation Support Facility Building E4081 in Edgewood has Gold accreditation. Others with Silver accreditation are Dundalk Readiness Center, Easton Readiness Center, Havre de Grace Readiness Center and the Salisbury Readiness Center. Lastly, we have three- (3) other buildings that are LEED compliant but for which formal applications for LEED Certification were not processed. Measures taken to ensure energy efficiency in these buildings include the use of efficient motors and variable frequency drives as well as building envelopes having high insulation values. Due to our military affiliation, the buildings were constructed to meet high standards of energy efficiency as required by the Federal Department of Defense.

In pursuit of increased energy efficiency, we converted the T8 fixtures in all the common areas of the Fifth Regiment Armory to LED using direct project assistance funds granted to us. During this year, our conscious energy reduction actions consisted of replacing existing light fixtures with their LED equivalent, and research then development of a project to install utility sub-meters in some buildings without them. Specifically, with the LED upgrades, at the Fifth Regiment Armory, the exterior building wall mounted fixtures and flood light type fixtures

around the entire perimeter were converted to LED. Electricity usage of these points was cut by about 2/3. On the interior, the original metal halide type bulbs illuminating the drill floor are being replaced with LEDs with similar reduction percentages.

Our goal in the coming years is to ensure that we continue to emphasize the efficient usage of our energy resources. We'll continue our efforts to prioritize buildings based on energy consumption per square foot to identify problems in our buildings as we prepare to have extensive energy audits performed at some of them. We have made good use of an energy efficiency grant as mentioned earlier and our energy saving activities will be greatly enhanced with more outside funding. This will enable us to work towards meeting the energy savings goals of the Governor's Executive Order as from FY21.

# APPENDICES

## Appendix 1: Data Methodology

The Executive Order pertains to "State-owned buildings" and therefore a detailed scope of reporting is necessary to ensure that all required data points are included in our reporting. Because most of the State's buildings (nearly 80%) are on shared utility meters and do not have building-level submeters, it was necessary to establish a methodology for reporting on building-level data when we have it and at the broader campus of complex level if we do not. For the purposes of reporting, there are two distinct reporting groups that are outlined and defined further below: *Independently Metered Buildings*; and *Campuses*.

All data utilized in this report comes from the Statewide Utility Database, also known as the State Energy Database, a centralized resource of all State facilities and energy usage and cost that is maintained by the Department of General Services. The database tracks energy cost and consumption for all State agencies, including electricity, natural gas, fuel oil, steam, chilled water, water and sewer commodities. Over 1.8 Million State-paid utility invoices are included in the database.

### SCOPE OF REPORTING

| | Reporting Group | Reporting Level | Examples |
|---|---|---|---|
|  | Independently Metered Buildings | Building level usage;<br>Building level EUI | Courthouses<br>Stand-alone office buildings<br>Stand-alone warehouses |
|  | Campuses | Campus-level usage;<br>Campus-level EUI | University campuses<br>Hospital campuses<br>Office complexes |

### DEFINITIONS

**Independently Metered Building:** *A State-owned permanent built structure enclosed with exterior walls and a roof, that: (1) consumes energy, (2) has its own energy utility meter, and (3) does not share energy utility meters with any other building.*

Data per each Independently Metered Building:

| | |
|---|---|
| Includes MMBTU for | • Building<br>• Any attached parking lot or structure (only if on same utility meter as building) |

| | |
|---|---|
| | • Any attached outdoor lighting (only if on same utility meter as building) |
| Includes SQFT for | • Building GSF<br>• Any attached structure (only if on same utility meter as building) |

**Campus:** *A group of two or more State-owned buildings that consume energy and share at least one energy utility meter.*

Data per each Campus:

| | |
|---|---|
| Includes MMBTU for | • Everything that consumes energy on that campus including:<br>• Buildings<br>• Outdoor lighting<br>• Parking lots and structures |
| Includes SQFT for | • Buildings<br>• Parking structures |

*Energy Utility Meters include: electric, natural gas, steam, chilled water, and fuel oil.*

## REPORTING METRICS

The primary reporting metric used in this report is **weather normalized EUI**, or Energy Use Intensity, which is energy usage per area in kBtu per square foot per year. All FY18 and FY19 total energy usage (reporting in MMBtu) is also weather normalized. The data is weather normalized to a baseline year of FY2018 using a common setpoint of 59°F.

With the exception of UMD, all energy used to power State buildings as reported in utility bills was converted to MMBtus from site-based energy. The large Combined Heat and Power (CHP) plant at the College Park campus made comparing their energy use against that of all other agencies a case of apples and oranges. Therefore, UMD and DGS agreed to report the electricity and steam produced by the plant as site-based energy, which facilitated a fair comparison between UMD's energy use, and the energy use of other units of State government.

## EXCLUSIONS FROM EO REPORTING

Building data attributes such as area (in gross square feet) are reported by the agencies for inclusion in the database. Agencies that do not own buildings were excluded in this report.

The following energy consuming entities were excluded from the report:

- Traffic lights, streetlights, and other structures that do not meet the definitions of "Independently Metered Buildings" or "Campuses" established above
- Buildings that are not owned by the State as of FY2018
- Buildings that were demolished prior to FY2018
- New construction after FY2018

## Appendix 2: Energy Usage for All State Agencies, FY18 & FY19

Summary energy usage by all agencies, ranked by baseline year usage (FY18).

| Rank | Agency | FY18 Sqft | FY18 Usage (MMBtu) | FY18 EUI (kBtu / Sqft) | FY19 Usage (MMBtu) | FY19 EUI (kBtu / Sqft) | % Change in Energy Usage |
|---|---|---|---|---|---|---|---|
| 1 | University of Maryland College Park (UMCP)* | 14,622,653 | 1,756,193 | 120.1 | 1,710,660 | 116.9 | -2.6% |
| 2 | Public Safety & Correctional Srvcs, Dept of (DPSCS) | 15,374,567 | 1,385,819 | 90.1 | 1,304,948 | 85.3 | -5.8% |
| 3 | University of Maryland Baltimore (UMB) | 5,950,069 | 904,967 | 152.1 | 891,677 | 149.9 | -1.5% |
| 4 | University of Maryland Baltimore County (UMBC) | 4,467,954 | 580,472 | 129.9 | 579,017 | 129.6 | -0.3% |
| 5 | General Services, Dept of (DGS) | 6,498,791 | 575,501 | 88.6 | 560,793 | 86.3 | -2.6% |
| 6 | Maryland Aviation Administration (MDOT-MAA) | 2,920,577 | 567,330 | 194.3 | 570,231 | 195.2 | 0.5% |
| 7 | Towson University (TU) | 6,036,906 | 463,915 | 76.9 | 468,144 | 77.6 | 0.9% |
| 8 | Health, Maryland Dept of (MDH) | 3,208,181 | 382,122 | 119.1 | 387,688 | 120.8 | 1.5% |
| 9 | Morgan State University (MSU) | 3,476,635 | 342,866 | 98.6 | 342,913 | 98.6 | 0.0% |
| 10 | Maryland Transit Administration (MDOT-MTA) | 1,562,344 | 340,403 | 217.9 | 337,921 | 216.3 | -0.7% |
| 11 | Frostburg State University (FSU) | 1,547,381 | 207,429 | 134.3 | 213,837 | 138.2 | 3.1% |
| 12 | Salisbury University (SU) | 2,217,621 | 182,154 | 82.1 | 172,156 | 77.6 | -5.5% |
| 13 | Stadium Authority, MD (STADAUTH) | 4,274,000 | 168,040 | 39.3 | 169,545 | 39.7 | 0.9% |
| 14 | University of Maryland Eastern Shore (UMES) | 1,093,365 | 154,368 | 141.2 | 108,220 | 99.0 | -29.9% |
| 15 | Bowie State University (BSU) | 1,332,563 | 153,917 | 115.5 | 136,643 | 102.5 | -11.2% |
| 16 | State Highway Administration (MDOT-SHA) | 2,276,739 | 139,194 | 61.1 | 147,567 | 64.8 | 6.0% |
| 17 | Maryland Port Administration (MDOT-MPA)** | 6,513,833 | 134,714 | 20.7 | 128,266 | 19.7 | -4.8% |
| 18 | Coppin State University (CSU) | 1,096,489 | 125,809 | 114.7 | 125,123 | 114.1 | -0.5% |
| 19 | Maryland Transportation Authority (MDTA) | 1,082,817 | 113,602 | 104.9 | 112,840 | 104.2 | -0.7% |
| 20 | Military Dept (DMIL) | 1,607,302 | 97,215 | 60.5 | 90,388 | 56.2 | -7.0% |
| 21 | Juvenile Services, Dept of (DJS) | 1,028,758 | 93,953 | 91.3 | 88,786 | 86.3 | -5.5% |
| 22 | Police, Dept of MD State (DMSP) | 600,622 | 87,359 | 145.4 | 90,468 | 150.6 | 3.6% |
| 23 | University of Maryland Global Campus (UMGC) | 1,005,624 | 82,637 | 82.2 | 74,605 | 74.2 | -9.7% |
| 24 | Baltimore City Community College (BCCC) | 736,165 | 77,446 | 105.2 | 80,016 | 108.7 | 3.3% |
| 25 | Motor Vehicle Administration (MDOT-MVA) | 355,031 | 69,399 | 195.5 | 64,512 | 181.7 | -7.0% |
| 26 | Saint Mary's College of MD (SMCM) | 928,924 | 67,808 | 73.0 | 63,731 | 68.6 | -6.0% |
| 27 | University of Baltimore (UB) | 885,521 | 58,403 | 66.0 | 69,688 | 78.7 | 19.3% |
| 28 | University of Maryland Center for Environmental Science (UMCES) | 349,510 | 58,298 | 166.8 | 45,286 | 129.6 | -22.3% |
| 29 | Natural Resources, Dept of (DNR)*** | 1,173,946 | 52,957 | 45.1 | 48,806 | 41.6 | -7.8% |
| 30 | Veterans Affairs, MD Dept of (MDVA) | 358,048 | 36,401 | 101.7 | 36,947 | 103.2 | 1.5% |
| 31 | University of MD Shady Grove (UMSG) | 507,256 | 34,273 | 67.6 | 36,987 | 72.9 | 7.9% |
| 32 | Maryland Public Television (MPT) | 140,497 | 30,953 | 220.3 | 30,410 | 216.5 | -1.8% |

| | Agency | FY18 Sqft | FY18 Usage (MMBtu) | FY18 EUI (kBtu / Sqft) | FY19 Usage (MMBtu) | FY19 EUI (kBtu / Sqft) | % Change in Energy Usage |
|---|---|---|---|---|---|---|---|
| **33** | Deaf, MD Schools for the | 616,675 | 26,869 | 43.6 | 38,309 | 62.1 | 42.6% |
| **34** | Agriculture, MD Dept of (MDOA) | 181,227 | 16,679 | 92.0 | 15,009 | 82.8 | -10.0% |
| **35** | Human Resources, Dept of (DHR) | 347,934 | 16,122 | 46.3 | 14,895 | 42.8 | -7.6% |
| **36** | Planning, Dept of (MDP) | 99,717 | 5,888 | 59.1 | 5,641 | 56.6 | -4.2% |
| **37** | Environmental Service, MD (MES) | 69,913 | 5,374 | 76.9 | 7,790 | 111.4 | 45.0% |
| **38** | Labor, Licensing and Regulation, Dept of (DLLR) | 96,640 | 5,307 | 54.9 | 6,510 | 67.4 | 22.7% |
| **39** | Canal Place Preservation & Dev Authority (CPPDA) | 29,994 | 1,839 | 61.3 | 1,498 | 49.9 | -18.5% |
| **40** | Environment, MD Dept of the (MDE) | 7,118 | 490 | 68.8 | 436 | 61.2 | -11.0% |
| **41** | Food Center Authority, MD (MFCA) | 63,600 | 329 | 5.2 | 450 | 7.1 | 37.1% |
| | TOTAL/AVERAGE | 96,743,507 | 9,604,812 | 98.3 | 9,379,356 | 96.3 | 0.28% |

*Notes:*

*UMCP data is based on self-reported data from the agency.

**MPA data represents the entire Department's energy usage and square footage. Due to limited confirmed data, DGS was not able to confirm state owned buildings within the scope and proper meter assignments needed for reporting. Therefore, data is summed up for the entire agency, inclusive of non-buildings and leased facilities that would fall outside of the reporting scope.

***DNR data represents the entire Department's energy usage and square footage. Due to limited confirmed data, DGS was not able to confirm state owned buildings within the scope and proper meter assignments needed for reporting. Therefore, data is summed up for the entire agency, inclusive of non-buildings and leased facilities that would fall outside of the reporting scope.

## Appendix 3: Top 20 Agencies – Independently Metered Buildings

The below table shows building-level energy usage and EUI for the top 20 energy using agencies for the baseline year of FY2018. Buildings included are those with building-level utility company meters.

| Agency | Building Name (Independently Metered only) | Floor Area (Sqft.) | Building Primary Use | Year Built | FY18 Usage (MMBTU) | FY18 EUI (kBTU/ Sqft.) | FY19 Usage (MMBTU) | FY19 EUI (kBTU/ Sqft.) | % Change in Usage from FY18 to FY19 |
|---|---|---|---|---|---|---|---|---|---|
| **BSU** | Goodloe Alumni House | 3,815 | College/University | 1916 | 255 | 66.8 | 238 | 62.4 | -6.62% |
| **DGS** | Hilton Height Community Center - 530 N Hilton | 8,750 | Office | 1948 | 425 | 48.5 | 485 | 55.4 | 14.15% |
| **DGS** | Annapolis Post Office | 22,994 | Office | 2017 | 839 | 36.5 | 728 | 31.6 | -13.27% |
| **DGS** | Hilton Height Community Center - 510 N Hilton | 22,900 | Other - Entertainment/Public Assembly | 1948 | 1,383 | 60.4 | 1,373 | 60.0 | -0.69% |
| **DGS** | Hagerstown - J. Louis Boublitz DC/MSC | 27,240 | Courthouse | 2000 | 1,430 | 52.5 | 2,015 | 74.0 | 40.93% |
| **DGS** | Denton - John Hargreaves DC/MSC | 31,798 | Courthouse | 1998 | 1,788 | 56.2 | 2,158 | 67.9 | 20.66% |
| **DGS** | Essex/Rosedale DC/MSC | 22,975 | Courthouse | 1982 | 2,100 | 91.4 | 2,371 | 103.2 | 12.91% |
| **DGS** | Arbutus/Catonsville DC/MSC | 32,657 | Courthouse | 1982 | 2,179 | 66.7 | 2,190 | 67.1 | 0.51% |
| **DGS** | Centreville - Carter Hickman DC/MSC | 37,783 | Courthouse | 1982 | 2,772 | 73.4 | 2,326 | 61.6 | -16.10% |
| **DGS** | OPD - 201 St. Paul Street | 32,000 | Office | 1900 | 2,783 | 87.0 | 3,251 | 101.6 | 16.82% |
| **DGS** | Prince Frederick - Louis L. Goldstein DC/MSC | 73,000 | Courthouse | 1991 | 3,669 | 50.3 | 3,628 | 49.7 | -1.12% |
| **DGS** | Westminster DC/MSC | 43,000 | Courthouse | 2002 | 4,125 | 95.9 | 4,379 | 101.8 | 6.14% |
| **DGS** | Towson DC | 52,000 | Courthouse | 1994 | 5,069 | 97.5 | 5,555 | 106.8 | 9.59% |
| **DGS** | Ellicott City DC/MSC | 75,300 | Courthouse | 1982 | 5,309 | 70.5 | 6,318 | 83.9 | 19.00% |
| **DGS** | Hyattsville DC/MSC | 82,000 | Courthouse | 1994 | 5,362 | 65.4 | 6,208 | 75.7 | 15.77% |
| **DGS** | Wabash - Borgerding DC/MSC | 52,824 | Courthouse | 1986 | 5,409 | 102.4 | 5,921 | 112.1 | 9.48% |
| **DGS** | Leonardtown - Joseph P. Carter DC/MSC | 77,920 | Courthouse | 1994 | 5,661 | 72.7 | 5,481 | 70.3 | -3.18% |
| **DGS** | Jessup State Complex | 126,800 | Office | 1970 | 6,011 | 47.4 | 5,821 | 45.9 | -3.16% |
| **DGS** | 2100 Guilford - Parole & Probation | 82,953 | Prison/Incarceration | 1924 | 6,012 | 72.5 | 5,234 | 63.1 | -12.93% |
| **DGS** | South Baltimore - Hargrove DC/MSC | 84,730 | Courthouse | 2003 | 6,721 | 79.3 | 6,400 | 75.5 | -4.77% |
| **DGS** | Elkton DC/MSC | 126,700 | Courthouse | 1983 | 6,725 | 53.1 | 7,018 | 55.4 | 4.36% |
| **DGS** | Glen Burnie - George M. Taylor DC/MSC | 97,104 | Courthouse | 1982 | 6,948 | 71.6 | 7,122 | 73.3 | 2.50% |
| **DGS** | Silver Spring - L. Leonard Ruben DC | 79,596 | Courthouse | 2004 | 7,273 | 91.4 | 8,072 | 101.4 | 10.99% |
| **DGS** | Shillman Building | 160,000 | Courthouse | 1972 | 9,564 | 59.8 | 10,846 | 67.8 | 13.40% |
| **DGS** | Salisbury - Paul Martin DC/MSC | 224,343 | Courthouse | 1990 | 10,182 | 45.4 | 9,922 | 44.2 | -2.55% |

| Agency | Building Name (Independently Metered only) | Floor Area (Sqft.) | Building Primary Use | Year Built | FY18 Usage (MMBTU) | FY18 EUI (kBTU/Sqft.) | FY19 Usage (MMBTU) | FY19 EUI (kBTU/Sqft.) | % Change in Usage from FY18 to FY19 |
|---|---|---|---|---|---|---|---|---|---|
| **DGS** | Bel Air - Mary Risteau DC/MSC | 140,000 | Courthouse | 1983 | 11,604 | 82.9 | 12,575 | 89.8 | 8.37% |
| **DGS** | Peoples Resource Center - 100 Community Place | 155,900 | Office | 1991 | 12,237 | 78.5 | 13,199 | 84.7 | 7.86% |
| **DGS** | Civic Plaza - 200 W BALTIMORE St | 217,700 | Office | 1911 | 15,600 | 71.7 | 15,224 | 69.9 | -2.41% |
| **DGS** | Rockville DC/MSC | 167,000 | Courthouse | 2011 | 26,234 | 157.1 | 17,903 | 107.2 | -31.76% |
| **DGS** | WilliamDonaldSchaefer-6 St. Paul | 305,400 | Office | 1986 | 33,508 | 109.7 | 34,015 | 111.4 | 1.51% |
| **DMIL-ARMY** | 209 S STORAGE SHED | 975 | Storage | 1976 | 2 | 2.2 | 2 | 1.6 | -25.22% |
| **DMIL-ARMY** | EDWARDS BUILDING | 25,704 | Office | 1903 | 3 | 0.1 | 0 | 0.0 | -100.00% |
| **DMIL-ARMY** | P-1 ALLEGHENY PUMP | 64 | Water Supply Facility | 1988 | 9 | 147.6 | 11 | 171.1 | 15.85% |
| **DMIL-ARMY** | W-1 PUMP HOUSE | 80 | Pump House | 1988 | 15 | 192.1 | 21 | 259.3 | 34.97% |
| **DMIL-ARMY** | 2-Bay Maintenance Shop | 6,657 | Storage | 1971 | 18 | 2.7 | 15 | 2.2 | -16.91% |
| **DMIL-ARMY** | RANGERS HOUSE | 1,600 | Office | 1988 | 27 | 16.7 | 29 | 18.1 | 8.04% |
| **DMIL-ARMY** | TABLERS LODGE | 820 | Office - Lodging/Residential | 1988 | 36 | 44.4 | 26 | 31.8 | -28.26% |
| **DMIL-ARMY** | STRAUSS LODGE A-1 | 2,112 | Office - Lodging/Residential | 1988 | 39 | 18.5 | 47 | 22.3 | 20.47% |
| **DMIL-ARMY** | WHITE OAK FMS | 2,873 | Storage | 1972 | 44 | 15.2 | 54 | 18.7 | 23.34% |
| **DMIL-ARMY** | TABLER'S STORAGE SHED | 120 | Storage | 1988 | 44 | 370.1 | 44 | 365.4 | -1.26% |
| **DMIL-ARMY** | 113- GATEHOUSE BUILDING | 64 | Other | 1990 | 63 | 980.9 | 71 | 1,108.4 | 12.99% |
| **DMIL-ARMY** | W-3 WHSE BUILDING | 6,156 | Warehouse - Unrefrigerated | 1924 | 64 | 10.4 | 77 | 12.4 | 19.54% |
| **DMIL-ARMY** | MAINTENANCE SHOP | 1,800 | Storage | 1988 | 79 | 43.7 | 80 | 44.4 | 1.58% |
| **DMIL-ARMY** | BLD. 402 WELL PUMP | 180 | Pump House | 1975 | 85 | 474.5 | 81 | 451.1 | -4.93% |
| **DMIL-ARMY** | W-2 WHSE BUILDING | 7,680 | Warehouse - Unrefrigerated | 1924 | 91 | 11.8 | 110 | 14.4 | 21.71% |
| **DMIL-ARMY** | O-1A BUILDING | 366 | Office | 1939 | 123 | 336.8 | 103 | 280.3 | -16.76% |
| **DMIL-ARMY** | 201- BEECHAM BUILDING | 5,095 | Hospital | 1999 | 130 | 25.5 | 118 | 23.2 | -8.92% |
| **DMIL-ARMY** | P1- MAINT BUILDING | 1,008 | Shop | 1991 | 207 | 205.5 | 163 | 162.2 | -21.10% |
| **DMIL-ARMY** | SEC 16 - EST 2000 | 512 | Office | 1975 | 211 | 412.6 | 189 | 369.0 | -10.55% |
| **DMIL-ARMY** | S-3 MAINT BUILDING | 2,356 | Repair Services | 1924 | 257 | 109.2 | 269 | 114.1 | 4.44% |

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|---|---|---|---|---|---|---|---|---|---|
| **DMIL-ARMY** | Pikesville Armory | 96,755 | Office | 1903 | 283 | 2.9 | 274 | 2.8 | -3.12% |
| **DMIL-ARMY** | Catonsville Armory | 29,127 | Office | 1957 | 338 | 11.6 | 380 | 13.1 | 12.52% |
| **DMIL-ARMY** | DUNDALK OLD FMS | 3,739 | Shop | 1960 | 356 | 95.3 | 426 | 113.8 | 19.48% |
| **DMIL-ARMY** | DUNDALK NEW FMS | 19,230 | Shop | 2008 | 535 | 27.8 | 512 | 26.6 | -4.20% |
| **DMIL-ARMY** | S-5 MAINT BUILDING | 2,337 | Repair Services | 1924 | 537 | 230.0 | 532 | 227.7 | -0.98% |
| **DMIL-ARMY** | NCO Building | 12,320 | Other - Recreation | 1903 | 595 | 48.3 | 752 | 61.0 | 26.23% |
| **DMIL-ARMY** | ELKTON ARMORY | 20,453 | Office | 2014 | 615 | 30.1 | 421 | 20.6 | -31.55% |
| **DMIL-ARMY** | USP&FO Warehouse | 1,440 | Warehouse - Unrefrigerated | 2007 | 638 | 443.0 | 666 | 462.8 | 4.48% |
| **DMIL-ARMY** | GLEN BURNIE ARMORY | 23,179 | Office | 1950 | 662 | 28.6 | 987 | 42.6 | 49.12% |
| **DMIL-ARMY** | O-1ADM- BUILDING | 2,400 | Office | 1939 | 681 | 283.6 | 182 | 76.0 | -73.18% |
| **DMIL-ARMY** | W-8 WHSE BUILDING | 9,600 | Warehouse - Unrefrigerated | 1924 | 742 | 77.3 | 452 | 47.0 | -39.14% |
| **DMIL-ARMY** | QUEEN ANNE ARMORY | 17,642 | Office | 1977 | 781 | 44.3 | 481 | 27.3 | -38.36% |
| **DMIL-ARMY** | M1 BUILDING | 9,600 | Other - Lodging/Residential | 1988 | 801 | 83.4 | 861 | 89.7 | 7.49% |
| **DMIL-ARMY** | SALISBURY FMS | 11,432 | Shop | 2004 | 836 | 73.1 | 864 | 75.6 | 3.41% |
| **DMIL-ARMY** | S-2 MAINT BUILDING | 19,844 | Shop | 1924 | 985 | 49.7 | 966 | 48.7 | -2.02% |
| **DMIL-ARMY** | HAGERSTOWN ARMORY | 30,306 | Office | 1978 | 998 | 32.9 | 1,027 | 33.9 | 2.88% |
| **DMIL-ARMY** | LAPLATA ARMORY | 23,230 | Office | 2016 | 1,087 | 46.8 | 1,137 | 49.0 | 4.65% |
| **DMIL-ARMY** | FREDERICK ARMORY | 18,630 | Office | 1978 | 1,240 | 66.5 | 1,105 | 59.3 | -10.87% |
| **DMIL-ARMY** | SALISBURY ARMORY | 33,070 | Office | 1959 | 1,460 | 44.1 | 1,198 | 36.2 | -17.95% |
| **DMIL-ARMY** | WESTMINSTER ARMORY | 17,229 | Office | 1980 | 1,527 | 88.6 | 1,305 | 75.8 | -14.50% |
| **DMIL-ARMY** | O-2 ADMIN BUILDING | 16,108 | Office | 1948 | 1,562 | 97.0 | 1,504 | 93.4 | -3.73% |
| **DMIL-ARMY** | ELLICOTT CITY ARMORY | 19,356 | Office | 1953 | 1,672 | 86.4 | 1,619 | 83.6 | -3.17% |
| **DMIL-ARMY** | ANNAPOLIS ARMORY | 41,473 | Office | 1959 | 1,700 | 41.0 | 1,871 | 45.1 | 10.06% |
| **DMIL-ARMY** | WHITE OAK ARMORY | 27,078 | Office | 1972 | 1,736 | 64.1 | 1,315 | 48.5 | -24.27% |
| **DMIL-ARMY** | A-1 ARMORY | 38,007 | Office | 1924 | 1,935 | 50.9 | 226 | 5.9 | -88.31% |

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|---|---|---|---|---|---|---|---|---|---|
| **DMIL-ARMY** | CADE ARMORY | 35,369 | Office | 1960 | 2,023 | 57.2 | 1,967 | 55.6 | -2.73% |
| **DMIL-ARMY** | GUNPOWDER-PURNELL ARMORY | 31,969 | Office | 1975 | 2,201 | 68.9 | 2,338 | 73.1 | 6.22% |
| **DMIL-ARMY** | CUMBERLAND ARMORY | 26,332 | Office | 1960 | 2,355 | 89.4 | 2,868 | 108.9 | 21.76% |
| **DMIL-ARMY** | PARKVILLE ARMORY | 39,279 | Office | 1964 | 2,358 | 60.0 | 2,888 | 73.5 | 22.48% |
| **DMIL-ARMY** | Dundalk Armory | 31,022 | Fitness Center/Health Club/Gym | 1960 | 3,271 | 105.4 | 3,052 | 98.4 | -6.67% |
| **DMIL-ARMY** | RUHL ARMORY-TOWSON | 71,699 | Office | 1980 | 3,909 | 54.5 | 3,642 | 50.8 | -6.83% |
| **DMIL-ARMY** | 114- ARMORY BUILDING | 63,481 | Office | 1990 | 7,839 | 123.5 | 8,147 | 128.3 | 3.94% |
| **DMIL-ARMY** | FIFTH REGIMENT ARMORY | 322,434 | Office | 1901 | 19,418 | 60.2 | 12,869 | 39.9 | -33.72% |
| **FSU** | Intramural Field Restroom | 720 | Restroom | 2012 | 8 | 11.7 | 8 | 10.6 | -9.17% |
| **FSU** | WFWM RADIO STATION | 100 | Office | 2015 | 76 | 764.6 | 89 | 886.7 | 15.97% |
| **FSU** | 20 BRADDOCK | 1,913 | Office | 1955 | 125 | 65.1 | 136 | 71.3 | 9.49% |
| **FSU** | MIDLOTHIAN ROAD | 27,520 | Irrigation | 2012 | 1,041 | 37.8 | 1,178 | 42.8 | 13.16% |
| **MAA** | 801 WILSON-POINT RD | 28,404 | Hangar | 1980 | 30 | 1.1 | 30 | 1.1 | -0.87% |
| **MAA** | 801 WILSON-POINT RD | 68,803 | Hangar | 1980 | 35 | 0.5 | 31 | 0.5 | -10.77% |
| **MAA** | Building 120 | 2,185 | Office | 1980 | 74 | 34.0 | 103 | 47.0 | 38.33% |
| **MAA** | 3000 Mathison Way | 60,000 | Office | 1990 | 79 | 1.3 | 46 | 0.8 | -42.33% |
| **MAA** | 2R 7023 ELM RD BLDG 129 | 5,000 | Warehouse - Unrefrigerated | 1980 | 143 | 28.7 | 30 | 6.0 | -79.04% |
| **MAA** | MAA Building 134 | 3,500 | Storage | 1980 | 160 | 45.6 | 37 | 10.7 | -76.63% |
| **MAA** | Building 117 | 8,844 | Storage | 1980 | 202 | 22.8 | 179 | 20.2 | -11.46% |
| **MAA** | Building 137 | 3,880 | Shop | 1980 | 207 | 53.3 | 213 | 54.9 | 3.11% |
| **MAA** | R 7023 Elm Rd Bldg 123, Bay A | 1,500 | Shop | 1980 | 225 | 150.2 | 265 | 176.6 | 17.55% |
| **MAA** | Building 113 | 28,400 | Storage | 1980 | 236 | 8.3 | 268 | 9.4 | 13.58% |
| **MAA** | Building 158 | 5,100 | Maintenance Shop | 1980 | 358 | 70.1 | 562 | 110.1 | 57.10% |
| **MAA** | Building 119 | 3,840 | Storage | 1980 | 394 | 102.7 | 503 | 130.9 | 27.42% |
| **MAA** | 701 Wilson Point Rd Hangar | 12,345 | Hangar | 2000 | 933 | 75.6 | 1,171 | 94.8 | 25.44% |
| **MAA** | Building 121 | 8,200 | Shop | 1980 | 996 | 121.5 | 1,042 | 127.0 | 4.54% |
| **MAA** | 701 WILSON-POINT RD | 9,181 | Hangar | 1980 | 1,049 | 114.3 | 915 | 99.6 | -12.85% |
| **MAA** | 701 Wilson-Point Road - Hangar 6 | 61,100 | Hangar | 1980 | 1,150 | 18.8 | 1,458 | 23.9 | 26.79% |
| **MAA** | 601 WILSON-POINT RD | 74,200 | Hangar | 1980 | 1,342 | 18.1 | 1,823 | 24.6 | 35.81% |
| **MAA** | 7057 Elm Rd Bldg 112 | 45,000 | Office | 1980 | 1,454 | 32.3 | 1,347 | 29.9 | -7.36% |
| **MAA** | 701 Wilson-Point Road - Hangar 4 | 61,800 | Hangar | 1980 | 1,568 | 25.4 | 1,497 | 24.2 | -4.52% |

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|---|---|---|---|---|---|---|---|---|---|
| **MAA** | Building 155 | 9,504 | Office | 1980 | 2,555 | 268.8 | 2,509 | 264.0 | -1.79% |
| **MAA** | Building 105 | 35,000 | Firestation | 1980 | 3,773 | 107.8 | 3,832 | 109.5 | 1.57% |
| **MAA** | 601 WILSON-POINT RD | 19,800 | Hangar | 1980 | 4,057 | 204.9 | 3,004 | 151.7 | -25.94% |
| **MAA** | Building 107 | 28,000 | Storage | 1980 | 4,874 | 174.1 | 6,516 | 232.7 | 33.68% |
| **MAA** | MAC Building 172 | 172,000 | Office | 1980 | 9,527 | 55.4 | 8,850 | 51.5 | -7.11% |
| **MAA** | 701 WILSON-POINT RD (Central) | 12,900 | Hangar | 1980 | 12,586 | 975.7 | 12,439 | 964.2 | -1.17% |
| **MAA** | Building 116 FMX Shop | 10,200 | Shop | 1995 | 17,979 | 1762.6 | 8,999 | 882.2 | -49.95% |
| **MAA** | 100 Building - BWI Airport | 2,129,891 | Hangar | 1947 | 501,342 | 235.4 | 510,611 | 239.7 | 1.85% |
| **MDH** | Garage | 1,400 | Repair Services | 1996 | 143 | 102.2 | 148 | 105.7 | 3.44% |
| **MDH** | Employee Dorms | 12,092 | Residential Care Facility | 1958 | 969 | 80.2 | 897 | 74.1 | -7.52% |
| **MDH** | Gym | 8,305 | Gym/Stadium | 1986 | 1,200 | 144.5 | 1,135 | 136.6 | -5.43% |
| **MDH** | Office of Chief Medical Examiner | 120,000 | Laboratory | 2010 | 17,153 | 142.9 | 19,750 | 164.6 | 15.14% |
| **MDH** | MDH Eastern Shore Hospital Center | 108,000 | Residential Care Facility | 2001 | 22,896 | 212.0 | 22,501 | 208.3 | -1.73% |
| **MDTA** | Western Shore Storage Building | 2,240 | Storage | 1905 | 22 | 9.6 | 20 | 9.0 | -6.32% |
| **MDTA** | Maintenance Building 1 | 3,027 | Office | - | 32 | 10.5 | 2 | 0.6 | -94.41% |
| **MDTA** | 9665 Orland Park Road (Maint. Bldg 1) | 3,292 | Office | 1940 | 166 | 50.5 | 199 | 60.6 | 19.91% |
| **MDTA** | Maintenance Building 2 | 5,234 | Office | 2019 | 308 | 58.8 | 479 | 91.4 | 55.47% |
| **MDTA** | 7677 LILLIAN HOLT DRIVE | 14,406 | Office | - | 313 | 21.7 | 341 | 23.7 | 8.96% |
| **MDTA** | OPS Building (2340) | 5,736 | Office | 1905 | 345 | 60.1 | 379 | 66.0 | 9.79% |
| **MDTA** | Eastern Shore Storage Building | 1,920 | Storage | 1905 | 472 | 245.8 | 493 | 256.9 | 4.52% |
| **MDTA** | 2330 BROENING HWY | 14,015 | Office | 1905 | 795 | 56.7 | 2,088 | 148.9 | 162.68% |
| **MDTA** | Police & Automotive Building | 38,860 | Mixed Use Property | 1905 | 2,017 | 51.9 | 1,986 | 51.1 | -1.51% |
| **MDTA** | Headquarters Building (2310) | 62,141 | Office | 1905 | 4,016 | 64.6 | 4,063 | 65.4 | 1.19% |
| **MDTA** | 303 AUTHORITY DR | 25,800 | Office | - | 6,020 | 233.3 | 5,156 | 199.8 | -14.35% |
| **MDTA** | Administration Building (1200 Frankfurst Ave) | 32,253 | Office | 1956 | 8,641 | 267.9 | 9,879 | 306.3 | 14.32% |
| **MDTA** | 1700 FRANKFURST AVENUE | 7,149 | Office | - | 15,255 | 2133.9 | 16,896 | 2,363.4 | 10.76% |
| **MSU** | 1140 E COLD-SPRING LA | 10,269 | Storage | 1950 | 26 | 2.5 | 31 | 3.0 | 20.81% |
| **MSU** | 2412 President's Residence | 4,270 | Residence | 1963 | 193 | 45.2 | 286 | 67.1 | 48.51% |
| **MSU** | Lillie Carroll Jackson Museum | 5,600 | Museum | 1900 | 306 | 54.7 | 313 | 55.9 | 2.19% |
| **MSU** | Morgan Christian Center | 3,883 | Office | 1942 | 379 | 97.7 | 405 | 104.2 | 6.61% |
| **MSU** | Thurgood Marshall D | 6,591 | Dormitory/Residence Hall | 1986 | 422 | 64.1 | 402 | 61.1 | -4.69% |
| **MSU** | Thurgood Marshall B | 19,774 | Dormitory/Residence Hall | 1986 | 941 | 47.6 | 987 | 49.9 | 4.98% |

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|---|---|---|---|---|---|---|---|---|---|
| **MSU** | Thurgood Marshall C | 19,774 | Dormitory/Residence Hall | 1986 | 966 | 48.9 | 916 | 46.3 | -5.17% |
| **MSU** | Thurgood Marshall A | 19,774 | Dormitory/Residence Hall | 1986 | 985 | 49.8 | 1,018 | 51.5 | 3.36% |
| **MSU** | Estuarine Center (off site) | 28,000 | Office | 1995 | 1,164 | 41.6 | 1,311 | 46.8 | 12.65% |
| **MSU** | 4530 Portage Ave | 40,856 | Office | 1983 | 1,490 | 36.5 | 1,420 | 34.8 | -4.70% |
| **MSU** | Turners Armory and Motor Pool | 42,626 | Office | 1951 | 1,726 | 40.5 | 2,152 | 50.5 | 24.70% |
| **MSU** | Business School | 138,000 | Office | 2016 | 18,403 | 133.4 | 11,194 | 81.1 | -39.17% |
| **MSU** | Behavioral & Social Science Center (BSSC) | 140,000 | Office | 1980 | 24,248 | 173.2 | 22,524 | 160.9 | -7.11% |
| **MTA** | Laurel Station | 800 | Transportation Terminal/Station | 1984 | 296 | 370.2 | 230 | 287.1 | -22.44% |
| **MTA** | Bush Bus Division | 25,000 | Storage | - | 594 | 23.8 | 609 | 24.4 | 2.47% |
| **MTA** | Light Rail Stations Cherry Hill | 40,000 | Storage | 1960 | 751 | 18.8 | 769 | 19.2 | 2.32% |
| **MTA** | Light Rail Stations Cherry Hill | 10,000 | - | - | 960 | 96.0 | 953 | 95.3 | -0.80% |
| **MTA** | Eastern Bus Division Trans Bldg | 13,913 | Shop | 1950 | 979 | 70.4 | 945 | 67.9 | -3.49% |
| **MTA** | MTA Police Mt. Hope DR | 90,000 | Police Station | 2011 | 3,112 | 34.6 | 3,137 | 34.9 | 0.83% |
| **MTA** | Procurement | 34,506 | Office | 2000 | 3,150 | 91.3 | 3,278 | 95.0 | 4.07% |
| **MTA** | Kirk Bus Division | 46,239 | Shop | 2016 | 11,562 | 250 | 13,349 | 288.7 | 15.46% |
| **MTA** | METRO Maintenance Old Court | 40,000 | Shop | 1979 | 5,569 | 139.2 | 4,980 | 124.5 | -10.58% |
| **MTA** | Cromwell Light Rail Maintenance | 56,279 | Shop | 2000 | 8,342 | 148.2 | 9,058 | 160.9 | 8.58% |
| **MTA** | MARC Maintenance Facilities Martins | 55,000 | Maintenance Shop | 2006 | 9,772 | 177.7 | 9,306 | 169.2 | -4.77% |
| **MTA** | Light Rail Maintenance North Ave | 107,000 | Shop | 1991 | 14,807 | 138.4 | 14,553 | 136.0 | -1.71% |
| **MTA** | Northwest Bus Division | 264,905 | Shop | 1974 | 17,426 | 65.8 | 17,568 | 66.3 | 0.81% |
| **MTA** | 5801 WABASH AVE | 130,000 | Shop | 1981 | 26,020 | 200.2 | 28,718 | 220.9 | 10.37% |
| **MTA** | Bush Bus Division | 348,702 | Shop | 1903 | 58,402 | 167.5 | 61,051 | 175.1 | 4.54% |
| **MTA** | Metro Stations Johns Hopkins | 300,000 | Transportation Terminal/Station | 1992 | 178,662 | 595.5 | 169,353 | 564.5 | -5.21% |
| **SHA** | Shop - Salisbury Old District Office | 1,789 | Shop | 1984 | 125 | 69.8 | 136 | 76.2 | 9.20% |
| **SHA** | Vehicle Calibration Building | 7,381 | Office | - | 573 | 77.6 | 948 | 128.5 | 65.66% |
| **SHA** | Highway Communications Division | 5,485 | Shop | - | 671 | 122.3 | 834 | 152.1 | 24.40% |
| **SHA** | Shop - Denton | 34,648 | Shop | 1984 | 696 | 20.1 | 831 | 24.0 | 19.50% |
| **SHA** | Shop - Snow Hill | 35,375 | Shop | 1958 | 699 | 19.8 | 514 | 14.5 | -26.46% |
| **SHA** | Shop - Cambridge | 63,988 | Shop | 1963 | 752 | 11.8 | 666 | 10.4 | -11.49% |
| **SHA** | Shop - Leonardtown | 45,891 | Shop | 1975 | 1,051 | 22.9 | 987 | 21.5 | -6.14% |
| **SHA** | Shop - Princess Anne | 36,074 | Shop | 1960 | 1,191 | 33.0 | 1,016 | 28.2 | -14.64% |

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|---|---|---|---|---|---|---|---|---|---|
| **SHA** | District Office/Shop - Chestertown | 54,302 | Office | - | 1,224 | 22.5 | 2,569 | 47.3 | 109.88% |
| **SHA** | Shop - Prince Frederick | 32,077 | Shop | 1968 | 1,251 | 39.0 | 1,216 | 37.9 | -2.81% |
| **SHA** | Shop - Easton | 31,100 | Shop | 1952 | 1,290 | 41.5 | 1,478 | 47.5 | 14.60% |
| **SHA** | District Office - LaVale | 18,406 | Office | - | 1,569 | 85.3 | 1,361 | 74.0 | -13.26% |
| **SHA** | Shop - Centerville | 44,192 | Shop | 1963 | 1,598 | 36.2 | 1,294 | 29.3 | -18.98% |
| **SHA** | Shop - Gaithersburg | 48,273 | Shop | 1994 | 1,736 | 36.0 | 2,142 | 44.4 | 23.39% |
| **SHA** | Shop - Dayton | 48,527 | Shop | 2003 | 1,907 | 39.3 | 1,836 | 37.8 | -3.72% |
| **SHA** | Shop - Laurel | 42,987 | Shop | 1987 | 2,085 | 48.5 | 2,968 | 69.0 | 42.37% |
| **SHA** | Shop - Lavale | 48,582 | Shop | - | 2,190 | 45.1 | 1,216 | 25.0 | -44.47% |
| **SHA** | Shop - Fairlands | 45,323 | Shop | 1998 | 2,260 | 49.9 | 3,453 | 76.2 | 52.81% |
| **SHA** | Shop - Hagerstown | 53,639 | Shop | 1986 | 2,276 | 42.4 | 2,202 | 41.1 | -3.25% |
| **SHA** | District Office-PG | 41,967 | Office | - | 2,425 | 57.8 | 3,382 | 80.6 | 39.49% |
| **SHA** | Shop - Upper Marlboro | 52,763 | Shop | 1998 | 2,559 | 48.5 | 2,816 | 53.4 | 10.06% |
| **SHA** | Shop - Churchville | 45,103 | Shop | 2000 | 2,628 | 58.3 | 2,407 | 53.4 | -8.39% |
| **SHA** | Shop - Elkton | 50,890 | Shop | 1987 | 2,799 | 55.0 | 2,526 | 49.6 | -9.77% |
| **SHA** | Shop - Glen Burnie | 52,430 | Shop | 1979 | 2,805 | 53.5 | 3,306 | 63.1 | 17.86% |
| **SHA** | 211 Building | 51,312 | Office | 1963 | 2,845 | 55.4 | 3,459 | 67.4 | 21.59% |
| **SHA** | Shop - Golden Ring | 36,230 | Shop | 1988 | 2,949 | 81.4 | 2,879 | 79.5 | -2.38% |
| **SHA** | Shop - Owings Mills | 49,498 | Shop | 1985 | 3,122 | 63.1 | 2,704 | 54.6 | -13.38% |
| **SHA** | Building 1 OOTS 2 & 3 | 134,954 | Office | - | 3,137 | 23.2 | 3,175 | 23.5 | 1.19% |
| **SHA** | Shop - Hereford | 45,754 | Shop | 1988 | 3,340 | 73.0 | 3,123 | 68.3 | -6.50% |
| **SHA** | District Office - Frederick | 67,621 | Office | - | 3,379 | 50.0 | 5,934 | 87.8 | 75.65% |
| **SHA** | Shop - LaPlata | 48,146 | Shop | 1985 | 3,407 | 70.8 | 3,180 | 66.0 | -6.66% |
| **SHA** | Shop - Westminster | 47,372 | Shop | 1986 | 4,003 | 84.5 | 4,240 | 89.5 | 5.93% |
| **SHA** | District Office - Salisbury | 52,568 | Office | - | 4,586 | 87.2 | 4,404 | 83.8 | -3.97% |
| **SHA** | District Office - Warren Road | 19,003 | Office | - | 4,611 | 242.6 | 4,692 | 246.9 | 1.76% |
| **SHA** | Building 1 SOC & OOM | 51,998 | Office | - | 4,761 | 91.6 | 4,385 | 84.3 | -7.90% |
| **SHA** | Shop - Keysers Ridge | 94,061 | Shop | 1983 | 4,890 | 52.0 | 2,965 | 31.5 | -39.37% |
| **SHA** | District office/shop - Annapolis | 47,777 | Office | - | 5,557 | 116.3 | 5,270 | 110.3 | -5.17% |
| **SHA** | Building 4 & Vehicle Calibration | 105,798 | Office | - | 10,169 | 96.1 | 9,180 | 86.8 | -9.72% |
| **SHA** | Building 4 | 98,417 | Office | - | 10,983 | 111.6 | 13,862 | 140.9 | 26.22% |
| **SHA** | Buildings 1-3 | 185,893 | Office | - | 14,066 | 75.7 | 14,349 | 77.2 | 2.01% |
| **SHA** | 707 Building | 199,145 | Office | - | 15,033 | 75.5 | 17,659 | 88.7 | 17.47% |
| **SU** | 1206 A Camden Ave. C-3 | 625 | Office | 1950 | 19 | 30.7 | 21 | 33.9 | 10.36% |
| **SU** | 1100 Camden Ave. Center for Conflict Resolution | 2,917 | Office | 1934 | 33 | 11.4 | 35 | 11.9 | 4.85% |

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|---|---|---|---|---|---|---|---|---|---|
| **SU** | 305 College Ave. Environmental Studies | 2,000 | Office | 1947 | 37 | 18.6 | 48 | 24.1 | 29.37% |
| **SU** | 1214 Camden Ave. University Analysis House | 3,085 | Office | 1937 | 41 | 13.3 | 38 | 12.4 | -7.12% |
| **SU** | 1504 S. Salisbury Blvd | 3,000 | Storage | 1970 | 47 | 15.8 | 45 | 14.9 | -5.56% |
| **SU** | 1106 Camden Ave. International Faculty House | 2,368 | Office | 1940 | 48 | 20.4 | 46 | 19.4 | -5.12% |
| **SU** | Tower Shelter | 212 | Antenna/Communication | 2014 | 49 | 229.5 | 49 | 231.7 | 0.94% |
| **SU** | 303 College Ave. Student Arts | 2,457 | Office | 1942 | 52 | 21.0 | 58 | 23.8 | 13.02% |
| **SU** | 1013 Camden Ave. Philosophy House | 3,340 | Office | 1928 | 54 | 16.3 | 65 | 19.4 | 18.95% |
| **SU** | 1206 Camden Ave. C-2 | 2,620 | Office | 1950 | 61 | 23.1 | 62 | 23.5 | 1.74% |
| **SU** | 215 Milford St. M-2 | 10,900 | Storage | 1980 | 69 | 6.4 | 195 | 17.9 | 180.89% |
| **SU** | 103 Power St. Grounds Storage | 3,675 | Storage | 1999 | 74 | 20.2 | 39 | 10.5 | -48.06% |
| **SU** | Nanticoke River Center | 7,082 | Other - Education | 2006 | 76 | 10.8 | 85 | 12.0 | 10.91% |
| **SU** | 406 Loblolly Lane Carriage House | 1,409 | Residence | 1930 | 91 | 64.3 | 89 | 63.4 | -1.38% |
| **SU** | 1108 Camden Ave. C-1 | 2,432 | Office | 1940 | 95 | 39.0 | 97 | 39.8 | 2.01% |
| **SU** | DOGWOOD VILLAGE K | 1,792 | Dormitory/Residence Hall | 1985 | 102 | 56.9 | 129 | 71.7 | 26.02% |
| **SU** | ATHLETIC TEAM BUILDING-SOCCER | 2,573 | Other | 2012 | 104 | 40.6 | 91 | 35.5 | -12.56% |
| **SU** | DOGWOOD VILLAGE L | 1,792 | Dormitory/Residence Hall | 1985 | 105 | 58.5 | 114 | 63.6 | 8.80% |
| **SU** | DOGWOOD VILLAGE O | 1,792 | Dormitory/Residence Hall | 1985 | 106 | 59.1 | 122 | 68.3 | 15.46% |
| **SU** | DOGWOOD VILLAGE M | 1,792 | Dormitory/Residence Hall | 1985 | 112 | 62.8 | 144 | 80.1 | 27.60% |
| **SU** | 1220 S. Division D-1 | 1,535 | Office | 1950 | 113 | 73.4 | 86 | 56.2 | -23.43% |
| **SU** | DOGWOOD VILLAGE N | 1,792 | Dormitory/Residence Hall | 1985 | 115 | 64.0 | 127 | 70.8 | 10.57% |
| **SU** | 1212 Camden Ave. Camden House | 2,680 | Office | 1940 | 120 | 44.8 | 116 | 43.5 | -2.94% |
| **SU** | DOGWOOD VILLAGE H | 1,792 | Dormitory/Residence Hall | 1985 | 124 | 69.2 | 143 | 79.6 | 15.12% |
| **SU** | DOGWOOD VILLAGE B | 1,792 | Dormitory/Residence Hall | 1985 | 124 | 69.2 | 125 | 69.7 | 0.71% |
| **SU** | 1308 Camden Ave. Foundation Center | 5,468 | Office | 1925 | 125 | 22.9 | 131 | 24.0 | 4.56% |
| **SU** | DOGWOOD VILLAGE F | 1,792 | Dormitory/Residence Hall | 1985 | 129 | 71.9 | 127 | 70.8 | -1.43% |
| **SU** | DOGWOOD VILLAGE C | 1,792 | Dormitory/Residence Hall | 1985 | 131 | 73.1 | 153 | 85.4 | 16.85% |
| **SU** | DOGWOOD VILLAGE G | 1,792 | Dormitory/Residence Hall | 1985 | 131 | 73.3 | 106 | 59.0 | -19.49% |
| **SU** | 1015 CAMDEN AVE, SALISBURY | 2,559 | Office | 1943 | 145 | 56.8 | 143 | 55.8 | -1.61% |

| Agency | Building Name (Independently Metered only) | Floor Area (Sqft.) | Building Primary Use | Year Built | FY18 Usage (MMBTU) | FY18 EUI (kBTU/Sqft.) | FY19 Usage (MMBTU) | FY19 EUI (kBTU/Sqft.) | % Change in Usage from FY18 to FY19 |
|---|---|---|---|---|---|---|---|---|---|
| **SU** | DOGWOOD VILLAGE E | 1,792 | Dormitory/Residence Hall | 1985 | 147 | 82.1 | 124 | 69.0 | -16.02% |
| **SU** | DOGWOOD VILLAGE D | 1,792 | Dormitory/Residence Hall | 1985 | 148 | 82.4 | 139 | 77.6 | -5.81% |
| **SU** | DOGWOOD VILLAGE J | 1,792 | Dormitory/Residence Hall | 1985 | 150 | 83.7 | 115 | 64.0 | -23.55% |
| **SU** | 1122 Camden Ave. Honors House | 3,946 | Office | 1956 | 154 | 38.9 | 131 | 33.3 | -14.40% |
| **SU** | DOGWOOD VILLAGE A | 1,792 | Dormitory/Residence Hall | 1985 | 154 | 85.7 | 143 | 79.8 | -6.92% |
| **SU** | 106 Pine Bluff P-1 | 5,832 | College/University | 1950 | 244 | 41.8 | 260 | 44.6 | 6.68% |
| **SU** | DOGWOOD VILLAGE SUPPORT BUILDING | 1,792 | Dormitory/Residence Hall | 1985 | 252 | 140.5 | 271 | 151.1 | 7.54% |
| **SU** | 1200 Camden Ave. Admissions House | 7,700 | Office | 1930 | 319 | 41.5 | 303 | 39.3 | -5.23% |
| **SU** | Outdoor Tennis Center | 2,578 | Outdoor Recreation | 2016 | 336 | 130.5 | 277 | 107.5 | -17.64% |
| **SU** | 1204 Camden Ave. Scarborough Hall | 8,400 | Office | 2001 | 383 | 45.6 | 370 | 44.1 | -3.24% |
| **SU** | 1120 Camden Ave Alumni House | 7,818 | Office | 1996 | 388 | 49.7 | 368 | 47.0 | -5.31% |
| **SU** | 205 Milford St. Indoor Tennis Center | 20,000 | Other - Recreation | 1975 | 469 | 23.4 | 357 | 17.8 | -23.95% |
| **SU** | 119 Bateman St Support Services | 15,200 | Warehouse - Unrefrigerated | 1960 | 531 | 34.9 | 560 | 36.8 | 5.47% |
| **SU** | 125 Bateman Street IT Building | 14,477 | Office | 1950 | 666 | 46.0 | 647 | 44.7 | -2.89% |
| **SU** | 201 Milford St. University Fitness | 15,034 | Fitness Center/Health Club/Gym | 1978 | 701 | 46.6 | 745 | 49.6 | 6.27% |
| **SU** | 1221 Wayne St. Green House & Grounds Office | 5,768 | Other | 1994 | 1,012 | 175.5 | 1,099 | 190.5 | 8.54% |
| **SU** | East Campus Complex | 30,695 | College/University | 1989 | 1,386 | 45.1 | 1,362 | 44.4 | -1.69% |
| **SU** | 1123 S Division Street - Maint Bldg | 36,000 | Other - Services | 2006 | 1,823 | 50.6 | 1,680 | 46.7 | -7.86% |
| **SU** | Sea Gull Stadium | 28,000 | Stadium (Open) | 2016 | 2,121 | 75.7 | 2,173 | 77.6 | 2.47% |
| **SU** | 1306 S. Salis. Blvd (Sea Gull Squ.) | 232,000 | Dormitory/Residence Hall | 2011 | 8,652 | 37.3 | 7,317 | 31.5 | -15.43% |
| **TU** | AUBURN HOUSE-AH | 11,600 | - | 1900 | 756 | 65.2 | 770 | 66.4 | 1.75% |
| **TU** | CHILD CARE CENTER - CC | 11,800 | Pre-School/Daycare | 2007 | 1,362 | 115.4 | 1,286 | 109.0 | -5.57% |
| **TU** | 7400 York Road - Y2 | 41,200 | Office | 2009 | 2,080 | 50.5 | 2,002 | 48.6 | -3.74% |
| **TU** | BARTON-BA | 73,696 | Dormitory/Residence Hall | 2011 | 4,387 | 59.5 | 4,288 | 58.2 | -2.24% |
| **TU** | FREDERICK DOUGLASS HOUSE | 85,540 | Dormitory/Residence Hall | 2011 | 4,912 | 57.4 | 5,001 | 58.5 | 1.81% |
| **TU** | CARROLLHALL-CH | 170,504 | Dormitory/Residence Hall | 2016 | 7,850 | 46.0 | 5,184 | 30.4 | -33.95% |
| **TU** | MARSHALLHALL | 156,594 | Dormitory | 2001 | 8,232 | 52.6 | 7,943 | 50.7 | -3.52% |

| Agency | Building Name (Independently Metered only) | Floor Area (Sqft.) | Building Primary Use | Year Built | FY18 Usage (MMBTU) | FY18 EUI (kBTU/Sqft.) | FY19 Usage (MMBTU) | FY19 EUI (kBTU/Sqft.) | % Change in Usage from FY18 to FY19 |
|---|---|---|---|---|---|---|---|---|---|
| **TU** | ADMINISTRATION BLDG (7720)-AD | 119,467 | Office | 1957 | 10,224 | 85.6 | 9,792 | 82.0 | -4.22% |
| **TU** | BURKSHIRE - TU MARRIOT-TM | 311,209 | Dormitory/Residence Hall | 1989 | 19,552 | 62.8 | 13,734 | 44.1 | -29.76% |
| **UMB** | INFO BLDG 100 N. GREENE ST | 32,683 | Office | 1895 | 0 | 0.0 | 0 | 0.0 | 11.97% |
| **UMB** | 300 RUSSELL ST, 600 WASH BLVD PS | 4,132 | Office | 1900 | 11 | 2.7 | 8 | 2.0 | -24.72% |
| **UMB** | 719-721 W. PRATT ST. | 5,000 | Office | | 17 | 3.4 | 2 | 0.5 | -85.66% |
| **UMB** | 601 W. Lexington | 8,835 | Office | 2000 | 41 | 4.7 | 22 | 2.5 | -46.63% |
| **UMB** | 300 RUSSELL ST 600 WASH BLVD 2ND FL | 4,132 | Office | 1900 | 72 | 17.3 | 68 | 16.5 | -5.10% |
| **UMB** | 300 RUSSELL ST 600 WASH BLVD 1ST FL | 4,132 | Office | 1900 | 97 | 23.5 | 95 | 22.9 | -2.53% |
| **UMB** | 300 RUSSELL ST 600 WASH BLVD 3RD FL | 4,132 | Office | 1900 | 103 | 24.9 | 110 | 26.5 | 6.39% |
| **UMB** | School of Social Work Administration Office | 3,779 | Office | 2000 | 809 | 214.0 | 1,306 | 345.5 | 61.46% |
| **UMB** | Pine Street Station - 212 N Pine St | 9,028 | Police Station | 1877 | 1,044 | 115.7 | 1,085 | 120.1 | 3.84% |
| **UMB** | Maryland Bar Center (MBC) | 30,572 | Administration | 1930 | 2,833 | 92.7 | 2,404 | 78.6 | -15.13% |
| **UMB** | General Research Building | 38,147 | Laboratory | 1967 | 9,517 | 249.5 | 9,221 | 241.7 | -3.11% |
| **UMBC** | Guard Station | 50 | Other | 2000 | 20 | 394.2 | 24 | 470.7 | 19.41% |
| **UMBC** | Radio Tower & 4 Ancillary Bldgs | 1,300 | Antenna/Communication | 2017 | 27 | 20.5 | 34 | 26.3 | 28.74% |
| **UMBC** | HazMat Storage | 300 | Storage | 2009 | 60 | 200.5 | 58 | 193.3 | -3.62% |
| **UMBC** | Plasma Spray Bldg | 2,467 | Laboratory | 1980 | 120 | 48.8 | 125 | 50.5 | 3.49% |
| **UMBC** | Army ROTC | 4,245 | College/University | 1986 | 140 | 33.0 | 142 | 33.5 | 1.36% |
| **UMBC** | Naval ROTC | 4,632 | College/University | 1963 | 156 | 33.6 | 160 | 34.6 | 2.91% |
| **UMBC** | Tech 2 Bldg | 4,256 | Office | 1992 | 286 | 67.3 | 292 | 68.7 | 2.01% |
| **UMBC** | Alumni House | 7,615 | Office | 1970 | 360 | 47.3 | 428 | 56.2 | 18.66% |
| **UMBC** | Professional Studies Bldg & Shed | 8,216 | Adult Education | 1980 | 614 | 74.8 | 581 | 70.7 | -5.48% |
| **UMBC** | Clean Energy Technology Incubator (CETI) | 22,767 | Laboratory | 1980 | 2,668 | 117.2 | 3,062 | 134.5 | 14.78% |
| **UMBC** | Chiller Plant | 3,129 | Energy/Power Station | 1980 | 4,125 | 1318.2 | 4,325 | 1,382.4 | 4.87% |
| **UMBC** | Technology Research Center (TRC) | 77,029 | Laboratory | 1958 | 12,490 | 162.1 | 11,958 | 155.2 | -4.26% |
| **UMBC** | Technology Center | 134,197 | Laboratory | 1980 | 18,875 | 140.6 | 19,667 | 146.6 | 4.20% |
| **UMBC** | Columbus Center | 263,937 | Office | 1995 | 58,326 | 221.0 | 56,214 | 213.0 | -3.62% |
| **UMCP** | 803-Adelphi Road Office Annex (8701 Adelphi Rd) | 4,818 | Office | 1956 | 17 | 3.5 | 16 | 3.3 | -5.88% |
| **UMCP** | CNS (Journalism) | 1,003 | College/University | - | 28 | 27.9 | 49 | 48.8 | 74.93% |

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|---|---|---|---|---|---|---|---|---|---|
| **UMCP** | LEAF House | 4,500 | Other-Technology/Science | 2007 | 30 | 6.7 | 26 | 5.8 | -12.80% |
| **UMCP** | 827-MFRI Structural Firefighting Bldg (Lower E. Shore) | 2,329 | Fire Station/College/University | 1995 | 122 | 52.4 | 150 | 64.4 | 22.95% |
| **UMCP** | 309-Indoor Practice Facility | 20,963 | Fitness Center/Health Club/Gym | 2001 | 139 | 6.6 | 137 | 6.5 | -1.44% |
| **UMCP** | 221-Astronomical Observatory | 1,643 | Other - Technology/Science | 1964 | 149 | 90.7 | 196 | 119.3 | 31.54% |
| **UMCP** | 842-MFRI Office/Classroom Building (W. Md) | 5,736 | College/University | 1994 | 251 | 43.8 | 327 | 57.0 | 30.28% |
| **UMCP** | 826-MFRI Office/Classroom Building (Lower E. Shore) | 6,888 | College/University | 1994 | 297 | 43.1 | 235 | 34.1 | -20.88% |
| **UMCP** | 164-University House | 15,133 | College/University | 2012 | 559 | 36.9 | 570 | 37.7 | 1.97% |
| **UMCP** | 846-MFRI Structural Firefighting Bldg (Upper E. Shore) | 2,329 | Fire Station/College/University | 2002 | 597 | 256.3 | 526 | 225.8 | -11.89% |
| **UMCP** | 395-Turfgrass Research Facility (Paint Branch) | 4,500 | Laboratory | 1999 | 696 | 154.7 | 712 | 158.2 | 2.30% |
| **UMCP** | 800-4-H Headquarters | 6,155 | College/University | 1989 | 702 | 114.1 | 684 | 111.1 | -2.56% |
| **UMCP** | 832-MFRI (Northeast) | 9,801 | Unknown | 2011 | 714 | 72.8 | 817 | 83.4 | 14.43% |
| **UMCP** | 171-Phi Sigma Sigma Sorority (4531 College Ave) | 10,445 | College/University | 1960 | 1,009 | 96.6 | 1,155 | 110.6 | 14.47% |
| **UMCP** | 821-MFRI Structural Firefighting Building (LaPlata) | 9,801 | Fire Station/College/University | 2001 | 1,094 | 111.6 | 965 | 98.5 | -11.79% |
| **UMCP** | 173-Delta Phi Epsilon Sorority (4514 Knox Rd) | 10,273 | College/University | 1964 | 1,264 | 123.0 | 1,149 | 111.8 | -9.10% |
| **UMCP** | 176-Alpha Phi Sorority (7402 Princeton Ave) | 11,833 | College/University | 1964 | 1,286 | 108.7 | 2,291 | 193.6 | 78.15% |
| **UMCP** | 175-Delta Gamma Sorority (4518 Knox Rd) | 11,662 | College/University | 1963 | 1,387 | 118.9 | 1,551 | 133.0 | 11.82% |
| **UMCP** | 174-Sigma Delta Tau Sorority (4516 Knox Rd) | 10,372 | College/University | 1963 | 1,409 | 135.8 | 1,104 | 106.4 | -21.65% |
| **UMCP** | 170-Alpha Delta Pi Sorority (4535 College Ave) | 10,459 | College/University | 1959 | 1,472 | 140.7 | 1,728 | 165.2 | 17.39% |
| **UMCP** | 172-Alpha Chi Omega Sorority (4525 College Ave) | 11,712 | College/University | 1960 | 1,691 | 144.4 | 1,969 | 168.1 | 16.44% |
| **UMCP** | 809-Litton 3 (5000 51st Avenue) | 9,763 | Police Services | 1984 | 2,320 | 237.6 | 798 | 81.7 | -65.60% |
| **UMCP** | 804-Cooperative Exten. Svc Annex (Riverdale) | 35,293 | Office | - | 2,389 | 67.7 | 2,378 | 67.4 | -0.46% |
| **UMCP** | 007-Pocomoke Building | 30,046 | Police Station | 1946 | 3,581 | 119.2 | 3,514 | 117.0 | -1.87% |
| **UMCP** | 812-Seneca Building | 40,770 | College/University | 1991 | 4,670 | 114.5 | 7,188 | 176.3 | 53.92% |
| **UMCP** | 806-Technology Ventures Building | 52,816 | College/University | 1960 | 4,953 | 93.8 | 4,717 | 89.3 | -4.76% |

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|---|---|---|---|---|---|---|---|---|---|
| **UMCP** | 805-Patapsco Building | 53,964 | Unknown | 1969 | 5,973 | 110.7 | 5,262 | 97.5 | -11.90% |
| **UMCP** | IBBR 1B | 43,683 | College/University | 1997 | 11,375 | 260.4 | 8,198 | 187.7 | -27.93% |
| **UMCP** | IBBR 1A | 34,928 | College/University | 1989 | 13,928 | 398.8 | 13,279 | 380.2 | -4.66% |
| **UMCP** | 199-MFRI Office/Classroom Building | 45,973 | College/University | 1955 | 16,535 | 359.7 | 19,130 | 416.1 | 15.69% |
| **UMCP** | 795-Avrum Gudelsky Veterinary Center | 85,716 | College/University | 1989 | 29,210 | 340.8 | 28,991 | 338.2 | -0.75% |
| **UMCP** | 810-Severn Building | 310,865 | College/University | 1998 | 46,497 | 149.6 | 55,266 | 177.8 | 18.86% |
| **UMCP** | IBBR 2 | 138,812 | College/University | 2006 | 58,471 | 421.2 | 59,510 | 428.7 | 1.78% |
| **UMES** | 1 TOM NICHOLS RD 11850, TOM NICHOLS ROAD | 940 | College/University | 1961 | 13 | 14.0 | 11 | 11.6 | -17.43% |
| **UMES** | 2 IRRIGATION PUMP, BACKBONE ROAD | 2,200 | College/University | 2004 | 15 | 6.9 | 19 | 8.5 | 22.60% |
| **UMES** | HAWKS LANDING 1322, WILLIAM P HYTCHE | 1,006 | Other - Lodging/Residential | 2001 | 23 | 23.2 | 32 | 31.6 | 36.09% |
| **UMES** | HAWKS LANDING 1522, WILLAIM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 24 | 23.6 | 25 | 24.8 | 4.90% |
| **UMES** | HAWKS LANDING 1414, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 28 | 27.4 | 24 | 24.3 | -11.39% |
| **UMES** | HAWKS LANDING 1132, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 28 | 27.4 | 22 | 22.2 | -19.20% |
| **UMES** | HAWKS LANDING 1411, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 28 | 28.0 | 26 | 26.1 | -6.77% |
| **UMES** | HAWKS LANDING 1433, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 29 | 28.6 | 26 | 25.7 | -10.15% |
| **UMES** | HAWKS LANDING 1223, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 30 | 30.1 | 26 | 26.0 | -13.74% |
| **UMES** | HAWKS LANDING 1131, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 30 | 30.2 | 29 | 29.0 | -3.95% |
| **UMES** | HAWKS LANDING 1423, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 31 | 30.5 | 34 | 33.6 | 10.04% |
| **UMES** | HAWKS LANDING 1231, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 31 | 31.0 | 30 | 30.2 | -2.52% |
| **UMES** | HAWKS LANDING 1112, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 32 | 31.9 | 34 | 33.5 | 5.26% |
| **UMES** | HAWKS LANDING 1121, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 33 | 32.4 | 26 | 25.8 | -20.42% |

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|---|---|---|---|---|---|---|---|---|---|
| **UMES** | HAWKS LANDING 1211, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 33 | 32.8 | 27 | 26.4 | -19.37% |
| **UMES** | HAWKS LANDING 1421, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 33 | 32.9 | 25 | 25.1 | -23.73% |
| **UMES** | HAWKS LANDING 1432, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 33 | 33.1 | 27 | 26.9 | -18.72% |
| **UMES** | HAWKS LANDING 1224, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 33 | 33.2 | 39 | 39.3 | 18.29% |
| **UMES** | HAWKS LANDING 1531, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 35 | 34.6 | 31 | 31.3 | -9.55% |
| **UMES** | HAWKS LANDING 1424, WILLIAM HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 35 | 34.8 | 25 | 24.5 | -29.48% |
| **UMES** | HAWKS LANDING 1412, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 35 | 34.8 | 31 | 31.0 | -11.09% |
| **UMES** | HAWKS LANDING 1313, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 36 | 35.4 | 36 | 35.3 | -0.26% |
| **UMES** | HAWKS LANDING 1434, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 36 | 35.9 | 39 | 39.0 | 8.52% |
| **UMES** | HAWKS LANDING 1324, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 36 | 36.2 | 36 | 35.5 | -1.74% |
| **UMES** | HAWKS LANDING 1323, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 37 | 36.5 | 29 | 28.4 | -22.23% |
| **UMES** | HAWKS LANDING 1222, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 38 | 37.7 | 29 | 29.2 | -22.43% |
| **UMES** | HAWKS LANDING 1431, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 38 | 37.8 | 31 | 31.1 | -17.52% |
| **UMES** | HAWKS LANDING 1532, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 38 | 38.1 | 29 | 29.0 | -23.87% |
| **UMES** | HAWKS LANDING 1233, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 41 | 40.3 | 32 | 31.7 | -21.48% |
| **UMES** | HAWKS LANDING 1331, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 42 | 41.4 | 25 | 25.3 | -38.86% |
| **UMES** | HAWKS LANDING 1334, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 42 | 42.0 | 37 | 36.4 | -13.50% |

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|---|---|---|---|---|---|---|---|---|---|
| **UMES** | HAWKS LANDING 1333, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 42 | 42.2 | 29 | 29.0 | -31.16% |
| **UMES** | HAWKS LANDING 1422, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 42 | 42.2 | 22 | 22.0 | -47.78% |
| **UMES** | HAWKS LANDING 1332, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 43 | 42.3 | 36 | 35.3 | -16.53% |
| **UMES** | HAWKS LANDING 1321, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 43 | 43.1 | 42 | 41.6 | -3.32% |
| **UMES** | HAWKS LANDING 1511, WILLIAM P HYTCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 43 | 43.1 | 47 | 46.4 | 7.51% |
| **UMES** | HAWKS LANDING 1512, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 45 | 44.3 | 34 | 34.1 | -23.11% |
| **UMES** | HAWKS LANDING 1232, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 45 | 45.2 | 43 | 43.0 | -4.87% |
| **UMES** | HAWKS LANDING 1234, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 46 | 45.3 | 44 | 43.7 | -3.61% |
| **UMES** | HAWKS LANDING 1221, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 47 | 46.4 | 44 | 44.2 | -4.70% |
| **UMES** | HAWKS LANDING 1122, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 49 | 49.0 | 29 | 28.8 | -41.24% |
| **UMES** | HAWKS LANDING 1312, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 51 | 50.9 | 35 | 34.3 | -32.59% |
| **UMES** | HAWKS LANDING 1212, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 54 | 54.1 | 58 | 57.6 | 6.43% |
| **UMES** | HAWKS LANDING 1413, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 59 | 58.7 | 48 | 47.8 | -18.56% |
| **UMES** | 2 TOM NICHOLS ROAD 11850, TOM NICHOLS ROAD | 14,033 | College/University | 1961 | 90 | 6.4 | 45 | 3.2 | -49.89% |
| **UMES** | HAWKS LANDING 1000, WILLIAM P HYCHE | 1,006 | Other - Lodging/Residential | 2001 | 134 | 132.9 | 133 | 132.3 | -0.51% |
| **UMES** | HAWKS LANDING 1314, WILLIAM P HYCHE BLVD | 1,006 | Other - Lodging/Residential | 2001 | 207 | 206.1 | 182 | 181.0 | -12.18% |
| **UMES** | GREEN HOUSE, BACKBONE HOUSE | 661 | College/University | 1975 | 385 | 582.2 | 118 | 178.9 | -69.27% |
| **UMES** | Coastal Ecology | 11,000 | College/University | 2005 | 1,000 | 90.9 | 1,358 | 123.5 | 35.84% |