Municipal Energy Audits

1. Background

The City of Rockville operates a variety of facilities, parks, water and sewer utilities, street and traffic lights, and fleet that consume significant energy resources; costing between three to four percent of the City's operating budget. The City's total annual energy costs for electricity, heating fuel, gasoline and diesel is approximately $3 million. Given that electricity accounts for more than 70 percent of the City's energy costs, the City continually works to identify and evaluate potential new strategies for cost control, efficiency, reliability, and sustainability.

The Mayor and Council adopted Resolution #12-13 on October 18, 2013 declaring the City of Rockville's intent to take a leadership role in reducing electricity consumption and generating renewable energy, partner with the Maryland Energy Administration (MEA), and enroll as a Maryland Smart Energy Community (MSEC). As part of the MSEC program, the City adopted an energy policy for City buildings and operations that establishes a 15 percent electricity reduction goal and a 20 percent renewable energy generation goal. The City developed an electricity baseline and identified several potential cost-effective energy projects and practices to meet the energy efficiency and renewable energy goals. Each year, the City continues to plan and implement energy operating and CIP projects to reduce energy costs at various sites with a combination of funds from the City, MSEC grants, and Pepco utility rebates.

2. Energy Team

Various departments and divisions play a role in energy reduction plan oversight and implementation, including the following:

- **Building and park operations**: Within the Department of Recreation and Parks, the Facilities Division oversees building management and maintenance practices and implementation of energy conservation projects, such as HVAC replacement and maintenance, lighting retrofits, and building automation systems. Individual facility and park managers also play a role in energy management in operations.
- **Water treatment, water distribution, and sewer collection operations**: Within the Department of Public Works, the Water Treatment Plant and Engineering Divisions oversee the planning, design, construction and operation of the City's water and sewer utilities. When feasible, energy efficiency is included in water plant upgrades, water system facility improvements, and water tank improvements to provide more reliable water system, ensure safe drinking water, increase fire flows, and reduce water main breaks and leakage (which result in wasted energy).

- **Street and traffic lights**: Within the Department of Public Works, the Traffic and Transportation Division oversees street and traffic lights. They have upgraded traffic signals and metered lights to LED and are planning retrofits for unmetered street lights.
- **Annual MSEC Reporting and Building Energy Benchmarking**: The Environmental Management Division oversees annual MSEC reporting and building energy benchmarking with assistance from the City's utility consultant and the Department of Recreation and Parks.

3. Utility Bill Management and Energy Tracking

In 2019, the City hired a utility consultant, Eric Ryan Corporation (ERC), that audits utility bills for approximately 132 electricity accounts and 27 natural gas accounts and enters usage and cost data into the web-based EnergyCAP platform and EPA ENERGY STAR Portfolio Manager. This new system allows a one-stop-shop for overseeing energy usage and expenditures for all accounts and facilities on a monthly and annual basis. Utility account managers can access the online tool to monitor different energy dashboards, run reports, and access consolidated data for budgets. The City spends up to $11,800 on this service per year. This service has produced savings on utility bills resulting from utility bill corrections and contracts for cheaper energy supply rates.

4. Energy Projects between 2018-2021

The City does not maintain an annual budget dedicated to energy efficiency projects; funding is incorporated into various operating and CIP budgets. Within the 2018 -2021 period, the City completed, is implementing, or is planning the following energy projects.

- **Lincoln Park Community Center Quick Energy Audit and Interior LED Lighting Retrofit (complete):** The Lincoln Park Community Center (LPCC) is located at 357 Frederick Avenue, Rockville. The building was originally constructed in 1970 and is approximately 12,516 square feet. The Lincoln Park Community Center is one of a handful of City facilities that was eligible to participate in Pepco's Small Business Incentive program that provides a free facility quick energy audit and larger utility incentive incentives than the standard program.
    - Based on a contractor's quick energy audit, the City was able to secure a Maryland Smart Energy Communities grant and Pepco rebates to offset a $54,460 interior lighting LED retrofit project. The Maryland Energy Administration awarded the City a $27,122 MSEC grant and Pepco provided a $18,181 rebate to offset costs to retrofit 157 interior lights with LED fixtures and modern controls. The project was completed in July of 2020. Annual energy savings is estimated to be $6,757.
    - The project replaced all 157 interior light fixtures (including 16 CFLs, over 100 T-8s and other fluorescent lights, one metal halide, and one incandescent) with energy efficient LED fixtures (linear ambient luminaires, LED integrated retrofit kits, and LED Energy Star lighting) and paired the fixtures with 127

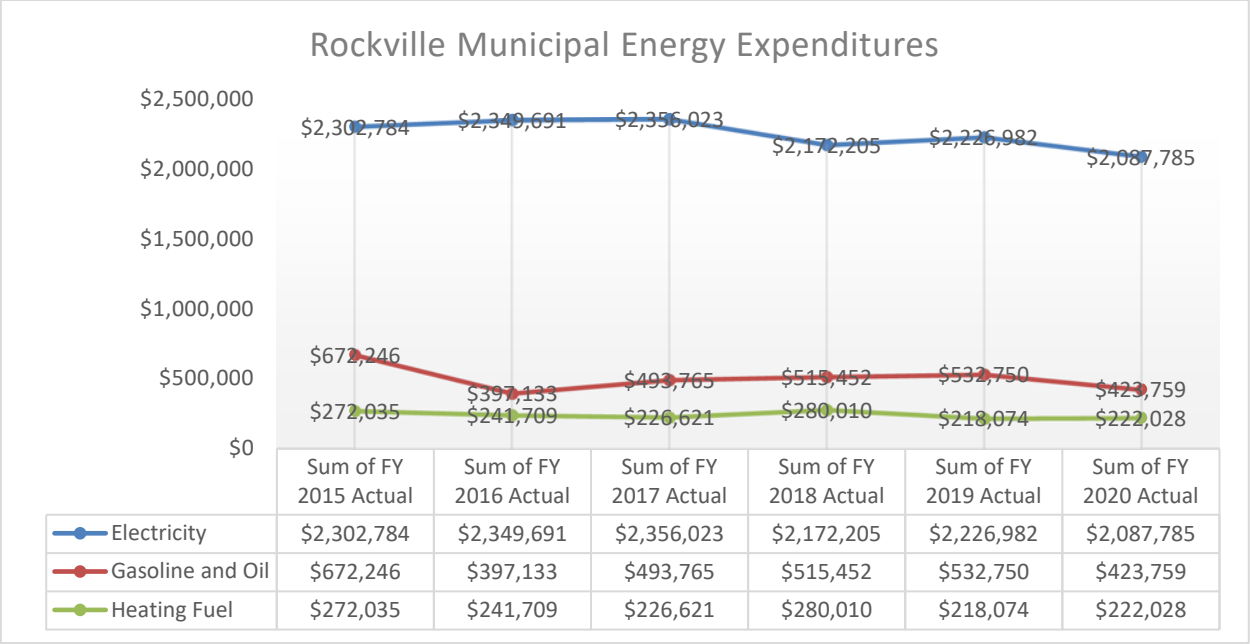
occupancy sensors to modernize and improve occupant lighting controls and maximize energy savings.
    - The project complemented energy efficiency projects completed at the LPCC, including HVAC upgrades and exterior lighting upgrades. By the end of this project, all interior and exterior light fixtures of LPCC were modernized with efficient fixtures. These comprehensive building improvements were intended to improve safety and reduce facility energy costs, maintenance and greenhouse gas emissions.
- **Dogwood Park Lighting Renovations (complete)**: The City completed a LED lighting retrofit at two Dogwood Park baseball and softball fields, in an amount not to exceed $427,090. The project replaced 67 lights with energy efficient LEDs and received a Pepco rebate of $13,230.
- **City Hall Interior Lighting Energy Audit (complete):** City Hall's Energy Star score as of December 2019 in pre-pandemic conditions was 38. A contractor conducted a lighting retrofit in October of 2020 to identify opportunities for lighting improvements and efficiencies. The project audited the second and third floors to generate cost and energy savings estimates for future grant and budget proposals. Total estimates to retrofit lighting on both floors was $153,848 with Pepco rebate estimates of $55,825; annual energy savings is estimated up to $13,864. Staff used the results of the lighting audit to plan phased retrofits and seek grant and utility rebates to offset the costs in FY 2022 and beyond.
- **City Hall LED interior lighting retrofit (in process)**: In 2021, Rockville was awarded a $35,000 grant to conduct energy efficient interior light-emitting diode (LED) lighting upgrades at the City Hall. The grant proposal allows the City to leverage State and utility incentives to work towards the Mayor and Council's adopted 15 percent energy efficiency reduction goal for municipal facilities and climate action priorities. This grant application seeks to upgrade 325 interior light fixtures on the second floor, including 256 sensors to maximize energy savings. A walk-through lighting assessment estimated the lighting retrofit would cost approximately $70,393. The project is also eligible to apply for up to $27,818 in Pepco rebates. Annual energy savings is estimated to be $6,123. If the project successfully secures the grant and the Pepco rebates, the energy savings recoups city net costs in less than two years. The project is being planned for implementation in FY 2022.
- **City Hall Full Building Energy Audit/Tune-up (in process)**: In the FY 2021 Budget, the Mayor and Council approved $11,000 for comprehensive energy audit of City Hall. As part of Pepco's Building Tune-up Program, the City contracted a consultant to assess City Hall's energy performance and identified potential conservation measures that may be implemented to reduce energy costs, increase operational efficiency and support carbon reduction goals. The initial energy audit of City Hall and review of the building energy management system occurred on May 26, 2021. In July of 2021, the City will receive a draft report, calculations and forms to submit to Pepco and Washington Gas for an engineering review. The utilities will then provide any comments/questions before providing pre-approval letters to allow us to move

forward with building tune-up projects and plan other measures in the FY 2023 budget and beyond.

- **Upgrading the energy management systems (in process):** In March of 2021, the Mayor and Council approved a contract to not to exceed $130,000 per year to upgrade building automation systems at City Hall, Thomas Farm Community Center, and the F. Scott Fitzgerald Theatre. The City currently uses Johnson Controls, Inc. building automated system (BAS) to control, monitor, schedule, and adjust the HVAC systems located at these facilities. The current BAS is in excess of 15 years old and many of the existing controllers were no longer supported by the manufacturer. An upgrade to the BAS will replace all of the obsolete controllers, add four (4) additional sites to the facilities' central monitoring station (Thomas Farm Community Center, Senior Center, Swim and Fitness Center, and Police Station), improve operational efficiency, provide the ability to monitor HVAC systems, set schedules, provide trend reporting, and make temperature adjustments remotely. Having the ability to monitor and adjust HVAC systems remotely not only decreases response time to HVAC service calls, but also aids in troubleshooting the HVAC systems, decreasing the amount of down time of the equipment. Facilities staff is currently working with the contractor on the transition.
- **LED Streetlight Conversion (planning)**: The FY 2022 capital budget includes the new LED Streetlight Conversion (TA22) project. This project provides for the replacement of all remaining city-owned and maintained high pressure sodium (HPS) streetlights (approximately 3,200) with more energy efficient, light- emitting diode (LED) luminaires. There is currently $1 million proposed in FY 2023 and $2.2 million unfunded in FY 2024 and FY 2025 for this project. The city anticipates applying for Pepco rebates through the EmPower Maryland incentive program. This project not only supports Vision Zero safety measures, but was also recommended by a MEA funded street light technical assessment to reduce energy use and carbon emissions.

5. Energy Expenditures

Over the last five years, energy expenditures for all operations have declined between 5 to 16 percent, with an average of 8 percent reduction in costs. It should be noted that changes to operations during the pandemic skewed energy consumption data in FY 2020.



	Sum of FY 2015 Actual	Sum of FY 2016 Actual	Sum of FY 2017 Actual	Sum of FY 2018 Actual	Sum of FY 2019 Actual	Sum of FY 2020 Actual
Electricity	$2,302,784	$2,349,691	$2,356,023	$2,172,205	$2,226,982	$2,087,785
Gasoline and Oil	$672,246	$397,133	$493,765	$515,452	$532,750	$423,759
Heating Fuel	$272,035	$241,709	$226,621	$280,010	$218,074	$222,028

6. Summary of other Municipal Energy Projects Completed to meet Energy Efficiency Goals (2015-2021)

Despite City growth and changes in operations, energy cost reductions between FY2015 and FY2020 were achieved through a variety of projects and strategies. Highlights are summarized below with funding sources from the City, MSEC grants and Pepco rebates:

1. Swim and Fitness Center/Welsh Park: North pool air handler/heat recovery replacement (City, MSEC and Pepco rebate); Light Emitting Diode (LED) lighting upgrade in the South indoor pool (City, Pepco rebate); upgrade of 52 outdoor parking lot lights to LED (City, MSEC and Pepco rebate), LED lighting replacement at the north pool (City, Pepco rebate), locker room renovation with energy efficient lighting and plumbing fixtures (Pepco rebate).
2. F. Scott Fitzgerald Social Hall: air handler replacement (City, MSEC and Pepco rebate); 100-ton high efficiency chiller replacement (City); LED lobby light replacement (City); upgraded commercial refrigerator (City).
3. Programmable Thermostats: Installation of 15 thermostats in City Hall, Gude Maintenance facility (Gude), Water Treatment Plant (WTP), Civic Center Cottage, Lincoln Park, Recreation Services Building, Twinbrook Annex (Pepco replacement program).
4. Glenview Mansion: 50-ton high efficiency chiller replacement (City), LED interior lighting upgrades (City), ENERGY STAR ice maker replacement (City, Pepco).
5. City Hall: chiller replacement (City), replaced 28 HPS outdoor parking lot lights with LED (City).
6. Water Treatment Plant: Conducted energy audit to identify energy conservation and retrofit measures for consideration in an upcoming plant rehabilitation project that includes comprehensive electrical system upgrades and renovations to the second

and third floors (City). The Water Treatment Plant also participates in an energy demand management program that curtails electricity use during high demand periods.

7. Lincoln Park Community Center: HVAC rooftop unit replacement (City), parking lot light LED retrofit (City), building exterior and interior light LED retrofit (MSEC and Pepco rebate).
8. HVAC maintenance: The Facilities Division initiated an increased preventative HVAC maintenance program to further improve efficiencies of existing systems (City).
9. Building Energy Training: Three City staff attended a building re-tuning course (City, Pepco rebate).