**Quarterly Energy Report**

**Q4 - December 2021**

## Energy Overview

In 2021, energy management strategies have been implemented to help track and reduce energy use within Louisville Metro Government (LMG). These efforts include setback scheduling, utility billing analysis, and building optimization efforts, and have produced approximately $745,000 of utility cost avoidance by the end of the calendar year. While substantial work has been dedicated to building a thorough and reliable database, improving benchmarking and data management practices will continue to be an ongoing effort. This report uses graphics generated through the benchmarking platform to help provide high level understanding of LMG's energy profile, however keep in mind that the accuracy of the charts may still be affected by gaps in historical data.

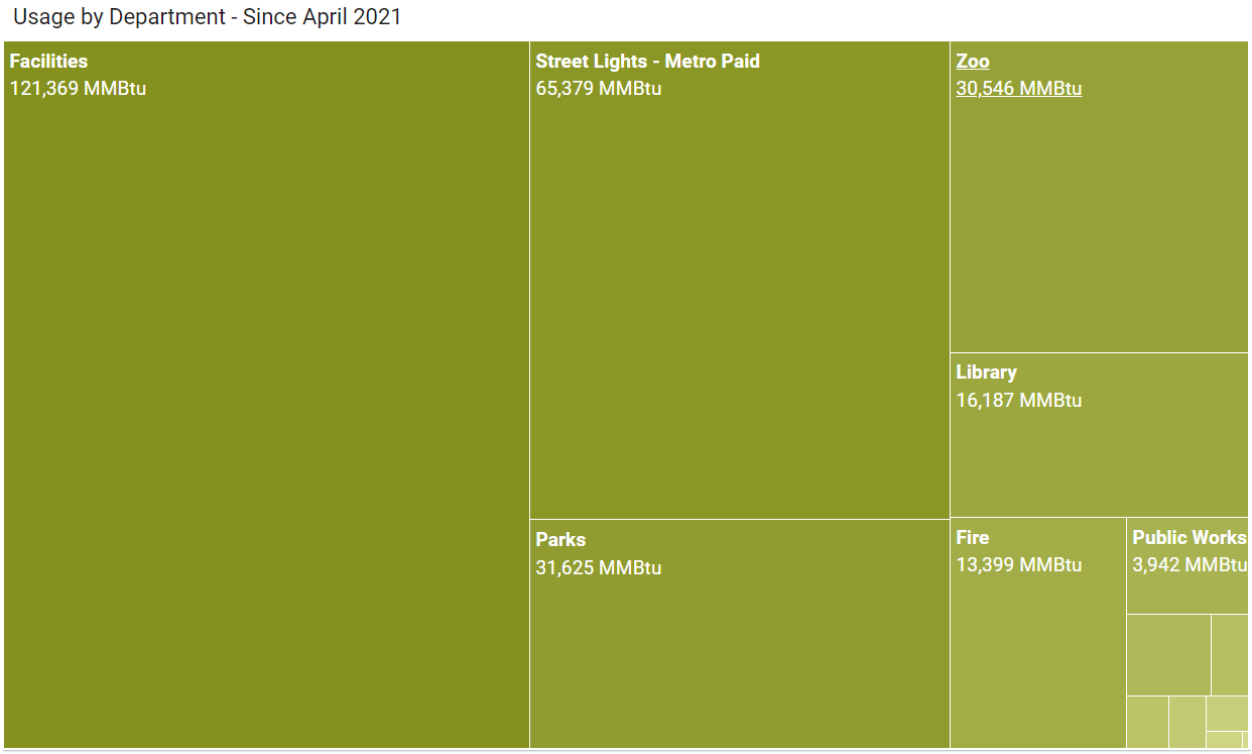


*Figure 1: Breakdown of recorded energy usage by department. Departments managing numerous facilities have the highest associated energy usage, and street lighting is the largest consumer of power not associated with buildings.*

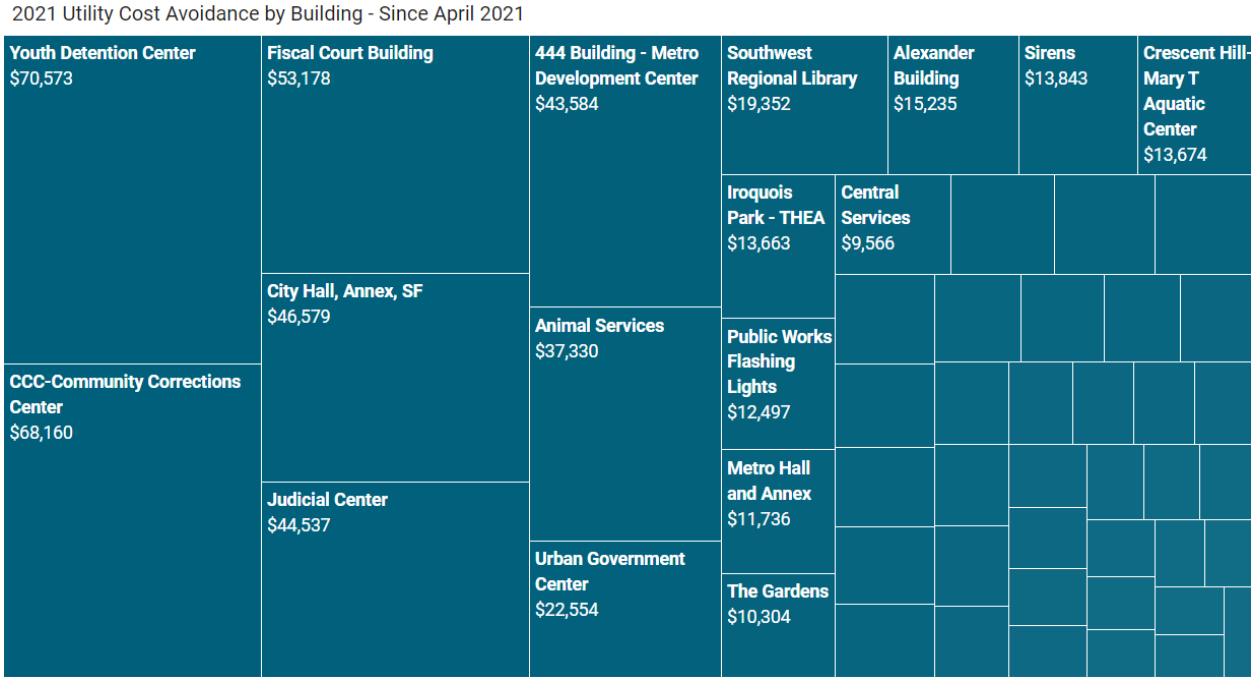


*Figure 2: Breakdown of utility cost avoidance per building. The amount of savings is influenced by the starting conditions, operational and equipment changes, controls capabilities, and how much runtime can be reduced.*

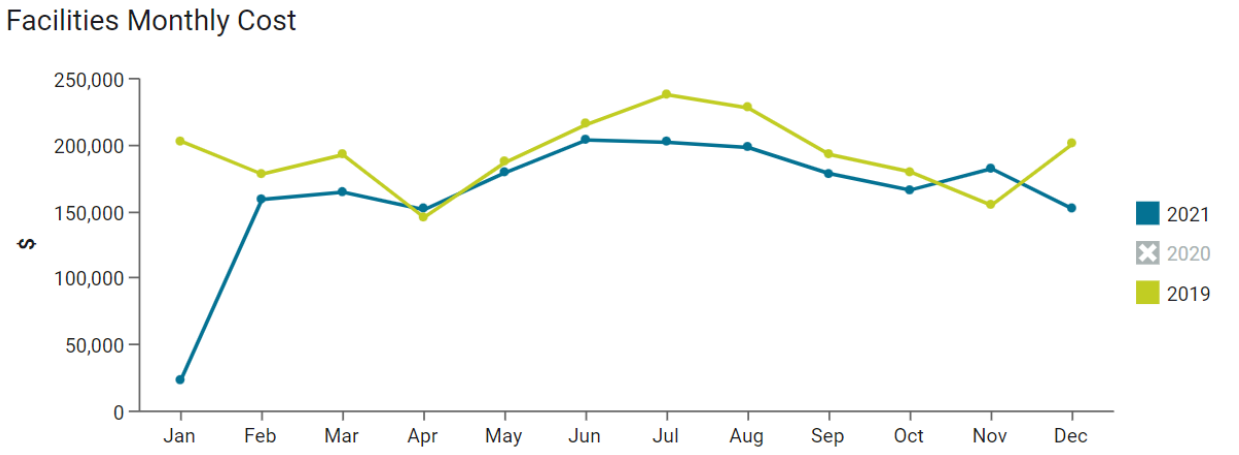


*Figure 3: Total year-over-year utility cost of buildings managed by the Office Facilities and Fleet Management. The current calendar year features notably lower utility costs than the 2019 baseline, despite a mid-year increase in LG&E's utility rates.*

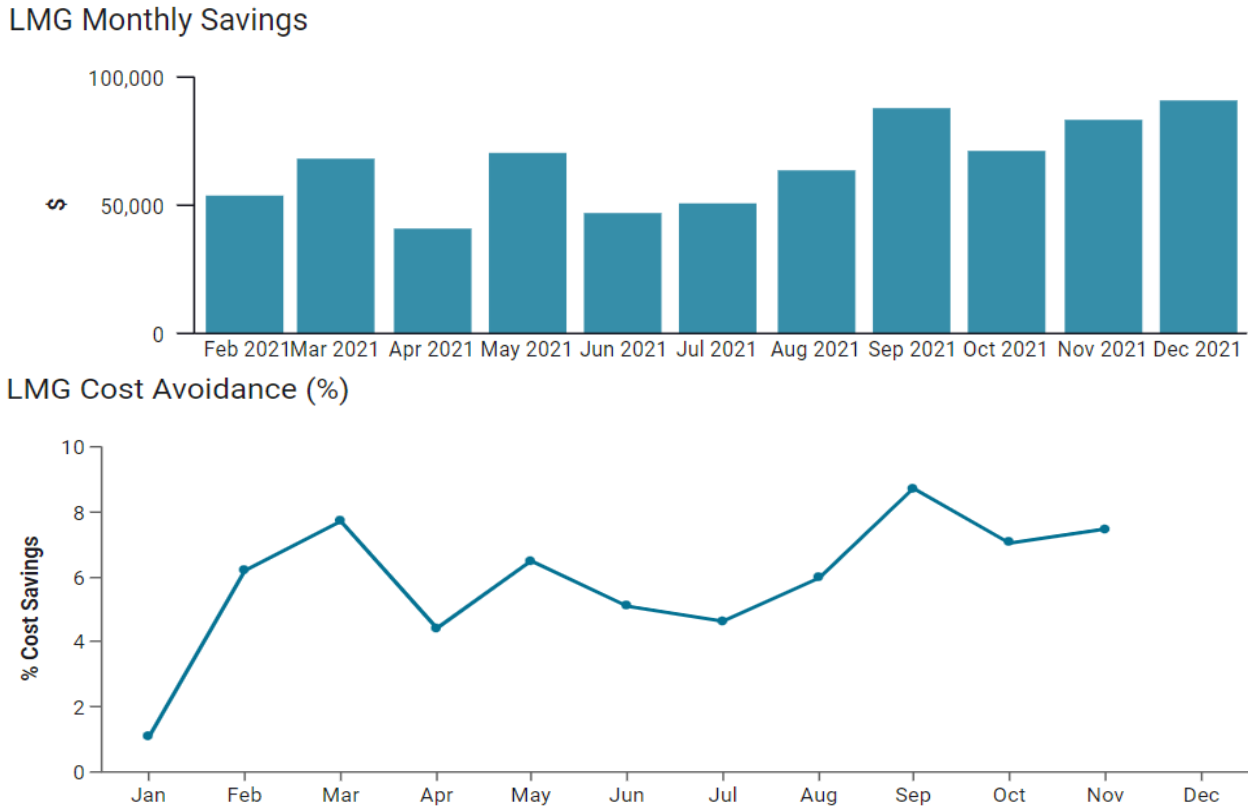


*Figure 4: Total monthly cost avoidance and percentage savings for LMG utility accounts. Significant savings can be observed from operational improvements from prior years.*

**Data**

Approximately 95% of LMG's utility spend is now being processed through digital billing, with data automatically being captured and benchmarked in our EnergyCAP database for most LMG facilities. Before 2021, less than 50% of this data was being captured, and very few buildings were being benchmarked. Now, any changes in building energy performance can be accurately monitored over time, which will also help target areas of high opportunity or new energy losses. This data is being used to generate dashboards and provide high-level breakdowns of LMG energy usage. A public-facing energy dashboard has been so that LMG data is more transparent and accessible to residents and to help provide context to the city's energy goals. Additionally, there have been extensive efforts in conjunction with Civic Innovation and Technology to import historical 2019 data into EnergyCAP to serve as a baseline year, which is used as a reference year to evaluate utility cost avoidance.

**Billing**

Large organizations need to routinely assess and optimize their utility accounts to ensure they are all classified under ideal rates and without unnecessary fees. With over 1300 utility accounts across a multitude of agencies, LMG's utility accounts utilize dozens of rates and billing structures. As end-use in buildings change, along with the pricing of LG&E's rates, opportunities arise for LMG to move accounts to more cost-effective options. In 2021, 260 LMG accounts have been identified as having more cost-effective billing alternatives, and requests to update billing have been submitted to LG&E for each. Additionally, 9 utility accounts were identified for closure as service was no longer needed in these locations due to vacated facilities or removed equipment. Together, these billing changes and account closures are anticipated to produce approximately $165,000 in utility savings annually moving forward. It is also important to note that in 2021, the Public Service Commission approved LG&E's request for a rate increase. Many LMG accounts may experience up to 9% higher power costs as of this year, which calls for continued rate analysis to identify the most cost-effective options.

**Building Optimization**

A core approach of energy management is improving the operations of building HVAC and mechanical systems so that they can maintain comfortable conditions while consuming far less energy. Night and weekend setbacks on HVAC operation can be logistically challenging to coordinate but have no implementation cost and substantially lower utility consumption. In 2021, new setback scheduling has been implemented in approximately 800,000 square feet of metro facilities. On average, this has produced a reduction in HVAC runtime of nearly 50% in

these facilities. The Energy Manager has been involved in evaluating operation of central heating and cooling systems in areas with historical performance issues to help target adjustments that will result in more comfortable and efficient buildings. This is an ongoing effort that will be including more buildings and tailored optimization strategies as appropriate. In buildings that have been targeted with larger systemic changes, utility cost avoidance of up to 50% have been seen in comparison to historical utility data.

As an organization with large building inventories, it is also important to invest in building improvements that will produce substantial utility returns. Projects that produce large utility savings can include LED lighting retrofits, building controls systems, recommissioning of aged equipment, and in some cases replacement of inefficient mechanical systems. There have been recent efforts to formalize an “Energy Innovation Fund” to facilitate investment in projects that produce utility cost savings. The proposed structure of this fund is being drafted, in coordination with OMB, to establish a long-term process to internally finance energy projects using the utility savings that are produced. Re-investing energy savings into LMG energy infrastructure through a dedicated energy fund can create momentum towards internal energy goals, while generating increasing returns over time.