

**Performance Audit 15-05:
City Building Energy Performance**

December 2015

City Auditor

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OFFICE OF INTERNAL AUDIT

Stan Sewell, City Auditor

December 17, 2015

To: Mayor Andy Berke
City Council Members

Subject: City Building Energy Performance (Report #15-05)

Dear Mayor Berke and City Council Members:

The attached report contains the results of our audit of City Building Energy Performance. Our audit found that the General Services Department has identified and implemented energy savings opportunities through facility monitoring and evaluations. However, we also identified opportunities for plan updates, implementing additional energy savings and developing additional funding sources.

We thank the management and staff of the General Services and Office of Sustainability departments for their cooperation and assistance during this audit.

Sincerely,

Stan Sewell, CPA, CGFM, CFE
City Auditor

Attachment

cc: Audit Committee Members
Stacy Richardson, Chief of Staff
David Carmody, Chief Operating Officer
Daisy Madison, Chief Financial Officer
Cary Bohannon, Director of General Services
Erik Schmidt, Director of Sustainability

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AUDIT PURPOSE

This audit was conducted in accordance with the Office of Internal Audit's 2015 Audit Agenda. The objective of this audit was to determine whether the General Services Department has effectively identified and implemented energy savings opportunities through facility monitoring and evaluations.

BACKGROUND

One of the General Services Department's primary tasks is the management, operation and maintenance of facilities used to provide services for residents and taxpayers. The acquisition and management of energy is fundamental to this task.

In 2012, the Mayor enacted Executive Order No. 2012-01 which includes an order to reduce overall energy use in City buildings 35% by 2020 relative to 2010 levels. The Office of Sustainability coordinates the implementation of the executive order. As a result of the executive order, promoting energy efficiency is one of the General Services Department's top priorities.

ENERGY STAR Portfolio Manager

General Services utilizes the Environmental Protection Agency's (EPA) free online ENERGY STAR Portfolio Manager to track energy use of city facilities. Currently, around 200 properties are maintained on the system. In addition to typical public service buildings, the Zoo, landfill, parks, golf courses, parking garages, pump stations and athletic complexes are tracked.

Eleven (11) of the City's properties are eligible for the ENERGY STAR score. The score enables management to understand how energy use compares to similar buildings nationwide.

The key performance indicator used by the City to benchmark properties is Energy Use Intensity (EUI). Based on the data entered into the Portfolio Manager, energy per square foot per year is used to calculate EUI for most property types. EPA relies on EUI as the basis for its ENERGY STAR Score.

Energy Savings Initiatives Implemented

We commend the General Services Department and Office of Sustainability for their energy monitoring and resulting energy savings

initiatives. The General Services Department has implemented the following energy savings initiatives:

- 1) Retrocommissioning of General Services managed facilities heating, ventilating and air conditioning (HVAC) systems.
- 2) Implementation of lighting upgrades.
- 3) Monitoring and scheduling of HVAC systems.
- 4) Establishment of standards for HVAC temperature set-points.
- 5) Daily and monthly monitoring and reporting of utility usage and key energy metrics.

FINDINGS AND RECOMMENDATIONS

Energy Action Plan

In essence, Executive Order No. 2012-01 is the City of Chattanooga's Energy Action Plan (EAP). It sets forth a unified plan to establish the City's energy policy and environmental protection goals. All City departments and other related entities are directed to work with the Office of Sustainability to establish reduction targets. General Services continuously collects data relative to energy consumption.

The executive order enumerates energy efficient practices for existing and new buildings, and includes continuous monitoring of efficiency goals. It additionally includes procurement of energy-efficient products, renewable energy sources and clean fuel vehicles.

Based on Energy Use Intensity (EUI) calculated by ENERGY STAR Portfolio Manager, approximately 50% of the City's buildings have made an improvement in energy use, while other buildings have remained about the same or need improvement.

The executive order has not been updated since its creation in 2012. The City has made changes and has taken action to improve energy use since the inception of the executive order.

Recommendation 1:

We recommend the Office of Sustainability review, evaluate and update Executive Order No. 2012-01 based on changes made and action taken since its inception.

***Auditee Response:** We concur with the audit finding and recommendation.*

Opportunities for Energy Savings

Our review of energy use and Energy Use Intensity (EUI) revealed opportunities to reduce cost and conserve energy. In particular, the majority of the sites needing improvement are used by the Fire and Police Departments. Energy savings opportunities have not been effectively implemented for these buildings.

Building energy evaluations determine whether systems are operating as intended or needed. These assessments can identify inadequacies that could cause unnecessary energy usage. During the process, low cost improvements can be identified and considered. The evaluations can be performed in-house or outsourced if needed.

Recommendation 2:

We recommend the General Services Department evaluate buildings needing improvement and propose energy savings opportunities that are feasible and cost effective.

***Auditee Response:** We concur with the audit finding and recommendation.*

Energy Grants

Various grants are available to promote energy efficient upgrades. Some grant programs are recurring and others are only offered once or are contingent on availability of funding. The City has not taken full advantage of grant funding opportunities for energy efficient upgrades. The City should take advantage of energy grant programs to facilitate energy reduction goals and to maximize expenditures for energy efficiency.

An example of funding available is the Clean Tennessee Energy Grants that are available to municipal governments, county governments, utility districts and other entities created by statute. The grant can be used to purchase, install and construct energy projects. Categories eligible include cleaner alternative energy, energy conservation and air quality improvement.

The City has used energy and sustainability grants in past years, however, they did not obtain available grants during fiscal years 2014 and 2015. During our audit, the Office of Sustainability started pursuing grant opportunities through Tennessee Valley Authority's (TVA) Combined Heat and Power Project (CHP), as well as Clean Tennessee Energy Grants. Additionally, the City is exploring financing

energy projects through low-cost Qualified Energy Conservation Bonds (QECCB).

Recommendation 3:

We recommend the Office of Sustainability identify and utilize eligible energy grants.

***Auditee Response:** We concur with the audit finding and recommendation.*

APPENDIX A: SCOPE, METHODOLOGY AND STANDARDS

Based on the work performed during the preliminary survey and the assessment of risk, the audit covers energy use between August 2014 to July 2015. When appropriate, the scope was expanded to meet the audit objectives. Source documentation was obtained from the General Services department. Original records as well as copies were used as evidence and verified through physical examination.

To determine whether the General Services Department has effectively identified and implemented energy savings opportunities through facility monitoring and evaluations, we reviewed Executive Order No. 2012-01, interviewed key personnel and reviewed the ENERGY STAR Portfolio Manager system. We also reviewed energy savings initiatives implemented by the City and identified additional opportunities for energy savings.

To develop our recommendations, we reviewed industry best practice documents. We also brainstormed additional opportunities for energy savings with General Services and Office of Sustainability department personnel.

We conducted this performance audit from July 2015 to December 2, 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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