Better Buildings CHALLENGE
U.S. DEPARTMENT OF ENERGY

MUNICIPAL PARTNER

CITY OF GILLETTE, WY

Implementation Model: Inventory and Tracking Process

COMMUNITY SIZE
Small Suburban, population 41,000

GOAL
To better manage the City's heating, ventilation, air conditioning (HVAC), and related equipment in order to reduce energy use and lower operating costs in City-owned buildings

BARRIER
Internal organizational barriers include a lack of a centralized system for data analysis and reporting and perception of organizational risk around investments in more efficient equipment

APPROACH
A process to inventory and track information associated with City Hall's HVAC equipment in order to more effectively manage the maintenance and repair of equipment and proactively prepare for associated capital needs

INITIATIVE LAUNCHED
July 2012

Overview

Gillette, Wyoming is the seat of Campbell County, the self-proclaimed energy capital of the nation where approximately 30% of U.S. coal is produced. The City's goal is to demonstrate to its citizens, utility customers, and neighboring communities that it values its natural resources. Therefore, the City has committed to reducing energy consumption by 20% by 2020. Due to the limited access to funding, staff members often find themselves managing large volumes of deferred maintenance, lobbying for replacement budgets, and making equipment purchase decisions with less than optimal data. To respond to these barriers, the City created a GIS-based inventory and depreciation schedule for HVAC

and related equipment in City Hall to ensure efficient management of the systems and guarantee proper maintenance and replacement as needed.

Gillette's Playbook

Policies

The City of Gillette is currently putting policies in place pertaining to HVAC equipment maintenance and replacement. The Facilities Maintenance Division will be required to approve all HVAC equipment purchases and service contracts.

Process

Municipal governments often experience planning and procurement challenges as they are subject to an added layer of public scrutiny and accountability, causing them to plan further ahead for large-ticket items. Building on an earlier feasibility study to identify efficiency opportunities, Gillette recognized that HVAC equipment represents a significant challenge to the City due to high replacement costs and obstacles related to installation. The installation of the very heavy HVAC equipment, for example, often requires a crane and sometimes necessitates the movement of walls and corridors.

To overcome these challenges and build on its energy benchmarking work, the City's Sustainability Division identified a method of tracking and documenting historical data, monitoring current configurations, and ascertaining future equipment needs. The complexity of this challenge was addressed partly by the use of ArcGIS, a robust GIS technology that stores all HVAC inventory data throughout the City Hall building. This technology incorporates geographical information and allows the user to visualize and interpret data to look for performance trends, relationships, and patterns. It also has the ability to manage a large amount of data and represent it in a variety of ways that can be easily manipulated to show only specific pieces of information. The City collects data based on locations within the building, photographs, serial numbers, installation data, life expectancies, preventative maintenance alerts, repair logs, and replacement equipment.

Understanding the strain on current staff to launch this initiative, the Sustainability Division secured a grant from the American Public Power Association Demonstration of Energy & Efficiency Developments Program (AAPA DEED) which allowed them to hire a summer intern from the University of Wyoming to be trained in GIS mapping technology and systems through the City's GIS Division. The intern supported the Sustainability Division and Facilities Manager in the creation of an HVAC equipment inventory and depreciation schedule, including the location of equipment within City facilities and research into the life cycles and replacement costs of equipment. This effort complements the installation of a sub-meter installed in City Hall in 2012.

Internal communication between departments is important to the success of this project because all HVAC equipment, in addition to its maintenance and replacement, must be approved by the Facilities Maintenance Division. The Sustainability Division also interfaced with the Finance Department to determine a depreciation schedule that allows for more accurate forecasting of and planning for future needs.

With the critical information obtained by creating the inventory and depreciation schedule of City Hall, the Sustainability Division is able to approach City Council and City Administrators with solid analysis to secure future funding for upgrades to the existing equipment.

Tools and Resources

The ability to properly forecast and budget for replacement equipment is a critical component of both smooth operations and energy efficiency. Gillette anticipates other organizations will benefit from its lessons learned while successfully leveraging the valuable tool of ArcGIS. For a more detailed description of lessons learned, please refer to the July 2013 “APPA DEED Student Internship” grant report.

Tools:

- Intern job description
- Copy of completed inventory
- Copy of completed depreciation schedule
- Screenshots of GIS tool
- Process flow for completing and updating inventory
- APPA DEED grant final report

Measuring Success

Gillette created a centralized system for equipment analysis, in part, to help internal stakeholders better understand energy efficiency opportunities and reduce the perception of risk to invest in more efficient equipment. They will measure the success of this initiative by examining key metrics such as the reduction in kilowatt-hour (kWh) usage per month, reduction in the operational energy budget, number of buildings in portfolio included in the assessment, and number of pieces of equipment in the assessment. These metrics will be assessed by comparing the Gillette City Hall Retro-commissioning Report to the assessment, analyzing internal municipal utility reporting, and sub-metering. Successful implementation of the GIS-based inventory and depreciation schedule could yield large savings and assist with managing stressed operational budgets.

Outcomes

Using GIS to manage municipal utility assets is a relatively new concept but is important because energy efficiency is a critical component of smooth operations. Gillette will be able to provide specific outcomes once the project is complete in October 2014, and the results of the project will be incorporated into the City’s Energy Action Plan.

After proving that the mapping project is applicable to a wide range of building systems, additional systems in the City Hall building were mapped and inventoried using the same

process. These systems included the fire protection system, electrical features, architectural features, and plumbing. In the future, the City hopes to expand the scope of this effort to include other City-owned buildings.

By developing a depreciation schedule, the City was able to become more fiscally responsible by anticipating funding needs and planning appropriately. Additionally, the process drove improved internal communication and teamwork among the participating divisions. The Sustainability Division is now more engaged in procurement decision-making.