Energy Management Initiative for Water & Wastewater Utilities – Summer 2011

City of Rolla

Partnering for Success

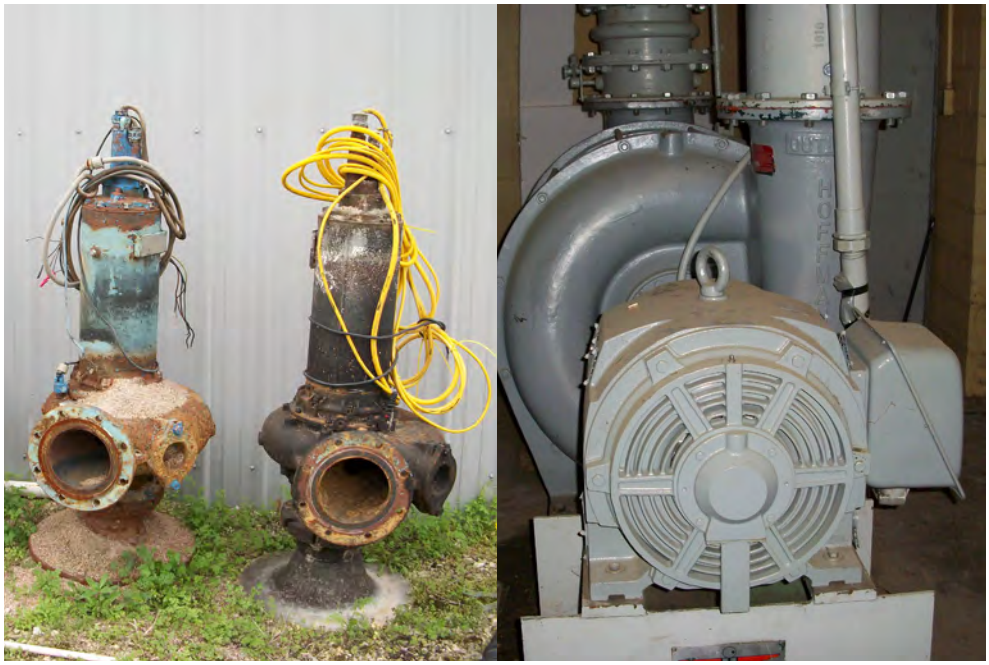
Overview

One of the most effective ways for cities to reduce their costs and improve environmental performance is to improve energy efficiency. In U.S. cities, an estimated 30 to 40 percent of municipal energy use and associated operating budgets are spent treating water and wastewater. Rising energy costs add to the other challenges that water utilities are facing such as the need to expand services, meet more stringent regulations, and replace aging infrastructure. Because most of the energy used to pump and treat water in the Midwest comes from coal-fired power plants, significant quantities of air pollutants are also emitted as a result. Energy conservation can be a mechanism to improve both air and water quality as well as save money.

In May 2009, the U.S. Environmental Protection Agency (EPA) invited 12 Missouri communities to participate in an Energy Management Initiative for Water and Wastewater Utilities, a pilot program led by the Missouri Water Utilities Partnership (MOWUP). Partners included the Missouri Department of Natural Resources, the Missouri University of Science & Technology, Siemens Industry, Inc. (Siemens) and EPA Region 7. Seven communities chose to participate in the pilot program which included developing an Energy Management Plan (EMP), implementing an energy efficiency project, maintaining data and sharing results. The City of Rolla was among the participating communities.

About the City of Rolla

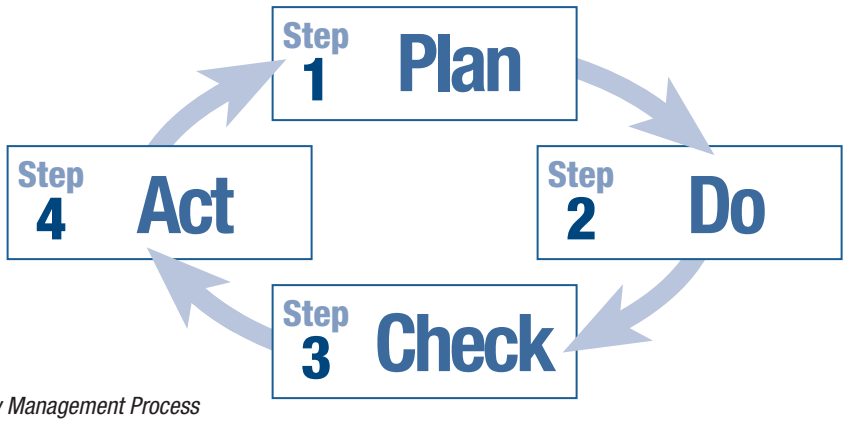
The City of Rolla Public Works Department serves the sewage treatment needs of approximately 19,500 people. Rolla Municipal Utilities, also a city-owned utility, provides potable water to the same community. The City of Rolla had previously initiated efforts to monitor energy usage, but programs were not as coordinated and effective as desired. The Energy Management Initiative undertaken through the MOWUP provided the tools for the City of Rolla to benchmark energy usage and use this information to choose upgrade projects that save energy and money.



Pumps and blowers slated for replacement under the EMP

The MOWUP performed a walk-through energy assessment and identified several energy savings projects for the City of Rolla's Wastewater Treatment Plant during Phase 1 of the MOWUP Initiative. For Phase 2, the Mayor of Rolla Bill Jenks requested Steve Hargis, public works director, and Allen McNece, wastewater superintendent, to attend the MOWUP workshops. They participated in four workshops that involved activities such as tracking energy use, listening to presentations, and writing an EMP. At the conclusion of these workshops, they indicated that they appreciated their involvement with this program.

> ***"At first, we wondered what time-waster we had gotten involved in this time, but it turned out to be a good program."***
>
> **Steve Hargis,**
> **Public Works Director**



Energy Management Process

Developing an Energy Management Plan

Within the workshops provided by MOWUP, the City of Rolla created an EMP based on the management philosophy of Plan-Do-Check-Act. In their EMP, the City of Rolla set a goal of a 25% overall reduction in electricity consumption in all currently

city-owned and operated facilities. The City of Rolla decided they needed expert assistance to thoroughly audit their facilities as part of an energy services contract. They released a request for proposals and selected Siemens from the pool of qualified applicants. Siemens recommended updates at the wastewater treatment plant: specifically, new blowers and pumps were recommended to replace the older inefficient models. The new pumps were installed January 28, 2011, and the new blowers are expected to be installed in September 2011. The expected savings each year from the replacement pumps alone are $8,000 (primarily from reduced maintenance costs). The savings from this process helped the city fund additional energy efficiency work at their office buildings, the fire department, and water treatment works. They used the results to create a plan of facility improvements which will have a blended payback period of 15 years. (A Missouri state law requires energy service contracts to be based on projects with a total payback period of 15 years or less.) Some of the selected energy savings projects, such as the replacement of the fire department roof, did not have the required short enough payback periods; but in combination with other energy savings projects that had quicker payback times, they could be included in the plan.

In the EMP, the City of Rolla also identified a need to reduce inflow and infiltration (I/I) in the wastewater collection system by 50% in the next five years. Subsequently, HDR Archer was selected as a consultant to investigate and determine how the city can best handle the I/I situation. The investigation is currently ongoing, and is expected to identify improvement projects that will measurably reduce the peak flow to the plant by reducing the I/I to the collection system.

To meet the Check element of their EMP, the City of Rolla anticipates implementing a formal audit plan to monitor the effectiveness of the energy usage reduction methodologies. They also plan to maintain energy data in EPA's ENERGY STAR® Portfolio Manager. This free online tool allows them to track energy usage each month and to monitor the performance of their energy savings upgrades. Based on these findings, they will improve the EMP, identify additional energy savings opportunities, and provide training to employees and the community.

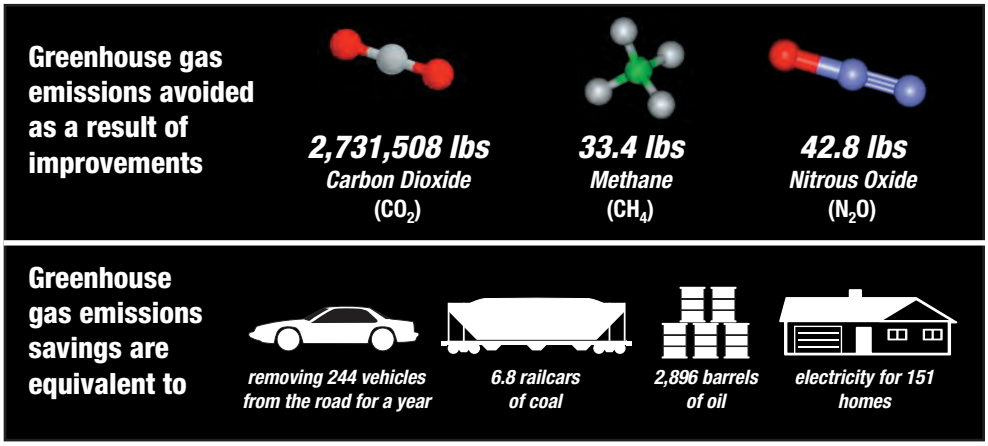
Financing

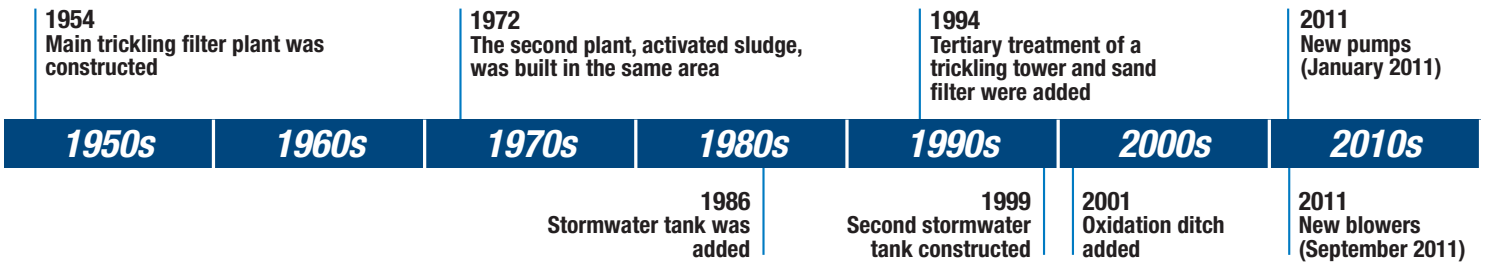
The total cost of the audits and ensuing upgrades to the infrastructure was just over 2 million dollars. This amount was financed and disbursed in several ways. An Energize Missouri Communities Grant issued through the Missouri Department of Natural Resources (MDNR) provided funding of $337,067. The City of Rolla also acquired a bank loan for over $1.5 million. Based on energy savings of about 1,300,000 kWh per year, the overall improvements are expected to save the City of Rolla up to $126,000 per year.

Lessons Learned

The City of Rolla participants came to appreciate the breadth of knowledge shared at the workshops and, most importantly, the realization that sometimes it takes outside assistance and expertise to get the job accomplished. Mr. Hargis commented that the City of Rolla employees initially disliked the idea of hiring outside help, because they had the talent in-house to benchmark, audit, plan, and implement the changes necessary to save energy. However, the City of Rolla encountered a situation where most employees struggled to maintain their current responsibilities and lacked the time required to undertake the new roles, responsibilities, focus, and drive required to achieve the energy savings results. Participating in MOWUP and hiring an energy services contractor provided them the extra push to make significant changes which will result in savings for the City of Rolla's community.

Annual greenhouse gas reductions resulting from the upgrades undertaken by the City of Rolla. They were calculated using EPA's eGRID web converter (http://cfpub.epa.gov/egridweb/ghg.cfm).





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