



City of Neosho

Overcome Challenges and Never Give Up



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 that include 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 (MDNR), 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 Neosho was among the participating communities.

About the City of Neosho

The City of Neosho is a community of approximately 10,500 people located on the western fringe of the Ozarks with a history

dating back to the early 1800s. The first wastewater treatment and drinking water plants were built in 1942 for the Fort Crowder army installation. A second wastewater treatment plant (WWTP) in Shoal Creek was built in 1986, and the drinking water treatment plant was overhauled in early 1980. These facilities continue to serve the City of Neosho today. Although various facilities were renovated over the years, some of the equipment is now inefficient and nearing the end of its design life. The city also has excessive quantities of stormwater entering its aging sewer lines and flowing to the WWTP for treatment. These situations provided a great opportunity for the city to assess its current assets, plan for capital and process improvements, and develop an Energy Management Plan (EMP) through the series of workshops offered by the MOWUP Initiative.

Energy Management Plan Development and Financing

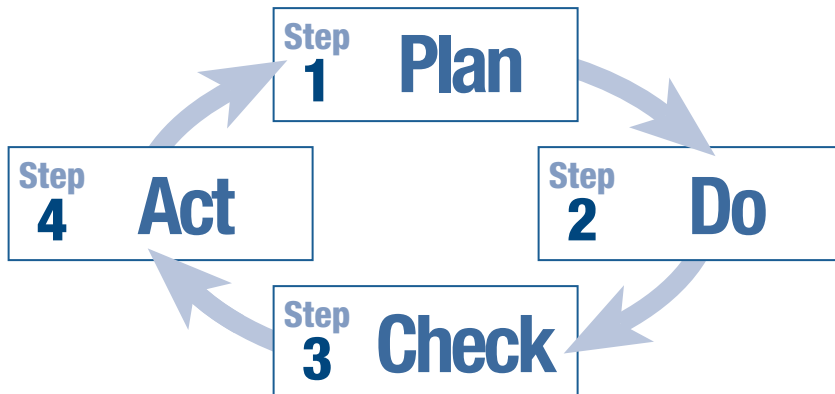
Mike Hightower, director of Public Works, and Duane Linch, water/wastewater superintendent, provided community leadership during the MOWUP Initiative. They sought input from water and WWTP operators, other city managers and the City Council. Then they worked with the City Planner to create



Old pumps slated for replacement

a cohesive plan, including a timeline and a cost estimate for priority equipment upgrades. Together, they established an energy reduction goal of 10% in two years and applied to MDNR's Division of Energy for an Energize Missouri Communities Grant. The application requested funds to cover the cost of replacing one pump, two blower motors, and interior lighting in the wastewater utility buildings. During the summer of 2010, the city was selected to receive \$58,000 in state funding for this initial project. A local funding match of \$20,186 will complete the financing for this project.

Just as the City of Neosho was preparing to implement the MOWUP project, the city found itself in a budget crisis and had to lay off some of its staff, including the City Planner who had been so integral to the project. With less staff and money, the city realized that it would have to adjust the energy reduction goal from 10% in two years to 10% in four years. According to Mr. Hightower, "We aren't changing the goal. We're just taking a little longer to get there." To add to the city's challenges, lightning struck one of the old pumps at the Crowder WWTP, taking it out of commission. A new pump had to be purchased and installed quickly because the damaged pump was so old that no replacement parts were available. It was among the purchases the city had planned to make with the state grant funds, which had not yet been awarded.



Energy Management Process

Building on Momentum

In addition to the MOWUP project, the City of Neosho is undertaking a \$9.5 million capital upgrade to the drinking water plant and a \$8.5 million upgrade to the WWTPs. These improvements include: new chlorine dispensing equipment, refurbished filter beds, and a new storage tank with high-efficiency service pumps at the drinking water treatment plant; and new aeration and mixing equipment at the Shoal Creek WWTP. All of these new systems will increase the overall energy efficiency of the city's municipal operations. The City of Neosho's EMP also identified additional projects as funding becomes available. One of those projects is a Supervisory Control and Data Acquisition (SCADA) system which would allow operators to control multiple plant operations from a single work station.

Pipes Can Improve Energy Efficiency

Prior to the MOWUP Initiative, the city had a pipe rehabilitation and replacement program in place for both drinking water and sewer lines. Since some of the city's piping dates back to the 1920s, water loss from broken drinking water pipes and stormwater flow into sewer lines had been a problem. Starting in 2009, the city set aside funds to repair and replace sections of pipelines each year. Between 10,000 and 15,000 linear feet of sewer lines have been replaced through 2010. The city expects a reduction in energy use as a result of pipeline improvements because energy will not be wasted in treating drinking water that is lost through leaks, nor treating rain water that has seeped into the sewer collection system during rain events.

Lessons Learned

Being in a MOWUP workshop classroom with other communities kept the city moti-

vated. Now the city has a simple EMP with goals, priorities and timelines that will help to improve energy efficiency and reduce costs. The most important lesson learned through the MOWUP Initiative was persistence (see quote below).

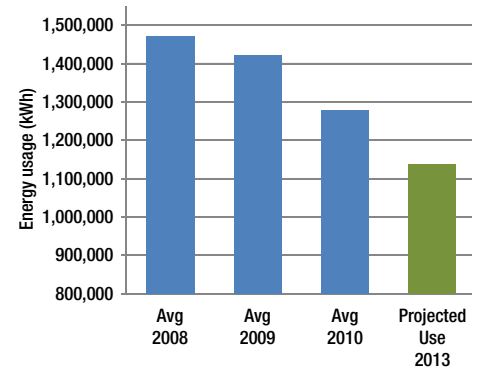
"If you don't stick to it, you'll quit completely."

**Duane Linch,
Water/Wastewater Superintendent**

Next Steps

The City of Neosho plans to conduct an energy audit, develop the specifications for the equipment to be purchased with grant money, and then procure the new equipment in Summer 2011. The city is currently negotiating with the engineering company, but expects to complete these projects by early 2012. The city will continue to implement other capital

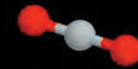
projects and track energy use, cost savings and environmental results.



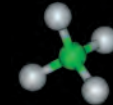
Projected annual energy savings

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

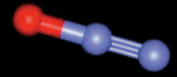
Greenhouse gas emissions avoided as a result of improvements



302,614 lbs
Carbon Dioxide
(CO₂)



4.35 lbs
Methane
(CH₄)



4.46 lbs
Nitrous Oxide
(N₂O)

Greenhouse gas emissions savings are equivalent to



removing 27 vehicles from the road for a year



.75 railcars of coal



321 barrels of oil



electricity for 16.7 homes

1942
Drinking water plant and Crowder Creek WWTP constructed

1979
Replaced trickling filter media; converted sludge drying to liquid aerated tanks at Crowder Creek

2011
Blowers, pumps and lighting upgrades

1940s

1950s

1960s

1970s

1980s

1990s

2000s

2010s

1980
Replaced flocculator at drinking water plant

1986
Shoal Creek WWTP built

2005
UV disinfection upgraded at Shoal Creek

Contacts

Kerry Herndon
Sustainable Infrastructure Program Manager
U.S. Environmental Protection Agency
Water, Wetlands and Pesticides Division
901 N. 5th Street
Kansas City, Kansas 66101
(913) 551-7286
fax (913) 551-7863
herndon.kerry@epa.gov

Ruben B. McCullers
U.S. Environmental Protection Agency
Resource Conservation and Pollution Prevention Section
901 N. 5th Street
Kansas City, Kansas 66101
(913) 551-7455
mccullers.ruben@epa.gov

Duane Linch
City of Neosho
Utility Superintendent
15318 Kentucky Rd
Neosho, Missouri 64850
(417) 451-8075
fax (417) 451-8076
dlinch@neoshomo.org



Author Ms. Samantha Markus works for the Shaw Group and is pursuing a Masters Program in Environmental Engineering at the Missouri University of Science and Technology (S&T). She can be reached via email at slm437@mst.edu.