



City of Winfield



Overview

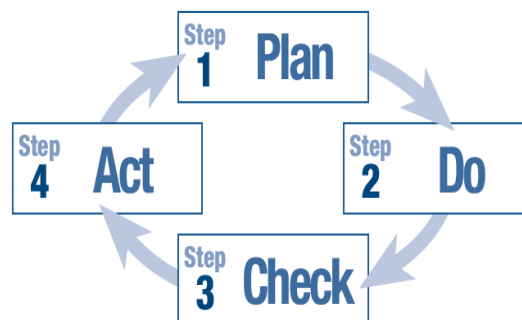
One of the most effective ways for cities to reduce their costs and improve environmental performance is to improve energy efficiency. In U.S. cities, an estimated 30 to 40 percent of municipal energy use and associated operating budgets are spent treating water and wastewater. Rising energy costs add to the other challenges that water utilities are facing. These challenges 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 2011, the U.S. Environmental Protection Agency (EPA) invited 10 Kansas communities to participate in an Energy Management Initiative for Water and Wastewater Utilities, a pilot program led by the Kansas Water and Energy Efficiency Partners (KANWE) which included the EPA Region 7 Office, Kansas Department of Health and Environment, the Wichita State University Environmental Finance Center, Kansas State University, Kansas Municipal Utilities, and Schneider Electric. Five communities chose to participate in the pilot program which included developing an Energy Management Plan, implementing an energy efficiency project, maintaining data and sharing results.

About Winfield's Water & Wastewater Treatment Utilities

The City of Winfield is home to nearly 12,500 people and is located in Cowley County along the Walnut River. The Water Treatment Plant (WTP) was built at its current location in 1997. Presently, the facility has the capacity to treat 5 million gallons per day. The plant draws raw water from the Winfield City Lake. Treatment includes the addition of flocculation and pre-treatment chemicals, ozone disinfection, gravity filtration, and movement to a transfer well where the finished water is pumped into ground storage. The plant has a computer based Supervisory Control and Data Acquisition system which allows for increased monitoring capabilities. Plant renovations were completed in 2005 and earned the city of Winfield the Public Works Project of the Year by the APWA Kansas Chapter along with the 2005 Contractors Association Award of Excellence.

Winfield's Wastewater Treatment Plant (WWTP) and Wastewater Collection System personnel maintain over sixty miles of sanitary sewer lines including fourteen lift stations, providing service to approximately 4,600 customers. The WWTP performs an activated sludge treatment process that treats approximately 1.6 million gallons of wastewater per day.



Developing an Energy Management Plan

The KANWE partnership provided an energy assessment and a series of 4 workshops for community representatives during which each developed an Energy Management Plan for their respective communities. The training followed a plan/do/check/act sequence, as outlined in EPA's *Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities*. During the workshops, participants set an energy goal and baseline, drafted an energy policy, formed an energy team, explored opportunities for saving energy, prioritized projects, developed near and longer term plans and developed a set of measures of success along with a schedule for implementation.

Winfield's energy policy calls for the city to reduce energy use by 10% (compared to their 2011 usage) in water and wastewater utilities by implementing a set of projects and practices. The policy further sets out the following standards for day-to-day operations at each of their water treatment facilities:

- Implement power savings practices for office equipment.
- Encourage the purchase, of energy efficient products, services, and designs in all future projects with energy conservation in mind.
- Programmable setback thermostats or Building Automation Systems will be utilized to maintain internal temperatures.
- All hot water heaters will be wrapped in a thermal blanket of at least 2" thickness and all exposed hot water lines should be covered with closed cell thermal insulation.

Project Selection

As part of Winfield's Energy Management Plan, the city chose to implement one major project and two minor projects. These were selected based on their regulatory impact, severity of the impact, environmental impact, long-term impact, cost and constructability, management support, and infrastructure impacts.

1. Install Variable Frequency Drives (VFD's) to Aeration Blowers

The city installed two VFD's on the aeration blowers of the WWTP. The two VFD's were ordered and installed for about \$20,000. This will save the city roughly \$24,000 per year, result in a reduction of about 40% of energy consumption, and will have an estimated payback time of 6 months. In conjunction with the VFD installation, the city decided to purchase hot water blankets for the hot water heaters in both the WWTP and the WTP. These will have a very low cost and the energy savings will accrue immediately.

2. Update Lighting Fixtures

The city plans to update lighting fixtures throughout the WWTP and WTP as existing units need replacement. By eventually replacing twenty, T12 fluorescents with T8 fluorescents, the city will save roughly \$1,000 annually in lighting at both treatment plants.

3. Install Occupancy Sensors

The city installed occupancy sensors in the WTP. This allows for areas of minimal use to be appropriately lighted. The cost of the installation will easily be recouped within one year, saving the city roughly \$540 per year.

"The biggest thing that came from the experience is we now look at all projects and evaluate the energy impact as a whole. We now consider energy use as part of the long term cost of a project."

***-James Ging, City of Winfield
Director of Electric and Water***

Financing

The City of Winfield paid for these improvements from their adopted budget. The City did not receive any outside funding for the energy savings projects. The expenses incurred from the projects were balanced out directly by the reduction in energy consumption at the two plants.

Next Steps

At the beginning of their participation in the KANWE partnership, the city of Winfield set a goal to improve their energy efficiency by 10% based

on 2011 energy usage as a baseline and then identified projects to meet that goal; but the plan is not done there. To maintain energy and water conservation standards, several activities will be put in place to ensure the success of the new policy. Progress will be monitored on a continuing basis by keeping energy consumption records. Training will be provided to employees to ensure they have the necessary skills and knowledge to effectively apply the technology used to achieve energy savings. The proper maintenance processes will be implemented and scheduled to ensure that systems operate as efficiently as possible.

In the future, the city of Winfield plans to apply the Energy Management System approach to other departments and programs.



Winfield Water Facilities

For More Information Contact:

- Kerry Herndon, Sustainable Infrastructure Program Manager, US EPA 913-551-7286, herndon.kerry@epa.gov
- James Ging, City of Winfield Director of Electric and Water 620-221-5600, jging@winfieldks.org
- Peter Hinkle, Business Development Rep., Schneider Electric 913-564-6363, peter.hinkle@shcneider-electric.com
- Angela Buzard, Director of Environmental Finance Center, WSU 316-978-3401, angela.buzard@wichita.edu