**ICMA Program Excellence Awards: Community Sustainability Awards**

**Energy Efficiencies**

**Problem Assessment, the Challenge or Need That Prompted the Local Government to Develop the Program**

The City of Phoenix Water Services Department (“Phoenix”) treats and distributes tap water to 1.5 million customers daily. Phoenix also manages the City's sewer system, as well as wastewater treatment operations for 2.5 million residents in five neighboring cities. Providing these services requires a tremendous amount of energy consumption, the cost of which is a significant portion the operating budget.

Phoenix knows the nexus between energy and water run deep in the Desert Southwest and is undertaking an aggressive program to reduce its carbon footprint and lower operating costs by improving the energy efficiency of its facilities and processes, and also by increasing its use of sustainable energy resources.

**Program Implementation and Costs**

Phoenix’s Energy Management and Sustainability Program has established a goal of reducing its operating energy intensity by 25 percent over the next 10 years. Significant components of the program include:

* Undertaking an aggressive program to test the efficiency of pumps, blowers, and other rotating assets. More than 85 pumps have been tested to date. Equipment found to be inefficient as a result of testing is being replaced.
* Creating energy management dashboards to monitor and trend the energy intensity of processes at water and wastewater treatment plants so operators can better manage electrical demand and identify inefficiencies. The dashboards are also used to manage electrical loads during peak demand periods. Since 2012, more than 130 power monitoring devices have been installed to interface with these dashboards.
* Making buildings and other workplaces more energy efficient. Phoenix Water has initiated a program to convert conventional lighting to energy-efficient light emitting diode (LED) lighting at all its facilities. The department is also making a substantial investment in replacing/upgrading HVAC systems and implementing control strategies to reduce energy use while maintaining building comfort.
* Establishing a non-carbon-based energy portfolio such as the Lake Pleasant Water Treatment Plant’s 7.5-megawatt (MW) solar facility, which started operation in January 2013, generates 15 million kilowatt-hours (kWh) energy annually, offsetting all the plant’s energy needs.

An important component of Phoenix’s Energy Management and Sustainability Program has included partnering with local electric service providers and federal agencies to leverage technical and financial resources. Examples of some of these partnerships include:

* Using DOE Industrial Assessment Centers (“IAC”) to conduct energy audits at Phoenix’s 23rd Avenue and 91st Avenue Wastewater Treatment Facilities. The IACs, located at premier engineering universities, give students hands-on experience analyzing the energy use at wastewater treatment plants and developing Energy Conservation Measures (“ECMs”) based on what they have learned. Phoenix has implemented many of the ECMs identified by the IAC at these two facilities.
* Participating in programs offered by Phoenix-area electric services providers. Arizona Public Service (“APS”) and Salt River Project (“SRP”) each offer financial incentives for customers to control power demand and implement energy conservation measures. Since 2013, Phoenix has received more than $200,000 in rebates from APS and SRP, with the money reinvested to implement more energy conservation measures.

Phoenix has established a Capital Improvement Program (“CIP”) budget of approximately $1.8M per year for its Energy Management and Sustainability Program, which is approximately 8 percent of the Department’s annual $22M energy budget.

**Tangible Results of Measurable Outcomes of the Program**

The investment Phoenix is making in energy management provides ongoing financial and environmental benefits for the Department and its customers. Some examples of the positive outcomes include: lighting improvements have reduced energy consumption by 1.1 M kWh per year with an electric cost savings of $127,000 and HVAC improvements have reduced energy consumption by 636,000 kWh per year with an electric cost savings of $70,000.

**Lessons Learned During Planning, Implementation, and Analysis of the Program**

Phoenix’s Energy Management and Sustainability Program has continuously evolved and expanded since when it was initially established in in 2012. Several important lessons have been learned during this journey:

* Perhaps the most important key to successfully establishing an energy program is designating a full-time “Energy Champion” to serve both as a visionary and as the leader. The Energy Champion’s job is to identify opportunities for improvement while the considering the needs and realities of the organization’s core business processes.
* By taking advantage of assistance available from local, state, and federal agencies, the services they provide are often free or low-cost, which helps leverage the budget available to implement worthy projects. Partnering can also lead to opportunities to collaborate with other agencies on different projects.
* Implementing energy projects with ancillary benefits is an effective way to promote a culture of energy awareness and environmental stewardship within the organization. For example, a LED lighting project significantly improved the light quality in one building at a water treatment facility. Pleased with the results, staff requested LED lighting projects be implemented at other facilities.
* In some cases, significant capital investment must be made to understanding how energy is being used and manage it properly. For example, installing power monitoring equipment on large pumps is expensive and does itself conserve energy. The data they provide, however, is essential for assessing the efficiency of pumping processes. Making improvements to these large, energy-intensive processes can result in tremendous energy (and cost) savings.

**How Program Raises Awareness of Contributions of Local Government Managers**

Recognized and an industry leader, Phoenix is a member of the American Water Works Association, Water Environment Federation, National Association of Clean Water Agencies, Western Urban Water Coalition, and the Association of Metropolitan Water Agencies. Phoenix is also very active in the AZ Water Association, a non-profit education organization with a membership of 2,700 water/wastewater professionally dedicated to preserving and enhancing Arizona’s water environment. The Department’s Energy Champion is a founding member and former chairman of AZ Water’s Energy Management and Sustainability Committee. The Committee’s mission is to assist Arizona water and wastewater utilities (many of which are local government agencies) with becoming more efficient and sustainable by:

* Organizing specialty conferences and workshops in the areas of energy management, resource recovery, renewable and alternative energy, and water loss control.
* Soliciting papers and presentations on energy-related topics for the AZ Water annual conferences and AZ Water lunchtime seminar series.
* Organizing sessions on energy management, renewable and alternative energy, resource recovery, and water loss control during the Annual AZ Water conferences.
* Organizing tours showcasing energy management, resource recovery, and alternative energy technologies.