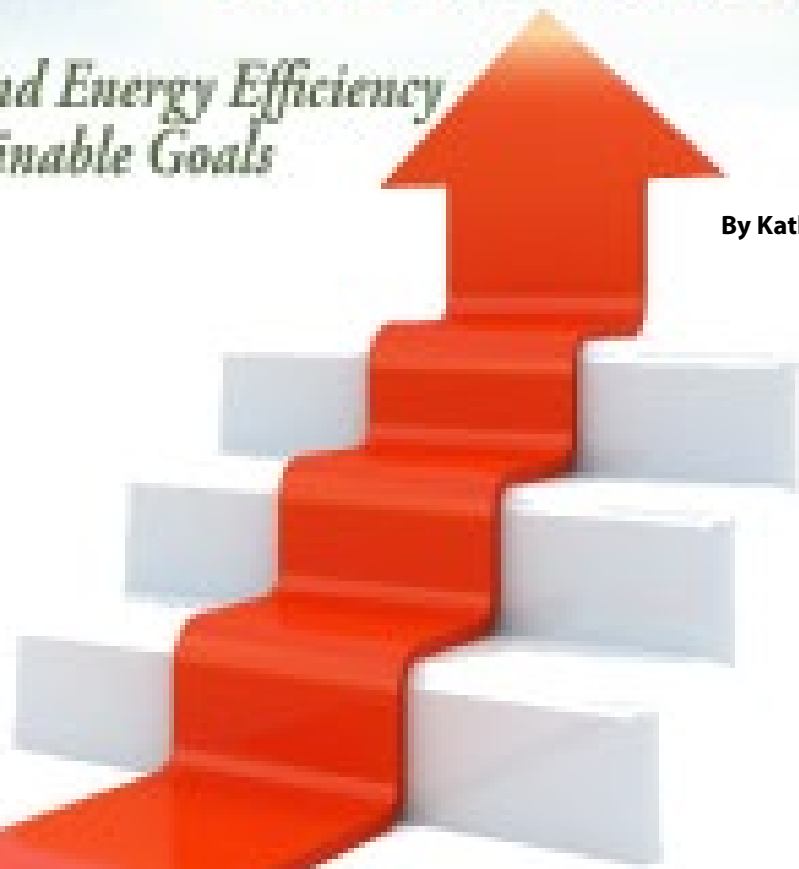




# *Taking Steps to* **Sustainability**

*Water and Energy Efficiency  
Are Attainable Goals*

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From improving small drinking water and wastewater treatment system compliance to creating thriving communities, sustainability—defined by The U.S. Environmental Protection Agency (EPA) as creating and maintaining “the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations”—makes sense on many levels. But creating such a program takes foresight and planning.

EPA notes that effective planning is essential for water and wastewater systems so they can manage their operations and infrastructure as well as ensuring the sustainability of the communities they serve. The agency further suggests that sustainability plans should include effective utility management practices, because it is critical to building and sustaining the technical, managerial, and financial capacity of the drinking water, wastewater, and stormwater systems that make up the water sector.

Becoming sustainable can seem like an overwhelming goal, but focusing on water and energy efficiency are important first steps water utilities can take to start the journey to sustainability.

### **Creating the Plan**

First things first: be sure to hammer out the goals, objectives, and targets of the plan and then decide how you will meet them. For example, if your goal is to become sustainable over the next five years, what would it take to satisfy that goal? These will be your objectives. Then you will set targets for how much and when these procedures will be accomplished. A target might be that your system will implement energy efficient practices by the second quarter of the fiscal year and achieve a 10 percent savings in energy expenditures.

Include a financial strategy that ensures adequate revenues for new infrastructure and operational investments—as well as the overall system—so they are sufficiently funded, operated, maintained, and replaced over time on a full lifecycle cost basis, with appropriate considerations for disadvantaged households.

Make sure the goals you set are attainable and measureable. Setting lofty goals could end up as a disappointment for the system and the community it serves. One way to help you achieve some sustainability goals is to develop partnerships.

### **Partnerships Evolve**

Creating a sustainability plan can provide small drinking water and wastewater systems with the opportunity to form unique partnerships with individuals, community environmental groups, industry and businesses, academia, and local, state, and federal governments. Through these partnerships, small systems can build sustainable practices that not only benefit them but their communities as well. For example, collaboration with neighboring systems can lead to more efficient and cost-effective methods of supplying participating communities with drinking water and wastewater services.

In addition, actively engaging employees in improvement efforts—helping to identify improvement opportunities, participating in cross-functional improvement teams, etc.—builds camaraderie.

### **Water Efficient Practices**

Water conservation is critical to balance current and future water needs. As public awareness grows, so does the attention paid to water conservation. Water conservation practices can result in lower wastewater discharges that can mean an improvement in overall water quality. It also diminishes our need to find or build new water sources, leaving them in reserve for our possible later use.

“More water will be available for current and future uses so people or the environment and communities will be more prepared to deal with water shortages,” says Ruth Greenhouse, conservation coordinator, Arizona Department of Water Resources. “This is particularly important in communities that rely on groundwater that is being depleted from overdraft, or communities where surface water supply is decreasing or at risk.”

Not only do water conservation and efficiency programs save small systems money, they can also provide the opportunity to develop educational and awareness programs for the customers, Greenhouse adds.

On the supply side, there are two key activities that will make a world of difference for the system’s water supplies, notes EPA. The first is accounting for water. The agency says that this strategy is probably the single most important step toward ensuring that a water utility is sustainable. This is best accomplished when water systems meter their customers’ water usage.



amount of money you spend each month for household water use. Your community saves the money spent pumping and treating water before and after use, plus conservation can delay expenditures for additional water sources and treatment facilities.

Water conservation can positively affect the reliability of your water supplies during periods of high demands (such as the summer months) and during droughts. Communities should implement a water conservation program that discourages wasteful water use at all times and restricts non-essential water uses during droughts, says EPA. During droughts, such a program can enable a community to respond to water shortages early and thus avoid the need for more extreme measures later.

One of the most effective ways to reduce demand for water is to establish rates that escalate as more water is used. "We recommend examining their user rates, which many communities haven't done in far too long to ensure that they are not only covering their costs, but also being able to set aside something for the emergency repairs and maintenance, as well as something for future capital improvements. This is a tough sell, but with the right education of local officials and customers it can be done," says Deb Martin, director of Great Lakes Rural Community Assistance Partnership (RCAP).

Consider getting consumers to reduce water use by installing water-efficient products or employing efficiency practices, such as turning the water off while brushing teeth or running washing machines only when they are full. Water systems can promote these actions through consumer rebates for plumbing fixtures and education programs to change public behavior.

### Energy Efficient Practices

"One of the things that we've been trying to get utilities to focus on these days is looking at their energy usage and how they might reduce their usage and costs, usually through simple fixes like operational modifications and other low-cost options," Martin says. "Energy costs represent the single highest cost after personnel for utilities, and substantial cost reductions often can be achieved through an audit. These audits can often be funded by utility companies (in whole or in part), and the savings achieved can then be put toward other aspects of the operations. This is just one example, and there are many more."

By determining baseline energy use, water and wastewater utility managers and operators can better understand their electricity provider's rate structure and how their current operations impact energy costs within that structure, says EPA. Further, energy-intensive processes such as pumping and aeration can be identified and prioritized for improvement. Baseline energy use can be determined through third-party energy audits or self-assessments.

Improving energy efficiency is an ongoing challenge for water sector utilities.

Metering helps to identify losses due to leakage and also provides the foundation on which to build an equitable rate structure to ensure adequate revenue to operate the system.

The second activity is water loss control. According to EPA, on average, water systems lose 14 percent of the water they treat to leaks. Some water systems have reported water losses exceeding 60 percent. Accounting for water and minimizing water loss are critical functions for any water utility that wants to be sustainable.

On the demand side, water conservation practices reduce the



## Compare your daily usage



While energy costs often represent 25 to 30 percent of a utility's total operation and maintenance (O&M) costs, they also represent the largest controllable cost of providing water and wastewater services, says EPA.

### Best Energy Practices

Once you know your baseline energy use and where you are consuming the most energy, you can identify and prioritize energy conservation opportunities. These opportunities are often easily achievable and involve implementation of best industry practices for energy management.

Increasingly, wastewater utilities are realizing that in addition to being a consumer of energy, they can be a generator of energy using combined heat and power also known as cogeneration. For example, Portland, Oregon's Columbia Boulevard Wastewater Treatment plant produces over 12 million kilowatt hours of electricity through a 1.7 megawatt cogeneration system. The heat from the system is used to warm the digesters while the electricity provides about 40 percent of the plant's daily power needs. Excess biogas is sold to a nearby metal roof manufacturing company, generating an additional \$60,000 for the wastewater treatment plant.

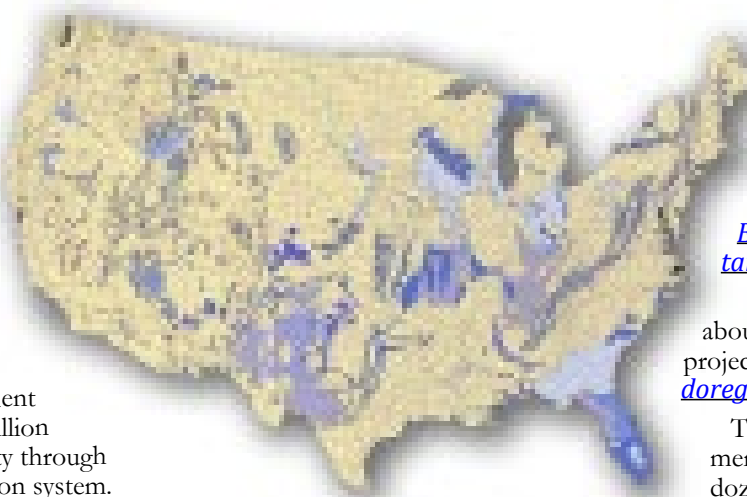
But you don't have to generate your own energy to be efficient. In lieu of generating renewable energy onsite,

utilities may have the option of purchasing renewable energy directly from the power grid or through the purchase of renewable energy certificates (RECs).

RECs are credits sold separately from electricity. They represent the environmental, social and other positive attributes of power generated by renewable

resources that enable organizations to choose renewable power even if their local utility or power marketer does not offer a green power product. The availability of these options varies according to your facility's location and your electricity provider's offerings.

While water and energy efficiency provide a good foundation for many small drinking water and wastewater systems, before you can do anything, you need to know where your assets lie.



### GIS Solutions

"Ohio RCAP is working on developing a shared GIS service for small utilities. These utilities generally cannot afford to have a GIS specialist on staff, so we were searching for a way of making this available to small communities," says Martin.

"We're in the process of developing an entity that will host all of the GIS data in the cloud for these systems that can then access maps of their systems and update them as needed. This has a number of sustainability implications," she continues. "First, it helps because many small systems don't even know where their lines, valves, and other system components are. Not only does this waste precious staff time, but it also puts them in a position that if they lose their operator then all of the knowledge of the system goes with him/her. In addition, they can't even begin to look at things like asset management, that help achieve sustainability, until they know what assets they have, what condition they're in, and where they are."

### Finding Your Way

Getting a handle on your system's assets, becoming more water and energy wise, along with proper planning have many benefits, and sustainable practices can be implemented. Sustainability practices can save money and time for systems with low budgets and manpower.

### More Information

To learn more about bringing sustainable practices to your systems, see EPA's *Planning for Sustainability: A Handbook for Water and Wastewater Utilities* at: <http://water.epa.gov/infrastructure/sustain/upload/EPA-s-Planning-for-Sustainability-Handbook.pdf>

For more information about Portland's cogeneration project, go to: [www.portlandoregon.gov](http://www.portlandoregon.gov).

The National Environmental Services Center has dozens of articles and products related to the topics discussed in this article. Visit the NESCC website at [www.nesc.wvu.edu](http://www.nesc.wvu.edu). A good way to find what you're looking for is to enter a key word or short description in the search feature found on the home page.