Why energy utilities should care about water

By Logan Jacobson
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When the tech research team at E Source started talking about delving into the relationship between water and energy, I was quick to volunteer to take the lead. Back when I started at E Source, I was interested in the energy sector because I wanted to learn more about something that most people take for granted: energy and its infrastructure. Now, more than two years later, I'm thrilled to take on the water-energy nexus for the same reason.

The term "water-energy nexus" refers to the complex relationship between energy and water. In its Ensuring the Resiliency of Our Future Water and Energy Systems article, the US Department of Energy describes the water-energy relationship: "[W]ater is used in all phases of energy production and electricity generation, and energy is required to extract, convey and deliver water and to treat wastewaters prior to their return to the environment." It's a broad topic that touches on everything from fracking in North Dakota to watering the herb garden in your windowsill, which is why many people consider the water-energy nexus to be nebulous and difficult to grasp.

> Utilities should target inefficiencies in potable water treatment, distribution, end uses, and wastewater treatment. Tweet this!

Because it's complicated, many utilities don't actively address the water-energy nexus. Instead of considering the holistic energy impacts of water consumption, many utilities consider only the energy it takes to heat water on-site. This compartmentalized view leads to tremendous waste in both sectors. Fortunately, as I address in my new report Three Ways to Address the Water-Energy Nexus at Your Utility (available to E Source Technology Assessment Service members), energy utilities are in a great position to help reduce energy and water waste. Specifically, energy utilities can target inefficiencies in four stages within the water-use cycle: potable water treatment, distribution, end uses, and wastewater treatment (**Figure 1**). See my full report for some specific technologies and approaches that can improve energy efficiency by reducing waste in the water system.

FIGURE 1: Potential energy savings in water treatment, distribution, and end

uses

While water end uses are one source of energy consumption already addressed by many utilities, supply water treatment, distribution, and wastewater treatment are also energy-intensive.

One major opportunity for energy utilities is to work directly with water utilities to improve efficiency. To do this, utilities must strategically design appropriate programs by considering the water utilities' needs and preferences. Two resources for this kind of data are the E Source Large Business Gap and Priority Benchmark and the E Source Small and Midsize Gap and Priority Benchmark (both available to E Source Account Management and Business Marketing Services members), which compile the results of surveys given to water utilities, among other large, midsize, and small business facilities, about their energy-efficiency practices and interests. According to this data, water utility respondents who had participated in an efficiency program in the past year indicated that their primary motivations to participate were financially focused (**Figure 2**). Note that other important influences on program participation included reducing need for maintenance or maintenance costs, and conducting facility renovations or upgrading equipment.

FIGURE 2: Reasons why water utility customers participate in energy-efficiency programs

The E Source Business Customer Insights Center compiles the data from our Large Business Gap and Priority and Small and Midsize Business Gap and Priority benchmarks into an online dashboard that enables users to browse the data with business-size and sector filters. Of the water utility customers who responded to our question "What would be the top three reasons your business would participate in an energy-efficiency project through your utility?," 55 percent reported they would do so to get a return on investment or payback. Other top reasons are shown in the word cloud below, where the size of the response correlates with the popularity of the answer.

Not surprisingly, the same data revealed that the respondents who weren't participating in a program felt that the largest barriers were also financially focused (**Figure 3**). These data suggest that while water utilities and their staff are eager to optimize their systems, inadequate funding for upgrades hinder advancement—an imbalance that well-crafted incentive programs could remedy.

FIGURE 3: Barriers to water utility customers participating in energy-efficiency programs

Of the water utility customers who responded to our business customer satisfaction survey question "What were the barriers, if any, to participating in an energy-efficiency program through your utility in the past 12 months?," 23 percent reported that utility incentives weren't robust enough to justify moving forward. Other barriers are shown in the word cloud below, where the size of the response correlates with the popularity of the answer.

I'm so excited to have gathered bigger-picture information on the water-energy nexus in my report, but I'm also looking forward to diving even deeper into the technologies and strategies that could help us

reduce the waste of water and energy—two of our most precious resources. If your utility has been working to address the water-energy nexus (or even just thinking about it), we'd love to hear what opportunities and challenges you've faced so far, and what information we can provide to best help you in 2017. Leave a comment below or send us an email!
