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calculator

Process Instrumentation

# The cost of water

leak detection, economy  
pumping and dosing

[usa.siemens.com/cost-of-water](http://usa.siemens.com/cost-of-water)

## How can you utilize process instrumentation to save money in the Water & Wastewater industries?

Water is by far the most widely used natural resource in the United States, with approximately 42 billion gallons consumed daily to support activities ranging from bathing to industrial manufacturing. Yet, in municipalities approximately 6 billion gallons of water are lost to leaks every day, and inefficient energy practices result in excess energy costs of up to 30 percent.

The nation's aging infrastructure includes over 2 million miles of water distribution pipes, most of which are past their life expectancy. With up to 240,000 water main breaks that occur each year, leaks and smaller breaks add up to a water loss between 14% and 18% of total distribution, and up to 6% of operating costs due to improper dosing can be recovered.

In addition to the significant amount of energy used to treat and distribute the water that is lost, inefficient energy

practices have a huge impact on the bottom line. Utilities are often subject to peak pricing schedules of electricity suppliers. Unfortunately for municipalities, peak water demands coincide with peak electricity demands of consumers. This increased demand means higher energy costs for pumps and therefore higher overall costs to water and wastewater plants. It is estimated that electricity accounts for 80% of municipal water processing and distribution costs – and also estimated that utilities can reduce costs between 15% to 30% by incorporating energy efficient practices.

Similar to poor efficiencies in pumping routines, inaccurate dosing of chemicals in wastewater can result in increased operating costs.

### The Solution

Siemens can offer solutions for these major causes of inefficiencies, resulting in significant cost savings for municipalities. Leak detection technology offered in Siemens flow meters allows municipalities to promptly

and accurately locate leaks or breaks in their distribution systems. In addition, efficient pumping algorithms built into Siemens pump controllers allow implementation of economy pumping routines to best suit electricity peak pricing and high-accuracy flow measurement systems can save money and improve chemical treatment systems. Together, these technologies result in more cost-efficient plant operation.

### Leak Detection with SITRANS F M MAG 8000

Leaking pipes often go years without being detected. By reducing lost water through leak detection technology, utilities can realize substantial cost savings in their systems.

Leak detection is often accomplished with manual equipment or a water auditing service. These methods limit leak detection to the duration of the survey and ignore any additional leaks or breaks that may occur between inspections.

Other options include costly permanent equipment spanning the entire length of the distribution network, such as a separate network of acoustic leak sensors, in addition to existing flow meters.

However, there is a simpler solution that incorporates leak detection into the flow meters located in pipelines. This solution eliminates the installation of additional leak detection equipment or the need to perform labor-intensive manual analysis. Furthermore, leaks can be monitored on a daily basis, allowing for prompt detection of leaks.

The SITRANS F M MAG 8000 flow meter includes integrated software optimized for leak detection applications. Leak detection alarms are set by the user to warn of any significant deviation from normal flow. The user specifies the minimum and maximum flow rates that are expected under normal conditions. If flow rates are detected outside of the set parameters, the alarm is sounded and the operator is promptly notified.

Compared to other methods, Siemens' technologies allow for effective solutions to leak detection in a single instrument. Incorporating leak detection into your system can help regain the 14-18% of potential revenue lost annually to leaks and breaks.

### Economy Pumping with SITRANS LUT400 Level Controller

Water and wastewater treatment plants are often the largest energy consumer for municipal governments. Pumping systems account for the majority of electricity used.

According to a Department of Energy study, optimizing pumping systems can reduce energy costs by 20% or more. The first step to implementing energy efficient practices in water or wastewater systems begins with the "energy hogs," motors and pumps. Treated water and sewage processing demands surge during times of peak electricity use, peak pricing rates can even be 80% more expensive per kWh than off-peak pricing! In order to realize significant savings, it is imperative to minimize pump operation during peak times. But how can pump routines be scheduled for off-peak times?

The SITRANS LUT400 controller line includes pump control parameters that can be set to minimize pumping activity during on-peak pricing. The LUT400 will pump the well down to the low set point during off-peak pricing, allowing for the well to completely fill when energy is at a premium. During the peak pricing periods, the controller will maintain a high



SITRANS LUT400 ultrasonic controller. SITRANS MAG 8000 flow meter and the FC Coriolis flow meter.

level in the well to be pumped out once the off-peak period returns. This pumping strategy greatly reduces the energy demand during the elevated rates of peak pricing and greatly improves the bottom line.

This smart approach to pumping only requires the economical investment in an LUT400 controller, which can control up to two motors.

### Proper Dosing with Coriolis Solutions

Similar to poor efficiencies in pumping routines, inaccurate dosing of chemicals in wastewater can result in increased operating costs. Under dosing can lead to system contamination downstream, which leads to fines, and over use can lead to high prices of chemicals. The addition of chemicals is key to the process because it helps with the removal of pathogens in the water. It is estimated that up to 6% of yearly operating costs can be correlated to the over dosing of these chemicals in the water. With over 16,000 water and wastewater treatment plants in the US this could lead to significant cost savings.

### Cost of Water Calculators

With the Siemens Cost of Water calculators, you will see just how much you can save by incorporating leak detection and economy pumping strategies into your plant. Check out the link below – discover payback periods of just months!

For more information and to try the calculator, visit the Siemens Cost of Water calculator page:

<http://www.usa.siemens.com/cost-of-water-calculator>

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