

# Process Water Does Have A Bottom Line

### **Industrial Water Reuse Can Increase Profits While Helping To Stave Off A Looming National Water Crisis**

The facts are hard to ignore. Industry accounts for an astounding amount of fresh water use ... and waste in the U.S. According to the United States Geological Survey (USGS), it is more than 100 million gallons per day. While a majority of that water is used for cooling in power plants, much of the remainder is used in processing plants.

In 2000, self-supplied industrial water withdrawals accounted for about 5 percent of the total water used, more than 20 million gallons per day according to the USGS. Industrial water use includes water used for fabrication, processing, washing and cooling. It also includes water used by pharmaceutical processing, petroleum extraction and refining, and industries producing chemical products, food and paper products.

Though industrial water use has stabilized in this country in recent years, it still represents the greatest opportunity for preserving this dwindling natural resource. That is because the other users don't have a lot of systemic flexibility.

There are three major players in the game of water use: agriculture, residential and industry. Cutting agricultural use is a hard sell; people have to eat. Cutting residential use would only help on a small scale unless implemented universally—unlikely at best. If we are to get serious about having clean fresh water for future generations, the answer will clearly have to come from better management of industrial water use.

And in the future we will have to get serious about fresh water use. According to the Associated Press, at least 36 states will face water shortages within five years because of a combination of rising temperatures, drought, population growth, urban sprawl, waste and excess. Fresh water withdrawals already exceed precipitation in many parts of the country. But, it is also a global problem.

By 2025 more than half of the nations in the world will face fresh water stress or shortages, and by 2050 as much as 75 percent of the world's population could face fresh water scarcity. So say Mike Hightower and Suzanne Pierce, water experts at Sandia National Laboratories, in an article they wrote that appeared in a recent issue of *Nature*.

### **Industrial Water Reuse**

In the industrial sector, there's a lot of money tied up in water, only most company

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executives don't know it. First, there is the initial cost for water, which according to a report is too low; and then there is the cost of using that water and treating it before it can be released.

It turns out that most executives only think they know how much their water is costing them. "Sure, they can tell how much they paid for the water, after all, they get a bill every month," says John Sparks, of ChemSave Unlimited in Cincinnati, OH. "But what they don't always understand is that water has a cost attached to it each time you use it in a process. Add that to the cost of chemicals and waste treatment, and you have the true cost of that water, and it isn't cheap." ChemSave helps companies control their water costs.

Traditionally, companies have resisted investing in water savings because they thought water was cheap, but that is changing. "We need to show them a return on investment in a year or less," adds Sparks. "We have to make the connection between improving environmental performance and improving bottom-line performance." Sparks calls the process "finding money" for his clients.

The Environmental Protection Agency (EPA) requires industry to return water in its original state. Removing oils, soaps and chemicals can drive water costs up to three times its original purchase price.

Efficient reuse saves consumption of the typical chemicals and energy (in the form of heat) used to prepare raw water for industrial use, and the additional treatment to make used water suitable for discharge back into the environment. Industries that use large amounts of process and cleaning waters are employing new technologies to conserve on fresh water primarily through reuse. But as has already been suggested, water is often filled with chemicals and solvents that first must be separated from the water for the water to be reusable.

### **New Technology**

The point is, water is a resource that gets more valuable every day, and the industrial sector offers the best opportunity to conserve it. Some companies are learning that they can cut water use and increase their bottom line at the same time by turning to technology from Aqueous Recovery Resources Inc. of Bedford Hills, NY.

The firm has developed an innovative technology that effectively separates process oils and other liquids, along with suspended contaminants, from water. The patented system enables users to separate liquids differing in specific gravity, thus making significant savings in water consumption by allowing reuse of the water, as well as other process fluids, such as the separated oil. This water savings also improves uptime, extends the use of detergents and significantly reduces the need to prepare water, thus saving on energy.

Called Suparator®, this exclusive "dynamic separation" technology is based on the Bernoulli's principle of physics. The unique application of this principal achieves

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ideal separation of any two fluids with a specific gravity differential. Unlike conventional water separation devices, it uses no moving parts or media to provide more than 99 percent separation of polluting oils or liquid contaminants from water while it is still in the process tanks, thus saving a typical industrial user millions of gallons of water each year.

This liquid-liquid separation allows reuse of the recovered contaminants, like oil, as well provides a means of reuse as well. Plus, because separation is accomplished dynamically, the Suparator® is able to remove dirt and other unwanted foreign objects from the suspended oil—all before it settles into the water tank and necessitates water and/or detergent changes.

Sparks has seen some major cost savings at companies that have used this technology to separate, and then reuse water and chemicals: "Their chemical costs have dropped up to 70 percent, and the water costs have fallen by 20 percent."

At Ford Motor Co.'s Dearborn, MI plant, the Suparator® removes preservative oil from pickup truck door "blanks" before the doors are formed in a giant press. The steel blanks have to be cleaned of oil and any dirt (or other foreign matter) prior to being stamped.

Daimler-Chrysler has successfully deployed the same technology in paint-line operations, resulting in a superior finish for the high-end Mercedes vehicle product line in which fluid quality is directly related to finish quality. The Daimler facility in Sindelfingen, Germany has achieved a carbon dioxide emission reduction equal to the auto emissions from 1.5 million kilometers by not having to re-heat replacement water.

The technology has also already been deployed on an exploratory basis in pharmaceutical solvent extractions, plastics and ballistic fiber production, petrochemical plant effluent pre-treatment, crude washing, in addition to other applications. In every instance, Suparator® more effectively removed the contaminating fluid from the aqueous stream than existing methods.

In Colorado, this technology has been assisting a water reclaimer supplying hydraulic fracturing water to Haliburton and other oil well production services firms. The Suparator® results surprised the seasoned professionals by recovering nearly 1,000 gallons of crude oil from a contaminated "produced water" source in less than four hours. The crude had a measured 500-PPM water. This low water content allowed the oil to be sold immediately at a significant profit to the water reclaimer.

Previously, the reclaimer was unable to remove the contaminated oil with a low enough water content for the market, and he had to have the water/oil mixture skimmed and hauled off at a significant expense. This inversion of the revenue stream is typical of a technology that represents a completely new breakthrough.

It is clear that by reducing industry's voracious appetite for clean water through point-of-use recycling saves significant money. At the same time, other resources are conserved along with the water, and energy may be conserved and uptime

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improved, all of which contributes to improved competitiveness.

In addition to providing a viable new means for industry to relieve its pressure on the limited supply of fresh water, dynamic separation also fundamentally changes the focus on water treatment. Instead of cleaning of the most contaminated industrial pollution, the new focus is on in-house pre-treatment and reuse to save costs and preserve water in the same way that any other industrial process component would be preserved and maintained.

For more information, visit [www.suparator.com](http://www.suparator.com) [1] or e-mail [info@suparator.com](mailto:info@suparator.com) [2].

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