



Above: Two tunnel washers at HandCraft Healthcare Linen & Uniform Specialists' new plant in Martinsburg, WV. Higher-pressure, "wide cake" tunnel presses have improved extraction, thus saving water and energy by reducing drying times.

Saving Water and Energy:

How Low Can You Go?

An overview of laundry resource conservation efforts that lower costs and benefit the environment

By Jack Morgan

For laundry operators, one source of good news is that saving water and energy—two of their most costly inputs—is a mutually reinforcing effort. In other words, if you invest in reusing or recycling water, you can usually capture the heat as well, thus saving on natural gas. The more you save on water, the more payback you get on natural gas.

Bullish on Björkmans

One company that's made significant strides in these areas is Hr Björkmans Entremattor, Arlöv, Sweden. Founded in 1993, this

company achieved impressive results by pursuing a vision for resource circularity. "We have developed our own patented water-recycling system, enabling us to reuse up to 98% of our wash water," says Carl-Johan Björkman, founder, managing director and CEO of Hr Björkmans, a mat-laundering specialist. "Water recycling also helps us save energy," he says. "We wash our mats at 40°C (104°F), and the recycled water maintains a temperature of around 30°C (86°F), meaning that only an additional 10°C (18°F) of heating is required."

The company's water-recycling system enables the reuse of virtually all wash water, with only roughly 2% lost due to evaporation. Björkman says that loss is primarily supplemented by collected rainwater, rather than by drawing fresh water from the local publicly owned treatment works (POTW).

The company also discharges virtually no wastewater into the public sewage-treatment system. Hr Björkmans' wastewater is purified in-house with the aid of biotechnological detergents that rely on naturally occurring microorganisms, rather than conventional chemicals. The same biological process is used to purify the company's wastewater. This allows recycled water to remain effective across multiple wash cycles. The biological detergents used for 90% of mat washing reduce chemical residues in recycled water. The microorganisms in these detergents break down soil in the water. They also perform effectively at low temperatures, thus saving additional energy during washing.

The company uses rainwater captured from the roof of its laundry facilities to replenish this closed-loop system to make up for evaporation losses. This further reduces the company's dependence on fresh-water supplies from the local POTW. Using this technology, Hr Björkmans estimates its yearly water savings at 16 million liters (4.22 million gallons).

Savings Made Simple

Few companies have gone as far as Hr Björkmans to save water and energy, but that doesn't mean progress isn't happening elsewhere. Joe McKeown, COO for HandCraft Healthcare Linen & Uniform Specialists, Richmond, VA, credits the introduction, in the early 2000s, of both higher pressure (55 Bar versus 28 Bar) and "wide cake" 1.3-meter-wide presses (vs. 1 meter-wide) for pressing additional water out of "cakes" of textiles due to its higher

pressure and additional width. That innovation saves natural gas by reducing drying times since there's less water to evaporate than using a 1-meter-wide press (35% to 40% moisture retention vs. 55%-60%). The wider press also returns more water to the tunnel. McKeown notes that "with a 28-bar, 1-meter-wide tunnel press which was very common up to the early 2000s, you get just under 500,000 lbs. of force exerted on a load of textiles coming out of a tunnel. However, a 55 Bar 1.3 meter press will exert more than three times (over 1.6 million lbs.) the amount of force compared to a 1-meter press."

Removing more water means reduced drying time. "I've got to evaporate more water in the dryers with a one-meter press than I do with a 1.3 meter press," McKeown says, speaking of the system installed at the company's recently opened Martinsburg, WV, plant. "And that's where you save the money. Because drying the linen one of the biggest gas consumers. For us, heating water is not that bad because we have a heat reclaimer. If you don't have a heat reclaimer, then your biggest consumer of natural gas is heating water, then dryers. But in our plant, it's dryers and then water."

Consultant Gerard O'Neill, president and CEO of American Laundry Systems, notes that when designing plants, he focuses on conserving heat and water by using a trench system that facilitates reuse and heat recovery. "I always design for at least a split trench and split pit-water reuse system," he says. "It costs very little to split/divide a trench and pit, and with the correct choices of what water to reuse and what water to let go down the sewer (after heat reclamation), you can typically get around 20% of your water reused, depending on how heavy the soil factor is, using this simple method. Additional benefits are that some chemistry is already in the water, and the water is already

hot, or more likely warm. If you run a cleaner/less soil type of laundry and use conventional washers, then the reuse number can go up to 30%... with some simple equipment. (i.e., a shaker screen, tank and pumps)." This can generate a return on investment (ROI) in months, depending on the cost of the water.

For additional water savings, the next step up is water reuse and wastewater recycling, O'Neill says. "The most common types in our industry are Ceramic Micro Filtration (CMF = 0.1-10 microns) and Ceramic Ultra Filtration (CUF = 0.01-0.1 microns)," he says. "Both work and work well in the correct application." Don't expect drinking-water quality from those systems, O'Neill says. For that level of savings, you'll want a reverse osmosis (RO) system. "Both CMF and CUF can get you over 50% recycling pretty easily," he says.

"Then from there to get to 75% or more, it can be done with equipment like an RO and or another level of micro filtration or ultra filtration after the initial membranes have done the 'heavy lifting,' so to speak." The latter two systems can generate significant savings, but they require a substantial investment. "Get your checkbook ready at this level," O'Neill says. "It is not cheap. But it does work, and the membranes and cleaning technology have come a long way in the last 10 years."

Two More Examples

We asked two other operators about their efforts to reduce water and energy consumption. Highlights of their responses follow. One company, Quintex Services Ltd., Winnipeg, Manitoba, Canada, had a Kemco RO system installed several years ago. The company continues to

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“ In 2021, our Western Division installed a Norchem ceramic filter. This has allowed us to reduce our water usage from 1.78 gallons per pound to our current usage, which is .93 gallons per pound. ”

make strides in other areas to save even more water and natural gas. Brodie Quinton, co-CEO of Quintex, described additional efforts to build on an already strong conservation program. “In 2022, we did a steam audit in partnership with Efficiency Manitoba (a semi-autonomous provincial government organization) to reduce energy consumption in our province,” he says. “We inspected almost 50 traps, repaired/replaced any damaged traps, and removed unused traps/inefficient piping. The result has been a savings in our natural gas consumption.” Quinton notes that Efficiency Manitoba estimated these moves would save the company \$20,000 per year in fuel costs. He questions whether the savings are that large, but they’re nonetheless significant.

Another program that Quintex accessed through provincial government authorities helped the company improve its air compressor system. “Also in 2022, with the help of Efficiency Manitoba rebates, we upgraded our air compressor to an energy-efficient model,” Quinton says. He adds that Efficiency Manitoba estimates this move will generate energy savings of 39,000 kWh/year. A third initiative involved improving lighting in the plant. “In 2021, we also did a lighting upgrade to LED lighting with the help of rebates from Efficiency Manitoba—upgrading 282 lights in the facility.”

O’Neill notes that adding light-emitting diode (LED) lighting is a simple

move that can significantly reduce electricity costs. He recommends replacing all fluorescent, sodium or other conventional lighting with today’s “state of the art” LED lights. “They get better and more efficient every year,” he says. “The LEDs of even a couple of years ago are not the LEDs available today. I am not saying swap out your lights now from 12 months ago. But around the 3-5 year mark, I would.” If incentives are available from the power company or government entities, as was the case with Quintex, you may want to replace your lights sooner, he says.

Another launderer, David Griggs, director of operational development for Superior Linen Service, Tulsa, OK, also highlighted recent energy- and water-saving upgrades at his company. “Over the last five years, Superior Linen Service has made significant investments to reduce our water and energy use,” he says. “In 2021, our Western Division installed a Norchem ceramic filter. This has allowed us to reduce our water usage from 1.78 gallons per pound to our current usage, which is .93 gallons per pound.”

Not surprisingly, this expansion of water recycling also saved on natural gas used to heat water. “This water reuse has allowed us to reduce our energy usage from 2,205 BTU per lb. to our current level of 1,700 BTU per lb,” Griggs says.

A third area slated for improvements at Superior Linen Service

is wash-aisle equipment. “Going forward in January of 2027, we will be installing a Lavatec 14 module CBW, which we anticipate will help us make even further reductions in our energy usage.”

Superior Linen Service has also installed LED lighting in its corporate office and two of its nine facilities in Oklahoma, Arkansas, Kansas and Missouri.

Ways to Save

Based on the comments above, it’s clear that companies in North America and Europe are pursuing various methods and technologies to save more energy, water and electricity. Programs range from ambitious projects like the 98% water-recovery rate that Hr Björkmans is achieving to upgrades to filtration systems, tunnel presses, or simply adding a tunnel washer that generates improved water reuse and efficiency compared to conventional washer/extractors. In some cases, such as LED lighting or steam-trap improvements, local utilities or state or provincial governments may offer incentives for upgrades.

It’s up to each company to decide which systems are a good fit for them and which will generate the best ROI. But there are opportunities at all levels for companies to make investments that will pay significant dividends, not only in saving water but also natural gas.

The choices and timing of these improvements are up to you. But the costs of these inputs aren’t likely to moderate anytime soon. How low can you go? The sooner you start implementing improvements, the sooner you’ll see the benefits of lower water and energy costs. **TS**

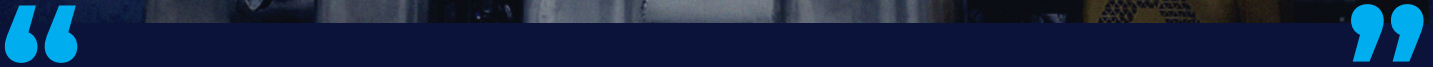


JACK MORGAN is senior editor of Textile Services. Contact him at 877.770.9274 or jmorgan@trsa.org.



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