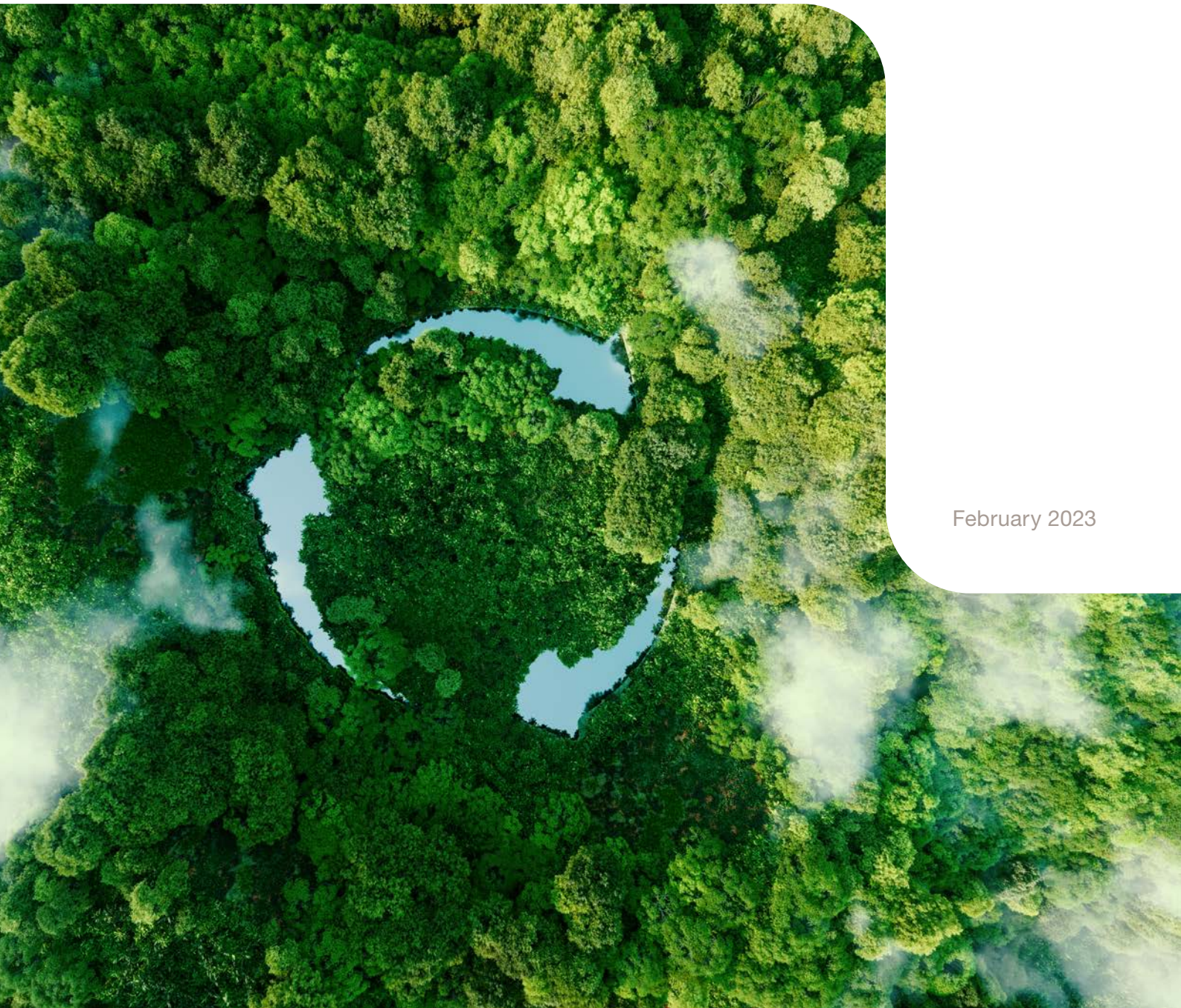
WHITE PAPER

Save on water and energy

– Optimize tank cleaning



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While manufacturers face soaring energy prices and ever stricter regulation on carbon emissions, the quest for energy efficient solutions is more important than ever. At the same time, water scarcity and rocketing water costs require the food and beverage industry to look for new ways to improve water efficiency. In this context, water and energy efficiencies have become strategic priorities in most companies.

Being a water and energy smart company provides several benefits. Most important, running a sustainable business gives license to operate in a world increasingly concerned with responsible production and consumption. Furthermore, efficiency gains allow companies to do more with less and execute growth strategies to serve a fast-growing world population with sustainable foods. And finally, water and energy savings equal cost savings and thereby competitive edge in the marketplace.

Following the UN's 2030 Agenda for Sustainable Development, climate action, environmental impact and water conservation have become integral in sustainable business strategies for companies.

Efficiency gains on existing production lines

Most industrial production lines are already built. Some recently, others many years ago. The existing installations may hide possibilities for substantial efficiency gains. Seen through a sustainability lens, it is time to focus more on optimizing the operation of these existing lines.

There is much to be saved by making simple upgrades to existing machines. Upgrades that improve every process step, minimize waste and return valuable efficiency gains with a short pay-back time.

Reducing the consumption of water and power allows companies to do more with less and put a brake on the energy and water bills. At the same time, responsible use of resources and net-zero production help companies achieve their sustainability goals.

Optimize™
by Alfa Laval

A continuous journey of optimization

In the light of the savings potential of existing installations, Alfa Laval has introduced Optimize™, which is a proactive approach to water and energy management through continuous upgrades.

Optimize™ is a process check that can accelerate sustainability efforts by enhancing existing processes. The Optimize™ approach helps identify critical hot spots, supports decisions on the optimum upgrade strategy and paves the way for hassle-free upgrades with no operational risk or costly downtime.

Creating and implementing the optimum upgrade strategy is a win-win for everybody – from production management to the finance department and for the sustainability team.

Financial

- Reduced energy and water costs
- Low risk investment and short pay-back time
- Reduced repair costs

Operational

- Reliable operations
- Roadmap for continuous improvements
- Consistent approach and benchmark
- Low failure rates
- High uptime
- Proactive approach to maintenance and upgrades

Sustainability

- Improved water efficiency
- Improved energy efficiency
- Reduced CO_2 emissions
- Leadership in sustainable production
- Meet consumer expectations

Cleaning in Place is a good place to start

When looking for water and energy savings, Cleaning in Place (CIP) is a good place to start. On average, 20% of the energy consumption at a food and beverage plant is used for CIP. Hence, the savings potential is big when replacing legacy components with next generation technology that saves on both water and energy.

Tank cleaning is one of the processes that account for massive consumption of water during CIP. And not only that. The amount of electricity used for pumping, heating, recovery, reuse and treatment of the tank cleaning water is equally high.

Alfa Laval has devoted substantial R&D resources to energy and water efficiency gains. Among others, a range of tank cleaning solutions is available to improve efficiency, save cost and achieve higher throughput.

Optimizing tank cleaning and saving on water, energy and chemicals not only responds to the current water and energy crises but also addresses the climate crisis by reducing carbon emissions.

In other words, there are many good reasons for putting tank cleaning on top of the optimization agenda, where simple changes to the current set-up can make a real difference.

Watch video to see how it works

Three different tank cleaning devices: static spray ball, rotary spray head and rotary jet head.

Three different options for tank cleaning

Even though modern and automated tank cleaning systems have been available for decades, in many places the most used cleaning device is still the static spray ball. The static spray ball dates back more than 100 years and uses the flow of water, cleaning media and time as the primary cleaning parameters. The static spray ball is not the most efficient solution, it uses excessive amounts of water and cleaning agent, prolongs the cleaning cycle – and even so the cleaning result may be inadequate.

Rotary spray head – one step up the efficiency ladder

The efficiency of the tank cleaning can be dramatically increased by simply replacing the static spray ball with a rotary spray head. The rotary spray head saves up to 40% on water consumption and reduces the cleaning time by about 30–40%.

Replacing the static spray ball with the rotary spray head is a simple upgrade, as the spray head uses the same pressure of 2–3 bar and can be connected to the existing water installations without extra work and disruption to production. The efficiency gains on water and energy consumption gives a payback time of only 2–3 months, when the rotary spray head replaces the static spray ball.

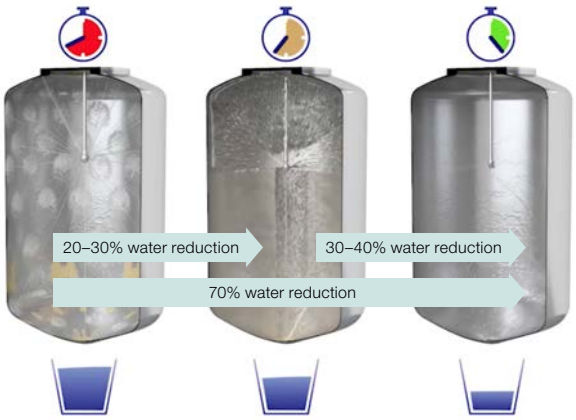
Jet head – for heavy duty cleaning and even bigger savings

With a jet head, the savings can be even bigger. By switching to a rotary jet head in tanks that process viscous products, the savings can be doubled compared to the static spray ball. Cleaning times can be reduced on average by more than 30% and water consumption by up to 70% compared to the static spray ball. When compared to the rotary spray head, the jet head saves 20–30% on water and chemicals.

The jet head installation is especially suited for difficult cleaning applications, complicated tank structures or large tanks up to more than 150 m³. The jet head operates at pressures of 5 bar.

Simple upgrades that provide instant results

Upgrading the tank cleaning equipment minimizes CIP time, costs and staffing requirements. Simple upgrades that require no additional changes to the tank cleaning installation help maximize productivity. This means higher throughput without investing in new production lines. Reducing the amount of water used for CIP also relieves the pressure on the water treatment plant and ensures capacity for higher volumes without extending the treatment plant.



Savings using three different tank cleaning systems: spray ball, rotary spray head and rotary jet head.

Table 1. Comparison of running costs

Parameters	Water consumption	Average time for CIP cycle	Average cost for CIP cycle
Static spray ball*	11 m^3/CIP	33 minutes	7 €
Rotary jet head	3.5 m^3/CIP	22 minutes	3 €
Total saving	7.5 m^3/CIP	10 minutes	4 €

* Based on the use of the Alfa Laval LKRK Static Spray Ball and the Alfa Laval TJ20G Rotary Jet Head (4x4.6), and return on investment calculated based on the use of a 50m^3 cream tank.

How to get started with Optimize™

To make the most of investments in water and energy efficiency, you need to know where the effort pays off. Where is the biggest consumption, where are the losses, and where is the biggest potential for improvement?

Optimize™ provides facts and insights that allow well-informed decisions on the upgrade strategy. The Optimize™ process check consists of three simple steps:

1. Onsite survey

Alfa Laval technicians make a tour of the plant to identify points where an upgrade, replacement or addition can bring substantial improvements in water and energy efficiency.

2. Optimize report

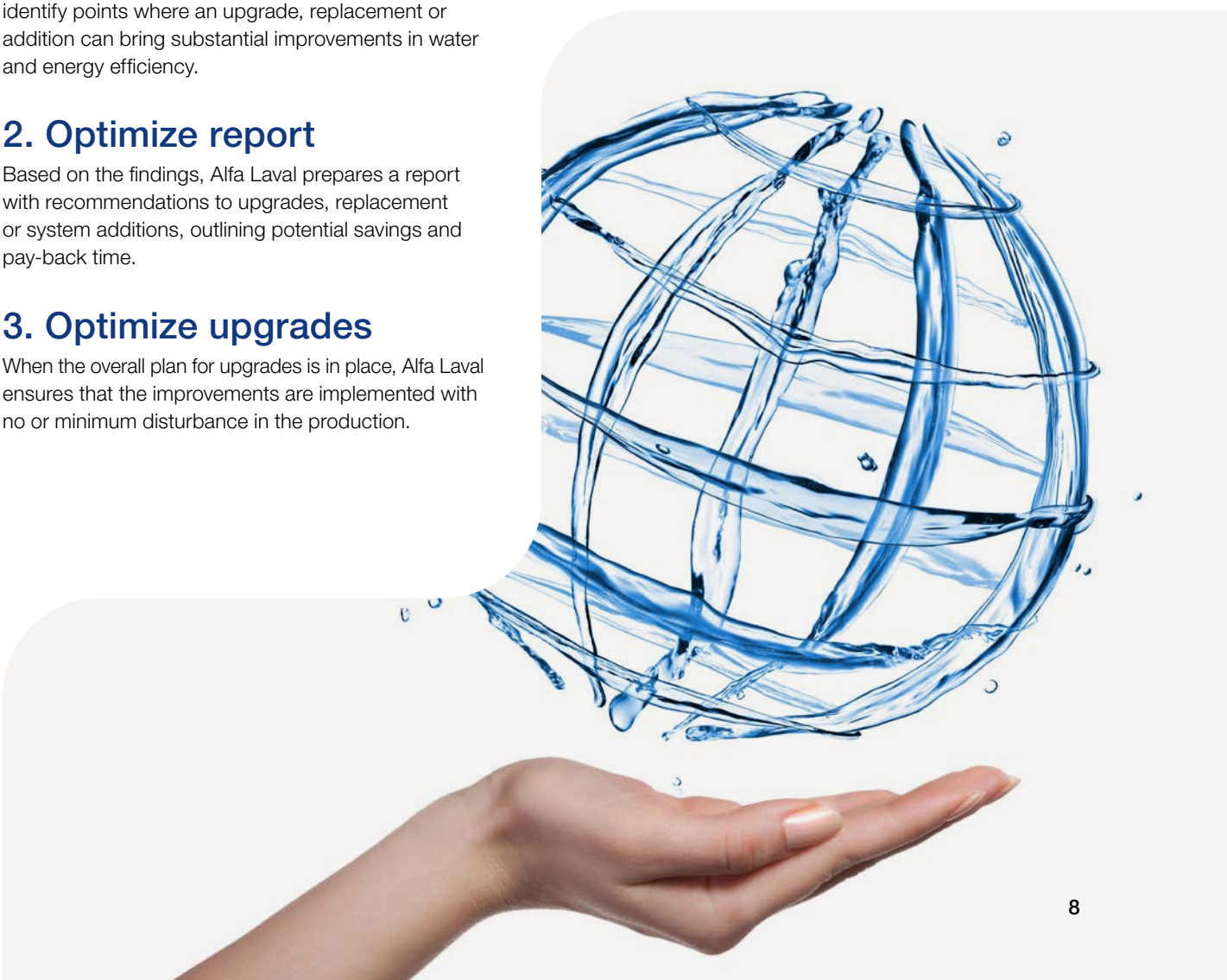
Based on the findings, Alfa Laval prepares a report with recommendations to upgrades, replacement or system additions, outlining potential savings and pay-back time.

3. Optimize upgrades

When the overall plan for upgrades is in place, Alfa Laval ensures that the improvements are implemented with no or minimum disturbance in the production.

The Optimize™ report documents the installation with information about current consumption and cost as a baseline for improvements. The report provides recommendations for future-proof upgrades that can improve the water and energy footprint of the plant.

A step-by-step implementation plan for component replacement, upgrades or modifications makes the task feasible and financially viable within the yearly budget framework.



In conclusion

Significant savings in water, energy and cleaning agents have a positive impact on the climate and resource footprint of the plant and on plant profitability. Using less water to achieve the same high, hygienic standard translates into big savings on electricity consumption and cleaning agents. It also means less effluent for treatment, reducing life cycle costs significantly.

Optimize™ enables the industry to become water smart. By optimizing tank cleaning, the efficiency journey has started, and there are many more options, for instance by upgrading valve control with ThinkTop.

For more information about Optimize™

For more information about optimized tank cleaning

For more information about ThinkTop and 90% savings on water, energy and cost

This is Alfa Laval

Alfa Laval is active in the areas of Energy, Marine, and Food & Water, offering its expertise, products, and service to a wide range of industries in some 100 countries. The company is committed to optimizing processes, creating responsible growth, and driving progress – always going the extra mile to support customers in achieving their business goals and sustainability targets.

Alfa Laval's innovative technologies are dedicated to purifying, refining, and reusing materials, promoting more responsible use of natural resources. They contribute to improved energy efficiency and heat recovery, better water treatment, and reduced emissions. Thereby, Alfa Laval is not only accelerating success for its customers, but also for people and the planet. Making the world better, every day. It's all about Advancing better™.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website. Please visit www.alfalaval.com to access the information.

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