

# Pathema sees opportunities to properly address the drinking water problem

*Taking shorter showers to save drinking water. It's a good idea, but the real progress can of course be achieved within industry. We are in conversation with Mark Boeren, the CEO of Pathema, and delve deeper into circular water use for industrial installations.*



**MARK  
BOEREN**  
CEO PATHEMA



Pathema started its mission in 2008 by making industrial cooling installations chemical-free. Which is already a huge step forward in terms of sustainability and the environment. It is now clear that not only pollution, but also drinking water is a global problem. Pathema's ingenious water technology can ensure that major industry no longer has to use billions of liters of drinking water for cooling.

Mark Boeren: "If we were to disconnect all cooling towers in the Netherlands from the drinking water network, this would provide drinking water for 27 million Dutch people. In the Netherlands there is actually no drinking water shortage at all. It is the big industry that uses too much drinking water, while this is not necessary."

## Efficient

Why cool with water? "Adiabatic cooling, or water evaporation to get rid of residual heat, is still the most efficient in terms of energy consumption,"

Boeren explains. "If you work with fans and dry cooling, you use less water but use more energy to cool away the same amount of residual heat. There are heating networks for exchanging heat, but there is a clear discrepancy between supply and demand.

For example, in summer the most heat is available, but the demand from the surroundings is lowest. So the industry has nowhere to go with the residual heat. In addition, we are in the middle of the energy transition, and energy costs must be reduced. Adiabatic cooling remains the most logical step and water will therefore always continue to play a role there."

## Business risks in the event of a drinking water shortage

Mark Boeren: "The drinking water industry makes use of displacement categories. The consumer is in category 1 and most industry, including data centers, is in 4. In the event of a drinking water shortage, this last category is the first to be disconnected from the

drinking water network. This can be quite disruptive, especially because we are so dependent on data centers and working in the cloud. We are not yet fully aware of this. The solution lies in water conservation and the reuse of waste water by large consumers."

Drinking water is often disposed or discharged as waste water after industrial use, while this waste water can also be used for other industrial processes, such as cooling. That's where the opportunities lie,

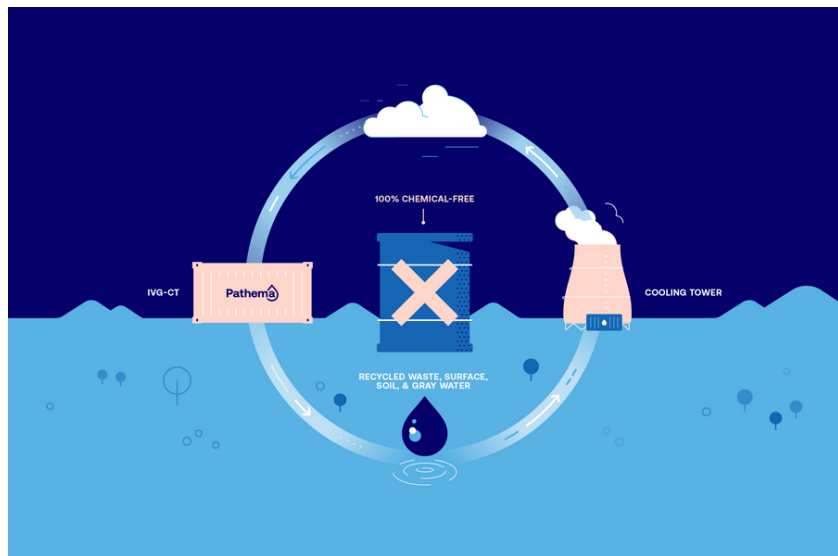
“ We break the linear economic model of take, make, waste with our mission of reduce, re-use and recycle. We want to motivate large industrial users of drinking water to use less (drinking) water, produce less waste water and reuse waste water for cooling processes instead of drinking or surface water.

according to Mark Boeren: “We break the linear economic model of take, make, waste with our mission of reduce, re-use and recycle. We want to motivate large industrial users of drinking water to use less (drinking) water, produce less waste water and reuse waste water for cooling processes instead of drinking or surface water. We are convinced that circular cooling will be the future”

### Lamb Weston

A good example of a successful implementation of chemical-free and circular cooling has been carried out at Lamb Weston. This company produces and supplies frozen potato products worldwide. Lamb Weston wants to produce as circular and chemical-free as possible by 2025. That is why Pathema developed a self-cleaning water treatment system for this company, to purify the waste water for reuse in the cooling towers. These systems were installed at 10 cooling towers between 2015 and 2019. Since then, these cooling towers have been running completely chemical-free, with drastically lower water consumption and a much smaller water footprint. But it didn't stop there. Pathema adapted the systems in such a way that Lamb Weston has been recycling its own waste water into utility water since the beginning of 2023. “Utility water is water that does not come into contact with the end product. At Lamb Weston, 40,000 liters of waste water per hour are reused as cooling and steam water. That is what an average person uses in drinking water per year(!). That is an enormous saving in drinking water and waste water.”

What does such an implementation look like? “We deliver our solutions fully containerized in large sea containers of 20 or 40 feet,” explains Boeren. “In larger projects, several containers are linked together. The production of these container systems takes between 20 to 30 weeks. After which they are placed at the customer as a ready-made product. Then it is just a matter of 2 weeks to connect the power supply and pipelines, before the system is put into operation. Our website contains a time-lapse video of how such an installation is delivered to a customer. All control technology is integrated and we can remotely monitor if everything is running within specifications. We provide the customer with KPI reports (Key Performance Indexes) on a weekly basis. But we can also link our software to the customer's building management system, so the customer can monitor everything 24/7.”



### Waste water as a commodity

Since April, permit issuers from Rijkswaterstaat (Department of Waterways and Public Works) make use of the 'Guidelines on the research obligation to apply BAT (Best Available Techniques) for open recirculating cooling water systems.' These guidelines help to oblige companies to conduct research into low-chemical or chemical-free waste water discharge. Pathema has been using a number of these BATs for alternative cooling water treatments for a long time, for example hydrodynamic cavitation (IVG) and partial electrolysis (PADES).

“Circular use of waste water is the future.”

“But ultimately we need to work together much more to share commodities such as (waste) water, just like back feeding solar energy. A great initiative that we are involved in is the Waterbank, a marketplace for users and consumers of waste water. A company that has leftover waste water could theoretically sell it to companies in the area. Data centers can then, for example, reuse industrial waste water as cooling water. The Dutch infrastructure and regulations are not yet ready for this. But there are opportunities to properly tackle the drinking water problem and that is what we are going for at Pathema!”

