

Using water sustainably in production

Water is becoming ever scarcer. Increasingly, production facilities are competing for water with households, agriculture, nature and other production facilities. Clever solutions for the recycling and reuse of water are needed. The resource consumption of water processing plants also needs to be examined.

Water is often a vital raw material in production, needed in a wide range of forms and qualities: as an ingredient in products and for flushing, cleaning, cooling and steam generation. But the availability of water is increasingly presenting production facilities with particular challenges. When modifying or expanding their product ranges, they regularly have to consider how the increased water needs can be met. The issue can even impact a facility's choice of location. Authorities and local governments often set limits for water extraction or discharge in order to safeguard the availability of water for other consumers.

In addition, German legislation, European directives and international obligations govern how water needs to be handled in the form of laws, ordinances, regulations and climate protection plans. "Climate action that is successful over the long term must go hand in hand with sustainable use and conservation of resources [...]" (German Climate Action Plan 2050, p. 29).

Optimising water processing plants

Companies can benefit both economically and environmentally from examining their plant technology and the water treatment processes they use for potential energy and resource savings. EnviroChemie, for example, determines production facilities' potential for recycling water and recyclable materials, and for saving energy. When it comes to plant operation, experts examine various areas and topics in a holistic way and develop recommendations for action.

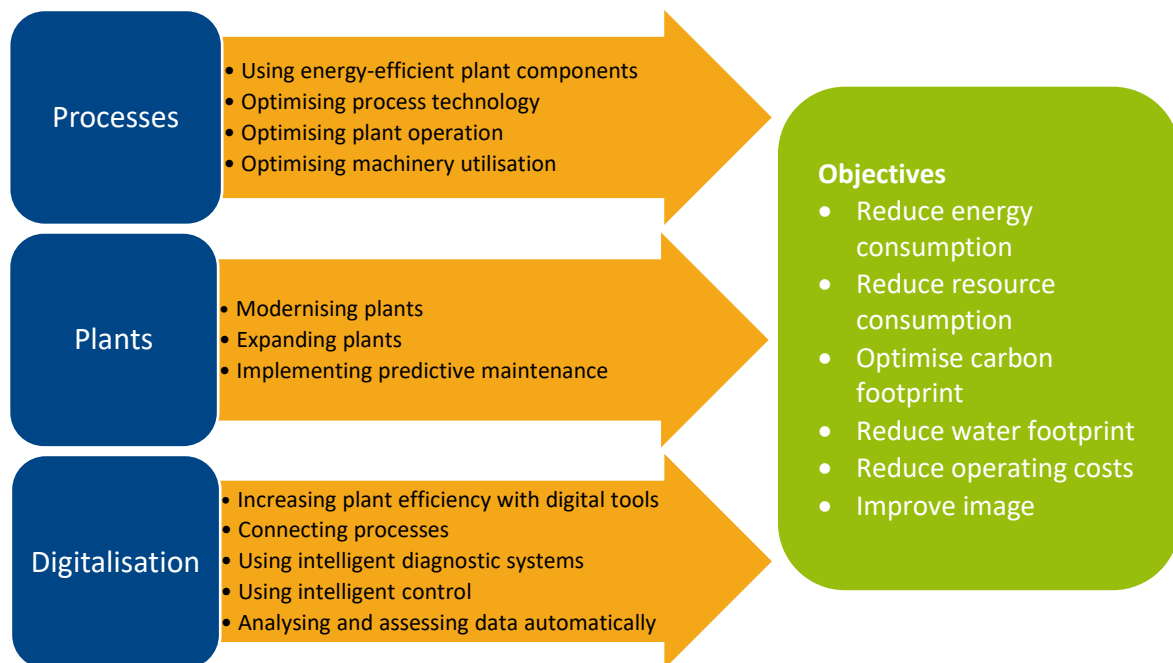


Fig.: Potential for optimising energy and resource consumption by analysing processes, plant technology and options for digitalisation.

Optimisation measures can initially consume resources and energy, so it is important to look at the big picture. The measures ultimately pay off because the operating costs can be optimised.

Case study: potato processor benefits from plant optimisation

On behalf of a German food producer that processes large quantities of potatoes, EnviroChemie has been responsible for operating the treatment plant for wastewater from production for more than 10 years. Up to 1,300 m³ of production wastewater containing starch is treated for direct discharge every day.

Working towards climate-neutral, resource-optimised wastewater treatment, various optimisation measures have been taken in recent years:

- Approx. 430,000 Nm³ of biogas are extracted and used for steam generation every year
- Power consumption has been reduced by 55%
- The amount of sludge produced has fallen by 50%
- The recycling of water has significantly reduced the quantity of fresh water needed
- Plant operation has been simplified by using WaterExpert, EnviroChemie's digital service platform (app), and installing additional online measurement technology

The adaptations to the process technology, the plant expansions and the use of digital aids secure the availability of water for the production facility, thus safeguarding the site's future.

Water recycling, optimised power consumption and biogas production have reduced CO₂ emissions and the water footprint. In addition, the consumption of primary energy for steam generation has been lowered.



Image: EnviroChemie operates the water processing plants for a potato processor and has reduced its consumption of power, fossil fuels and fresh water in multiple optimisation phases.

Case study: water recycling for a dairy

Dairies rely on large quantities of fresh water for their production. If they produce largely dry products, vapour condensates are formed. Treating these significantly reduces the amount of fresh water needed.

A German dairy that manufactures products including powdered milk wanted to use water more sustainably and reduce its operating costs – decreasing the workload and costs involved in its current wastewater treatment.

EnviroChemie's experts in the field analysed the processes and suggested an Envopur system for water recycling: a process using a combination of biological and membrane treatment. By purifying around 120 cubic meters of vapour condensate per hour, the dairy achieves the following benefits:

- Water recycling has reduced the quantity of wastewater by around 80 to 85%.
- The recycled water can be used for various purposes, including as sillage, cooling tower make-up water or boiler feed water.

Treatment can be useful for quantities as low as 25 cubic meters of vapour condensate per hour. Where prices for fresh water or wastewater are particularly high, the process can be cost-effective from just 10 cubic meters per hour. Experts from EnviroChemie examine this on a case-by-case basis.



Image: A recycling plant for vapour condensate saves fresh water for a dairy and reduces the pressure on its wastewater treatment plant.

Recyclable materials replace wastewater

Production facilities today often face the question of how to deal with ever greater water shortages and the transition to alternative energies. Where needed, EnviroChemie's experts consider the entire water processing system and determine potential for improvement. It may be possible to recycle water substreams such as vapour condensates for reuse in production. Depending on the application, changes to process technology may allow biogas to be produced, thus reducing the need for fossil fuels. Optimising or modernising plant components can reduce power consumption significantly. The use of digital tools like WaterExpert simplifies plant operation and delivers a constant stream of data as the basis for further plant optimisation. Operating costs can then be decreased even further. The plant's carbon and water footprints can also be reduced.



Fig.: EnviroChemie's WaterExpert digital service platform simplifies plant operation and makes recommendations for plant optimisation.

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