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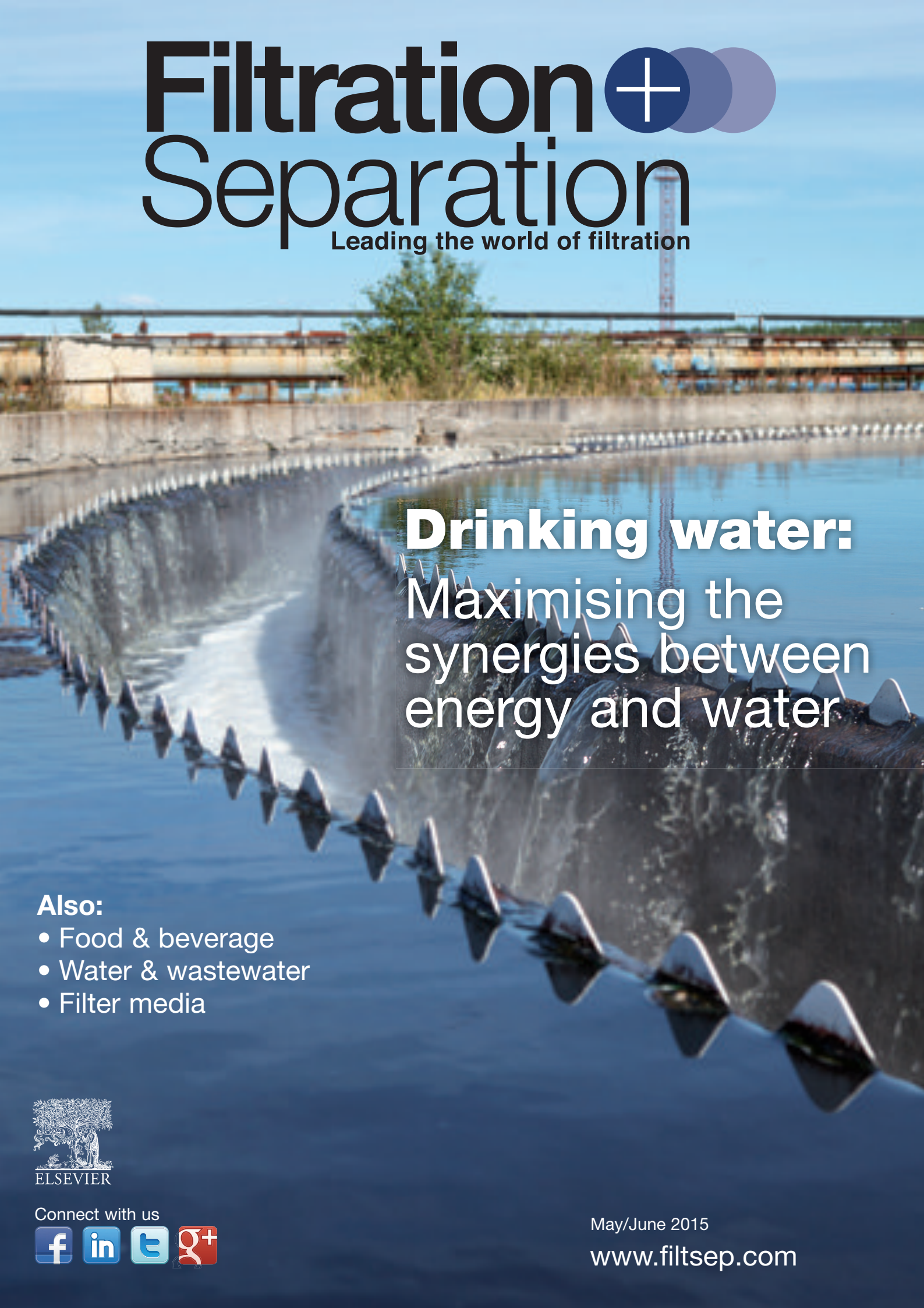

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Food & beverage

Process water purifier bears fruit in Italy

Fruit production requires large amounts of fresh water for washing, sorting and packing. The water must be clean and cannot contain any impurities. This presents a major challenge for producers trying to make water suitable for reuse. Here, we see how Apateq uses membrane technology to purify water, enabling Texel to reuse water from fruit processing.

Clean-tech full-solution provider APATEQ has developed a proprietary process technology for ultrafiltration membranes, preventing them from clogging and wearing with minimal amounts of chemicals used at low energy consumption. TEXEL, one of the largest agricultural cooperative in Southern Tyrol takes advantage from the novelty and ordered a recycling plant for process water, enabling them to reduce their fresh water need from 75m^3/h down to less than 20m^3/h.

Growing fruits requires large amounts of fresh water, which is used not only for irrigation but also for washing, sorting and packing. Of course this water must be very clean and cannot contain any impurities. It presents a major challenge for producers to meet this requirement and especially eliminate germs and plant protection products consistently from the process water to make it suitable for reuse after a certain treatment.

Apples floating on the water streets for packing at Texel.

Traditional weaknesses

Traditionally used technologies such as activated carbon filters show weaknesses: they clog after a certain period of time due the high bacterial growth caused by the organic load of the wastewater. The common practice today is often still that fresh water is used over a certain period of time until it is entirely replaced by new fresh water. But this quickly leads to bacterially contaminated process water and thus high volumes of wastewater need to be disposed of and equally high volumes of fresh water is needed for replenishment.

Texel, one of the leading agricultural cooperatives in South Tyrol / Italy and

pioneer for new technological standards, appointed the Luxembourgish clean-tech venture Apateq to implement a new system for the treatment of their well and process water. Contrary to other solutions available on the market, Apateq uses membrane technology to consistently remove all germs and other contaminations from the water. The company employs a proprietary process technology that prevents the membranes from clogging and thus makes them suitable for an application in the fruit industry whose wastewater is typically characterised by high organic loads ascribing to the high fructose content.

The plant that Apateq designed for Texel consists of an ultrafiltration membrane module treating 40 m^3/h and a reverse osmosis unit treating 30 m^3/h, both frame mounted for an easy installation at the client's facility. Recovery rates of the water are 90% for the ultrafiltration and 85% for the reverse osmosis. Losses are mainly ascribed to evaporation and water residues on the fruit surfaces. These losses are compensated by well water, which is treated by a manganese filter system to remove the high manganese load of more than 500 microgram/l from the raw well water.

The plant is operated by a programmable logic control (PLC) with a touch screen interface, which is integrated into the frame of the reverse osmosis unit.
A remote control function enabled observance and trouble-shooting from the distance, for example by the Apateq engineering and maintenance team in Luxembourg.

The Texel plant consists of an ultrafiltration membrane module treating 40 m^3/h and a reverse osmosis unit.

The plant is operated by a programmable logic control (PLC) with a touch screen interface, which is integrated into the frame of the reverse osmosis unit.

Fresh water savings

By implementing the Apateq wastewater treatment plant, Texel reduces its fresh water consumption from originally 75 m^3/h to less than 20 m^3/h. The effluent from the system by far exceeds the requirements for fruit handling and guarantees, thus, an impeccable quality for the whole process. With very small UF membrane pore sizes of 0.015 µm and the subsequent reverse osmosis treatment, all suspended and dissolved solids, plant protection as well as all bacteria and 99% of the viruses are eliminated from the water.

The plants' operation costs are very low due to the minimum usage of chemicals and energy, long-lifetime of membranes, long intervals between CIP's (Clean In Place), the vast reduction of wastewater disposal fees and the majority of fresh water expenses. Besides, no full-time plant operator is required. The process water recycling plant from Apateq at Texel has been commissioned in November 2014.

"We developed a proprietary technology that allows us to use membranes to efficiently treat process water from fruit processing for reuse. Our membranes do not clog fast and allow long intervals in between their effortless cleaning procedures. The Apateq solution is completely new for this market and first implemented at Texel ", said Apateq chief technology officer, Ulrich Bäuerle. Texel director Christoph Tappeiner states: "Texel stands for highest quality. We see ourselves as pioneers in setting new technical standards by applying the best technology available on the market and that is why we chose Apateq for this major project."

Besides full-solution systems for the treatment of industrial wastewater, Apateq provides, based on their proprietary technologies, compact, turn-key (municipal) wastewater treatment plants for demanding applications and oil-water separation systems for the treatment of produced water from oil and gas extraction as well as fracking flowback water. The company is headquartered in Luxembourg and today serves customers in Europe, USA and Canada. ●

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