

## **OPERATING EXPERIENCE OF 3<sup>rd</sup> GENERATION MEMBRANE MBR IN EUROPE.**

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### **Abstract**

The MBR market continues to show high growth a significant part of the installed base as either fiber or flat plate submerged membranes. Recently a market has developed for 'dry' mounted membranes where the membrane is outside the bioreactor. This allows easy access to all parts of the plant, including the membranes.

The two options available for MBR are either submerging membranes in the bioreactor itself (or in a separate membrane tank next to the plant), or recycle sludge for separation in tubular membranes. The conventional way of operating tubular membranes is based on high cross flow velocities with the consequent high energy consumption. With the move to a "greener" environment lower energy systems were required. Norit X-Flow has developed an application of the "dry" membrane concept called Airlift MBR.

The AirLift MBR development has reduced the energy requirements to a lower level than is required for submerged MBR plants.

A number of AirLift MBRs are now operating globally including Australia. Of particular interest is a medium sized, 3,6 MLD, plant operating in Holland since October 2007 treating municipal wastewater in parallel with a conventional activated sludge plant with sand filtration allowing a direct comparison of the two processes with respect to product water quality, OPEX and CAPEX.

The operational data obtained since start-up for the two processes will be reviewed with reference to the relevant parameters for the selection of either a conventional or an AirLift MBR process and where the AirLift MBR is the preferred choice the technical specification of the pre-treatment system, technical issues during construction and commissioning, process optimization and lessons learned for the design of future plants are reviewed.