

## ENERGY RECOVERY FROM FILTRATE WATER IN WWTPS

### CASE STUDY

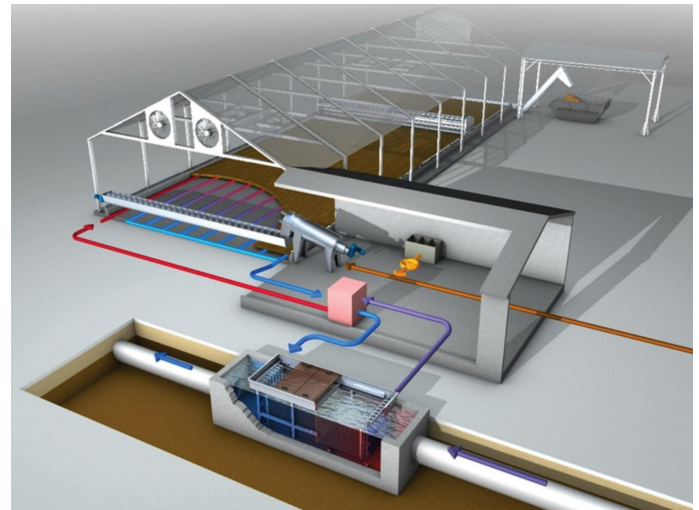
Sewage sludge disposal is a key issue on sewage treatment works. Irrespective of the way of sludge utilization, sludge weight and volume are the main causes for high costs. State-of-the-art technology offers several dewatering options but most of these solutions disregard the rich energy potential of filtrate water. The wastewater heat exchanger HUBER RoWin utilises this energy potential.

The primary goal of sewage sludge dewatering on wastewater treatment plants is to increase sludge solids contents. With the presently available state-of-the-art technology dry substance contents of approx. 30% are achieved after dewatering. Related to the inlet load, approx. 25% of water are normally extracted from the sludge. This water is returned to the plant along with the wastewater and undergoes the individual treatment steps. But the fact that the separated water has a very high temperature is completely disregarded. Due to the biological activities going on within the digester at a temperature of approx. 36° C, the filtrate hides a huge potential of thermal energy. You only have to use it!

The wastewater heat exchanger HUBER RoWin extracts and utilises this thermal energy from the filtrate water. Heat pumps can be used to further increase the effective temperature in order to provide for different possible applications of this eco-friendly method of energy generation.

The first to be mentioned is digester heating. The optimal temperature for the biological processes in the sludge tower, which is normally 36 °C, needs to be maintained. A flow temperature between 40 °C and 50 °C is required; this depends on the type of digester heating. The high inlet temperature to the HUBER RoWin unit leads to ideal performance coefficient of the heat pump. This energy circulation saves a great part of the conventional heating costs.

The recovered energy can be used to heat the social buildings on sewage treatment plants. Operating costs can significantly be reduced by using modern heating systems. About 80% of the effective energy from filtrate water can be recovered if a floor heating is used.



If an additional increase of the dry substance content of sewage sludge is required after dewatering in centrifuges or belt filter presses, the market offers several drying methods. They may be supported by the extracted thermal energy from the filtrate water, offering an eco-friendly reduction of disposal costs.

Only 18 m<sup>3</sup>/h filtrate is required to generate about 270 kW thermal output with a temperature of 45 °C by using the HUBER RoWin system and heat pump. The performance coefficients of > 4.5 achieved by the heat pump show an energy expenditure of below 60 kW. If the required electricity is generated from biogas, the financial benefit becomes even more obvious.

Especially in summer energy extraction is not only a financial benefit. As the temperature in the WWTP outlet is reduced, also the thermal input into the receiving water course is reduced and algae growth inhibited with a positive effect on water quality.

A sewage treatment plant consists not only of energy consuming units but also offers a rich energy source. The wastewater heat exchanger RoWin extracts this previously unutilized energy from the filtrate water and in this way represents the link between this economically and ecologically convincing method of energy production.