

Water and energy – ingredients for the food and beverage industry

“Recovering wastewater for reuse and creating power from organic rich effluent is no longer a concept but a reality and is being increasingly viewed as a lucrative business decision.”

Grahame Thompson, Business Development Manager for Talbot Green Energy is adamant in his statement and encourages companies in the food and beverage sector which have the correct effluent character to investigate the potential for generating energy and recovering wastewater.

Water and energy are among the major contributors to production costs; thus, becoming more self sufficient in terms of water and energy, has both environmental and financial benefits.

The focus of many companies in the food and beverage industry, as far as effluent treatment is concerned, has generally been limited to reducing effluent discharge tariffs or at most treating effluent to a quality that meets municipal standards. However, what they have failed to realize, is the true value of the effluent discharging down the drain.

Talbot & Talbot suggests a shift in this thinking and that is to motivate industries to select appropriate technologies that will enable them to treat wastewater that is fit for reuse and, at the same time, convert the organic material to methane using anaerobic digestion.

Green energy

Harvesting green energy from wastewater affords a project a dual benefit. Firstly, treating the wastewater through the anaerobic digestion process provides the industry with a substantially treated effluent. Secondly, the resultant biogas is valuable and can be used for cogeneration purposes.

In order to attach some perspective to the value, one ton of Chemical Oxygen Demand (COD) digested

produces the equivalent of 350 Nm³ of methane and 0,15 MW of power. A typical brewery producing 4 Mhl of beer per year will produce an approximate 3 MW of electricity, equivalent to 11% of the brewery's total power requirement.

A recent project completed in Thailand at a 300 t/d starch factory, showed that the energy yield is double that required for the mill's production. This renders the factory completely energy self-sufficient and the surplus is sold to the grid. Another example features a distillery that produces 100 kl/d of ethanol. This project has the potential to produce 11,3 MW of power and, if fed to a gas engine, could produce 4,5 MW of electricity, plus 4,5 MW of thermal power. In terms of fuel replacement, the same distillery could produce the equivalent of 24,3t/d of HFO or 14,2t/d of coal.

Economic feasibility

Grahame Thompson concedes that potential energy generating projects only become viable at high COD-loading rates or in areas where power and fuel is expensive. When asked to provide some estimates, he explained that economic feasibility becomes attractive when the cost of HFO, coal and electricity is greater than R2/l, R650/t and R0,2/kWh respectively. For reasons mentioned above, Talbot Green Energy focuses its efforts on the African market where the

correct effluent exists and the cost of fuel and electricity is also in the correct ballpark.

Regarding technologies suitable for wastewater treatment and biogas production, Thompson suggests partnering with a reliable team from conceptual to implementation stage and beyond, into the operation of the plants. A thorough understanding and extensive experience in various technologies is imperative for the success of a project. Within the AD technology for instance, there is an entire range of configurations; the ability to select and appropriately apply them to a specific application is a science in itself. It is only the correct selection, design and proactive management of the plant that will provide a total wastewater and power generation solution.

When considering on-site wastewater treatment it is highly recommended that industries approach a resource (water and energy) management program in an integrated manner. In order for the exercise to be meaningful and sustainable, it requires a step-wise, holistic approach that should begin with a wastewater and energy management plan (WWEMP). A WWEMP is a



One of the anaerobic digesters used by Talbot & Talbot

comprehensive undertaking that considers all site-specific conditions and reduces the risk of effluent plant failure in the long run, by establishing water management measures from factory floor to end-of-pipe treatment and beyond.



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