



Bluetongue Brewery

Water and energy reuse in F&B industry

Australia's CST Wastewater Solutions—in partnership with Global Water Engineering—is shifting the paradigm of increasing water and energy efficiencies in production plants

A water recovery plant designed to target world's best-practice water reuse standards in the food and beverage industry has exceeded its designers' high expectations in its first year of service at the new Bluetongue brewery in Australia.

The wastewater treatment and green energy plant at the AUS\$120 million Pacific Beverages' Bluetongue Brewery in New South Wales also provides valuable renewable energy for the brewery, reducing its dependence on fossil fuels and ultimately cutting overall energy needs by 15 per cent.

The plant—engineered by Australia's CST Wastewater Solutions in partnership with Global Water Engineering—has achieved all the high environmental performance targets set by Pacific Beverages, a SABMiller/Coca Cola Amatil joint venture, says CST Wastewater Solutions managing director Mr Mike Bambridge.

The plant was also a finalist in two categories of this year's Engineering Excellence Awards, Sydney 2011, conducted by Engineers Australia, which attracted a record field of more than 90 entrants. Bluetongue was a finalist in the Environmental and Heritage category and the products, manufacturing, facilities and processes

category.

Pacific Beverages designed the plant to ultimately have an annual capacity of 150 million litres, while targeting a reduction in water usage to 2.2 litres per litre of beer produced. This figure is amongst the best in the world and certainly well above the global average of four to five litres of water to every litre of beer, says the CEO of Pacific Beverages Mr Peter McLoughlin.

The GWE anaerobic technology plant employed at the plant produces sufficient green energy (methane) from its closed anaerobic reactor to power a designated steam boiler and cut the brewery's overall energy consumption by about 15 per cent. This equates to about 300,000 Mj.

Mr Bambridge says that the plant indirectly reduces the brewery's carbon footprint by reducing the brewery's demands on fossil fuels and the electricity needs for wastewater treatment by using energy-friendly anaerobic pre-treatment technology in which GWE is a world leader.

“And the plant produces treated effluent to be safely reused as process and cleaning water within the brewery, reducing by ca. 50 per cent the need for fresh water, thereby greatly contributing to reducing the amount of

water typically used to produce a litre of beer.”

Highlights of the system’s performance in its first year of service include:

1 The COD removal rates over the anaerobic reactor have consistently been above the design of 85 per cent removal. The same for the biogas production which has been better than theoretical production rates. Approximately 1,436 Nm³/d at 80 per cent CH₄ at average loading (approximately 2,157 Nm³/d at max loading).

2 The performance of the wastewater plant has enabled Pacific Beverages to be on target to meet its goal to be world’s best practice for breweries in water management by using only 2.2 litres of water for each litre of beer produced.

3 This WWTP has leading edge wastewater technologies including anaerobic pretreatment, MBR (membrane bioreactor) and RO (reverse osmosis) as well as biogas reuse. It is a model plant for the future for companies in the food and beverage industry.

The design philosophy has been to treat the wastewater as a resource from which water and energy can be recovered in addition to reducing the site’s carbon footprint.

“This is a landmark achievement of water conservation and green energy production, achieved by combining the latest versions of advanced and reliable technologies available globally,” said Mr Bambridge. “It demonstrates the technology’s practicality for extensive use not only throughout the Australian food and beverage sector—which involves more than 20,000 companies—but also globally,” says Mr Bambridge, whose company employed the latest technologies from a range proven globally by Global Water Engineering (GWE), headed by CEO Mr Jean Pierre Ombregt.

GWE has successfully built more than 250 plants producing biogas as part of the industrial effluent clean-up system, of which more than 75 were supplied with subsequent biogas utilisation systems for clients worldwide. Users of GWE technologies extend from the Bluetongue Brewery to global players such as Budweiser, Chang, Carlsberg, Coca Cola, Corn Products Int’l, Danone, Fosters, Heineken, Interbrew, Kraft, National Starch & Chemicals, Nestlé, Pepsi Cola, SAB-Miller, San Miguel, Singha, Sunkist and Tsingtao.

“Many of the latest installations use advanced technologies—including anaerobic pre-treatment of water and aerobic polishing—to enhance water discharge purities while converting waste to methane to be burned to power boiler and hot water systems, for example. Advanced technologies are also used to power generators and permanently replace fossil fuels. On average, the removal efficiency of GWE’s

anaerobic wastewater treatment installations is as high as 90 to 95 per cent, easily bringing the organic load down to regulatory discharge standards for most types of wastewater,” says Mr Ombregt.

Besides the economic advantages of GWE’s anaerobic wastewater treatment, there is also a clear environmental advantage in significantly reducing factories’ carbon footprint. This is done not only by supplying renewable energy from the closed anaerobic reactor, thus reducing or even eliminating reliance on fossil fuels, but also by replacing traditional, open, methane-producing lagoons, and by replacing power-consuming, sludge-producing aerobic WWTPs.

“The concept of using wastewater to create green energy is much more widely applicable than often realised. Any factory with a biological waste stream or wastewater with high COD (Chemical Oxygen Demand) can easily use this model to generate energy,” says Mr Ombregt. [WWA](#)

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