



## Media Release – GWE/CST– November 2014

*(Attn media including agriculture, food and beverage manufacturing, environmental, energy, infrastructure, government utility, municipal, manufacturing, materials handling, primary processing (inc pulp and paper), process engineering, safety and water and wastewater media)*



*Chok Chai Starch RAPTOR™ with fresh cassava roots, left, and Remo-Frit plant also transforming waste into green energy*

# Are food, beverage and primary processors literally pouring profit down the drain?

Many food, beverage and primary processors in the Australasian and Asia-Pacific region have traditionally viewed their wastewater primarily as a problem that has to be solved to meet local discharge standards.

They view investment in waste water treatment purely as a cost impost required to meet environmental and health standards. Some processors have made the problem even worse - and more expensive to solve - by using their settling ponds and other treatment facilities as a place into which to deposit process failures entrained in their waste streams.

**This only adds to the investment and energy costs required (for diffuser and other technologies) to get the waste water up to legal standards for disposal within local regulations.**

**The result of such practices is not only environmental groundwater and discharge hazards, but also increasing community objections from neighbouring residents. Far more urban communities are now focused on these problems as pressure on land resources as increasing urbanisation throughout the Asia-Pacific places food, beverage and primary processing plants closer to expanding communities. Activists in these communities are not slow to let companies know what they think of smells, noise and discharges emanating from factories.**

**So, many forward-thinking companies are taking the initiative to search the globe for best practice methods to achieve as close to possible as zero waste in their plants, often through prevention of biowaste in the first place and often through re-use of potentially contaminating products into useful forms.**

**One of the most dramatic but least publicised results of this search for excellence is the installation by hundreds of processing plants around the globe of anaerobic digestion plants to not only remove nutrients (BOD, COD) from their waste water and solids waste streams, but also to convert the waste itself into biogas (methane) to replace fossil fuels.**

**The best of these technologies not only remove up to 99 per cent or more of organic matter from waste streams, but also provide an ongoing and reliable source of base load green energy for profitable use. Unlike windmills and solar power (which have excellent applications in some situations), this biological source of energy can be tapped on demand to fuel boilers and heat processes, or even to fuel generators to sell electricity back into the local grid (a great advantage in areas of the Asia-Pacific where electricity production can be highly centralised, and major losses may be incurred in transmitting energy across long distances. Companies who sell electricity back to the grid may also earn carbon credits in doing so. This can be a key competitive advantage for companies in industries such as food, beverage and primary production.**

**As a result of their efficiency, anaerobic digestion facilities have been recognised by the United Nations Development Program as one of the most useful decentralised sources of energy supply, as they are less capital-intensive than large power plants. They can also benefit local communities by providing local energy supplies and eliminate the need for large and often smelly and environmentally challenging lagoons.**

## Anaerobic digestion

Anaerobic digestion is a biological process whereby bacteria break down organic material into more basic compounds without requiring oxygen as a component of the process.

Modern anaerobic processes can vastly concentrate the process in environmentally harmonious closed reactors, operated under ideal temperature and process control to optimise waste consumption and, in the process, generate large quantities of methane (CH<sub>4</sub>) from the organic materials in the wastewater. The same technology can be applied in covered lagoons, with less control and efficiency than reactors but at a lesser cost and still with considerable green energy gains.

“The quantities of methane produced by anaerobic digestion can diminish or even completely replace the use of fossil fuels in the production process,” says Mike Bambridge, Managing Director of CST Wastewater Solutions, which is installing in Australia anaerobic digestion plants using the technologies of Global Water Engineering. GWE, with headquarters in Thailand, is headed by green Global Water Engineering CEO and Chairman Mr Jean Pierre Ombregt, who has been a world leader in anaerobic digestion of industrial effluents and green energy solutions for more than 35 years and whose company has been involved in more than 300 water and waste water projects in Asia, Africa, North and South America, Australia, China, Europe (including Eastern Europe) and Russia.

One ton of COD (chemical oxygen demand) digested anaerobically generates 350Nm<sup>3</sup> of methane, equivalent to approximately 312 litres of fuel oil, or generates about 1,400 kWh of green electricity. Multiplied over a plant over a year, this output can and does add up to millions of dollars saved on fossil fuels.

Depending of the scale of the anaerobic plant employed, the green energy generated can repay the cost of the anaerobic plant within as little as two years – and go on generating profit virtually in perpetuity.

### Industry Examples

CST Wastewater Solutions is involved in a number of GWE anaerobic installations, ranging from a fully enclosed reactor (tank) type at the Bluetongue brewery near Sydney, to a closed high-rate anaerobic lagoon (COHRAL™) type for Oakey Beef Exports on Queensland’s Darling Downs. This latter installation, scheduled for completion next year, will extract green energy biogas from its waste water streams to replace millions of dollars worth of natural gas currently consumed at the abattoir. Adoption of the technology is the result of an exhaustive selection process and the committed alliance to the environment of

**Oakey Beef Exports and its owners Nippon Meat Packers, says the General Manager of Nippon Meat Packers' Oakey Beef Exports Mr Pat Gleeson.**

**“We look to reduce our gas usage by 42-50% – so it’s massive,” says Mr Gleeson.” And natural gas costs are only going one way.**

**“Manufacturing is very tough at the best of times and we always have to be looking for solutions to reduce our costs.**

**Australian Federal Industry Minister Ian Macfarlane, who opened the Oakey plant this year, agrees – and says other meat plants will follow Oakey. “The economic payback period is quite short, so not only will they make the investment, and do things that are good for the environment, but they’ll actually get their money back quite quickly.”**



*Australian Federal Industry Minister Ian Macfarlane, right, performs the launch ceremony, congratulating the General Manager of Nippon Meat Packers' Oakey Beef Exports Mr Pat Gleeson, centre, and the Managing Director of CST Wastewater Solutions, Mr Michael Bambridge, Right, whose company installed the GWE COHRAL technology.*

**Both the Bluetongue installation and the Oakey are among GWE anaerobic installations that not only clean waste water to high standards, but also, in scores of instances, transform a process problem into a source of profit by producing green energy.**

**“But most industries have not realised the potential of this green energy cash cow – the opportunity to turn a problem into a profit, to transform an environmental challenge into a sustainability gain,” says Mr Bambridge .**

**“These technologies that transform waste and waste water into green energy are eminently applicable to any industry with a biological waste water stream, including particularly food and beverage industries and agro industries with water and pulp waste streams such starch and sugar pulps, vegetable or potato waste.”**

**An example of an Asia-Pacific company that does convert pulp waste to produce greater quantities of green energy is provided by the Chok Chai Starch tapioca starch plant in Uthai Thani, Thailand. This project is a finalist in the energy category of the prestigious 2014 IChemE global awards run by the Institution of Chemical Engineers representing 40,000 members across 120 countries.**

**Chok Chai uses groundbreaking GWE RAPTOR™ anaerobic waste water technology coupled with ANAMIX™ thermophilic digester for the processing of waste cassava pulp. The RAPTOR™ system greatly reduces an environmental pollution issue by processing and converting to useful green energy the leftover fresh pulp, which starts to ferment once stored. Such rotting organic material can generate considerable odour and release heavily polluted wastewater leaching out of mountainous pulp piles.**

**Another company to deploy the RAPTOR™ system is the global exporter of processed potato products, Remo-Frit, which has won international acclaim for demonstrating the environmental and economic benefits of converting waste products into green energy.**

**Global Water Engineering Ltd (GWE) built a complete wastewater treatment plant and a RAPTOR™ plant for the solid residues of the Remo-Frit potato processing plant in Verrebroek, Belgium, where Flemish government Minister President Kris Peeters inaugurated the facility in the presence of GWE and Remo-Frit owners and top management. The Flemish Government invested 0.5 million Euro as a grant.**

**Energy savings produced by biogas production at Remo-Frit are achieved in perpetuity, with fossil fuel equivalent savings totaling \$US40 million (nearly Euro 30 million) in the first decade at today's prices.**

### **Conclusion**

**“Like forward thinking Asia-Pacific companies, Europe's food and beverage producers are highly focused on minimising waste and making the most of by-products in re-use, recycling and recovery,” says Mike Bambridge.**

**“But most industries have not realised the potential of this green energy cash cow because they have mainly been focusing on treating their effluent to meet local discharge standards at the lowest possible investment costs. By doing so, wastewater treatment installations have only generated additional operating costs and have never been seen as revenue generators,” says Michael Bambridge.**

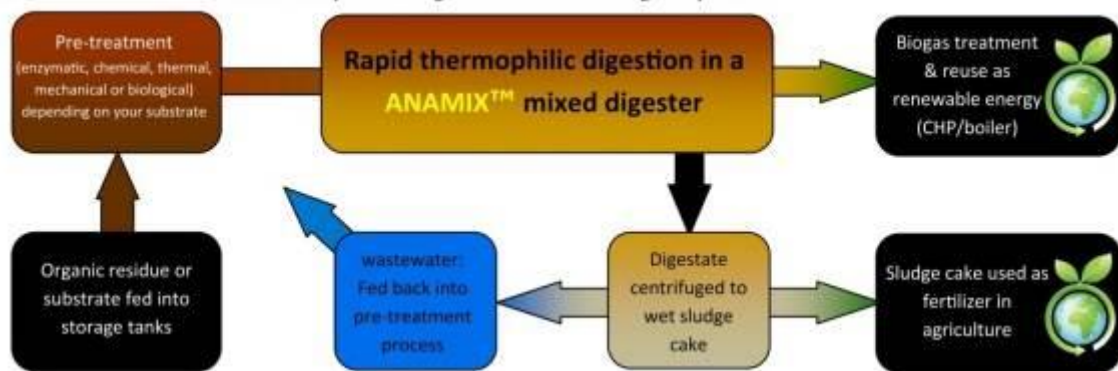
**“However, applying anaerobic wastewater treatment sheds a whole different light on the cost structure of wastewater treatment infrastructure. It can now actually become a substantial additional source of income for many factories and processing plants throughout the Asia-Pacific and throughout the world.”**

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## For Editors' information: GWE RAPTOR™

*TYPICAL GWE RAPTOR™ PROCESS - for optimized digestion and maximum green power*



GWE's RAPTOR™ technology is a powerful liquid-state anaerobic digestion process that consists of enhanced pre-treatment followed by multi-step biological fermentation. A RAPTOR™ plant is a total solution, starting with logistics for handling the energy crop and ending with the production of biogas, green electricity or steam. A wide range of organic residue types can be processed, resulting in an efficient and rapid conversion of the material to agricultural fertiliser and biogas.

RAPTOR™ technologies are particularly applicable to such industries as:

- **Food waste**, such as market surplus, kitchen waste, off specification fruit and vegetables, and excess crops
- **Agro-industry residues**, like starch and sugar pulps, vegetable or potato waste.
- **Industrial residues**, such as brewery waste (spent grain), fruit processing waste, and paper mill sludge.
- **Energy crops**, for example corn (silage), various grasses, algae.

The diversity of the material to be processed means a range of different RAPTOR™ pre-treatments are available, to allow the highest possible conversion efficiency.