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Transforming Wastewater into Green Energy

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Transforming Wastewater into Green Energy

Water Engineering has partnered Chokyeuonyong Industrial in Thailand to cut effluent COD pollution levels at its cassava production plant by more than 95 per cent gas from its wastewater to power its boilers and generate electricity for its own use and to sell back to the provincial grid.

Processing 1200 tons of cassava roots a day, Chokyeuonyong Industrial, headed by Tawatchai Yuenyong, has shown what it takes to become a leading intern citizen and good local neighbor to surrounding homes and businesses by using GWE anaerobic technology supplied by local GWE agent Retech Energy with a capa effluent a day.

The installation provides an international model of how it is possible to attain top environmental standards of wastewater cleanliness while generating green power as profits as well, says GWE CEO Mr Jean Pierre Ombregt, whose company has completed more than 300 water and waste water projects in more than 60 countries Africa, North and South America, Australia, China, Europe (including Eastern Europe) and Russia. GWE has successfully built and commissioned more than 75 t systems for clients worldwide.

Commissioned and refined over the past three years, the Chokyeuonyong installation:

Cut the Chemical Oxygen Demand (COD) pollution level of influent wastewater from 22,500 ml/l (14,525mg/l Biochemical Oxygen Demand, BOD O2) to less 1 resulting substantially cleaner discharges to treatment ponds and ultimately the environment (and in the process dramatically reduced odor from typical ponds)

Returns up to 2.7 Mw of electricity a year to a provincial power grid, PEA, which serves some areas distant from major generating sources and welcomes fresh input generated locally

Saves the equivalent of up to 21,000 liters a day of fuel oil by producing up to 34,000 Nm3 of bio gas, which is used to power the boilers and heating equipment use cassava drying and processing and to generate electricity for the large amounts of rotating equipment used in processing

Generates carbon credits under the United Nations' Framework Convention on Climate Change, through which it earns valuable internationally tradeable C representing the right to emit one ton of carbon dioxide or carbon dioxide equivalent.

Chokyeuonyong's achievement has implications for a broad range of primary processing industries and particularly for cassava-producing countries that turn this raw material into high-value starch for domestic and international markets," says Mr Ombregt.

"The UN's Food and Agriculture organization estimates that each year, some 60 million tons of starch are extracted from a wide range of cereal, root and tuber cr staggering variety of products: as stabilizers in soups and frozen food, as coating on pills and paper, as adhesives on stamps and plywood, as a stiffening agent in material for making ethanol, in non-food products, such as pharmaceuticals and thermobioplastics and even as binder in concrete.

"Our technology applies to a broad range of these crops, including particularly the 10 per cent of world starch that comes from world cassava root production of some a year. The FAO says many developing countries could strengthen their rural economies — and boost cassava farmers incomes — by converting more of that relative material into high-value starches.

"Thailand, as the world's largest exporter of starch, is well placed to show leadership in how to achieve such progress in an environmentally friendly manner. Or excellent guidance from Retech Energy's team head by Managing Director Hans Westphal — has achieved results that serve as an international model of how to right."

Chokyeuonyong's process involves an equalization basin (total volume 1600m3) with submerged agitators, degasifying basin with agitator (24 m3) in-line pH adj storage tank (25m3) UASB methane reactor (active volume 4800 m3) and biogas flare (standby, for use if required). The technology is all above-ground for simple maintenance.

GWE's state-of-the-art anaerobic treatment significantly reduces the plant's carbon footprint by avoiding the release of methane gas into the atmosphere.

The wastewater passes through several pre-treatment steps before entering a GWE methane reactor in which the wastewater's organic content (COD) is digested closed reactor, degrading the compounds and converting them into valuable biogas and cleaned effluent.

Biogas from the process is collected and reused as renewable fuel in the plant's thermal oil boiler, saving money that would otherwise be spent on bunker oil, which is fluctuations in price and which, Jean-Pierre Ombregt says, can only increase in price over time. Chokyeuonyong's excess biogas is used in electrical power generation

"Food product processing plants such as Chokyeuonyong's depend extensively on electrically powered rotating equipment, so it is very wise to have an almost infinite provides a hedge against rising oil prices and which can also be sold back into the grid," says Mr Ombregt.

Chokyeuonyong Industrial President Tawatchai Yuenyong says his company's investment program has been well justified by the outcome in terms of environment results and as a good neighbor in the local community — "Our investment program has had a very happy ending," he says.

Not only does the plant have a highly efficient wastewater system that complies with Thailand's strict environmental standards, but also it will continue to repay invest years ahead.

Results achieved at Chokyeuonyong can be even further improved by converting also its solid wastes (residual pulp from the roots, after starch extraction) into bioga GWE's RAPTOR treatment system for solid organic residues, says GWE.

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Its RAPTOR technology stands for Rapid Transformation of Organic Residues. It's a powerful liquid-state anaerobic digestion process that consists of enhance followed by multi-step biological fermentation to optimize conversion of almost any organic residue or energy crop into biogas, valuable electricity or heat.

Source: http://www.waterandwastewater.com/www_services/news_center/publish/article_002340.shtml

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