Biogas train on track for completion

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Environmental engineering company Talbot & Talbot is designing and supplying a biogas train on its first green energy project in South Africa.

The company, which specialises in wastewater and sustainable resource management, is carrying out the full turnkey supply contract of the biogas train, following the award of the contract in November last year.

Business development manager for Talbot & Talbot's green energy division, **Grahame Thompson**, states that the R5-million biogas project, which is set for completion this month, entails the use of the anaerobic wastewater digestion to produce biogas, which is to be used as boiler fuel, or converted to electricity. He comments, however, that although green energy projects such as this one have been successful in other parts of the world, South Africa has not made use of such opportunities to provide electricity.

"In South Africa, the low cost of energy has been prohibitive for these types of projects. Although the technology has been around for decades, providing biogas feed to boilers from an anaerobic digester is a specialised application, owing to the configurations of the technology available," he says.

He points out that experience becomes paramount in appropriately selecting the correct configuration of anaerobic digesters.

He adds that decision-makers in industry may also be hesitant to apply the technology, because they perceive it to be new. He points out, however, that the technology is well established internationally.

Biogas is generated from the anaerobic digestion of organic matter. It is generated in landfill sites since organic matter, such as domestic food and garden waste, is buried and compressed in a dark oxygen-free environment. For decades after a landfill site has been filled, biogas continues to be generated and released into the atmosphere. Further, biogas is made up primarily of methane and carbon dioxide, but can also contain small quantities of nitrogen, hydrogen, hydrogen sulphide, and even oxygen. With processing, biogas can be cleaned up to be a substitute for natural gas.

He adds that the methods of biogas control, managing varying methane content and biogas production are based on old technology, and that it is imperative to provide the correct anaerobic digester configuration for each specific variety of wastewater.

Talbot & Talbot is looking at expanding its operations into Africa, and targets high organic effluent streams and existing anaerobic digesters to harvest their biogas for green energy production.

The company partners with international company Global Water Engineering, which has installed 421 anaerobic digesters worldwide. These digesters collectively treat 4,2-million kilograms of chemical oxygen demand daily, and thereby can produce 480 MW of power, which is about 27% of the power capacity of the only commercial nuclear power station in Africa, Koeberg.

In South Africa alone, Talbot & Talbot has installed four anaerobic digesters in the food and beverage industry, one of which harvests the biogas generated as a fuel source for the replacement of fossil fuel. The biogas produces 10% to 11% of the production process's total energy requirement.

On-site anaerobic digestion of industrial wastewater, to produce methane, may hold the key to immediate safeguarding of power supply for many industries.

This process has many advantages over the generation of biofuel from edible crops, and Thompson says that this is particularly true in a world that is experiencing food shortages and soaring food prices.

Thompson encourages industries to focus more on waste materials, such as industrial wastewater, that can be treated anaerobically. The benefits of waste digestion are multifaceted and the process presents no side effects.

"This creation of power from rich organic effluent has become a successful reality and is being applied by an increasing number of food and beverage manufacturers worldwide, and these industries have started reaping the environmental and financial rewards," he states.

Biogas production has a significant advantage over other biofuel production methods in that it uses, strictly, waste products, and can cope with the fluctuating quality of the raw material. In addition, production costs are reduced by reducing the need for coal-generated power, since biogas is a free product of wastewater treatment.

In the agricultural sectors, biogas should be considered a downstream product.

The technology of anaerobic digestion has made spectacular advances over the last five to ten years, particularly in the field of solid and liquid/solid mixtures. Anaerobic digestion comes into its own where the biogas recovered has strategic value for the waste generator.

"The fact that this is achieved through the use of renewable green energy, usually in a cost-positive investment environment, has the added benefit of improving the quality of the effluent being discharged, and makes anaerobic digestion an appealing solution," he adds.

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