

BIOGAS for electricity

The use of boilers is the most obvious cogeneration scheme which food/beverage processors might think about (see page 36). However, biogas converters are another possibility - in which a factory's organic effluent or waste is converted via anaerobic digestion to methane for use in burners and generators, etc.

Such "green energy" - not yet well known in SA - often has an additional benefit of handling unwanted effluent or waste.

While companies may be deterred by a perception that biogas technology is new, it is in fact well established internationally.

Where such schemes might previously have been considered for idealistic reasons, they are rapidly becoming more economic as electricity prices (and effluent disposal rates) rise. Carbon credits are an additional, though bureaucracy-bound potential income stream.

Grahame Thompson, business development manager for Talbot Green Energy of SA, says one ton of chemical oxygen demand (COD) digested produces the equivalent of 350N cu metres of methane and 0.15MW of power.

A typical brewery producing four million hectolitres of beer per year can, via biogas, produce about 3MW of electricity - equivalent to about 11% of its total power requirement, he says.

Potential energy-generating projects only become viable at particularly high COD loading rates, or in areas where power and fuel are expensive (which is rapidly happening in SA).

A fundamental strategic decision which a factory owner will have to take, however, is the type of contract to enter:

- A joint venture-type agreement with a specialist biogas converter company, in which the latter company (with long-acquired skills and experience) would finance and/or run the operation, taking a large cut of the proceeds. There are many overseas companies, and a few local ones, which will do this.

- Whether to embark on such a project without such a partner. Obviously this option has a steeper

risk/return profile.

If the latter option is chosen, although biogas converters are little known in SA, there are some local suppliers and consultants who will assist.

Consultants

For medium/larger industrial projects, Talbot Green Energy appears to be the only indigenous SA company.

For smaller, more do-it-yourself projects, Biogas Power of Eston (near Durban), KwaZulu-Natal, has built up a body of knowledge on agricultural projects - particularly farm dairies and piggeries - over the past five years.

Biogas Power is now undertaking consulting projects throughout SA and has patented some of its equipment.

It is important, says Shelby Tyne, a co-founder of Biogas Power, that a biogas digester should not cost too much so that the payback period is not too long.

For instance, on Biogas Power's first farm project, the cost of the biogas digester was \$28,000, compared with an estimated \$350,000 which an overseas-technology installation would have cost.

More recently, he says, an SA farmer with 250 cows was quoted \$800,000 by a US consultancy for a biogas installation. This would have resulted in far too long a payback period for an operation of that size.

Biogas Power is able to install at lower prices, he says, because it uses own-designs and locally-sourced inputs. Its designs are based on well-established Indian biogas technology.

Biogas Power's technology is based around a patented "biobag" - basically, a flexible digester bag, which makes the system safer. In the event of methane build-up (which could result in an explosion), the methane is released.

Currently, his company has about 10 farm consulting projects, every one of which has different needs, he says. One farm may require electricity, another may need heating for boilers to produce hot water for sterilisation, etc.

Methane has the advantage over electricity of being storable, although in SA currently there is no fabricator of high-pressure vessels for methane, which have to be imported.

But not only agri-companies which are producing litter should consider installing biogas converters. Any company which has organic material as a byproduct should, because any organic material can be digested, with the right bacteria.

This includes abattoirs (digesting offal), canneries, potato chip factories, cheese factories (using whey), factories with animal bone as a byproduct, etc.

Many of these projects would be economic immediately, says Tyne.

Subsidies

Possible, promised subsidies from Eskom for cogeneration, and carbon credit revenues, might appear to sweeten the proposition. But Tyne believes that viability calculations should be done excluding these.

High "transaction costs" (mainly costs of applying) mean that carbon credits (Cleaner Development Mechanism (CDM) funding) are uneconomic for any facility smaller than a medium-sized brewery.

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For additional suppliers in SA and overseas, see this article on www.developotechnology.com (subscription required).

For more on carbon credits and biogas converters, search on www.developotechnology.com.