Business Guide Factsheets
Ref. No 87

Biogas Production

Biogas is a methane-rich gas produced from natural sources such as slurry, green waste, and waste food. Biogas can be used to provide heating, to produce electricity, or both (Combined Heat and Power - CHP).

Summary

- Biogas is produced by the anaerobic (without oxygen) digestion of organic matter by bacteria, and is composed mainly of methane and carbon dioxide.

- Since the digestion process destroys a large proportion of potentially harmful pathogens, the remaining digestate is less hazardous for the water environment when used as a fertiliser. Biogas production has recently been established on a number of farms in southwest Scotland, mainly in response to bathing water quality concerns from untreated slurry runoff from farmland during extreme weather events. These farms use the biogas for space heating and electricity used in the farmhouse.

- There are also a number of commercial biogas plants in the UK, which process large amounts of slurry from several farms and generate income from the sale of electricity.

Site requirements

Inputs: Biogas production needs a source of raw material, and is suited to dairy, pig or poultry farms where there is a source of slurry.

Equipment: The equipment consists of the bio-reactor, pumps to move slurry to the reactor, and any equipment needed to pre-process wastes e.g. shredders for kitchen waste.

Regulations: The installation must comply with all safety and building regulations. On the 1st of May 2005, a new building standards system came into operation in Scotland. All building warrant applications from this date are processed under the Building (Scotland) Act 2003, information on which is set out on the following website: www.sbsa.gov.uk.

The Scottish Building Standards Agency (SBSA) is an executive agency of the Scottish Executive to undertake the national functions related to the building standards system.

Planning requirements

Planning permission may be required, depending on the circumstances of the site. As the process is conducted for agricultural purposes, it may be argued that, for appropriate sites, it should be able to proceed under Permitted Development status. In any circumstance, it is recommended that your local authority planning department be consulted at an early stage and certainly before works are carried out.

In the case of any digestable materials supplied from other premises or farms, either slurry or vegetable matter, a waste management licence or a waste management licence exemption is likely to be required. Therefore, on that subject, SEPA should be consulted at an early stage.

Capital & Installation costs

Anaerobic digesters are expensive, but may be commercially viable where electricity is generated and sold. A biogas reactor system serving a 250 ha dairy farm, generating 20kW of electricity, may cost between £100,000 - £200,000, including slurry collection pumps and combined heat and power unit.

A larger commercial plant, generating 250kW might cost £400k to £500k, with operating surplus of £75k to £125k per annum.

Operation and Maintenance Costs

Running costs depend on the size of the plant, but an order of magnitude would be around £2,000 per year for a system serving a single dairy farm.

Savings

Savings come from reduced heating bills and income from any electricity sold. Savings and income reported at Walford College Farm (total capital cost £134,000) were reported as:

electricity generated	£17,082/year,
hot water	£2,628/year
reduced fertilizer	£2,000
reduced slurry spreading costs	£2,500

On these costs and savings, payback time would be 6 years.

Sources of Funding Support

At the time of writing, it is not clear what support for biogas projects may be available under Land Management Contracts from 2007 onwards. In any event, the following sources of assistance are relevant to the contribution that biogas production may make to heat and/or power for farmhouses.

Scottish Communities and Householder's Renewable Initiative:
The Energy Savings Trust (EST) and Highlands & Islands Community Energy Company run the Scottish Communities and Householder's Renewable Initiative (SCHRI). Householders can receive up to 30 per cent of the total cost of their project up to a limit of £4,000. Community schemes can receive a maximum grant of £10,000 for a feasibility study and a maximum grant of £100,000 for a capital project. Contact: www.est.org.uk/schri/ or call 0800 138 8858.

Loan Action Scotland:
Loan Action Scotland is funded by the Scottish Executive through the Scottish Energy Efficiency Office in support of Action Energy. Loans may be advanced against a range of energy saving measures to enable companies to take action to reduce their energy bills. It is primarily an energy efficiency scheme, but it may be worth discussing whether biomass heating equipment would be eligible.

The scheme provides interest free loans of £5,000 to £50,000. Loans can have a repayment period of up to five years. The loans are available to companies based in Scotland, with up to 250 employees. Companies must be able to demonstrate that the actions proposed will deliver the energy efficiency benefits claimed. See: www.energy-efficiency.org/howto/help/loan/index.html

Tax Incentive

Enhanced capital allowances (ECA) Scheme:
The aim is to encourage businesses to invest in low carbon technologies, and so reduce UK carbon emissions. Combined heat and power plants are included as energy saving plant and machinery. The ECA scheme is an integral part of the Climate Change Levy Programme, and was introduced by the Finance Act of 2001. Sponsoring organisations are the Treasury, DEFRA and The Carbon Trust.

Enhanced Capital Allowances (ECAs) enable a business to claim 100% first-year capital allowances on their spending on qualifying plant and machinery. All businesses that are subject to UK taxation are eligible, regardless of size, industrial or commercial sector or location.
See: http://www.hmrc.gov.uk/capital_allowances/eca-guidance-pt1.htm

Advice

Energy Savings Trust (EST) business advisers can help small to medium sized businesses make best use of the many energy and resource efficiency schemes provided by the Trust and other government funded organisations. They can also help access tax incentives and interest free loans to help finance improvements.

EST advisers can help you access:

- Free and impartial information and advice.
- Free on-site energy, waste and water audits.
- Practical guides and best practice literature.
- Low carbon, clean fuel and renewable technologies.
- Relevant training and seminars.

Contact: **0845 458 5040**