Case study: Anaerobic Digestion

Soil Association Scotland

Climate change is bringing about a new set of challenges and opportunities for agriculture. While global warming may lead to extended crop growing seasons, it could also lead to unpredictable weather, new pests and diseases, and a requirement for farmers to substantially reduce their carbon footprint.

Soil Association Scotland is running a skills development programme to help farmers and growers improve their business sustainability, cut greenhouse gas emissions, reduce agriculture's carbon footprint and increase resilience to climate change.

Anaerobic Digestion

Anaerobic Digestion (AD) biogas plants break down feed stocks including livestock slurries, manures, food and abattoir waste to produce electricity and digestate for crops. AD can reduce methane emissions, help to manage waste locally and reduce farm reliance on bought in fertilisers.

Energy costs on farms are rising significantly. In using anaerobic digestion, Gask Farm not only reduces costs, but also generates electricity which they sell to bring in extra income.

Gask Farm, Turriff, Aberdeenshire

Gask is an arable and pig farm run by John Rennie and Sons. The farm has 800 acres of arable crops and 280 breeding sows, with all progeny fattened on the farm, producing finished pigs at 116kgs.

The AD plant was started up in late 2006 and uses all the slurry from the pig enterprise. The slurry along with locally sourced abattoir waste and glycerine is fed five times a day by a fully auto automated system into the anaerobic digester.

The digestion process produces gasses – 67% methane and 32% carbon dioxide. The methane powers two 230kW engines which in turn power an electrical generator.

About 15% of the electricity produced is used to run the facility and the rest is exported to the national grid.

Photo credit: Gask Farm

Benefits

- AD diverts biodegradable materials from landfill sites and treats manures, which reduces methane emissions.
- AD can manage waste locally and reduce both transport movements and emissions.
- AD produces digestate, a liquid that contains nutrients in a form easily available to plants. Gask Farm uses digestate to grow cereal crops, which reduces their need for bought-in fertilisers.
- Digests need to be analysed and matched with soil analysis to get optimum benefit.
- Gate fees from brought in feed stocks can bring in extra farm income.
- The electricity can be used on farm or sold to the national grid. It is also eligible for Feed-in Tarrif payments.

Considerations

- You need to look in advance at planning a grid connection. You also need to discuss your plans with SEPA.
- You need to manage the digester carefully to keep the bacterial population stable. Make sure you have secure feed stocks to provide a consistent diet.
- You need a reliable high-yielding source of slurry to make the plant viable.
- Regular maintenance is essential to prevent the build up of feedstock contaminants in the digester.
- Large-scale plants are likely to be more viable than small-scale. You may be able to establish a collaborative plant with another farm. This also increases feed stock availability.

Sources of further information

John Rennie & Sons, Gask Farm, Turriff, Aberdeenshire, AB53 8BP **Tel:** 01888 563205. **Website:** www.gaskfarm.co.uk

Weltec Biopower, UK agents Greenplan Agricultural Technologies, 56 Gleneagles Drive, Fulwood, Preston, PR2 7EU **Website**: www.weltec-biopower.co.uk

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Biogen Greenfinch, Milton Parc, Milton Earnest, Bedfordshire, MK44 1YU **Tel**: 01234 827249
http://www.biogen.co.uk/farm-landowners.asp

SEPA Corporate office, Erskine Court, Castle Business Park, Stirling, FK9 4TR **Tel**: 01786 457700

Feed-in Tarrifs (FITS) **Website:** www.fitariffs.co.uk

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Funded by the Scottish Rural Development Programme Skills Development Scheme and the Robertson Trust

The Scottish Government Riaghaltas na h-Alba
The European Agricultural Fund for Rural Development: Europe investing in rural areas
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