

FOCUS ON RENEWABLE ENERGY KEMBLE FARMS LTD

David Ball is farm manager for Kemble Farms Ltd. In 2008 they completed the installation of a 300kW anaerobic digestion plant, which complemented their dairy unit and provided another income following fluctuating milk prices. The plant was limited to this size by its locality to National Grid connections. For example, if they went above 300kW at its current location, they would require three miles of additional cabling. While generating electricity and making economic sense, the plant is also producing additional benefits for the environment and local residents.



- Gloucestershire enterprise of **2000 acres** of arable and **750** dairy cows
- **300kW** anaerobic digester
- **£1 million** investment
- Payback of **5-7 years**
- Farm benefit of increased fertiliser efficiency, with income from electric and heat export

THE DETAIL

How much did the system cost to install?

The entire system cost approximately £1 million. However, this includes all the anaerobic digestion equipment, additional storage and silage clamp. The majority of this was financed by the farm, but we also received a 32% grant from the Department for Energy and Climate Change (DECC).

All of the electricity produced is exported to the National Grid and as it is produced by anaerobic digestion, we receive double ROCs. At the feasibility stage we budgeted for £56/MW AD production, which rose to £71/MW by the time we were producing and lasted for six months. However, for the plant's first full year we received £42/MW and in 2010 we are receiving £35/MW. However, we are confident that these prices will rise again.

We also add maize and Glycerol (a bi-product of biodiesel) to the slurry for increased efficiency, however, the price of these inputs have both dramatically increased recently. The first two years were also a learning process, where we have honed the inputs and increased our knowledge about running the plant.



Taking all these factors into consideration I would estimate our payback to be 5 years from now, as we are running at a good efficiency, making the overall period approximately 7 years.

What other benefits have you seen?

The digestate our plant produces is dry and friable once separated and as a result we are now investigating other outlets for this product.

Another income source we are yet to pursue properly is excess heat. Currently, the dairy unit only uses the heat for washing down and we supply three herdsman's cottages near the farm. We still have more heat which we could export.

The liquid slurry is spread on the surrounding fields and acts as a fertiliser for the fodder and arable side of the farm. The liquid that has been through the system has increased benefits as the N seems to be taken up much quicker as it is more available to the plant. There has been a particularly positive response from our spring barley crop.

What challenges have you faced?

The plant requires quite a lot of maintenance; in particular we have experienced mechanical problems with the combined heat and power unit. This was mainly as a result of impurities in the biogas having come from slurry digestion.

As with any new technology there is also a steep learning curve and it has taken us about two years to learn how to manage the plant and run it efficiently.

Our large digestate storage capacity allows us to target our applications to crops so as to make maximum use of the nutrient value rather than spread just because the store is full.

What do your fellow farmers think?

The groups I have had around are all very interested in the technology and reducing their reliance on buying in artificial fertilisers. However the cost, scale and complexity of the technology are still overarching worries.



'The figures and information expressed in this case study are specific to the farm involved. Farmers should take their own professional advice about the likely costs and benefits of using renewable energy, and take professional advice about the legal, tax, planning and SPS / agri-environment scheme issues that may be involved in renewable energy installations.'

For advice and information on how to apply this approach to your own farm, take a look at FACTSHEET 17: FOCUS ON FARM ANAEROBIC DIGESTION

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