

RENEWABLE ENERGY BEST PRACTICE CASE STUDY
IRISH ENERGY CENTRE, RENEWABLE ENERGY INFORMATION OFFICE

ANAEROBIC DIGESTION AT BALLYSHANNON FARMS

Site: Adamstown, County Wexford

Starting-up date: 1995

1. AIM OF THE PROJECT

The anaerobic digestion unit was commissioned to provide a number of integrated solutions for the 200 dairy cow herd and cheese making enterprise at Ballyshannon Farms. These solutions include a back-up power source necessary for cheese/dairy operations, high quality natural fertiliser for the farm and an environmentally sustainable waste treatment process for handling manure and waste whey.

2. DESCRIPTION

The anaerobic digester runs on cow slurry in winter, pig slurry in summer and whey from cheese production throughout the year.

The digester unit is an insulated 200 m³ rectangular, concrete tank with a fibreglass lid. The retention time for slurry within the tank is 20 days. The operating temperature is 36 °C. Agitation is achieved by recirculating gas through the tank.

Slurry leaving the plant goes through a separator and the thin separated liquor is pumped through a heat exchanger to preheat the cold incoming slurry, which is then stored in an overground tank. Night-time gas production is stored in gas bags to maximise day-time electrical generation.

The gas is burned in a 2-cylinder horizontal, open crankhouse 360 degree twin National Engine with a displacement of 150 litres. This 60-year-old model was chosen in favour of a more modern design due to its large size and slow running speed, which reduces wear and tear, minimises the formation of corrosive by-products and allows more complete combustion.

The engine generates 100 kW electric power and heat is recovered from both the cooling water and exhaust gas.

3. OWNER

The plant is owned by Ballyshannon Farms - a private enterprise combining a dairy farm with cheese making - the well known Irish brand, Carrigbyrne.

4. INVESTMENT AND FINANCING

The total capital costs for the unit were in the region of IR£60,000, breaking down to IR£36,000 for parts and equipment, IR£12,000 for civil works and IR£12,000 for electrical infrastructure. Revenue from electricity sales is estimated at just over IR£13,000 per annum, with revenue from the sale of compost and hot water estimated at a further IR£5,000 each per annum. The plant also provides annual savings of IR£2,500 on energy bills and IR£5,400 on fertiliser. The annual running costs are estimated at IR£10,000 and the projected simple payback period is 3 years.

5. RESULTS (ENERGY DETAILS)

Biogas production from the unit is 600 m³ per day, translating to an energy value of 3,900 kWhrs. The efficiency of the engine for electricity production is 30 %, generating 1170 kWhrs electricity. In addition, 1365 kWhrs heat per day is produced.

6. ENVIRONMENTAL IMPACT

The plant contributes to environmental protection by controlling emissions of the potent greenhouse methane, which is generated through the natural decay of organic waste. In addition, it displaces the need to burn fossil fuels. Relative to untreated manure, the soil conditioning by-products have the advantages, in terms of landspreading, of pleasant odour, reduced B.O.D. and disease-causing potential and improved fertilising properties.

7. USERS

There is potential for the project to be replicated at farms of this size around the country. The technology can prove most economic where animals are farmed intensively and housed indoors for a significant portion of the year.

8. MAIN MANUFACTURERS AND SERVICE SUPPLIERS

Project Design and Management

Ballyshannon Farms, Adamstown,
Enniscorthy, County Wexford.
Tel +353 54 40560; Fax +353 54 40779

Pumps

ABS Pumps, Clonard Road, Wexford.
Tel +353 53 43200; Fax +353 53 42335

9. MORE INFORMATION

Ballyshannon Farms, Wexford.

Irish Energy Centre,
Renewable Energy Information Office,
Shinagh House,
Bandon, County Cork.

Tel +353 23 42193 Fax +353 23 41304.
email renewables@reio.ie
Web <http://www.irish-energy.ie>

RENEWABLE ENERGY BEST PRACTICE CASE STUDIES

This case study is reproduced from the 'Renewable Energy' Best Practice Projects Yearbook, which is a reference of THERMIE supported projects.

Ten Irish renewable energy case studies are available :

- Anaerobic Digestion at Ballyshannon Farms
- Micro-Scale Hydropower Project
- Housing Development with Solar Heating
- Small-Scale Wind Energy Project
- Anarget Hydropower Site
- Solar Water Heating for a Family Home
- Landfill Gas Utilisation Project, Dublin
- Restoration of Cahir Mills
- Kenmare Hydropower Station
- Use of Wood Waste for Heat Production at the Willamette Plant

Each case study is available free, either as a colour A4 publication with photograph, or in text format as above. To request further copies, contact the Renewable Energy Information Office at the above address.