



Intelligent Energy  Europe



Biogas plant EARL Les Brimbelles

INTRODUCTION

Fabienne et Francis Claudepierre owns a dairy farm conventionned "Agriculture biologique". This is located in Migneville (North East of France).
1200 m³ of liquide manure and 80 m³ of white and green water.

Biogas is then valorised in electricity and heat.

Investment was 160 000 € (plus setting of standards). The return of investment time is estimated around 6 years.

KEYWORDS

- CHP : Combined Heat Power
- Digester
- Fertilisers production
- 6 years depreciation



CONTEXT

EARL Les Brimbelles manages cattle of 60 dairy cows which mean 91 livestock's units (plus juveniles). The livestock is on open housing (loose boxes) with an area for feeding yoke cow traps. The rest of the herd is on deep litter. All the livestock spends 7 months indoors and only 3 hours per day during the last 5 months.

To set of standards, Mr and Ms Claudepierre decided to include a methanisation unit on their exploitation. 3 mains objectives were to reach:

- was carried out before the methanisation unit building.

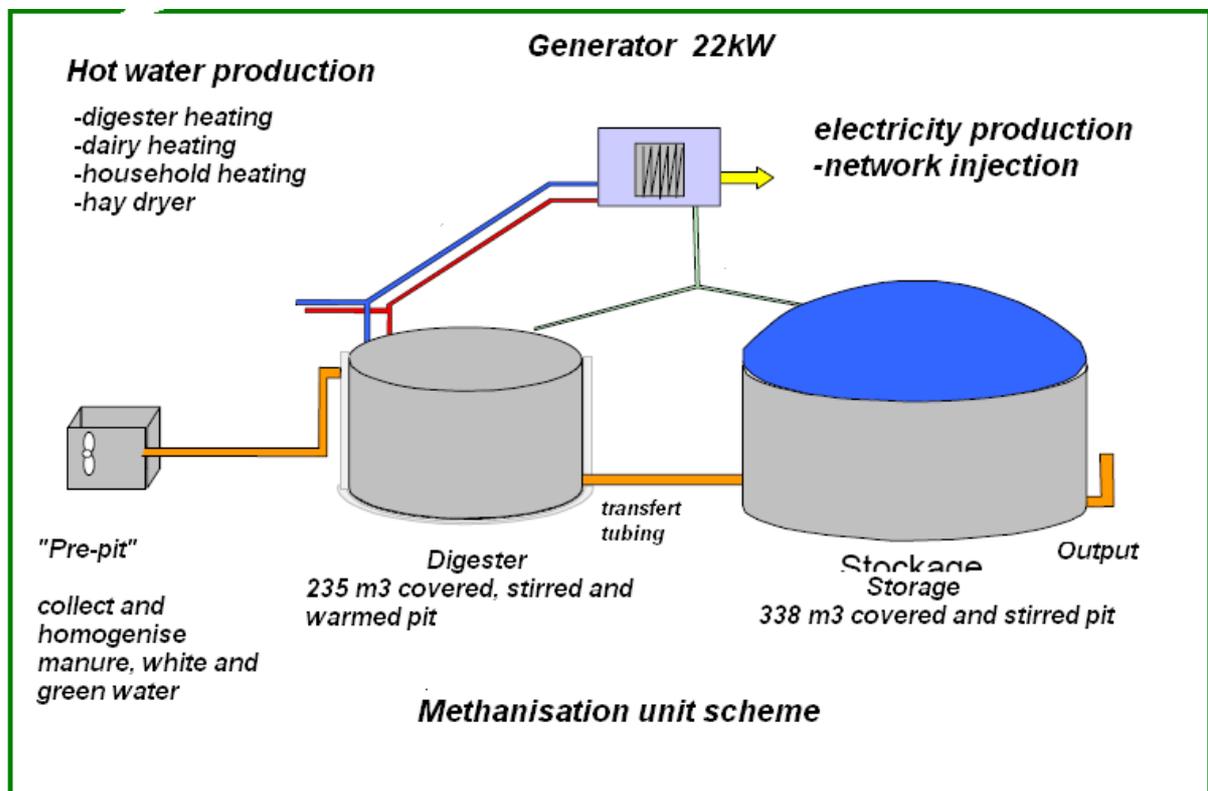
- water quality preservation by breeding effluents treating

- service activity creation (renewable energy producer)
- high quality milk production to meet the requirements of organic agriculture..

The unit treats 1200 m³ of liquide manure and 80 m³ of white and green water. 1,5 m³ is also treated each day.

Effluents are then spread on the 110 ha of the exploitation.

Biogas is converted in electricity. All electricity is sold to EDF (French national electricity company) and the heat produced is used to warm the digester, household, the dairy and the hay dryer.



TECHNICAL OVERVIEW

The digester is under continuous stirring. The farmers set themselves the wooden framework for the cover, PVC tubing and the plumbing system.

A « pre-pit » of 70 m³ collects substrates. Here they are stirred and pumped until the digester (12 m far) via a grinding pump.

The digester is 235 m³ concrete-pit. It is totally isolated (styrodur plates) and equipped with a heating system (40°C)

The pit is covered by an EPDM membrane. To ensure substrates homogenisation, an agitator is disposed inside the digester.

Organic residues are transferred in the second pit by overflowing.

The storage pit is based on the same building as the digester. Only the capacity differs (338 m³)

PERFORMANCE

350 m³ of biogas are produced per day.

Biogas converted in the gas turbine generator set provides 100 000 kWh (el) and 200 000 kWh (th) per year.



Technical data		
Construction year.....2002-2003		
Wastes	Bovine liquid manure	1200 m ³ /year
	Green and white waters	80 m ³ /year
	Lactoserum	540 t/year
Volumes	Digester	235 m ³
	Residues storage pit	338 m ³
Methanisation	Residence time	80 days
	Temperature	30 °C
Co-generation	Gas production	350m ³ /day
	Electric power	22 kW
	Thermal power	44 kW
	Electricity production	100 000 kWh/year
Hay Dryer	Heat production	200 000 kWh/year
	Amount	
	Drying time	35 days (12h/day)
	Heat used	15 000 kWh
	Quality of the dried hay	0,82 Feed Unit

FINANCIAL ASPECTS

Total investment was 160 000 € (without the hay dryer). 55% of the cost was granted by ADEME, Conseil Régional de Lorraine and PMPOA (standards organism).

2500 work hours were spent for this project.

Each year, the farmers receive 14 000 € (7800 € for electricity selling, 6200 € for heat and fertilisers savings)

Annual cost for maintenance are mainly due to the cogenerator (around 2000 €).

The return of investment time is estimated around 6 years

Investment detail (2005)	Costs (€)
Cogeneration unit	20092
Pumps, stirrers	8417
Propane line	1853
Geomembrane	3649
Propane pit	700
Others	3560
TOTAL Equipment	38271
Study and building authorisation	2552
Isolation	3540
Earth work	12420
TOTAL Civil Engineering	23935
Electric connection system	12017
Heating connection system	11541
Biogas connection system	10180
Others	3981
TOTAL intern connection	37721
EDF connection	16742
Activation costs	3750
OVERALL TOTAL	125119



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