

Handout of presentation on community biogas by Andy Bull, SWEA, UK

# Anaerobic Digestion (AD)

Andy Bull  
Senior Project Manager  
Severn Wye Energy Agency  
Wales Office, Builth Wells

Energy 21 – 'Community Energy Transition' Seminar  
August 16-18, 2008, CAT, Wales, UK

[http://www.inforse.org/europe/seminar08\\_Energy21.htm](http://www.inforse.org/europe/seminar08_Energy21.htm)

The sole responsibility for the content of this document lies with the authors. It does not represent the opinion of the European Commission. The European Commission is not responsible for any use that may be made of the information contained therein.

An "Intelligent Energy for Europe" project

7 promoting regions

Experienced partners from Germany and Austria

## The BBC journalist's version:-

**Cow dung could power eco-village**

Homes in a new Pembrokeshire eco-village could be fuelled by cow dung. The plans to pipe methane gas from a dairy are part of the winning design for the Lawrenny EcoVillage Project near Pembroke Dock. The designs were selected earlier this week after a competition to build a carbon-neutral village. The news will also be welcome relief to local people after the 35% rise in British Gas prices announced on Wednesday. The proposed 30 homes will be supplied with gas from a huge vat which will collect the cattle's waste. While it takes just 30 cows to produce a tonne of dung a day, the energy plan will see the village's existing cow herd double to 350 to ensure enough end product.

## The reality is a little more complicated!

Think of the "huge vat" as an artificial stomach. It likes:-

- A balanced diet
- Warm even temperatures
- Constant feeding
- Care and attention

## And it isn't all about Cow Muck

(as anyone who listens to the Archers will tell you (apparently))

Huge range of feedstocks with a huge range of gas yields.

Any readily bio-degradable material:-

- Agricultural residues
- Energy crops (including grass silage)
- Food industry residues, including some abattoir wastes
- Source-segregated food waste
- Grass cuttings

But NOT

- Woody waste
- General garden wastes – stones and soil

Needs to be balanced to get digestion process right and digestate useable

waste products may also attract a "gate fee"

Somewhere to store and/or receive the feedstock

The nature of the store/reception building will depend upon the feedstock  
A weighbridge may well be necessary

Handout of presentation on community biogas by Andy Bull, SWEA, UK


**Feed-in**

Little and often  
System will again depend upon the feedstock – could be largely automated




**The Digester**

- Huge vat
- Stirrers of one sort or another
- Gas storage
- Emergency flare
- Often more than one tank



**“Retention Time”**

Depends upon feedstock  
Typically 25-60 days  
It is an average time as the digester is trickle fed  
Critical to calculations





**Pasteurisation**

Necessary where food-waste is involved – “Animal Bi-products Order”

It is a reaction to the Foot and Mouth outbreak but catches veggies too!


**Using the Gas**

- Some heat is required for the process
- “normal” solution is electricity generator
- Heat should be used wherever possible
- Bio-methane for vehicles
- Mains feed-in

**Don't throw away energy**

It is really difficult – especially in the UK it seems – but dumping energy is scandalously inefficient



Handout of presentation on community biogas by Andy Bull, SWEA, UK

### The digestate




- Liquid. Direct replacement for NPK fertiliser – need 6 months storage capacity
- Solid. Soil improver
- PAS110





The plant will run itself for much of the time but someone must be close at hand all of the time

Pretty much fully automated



### Is it a “community” technology?



Well – that inevitably partly depends upon your definition of “community”

### YES – it is ideal for communities

- Working at its best when feedstocks are extremely local
- Can supply heat to the neighbourhood
- Feedstock quality control could be higher if the community has a direct interest
- Reliable technology with good income (double ROCs)
- Part-time but always available labour requirement
- Local use of digestate

### NO – it doesn't suit community development at all

- High(ish) capital costs
- Income uncertain in the medium/long term
- Difficulty of securing longer term contracts
- Complex (ish) regulatory procedures
- Planning process might divide communities?
- “Big boys” will join the party and try to squeeze out the smaller players
- Requires skilled and competent operators

Handout of presentation on community biogas by Andy Bull, SWEA, UK

**BIOGAS PLANTS DEVELOPMENT FOR INVESTMENT**  
**QUICK CHECK – K.O. CRITERIA**

1. Is the long term availability of minimum 2000 t/a of substrates ensured?
2. Is there enough area of land available to spread/use the digestate, or is it possible to market it as a fertiliser?
3. Is it possible to connect the biogas plant to the energy (power and heat) network at reasonable rates?
4. Is there a commitment to inform the general public who might be affected by the project before the development is submitted for planning permission hand? (This process might to avoid opposition)
5. Can the approval conditions to build the biogas plant be fulfilled and the necessary licenses be obtained? Is it likely that planning permission will be granted – eg Are the vehicular access and nearby public highway networks suitable for the safe transfer of feedstocks into the site? b. Does the site, or other land close by, carry a conservation designation that will inhibit the construction of the plant? c. Does the site have near neighbours that are likely to be sensitive (eg school or residential)? d. Is the site particularly prominent in the landscape with little opportunity for adequate screening?
6. Is there enough space available to build the biogas plant without interfering with normal business operation of the proposed site?
7. Is there enough skilled manpower available that, with suitable training, could operate the biogas plant?
8. Is there a reasonable prospect of adequate financing of the project being secured?

**Note: If "NO" is the answer to any one of the above criteria, then the viability of the project is questionable.**

**Do we have a scheme?**

**The key determinants.**

**Can we get enough feedstock?**

**2k tonnes or a leap into the unknown (ish)**

Cwmharry Land Trust collect food waste for Powys CC

**If you think that you can get the feedstock (and keep it coming for at least 10 years) – only then start looking for a site!**

The site will often almost self-select – but will the planners agree?

**AD is a fantastic technology**

**BUT**

**It isn't for the faint-hearted**

**A biogas plant isn't only for Christmas!**

**We are here to help!**  
 especially if you are in Powys, Monmouthshire, Gloucestershire or Wiltshire

Andy Bull  
 SWEA  
 Wales Office  
 Entrance A  
 Royal Welsh Showground  
 Builth Wells  
 LD2 3NJ

Email: [andy@swea.co.uk](mailto:andy@swea.co.uk)  
 Tel: 01982 551006

(or various regions of Belgium, France, Italy, Spain, Slovenia and Poland)