FRE-ENERGY

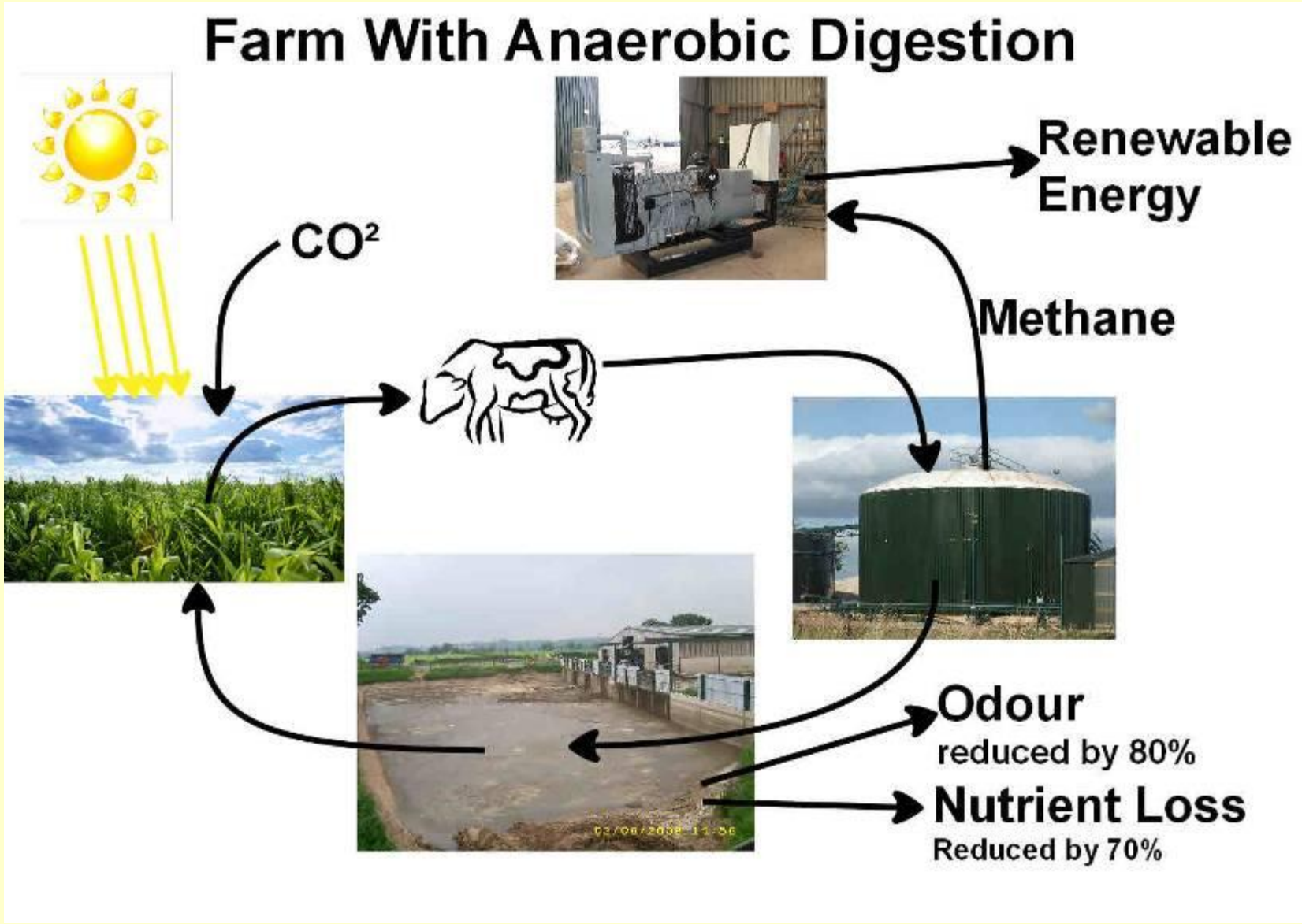
Anaerobic Digestion

"A local solution to a global problem"

Farm
Renewable
Environmental
Energy Ltd

www.fre-energy.co.uk
Tel: 0845 8330504

What is AD


Farm With Anaerobic Digestion
Renewable Energy
CO²
Methane
Odour
reduced by 80%
Nutrient Loss
Reduced by 70%

Anaerobic Digestion

a natural fermentation process

Diversification

Get Another Job!

Options:

- Go Organic – (Get into a niche market)
- Get Bigger – (Borrow more money then run faster to stand still)
- Farm Shop / Box scheme
- Add value on farm (Ice Cream, Cheese, yogurt…)
- Livery
- Caravan Site / Storage
- Golf Course
- Barn Conversions – (for sale or holiday let)
- Farm House Bed & Breakfast
- Give up & become a Consultant!

Diversifying into AD?

- AD does not detract from your core business.

  It enhances it!

- AD does not require re-skilling.

  If you understand cow nutrition you can already feed a digester.

- AD provides an alternative income stream

  Non food and independent of supermarkets – currently.

AD is **NOT** about getting another job, it's a way of making the job you already do more profitable.

How much does AD cost?

250 m3 Digester – 150 Cows – 360t Silage

- De-gritting, gas agitation and foam alleviation.
- 24 kW CHP (Combined Heat & Power)
- Gas Holder.
- Loading system, pump, macerator.
- Approximate Cost erected & commissioned

Cost	£ 207,000	
Revenue (Feed In Tariff)	£ 63,000	
Running Costs	£ 10,500	
Profit	£ 52,500	(25%)

A farm digester in Bishops Castle that has been running for 20 Years.

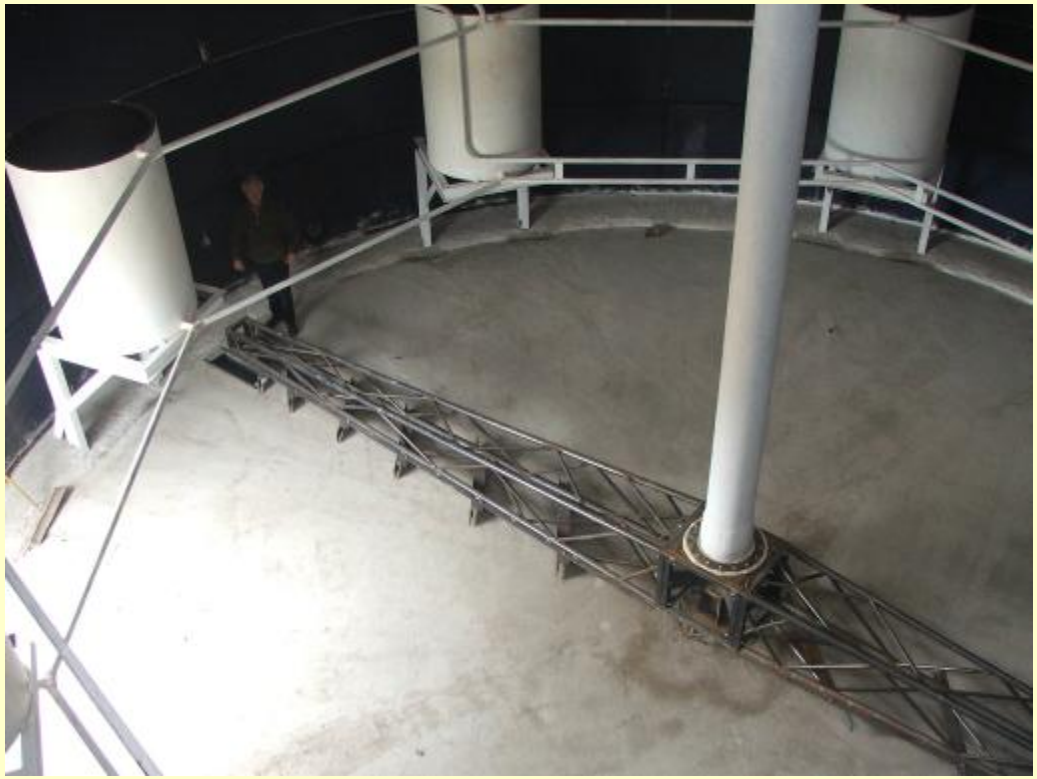
Digester on an organic dairy farm Welshampton running for 20 Years.

FRE-Energy – Lodge Farm digester running for 2 Months.

3 Years Ash Bedding

FRE-Energy – ADG system

Smart award wining patented technology



- **As dry matter digests inorganic matter sinks to the bottom of the digester gradually filling it up, reducing digester capacity.**

- **De-gritting removes the limitations on material for digestion.**
  i.e. you can still bed on sand or ash.
- **You can digest root crops e.g. Potatoes, fodder beat.**
- **You can digest high grit mucks e.g. Chicken litter.**

Minimal Parasitic Load

Energy used to run the process, is lost.

- **TOTAL parasitic load for an 250m³ gas agitated digester = 0.5 kW approx 2W/m³ of digester.**
- **For propeller or jet mixed systems this is generally 15W/m³.**
- **For an 250m³ digester this is 0.5kW verses 3.75 kW. Amounting to (3.75 x 24 x 365) 28,470 kWh per year.**
- **At 10 pence / kWh = £2,847 a year.**

Long Life Insulated Roof

- **Biogas is extremely corrosive.**
- **Heat lost is heat not available for other uses.**
- **The FRE-Energy fibreglass roof is resistant to corrosion.**
- **The FRE-Energy roof has insulation at least as good as the tank.**
- **The FRE-Energy roof has a 20 year guarantee the best you will get on a material roof is 5 years.**
- **The FRE-Energy roof will not blow away!**

Roof in construction

Health and Safety

- **There is no need to enter the gas space or break the gas seal to maintain any FRE-Energy digester parts.**
- **Gas pumps are duplicated and external to the digester.**
- **De-gritting arm is suspended from the digester roof with external bearings.**

All Serviceable Parts are external to the digester

Benefits to Farming

- The nutrients in Digestate are in a far more available form. There is between 20 & 25% better nutrient uptake.
- The AD process kills most weed seeds plus foot & mouth and TB.
- Separated digestate does not taint grass eliminating rejection.
- Digestate from AD with added food waste has far greater fertiliser value than straight slurry.

Nitrogen enhancement With AD

	Whole Cow Slurry	Un Separated Digestate	Whole Stored
DM%	7	4	7
Total N – kg/t	5.47	5.15	5.47
Available N – kg/t	3.29	4.12	0.9
% Avail' N	60.1%	80.0%	16.5%
Mineral N : Org' N	1.5	4.0	0.2
Phosphate – kg/t	1.02	1.16	1.02

Improvement in fertiliser value £22.00 per cow

Assuming 12 month housing, nitrogen fertiliser £300 / Tonne

150 Cows -> £ 3,300

Pathogen kills at 35 C

• Salmonella T.	2.4 Days
• Salmonella D.	2.1 Days
• Coliform Bacteria	3.1 Days
• Staphilococcus Aureus	0.9 Days
• Mcrob' Para TB	6.0 Days
• Foot & Mouth	1.0 Day

Figures are from the 3 year research programme undertaken by the Danish Veterinary Directorate.

What to do next?

Assessment of your own inputs.

Assessment of external inputs.

Availability of land for outputs.

Feasibility of local grid connection.

Environmental and planning implications.

Sources of funding (grants).

AD versus the three P's

Politicians.

- Are vocal in their support of AD, however the message is not getting through to the administrators.

Planners.

- Currently view AD as an industrial process best suited to industrial estates and not rural locations.

Power companies.

- Are keen to encourage renewable generation but make it very difficult and expensive to connect to the national grid. – (Turkeys voting for Christmas).

Final comment

We'll be up to our necks in water, fireballs will rage across the sky And there'll be monster hurricanes, but there'll still be a man in a suit telling us we've filled in a form incorrectly.

Unfortunately, like cockroaches, I think they will be the ones to survive climate change!

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