

Developing the use of digestate in the UK

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Government's shared goals for anaerobic digestion

- In UK anaerobic digestion will be:
- Established technology
- Produce renewable energy (for heat, power & transport)
- Mitigate methane emission from agriculture
- Divert methane organic waste from landfill

Source: DEFRA

Huge resource or problem

DEFRA calculations:

100 million tonnes of organic material
of which

12-20 million tonnes of food waste inc.50%
source separated MSW

90 million tonnes of animal manure

1.73 million tonnes of sewage sludge

Digestate output approximately 80m t/year

Source: DEFRA

Digestate a source of nutrients

Quantity difficult to assess – depends on TS content of the feedstock

Sources:

1 Biocycle

2 Indicative average

3.MAFF RB 209

Source	Total N Kg/t	P ₂ O Kg/t	K ₂ O Kg/t
Food waste ¹	8.0	2.5	3.84
Animal manure ²	6.0	2.29	6.9
Sewage sludge ³	7.5	9.0	Trace

Using the biofertiliser produced in a farm digester

	NH ₄ -N	P ₂ O ₅	K ₂ O
Crop demand /t	152	81	98
From own biofertiliser/t (Digestate from maize & grass silage, manure, & citrus pulp)	118	104	180
Deficit to be made up from mineral fertiliser	34 tonnes	None	None

Gross saving on purchase of mineral fertiliser £37,000 Euros
Source: M.A.Piper & Son Farms

Producing digestate

- Farmers own biogas plants co-digesting animal manure with energy crops
- Farm energy enterprises with food waste and other industrial residues
(**Major government initiative**)
- Local authority/ environmental resource management company owned plants (**Rapid uptake of AD**)

Producing digestate: farm plants



**Farm scale plants
5,000-30,000
tonnes per year.**

**Process own slurry
or co-digest with
energy crops**

Photo: Courtesy of Greenfinch Ltd (now Biogengreenfinch Ltd)

Producing digestate: farm energy enterprise



Photo: Courtesy of Biogen (UK) now Biogengreenfinch Ltd

Farm scale 40,000 t/ year co-digestion of pig manure with source separated municipal waste (food) collected from households, food processing plants including animal by-products, etc

Producing digestate - A centralised biogas plant



146,000 t/year Constructed in 2002 to co-digest animal manure and industrial wastes from the food processing industries including animal by-products but since 2007 co-digests mainly residues from the food processing industries

Quality protocol for production and use of quality outputs from AD of source separated biodegradable waste

- Required by the Environment Agency to define when the digestate can be used as a product rather than a waste
- Describes how the digestate is to be used
- Would not be applicable in Scotland
- Source: WRAP

Main purpose of the protocol

- Clarifies when waste controls are no longer required
- Ensures environmental protection
- Provides users with certainty that the product conforms with a standard

Source: WRAP

Need for a quality protocol

- Confidence in the product
- Clarity for regulators and regulated
- Waste status a barrier
- Development of a quality protocol depends on the existence of a quality specification
- Builds on experience from PAS 100 for compost

Source :WRAP

Key elements of standard (PAS 110)

- **Defined input list**

 - Source segregated biowastes

 - Biodegradable non –waste material

 - Allows for packaged waste

- **Supply agreement with waste supplier**

 - AD operator knows what inputs are

 - AD operator undertakes analysis as appropriate

- **Process control**

 - A badly run plant will produce a bad product

 - Minimum quality set for whole digestate & separated fibre

Source: WRAP

Pasteurisation

- ABPR treatment or equivalent for all waste
- Pasteurisation required if material moved between farms
- **Not required if the input material is produced and used on the same farm**

Regular sampling and analysis covers
pathogens, PTEs, stability, physical contaminants
& provides nutrient declaration

Source: WRAP

The current position

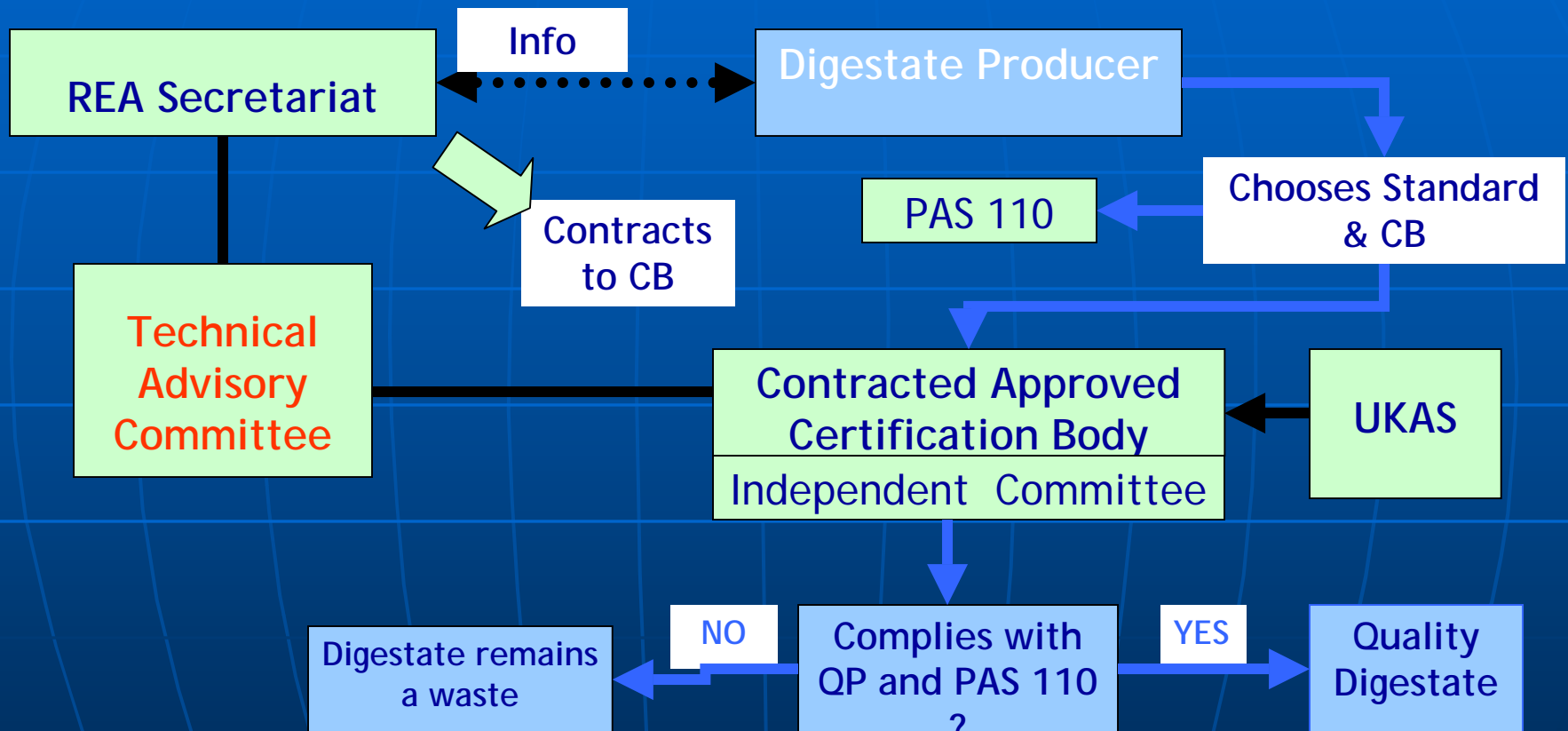
- Quality protocol awaiting signing off by the EC Technical Standards Committee – Formal issue 2009
- PAS 110 (the Standard) awaiting the final work on the stability and the PTE limits
- Aim to finalise Spring 2009
- Will be available as pdf

Government capital grant support

WRAP organics capital grant programmes

- Proven technologies
- 16.15 M Euros (England, Scotland NI)
- Welsh Assembly 42.4M Euros capital grants
- New Environmental Transformation Fund
- Cutting edge technology 10.06 M Euro (England only)
- 106 M Euros announced in the April 2009 budget for the anaerobic digestion of food waste
- Exchange rate 1.06 Euros = £1

The route to certification



Source: Renewable Energy Association

The UK moves forward

- Support measures at an unprecedented level with AD on the brink of a massive expansion
- Digestate as a biofertiliser about to become a major supplier of plant nutrients.
- What PAS 100 did for compost PAS 110 will do for digestate as a biofertiliser

Sponsors supporting UK attendance at the IEA

- The UK industry would like to thank DEFRA for their subscription to the IEA Bioenergy Task 37 BERR & DfT Task 37 (UK) would like to thank its sponsors of support: Agri-food & Biosciences Research Institute, Biogen (UK), Bioplex Technologies, Biffa Waste Services, Biogas Nord, Country Land and Business Association, Renewables East, Greenfinch, Hardstaff Group, Organic Power, Royal Institution of Chartered Surveyors, Summerleaze, Sustraco, Univ. So'ton, Veolia, Xergi A/S, WEDA-GB & the many others who make up the new network for dissemination

UK on the move

- Support measures at an unprecedented level with AD on the brink of a massive expansion
- Digestate as a biofertiliser about to become a major supplier of plant nutrients.
- What PAS 100 did for compost PAS 110 will do for digestate as a biofertiliser