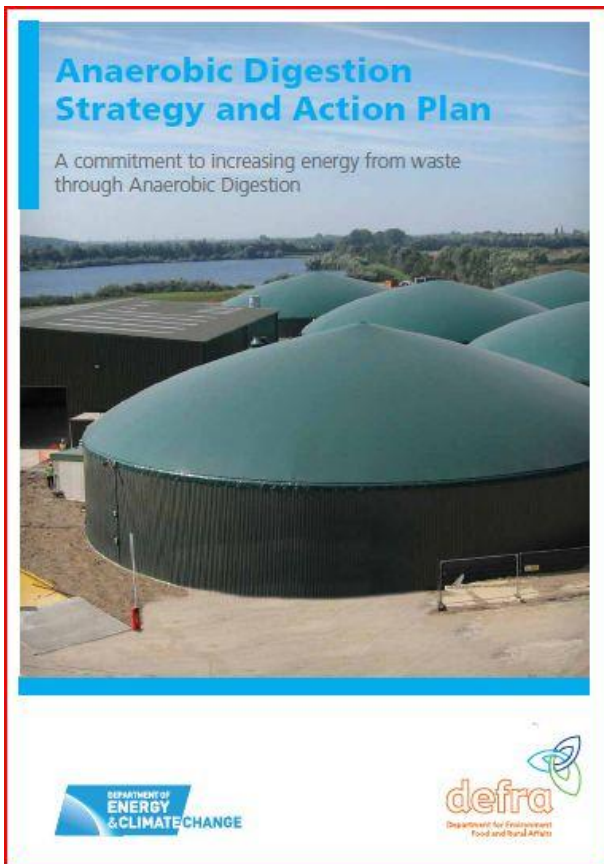

Work on AD in the UK

Nina Sweet

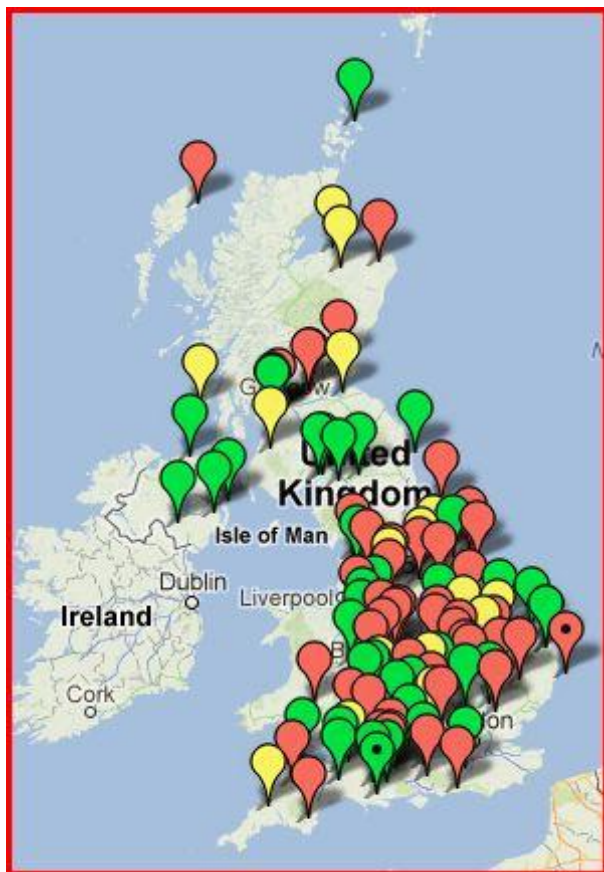
WRAP

AD Strategy/Action Plan



- **Published June 2011. About increasing energy from waste through AD**
- **Progress report published last year**
- **Most actions will be completed this year**
- **Chance to take stock of what has been achieved and how to take forward in the future**

The AD landscape (February 2013)



- **Total: 106 plants**
- **Waste feedstocks: 47 plants**
- **Farm feedstocks: 42 plants**
- **Industrial: 17 plants**
- **54 when AD Strategy published**

Work areas in the AD Action Plan

**Improving our understanding
of the AD baseline**

Building UK skills

**Building safe and secure
markets for digestate**

**Raising awareness of AD –
Community AD and localism**

**Building markets for
biomethane and transport
fuels**

AD in the rural community

Finance

Regulation



Regulation

- Many changes/simplifications introduced by the Environment Agency:-
 - New Standard Rules for permits
 - Framework for assessing novel inputs
 - Changes to the Quality Protocol and PAS 110
 - Development of a Quality Protocol for Biomethane
- New Biowaste Regulatory Forum
- New permitted development rights introduced by DCLG for small on-farm AD plants

Finance

- AD Loan Fund established. Two loans offered:
 - £800k to Malaby Biogas (Wiltshire), 20,000 tonnes capacity
 - £850k to Emerald Biogas (North East), 50,000 tonnes capacity
- AD also included within scope of Green Investment Bank. Already two investments.
- Other actions to facilitate investment e.g. the WRAP/ADBA due diligence templates

Knowledge and Understanding

- Baseline report published September 2011
- Updated information on plants, benefits and research via the portal
- Feedstocks portal
[www.wrap.org.uk/FWRP]



Building safe and secure markets for digestate

- Field trials on digestate use in agriculture and knowledge awareness are ongoing
- Trials of use in landscape and regeneration
- Reports published include:-
 - Digestate enhancement and novel products
 - Market expectations

Training and Skills

- National Occupational Standards developed by EU Skills
- Work in progress – needs to be reviewed
- Also need for training providers to consider whether they need to change courses etc to meet the NOS.

Raising awareness of AD – Community AD and localism

- Case studies of different types and scales of operation
- Driving Innovation in AD – including focus on small scale. Two phases.
- Four projects specifically on small scale being taken forward to demonstration stage

Building markets for biomethane and transport fuels

- Report by Low Carbon Vehicle Partnership on HGV cost modelling
- £9.5 m low carbon truck programme launched

AD in the rural community

- OFGEM group made recommendations to make it easier and cheaper to inject biomethane into the grid
- Defra workshop on sustainability of crops feedstocks



Questions

- In which areas have there been most and least progress?
- Awareness of Strategy work, for example on digestate or Driving Innovation?
- How helpful have the actions been in getting projects off the ground?
- Have the barriers to AD changed since the Strategy started?
- What are the top priorities now and how should the industry take these forward?

The food waste resources portal released in May 2013 via www.wrap.org.uk/FWRP

Food Waste Resources Portal

A collection of food waste reports from across the UK



All sectors

Food waste from all sectors



Commercial and Industrial (C&I)

Reports - food waste from the C&I sector



Hospitality

Reports - food waste from the hospitality sector



Households

Reports - food waste from households



Local authorities

Reports - food waste from local authorities



Supply chain

Reports - food waste from the supply chain

About the portal

The Food Waste Resources Portal is a signposting tool which provides links to the most up to date and relevant sources of data on the different sources of food waste which could be used as feedstock for anaerobic digestion.

Read the guidance note for more information

Statistical resources

National Statistics Publications Hub
School population statistics by local authority area

Other links and resources

NISP
WasteNet
Environment Agency
The Food Waste Network

Driving Innovation in AD (DIAD)

DIAD-I Demonstrations are taking place now and will be reporting over the next 9 months

- Evergreen Gas Ltd
- Aardvark EM Ltd
- Cranfield University

DIAD-II is under way with 11 feasibility projects currently on-going for delivery in June 2013

Launched in November 2012, DIAD-II had 4 work streams:

- Scaling of AD technology
- Processing and enhancing digestate
- Using heat in AD
- Proof of market, AD technologies

Investor day – September 2013

Demonstration Phase

Four projects progressing through the demonstration phase

It's purpose:

- To establish parameters
- Benefits at the full scale
- De-risk the technology post demonstration
- Cost benefit analysis
- Industry visits
- A business case for approaching the market



DIAD-II Feasibility Projects

Company	Project
BRE	Small scale heat Distribution Networks
CNG Services Ltd	Low cost biomethane enrichment
Community By Design	Micro-urban community digester system
Cwm Harry Land Trust	Efficient use of AD by-products – profitable phosphate recycling
Farm Gas Power	De-gritting and SIDCOM
Fiberight	Cellulosic Fibre cleaning for high throughput AD
Harper Adams Energy	Recycling Nutrients and Water from Digestate
Methanogen	Dry AD for farm yard manures
NNFCC	Biogas networks
Perceptive Engineering	Optimisation of small scale AD
Safe Training Systems	Siloxane testing in Biogas

Agriculture Update

Latest bulletin on *DC-Agri* project:

<http://www.wrap.org.uk/dc-agri>

The update focuses on how better digestate management can improve nitrogen use – extension to work on ammonia losses & storage requirements

Manner-NPK now includes food-based digestate as a material type

www.planet4farmers.co.uk/manner

WRAP Working together for a world without waste

Digestate & Compost in Agriculture, Bulletin 5 – April 2013

Good practice in digestate management improves nitrogen use efficiency

The latest results from the Digestate & Compost in Agriculture field experiments are providing strong indicators on how best to use digestate, notwithstanding that 2012 was a difficult season for farmers. The bulletin focuses on the experiments that are measuring the supply of crop available nitrogen from digestate, and the potential for losses to the environment. Also covered is the release of MANNER-NPK, a practical software tool that will allow farmers and advisers to gain a quick estimate of crop available nutrients from digestate, compost and a wide range of livestock manures.

The DC-Agri project has already established that digestate is a valuable source of readily available nitrogen (see Bulletin 2), but the latest results have shown that to optimise nitrogen use efficiency and crop performance, the timing and method of digestate application are critical.

The new evidence shows where and how potential losses may occur, and how the delivery of nitrogen to the crop can be improved through minimising those losses. By using as much of the nitrogen in digestate as possible, the farmer gains much more in respect of expensive 'tagger' fertiliser. As well as informing good practice, the research has also supported digestate's inclusion in the latest version of MANNER-NPK produced by ADAS.

Efficient use of digestate

When organic material such as livestock slurry or digestate are used, nitrogen losses can occur through natural processes, just like 'tagger' fertilisers. There are three main ways in which nitrogen can be lost:

- volatilisation to the atmosphere as ammonia, which can produce natural health and odour issues locally;
- leaching of nitrate to groundwater, which affects water quality; and
- denitrification, which sends nitrous oxide to potent greenhouse gas and nitrogen gas to the atmosphere.

The pathway for each of these is illustrated in Figure 1. There is additional advice and guidance on minimising those losses from livestock manure and slurry applications, although information on digestate is scarce. Results from the field experiments are addressing the need and will support guidance to

optimise the efficient use of nitrogen from digestate, and minimise potential impacts on the wider environment.

The experiments

Field experiments in January 2012 measured how efficiently crops used up and used nitrogen (N) supplied by digestate. Autumn and spring applications were made at three rates that represented contrasting soil types and climates:

- Wiltshire, Norfolk (winter wheat);
- North Wales, Devon (grass); and
- ACAS Puddleston, Cambridgeshire (grass).

Digestate applications were compared with 'tagger' fertiliser N and N supply from compost, manure and cattle slurry, applied by either surface broadcasting or bandspreading in fully replicated experimental plots.

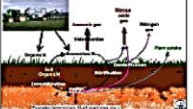


Figure 1. Nitrogen pathways following application of organic materials to land.



Markets for Digestate

'Enhancement and treatment of digestates from anaerobic digestion'.

<http://www.wrap.org.uk/node/13207>



'Market expectations and requirements for digestate'

<http://www.wrap.org.uk/content/market-expectations-and-requirements-digestate>



Landscaping & Regeneration

15 field trials including digestate use in landscape and regeneration projects across the UK 2012-2014

- Energy crops on brownfield/ marginal land
- Sports turf fertiliser and turf production

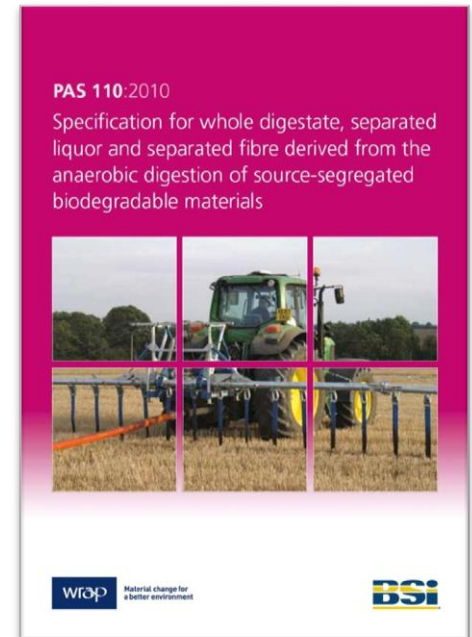
All projects will have an associated knowledge exchange programme

- Dedicated WRAP site with links to project websites
- Course materials for higher education
- Journal and trade magazine articles
- Project bulletin - 1st year results (June)
- Events and site visits
- Sector body engagement
- Third party conferences



PAS110 Update – April 2013

- **Technical projects consultation – closed on 16th April 2013:**
 - Digestate stability (RBP) test
 - Digestate PTE limits
 - Pasteurisation requirement for non-ABP inputs
- **The results will feed into the PAS110 review**
- **BSI process due to being in May with updated PAS expected late 2013**



Rural Communities Renewable Energy Fund

- **Launching this spring**
 - Finance for rural communities for initial development work for renewable energy schemes.
 - Stage 1 - grant of up to £20,000 to pay for an initial feasibility report.
 - Stage 2 - unsecured loan of up to approximately £130,000 to pay for detailed business planning and planning applications.
 - Loans are repayable on financial close.
 - Premium will be payable on repayment of the loan.
- **The fund will be open in Spring 2013, and will be open to many renewable technologies including AD**
- **The project needs to benefit rural communities in England**

Scotland Update – Community AD

Feasibility Support for community Scale AD

- Waste (Scotland) Regulations 2012 – Requirement for Local Authorities to collect food waste separately
- Aims to 'plug' the geographical gaps in AD in Scotland
- Up to £10,000 support
- <http://www.zerowastescotland.org.uk/content/application-form-funding-support-feasibility-studies-community-scale-ad-ori005-100>



Wales Update

There are currently 6 plants operating in Wales:

- 3 Waste fed processing 34,500 tpa
- 3 Farm Fed processing 88,680 tpa

Research:

A WRAP Cymru project; "Assessing the Costs and Benefits for Production and Beneficial Application of Anaerobic Digestate to Agricultural Land in Wales" is due to complete in summer 2013



Lodge Farm Digester, Wrexham

Conclusions

- Very active programme of work in the UK
- Focus on food waste treatment but also work on innovation and small scale farm systems
- Digestate and biogas management and development vital
- Experience in food waste minimisation and collection
- Actively looking for opportunities to develop and share knowledge.