

Department for Environment, Food and Rural Affairs

Anaerobic Digestion Strategy and Action Plan Annual Report 2012-13

August 2013

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Summary

This document is the second annual report on progress under the Anaerobic Digestion Strategy and Action Plan which was published in June 2011¹. The Strategy/Action Plan is designed to deliver the Government's commitment to increase the energy from waste produced through anaerobic digestion.

In dealing with wastes, we apply the waste hierarchy – prevention and reuse, recycling, recovery and disposal. Defra has published guidance on applying the waste hierarchy which recognises that anaerobic digestion is generally the best option available for dealing with separately collected food waste. However, local circumstances and local wishes may make other solutions preferable; such decisions are a matter for the local authorities and other interested parties concerned.

The 56 actions in the Anaerobic Digestion Strategy and Action Plan do not, therefore, set targets for the adoption of the technology – instead it aims to tackle barriers to the increased uptake of AD in England.

A Steering Group monitors progress under the Action Plan and ensures that the actions remain relevant to the challenges that the AD sector faces. The members of that group and its terms of reference are set out in Annex A. 32 of the Actions have now been completed, a further 15 are being progressed towards completion, eight are ongoing actions. One action is not being progressed.

The eight major areas of work in the Action Plan are:-

- 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

¹ <https://www.gov.uk/government/publications/anaerobic-digestion-strategy-and-action-plan>

Highlights of the year

This year has seen continued progress under the Action Plan and steady growth in the number of AD Plants in the UK.

Highlights of the past year include:

- The number of plants in the UK has risen to 110 up from 68 since the baseline was established as part of the AD Strategy in September 2011. More than 200 AD projects currently have received planning permission
- There are two operational AD plants in England designed to inject into the gas grid
- Launch of a food waste portal helping developers to identify and quantify potential feedstocks for AD
- WRAP selected projects under the 'Driving Innovation in AD' programme to take to demonstration phase and launched a second phase of the programme
- Publication of National Occupational Standards for anaerobic digestion
- Finalisation of a Quality Protocol on biomethane
- DECC consulted on extending the Renewable Heat Incentive for the use of heat from biogas plants; pre-accreditation for feed in tariffs was introduced
- Launch of the Rural Communities Energy Fund
- Green Investment Bank support for anaerobic digestion including publication of a market report
- Ecosystem Markets Task Force final report recognised the role for anaerobic digestion in closing the loop using farm waste to generate energy
- Publication of ADBA's 'Practical Guide to AD', providing detailed information to developers and operators on existing standards and industry best practice
- WRAP work to develop markets for digestate, with on-going field experiments in agriculture and new trials in the landscaping, regeneration, sports turf and horticulture sectors
- Ten Demonstration Projects collecting food waste from businesses.
- Development and testing of new support tools aimed at businesses to help them procure and implement food collections into their organisations.

Tackling the barriers

Improving our understanding of the AD landscape

This area involves actions to collect and make widely available information on AD.

In the past few years, as the industry has developed, the Biogas Portal: - <http://www.biogas-info.co.uk/>, has provided a trusted and independent source of information on AD. The site also acts as a repository for the work carried out under the AD Action Plan². The Biogas map provides up to date information on the number and type of AD plants in the UK, enabling the progress of the industry to be measured against the baseline established in September 2011.

Defra has funded, for three years, the NNFCC to run the Biogas Portal. Discussions with stakeholders are ongoing about the future of the Portal after Government funding ends in March 2014.

During this year, WRAP established a “food waste resources portal”³ (FWRP) which brings together information on feedstocks for AD. This information is produced in a wide variety of formats and from numerous sources. Collating the data via the FWRP should make it easier for AD developers to identify potential feedstock supplies.

WRAP also made further progress in tackling the market failure that most food producing businesses regard separate food waste collections as unaffordable. WRAP published a business case looking at how food waste collections could best be provided to small and medium sized companies in the food service industry. The business case showed that adding a food waste collection need not increase costs.

As part of its three year support fund for demonstration projects on good practice in food waste collections from business, WRAP set up 10 demonstration projects in summer 2012. They are collecting food waste from businesses using a range of methods and targeting different food producing businesses. WRAP will produce a first report at the end of the year which will help new service providers to design effective collection services to the sector.

In addition, WRAP will, in late summer 2013, publish support tools and guidance to help food service businesses who are considering food waste collections with queries around cost, setting up in their commercial kitchens and issues to consider in procurement of new services. Once more data is collected from public sector and larger commercial/industrial premises the tools will be refined for these audiences.

² <http://www.biogas-info.co.uk/index.php/ad-strategy-a-action-plan.html>

³ <http://www.wrap.org.uk/content/food-waste-resources-portal-registration>

WRAP has also carried out a project to look at existing financial models for AD and to check whether there are gaps within them. In doing so, WRAP recognise that developers will need to do their own detailed business modelling but may, at an earlier stage, find generic models such as the Anderson Calculator⁴ useful in assessing the feasibility of projects.

Under one of the original actions from the AD Action Plan, ADBA published a dictionary of AD terms and acronyms, with support from other stakeholders⁵.

Skills

In March, Energy and Utility (EU) Skills completed their work in developing national occupational standards. The project identified that most of the required standards already existed although one new standard was developed – EUSAD01 on maintaining site biosecurity and personal hygiene on anaerobic digestion plants. A total of 22 standards were identified. During the course of the project, a proposed qualification structure was identified and consulted on with employers. It is now for training organisations and Awarding Organisations to consider the NOS and consider whether to adapt their training provision/offer qualifications in this area. The Waste Management Industry Training & Advisory Board (WAMITAB) have already developed a level 2 Diploma for Anaerobic Digestion Operatives⁶.

EU Skills has subsequently carried out further consultation with the industry on the ‘anaerobic digestion’ suite of national occupational standards to establish if any meaningful “gaps” in performance and knowledge criteria exist within them.

During the year, Cogent - the Sector Skills Council (SSC) for the chemicals, pharmaceuticals, nuclear, life Sciences, petroleum and polymer industries – published a market profile of the anaerobic digestion sector analysing skills and training needs in the context of the development of the sector⁷.

⁴ <http://www.nfcc.co.uk/tools/ad-cost-calculator-standard-edition-economic-assessment-of-anaerobic-digestion-technology-its-suitability-to-uk-farming-waste-systems-tool-nfcc-10-010>

⁵ <http://www.adbiogas.co.uk/resources/ad-strategy-and-action-plan/>

⁶ http://register.ofqual.gov.uk/Qualification/Details/600_8140_5

⁷ http://www.cogent-ssc.com/research/Publications/publications/KADA_Final_Report.pdf

Building safe and secure markets for digestate

The continuing expansion of the AD sector makes it even more important that markets are developed which recognise the value of digestate as a fertiliser. However, developing markets for a relatively new product like digestate requires a sustained effort. The necessary activity falls into three broad categories:- (i) identifying potential markets (ii) demonstrating the potential benefits of the products (iii) addressing concerns from stakeholders. The work which WRAP has led under the Strategy has tackled all three areas; this work is ongoing.

The most substantial part of this programme is the joint WRAP/Defra programme of field trials to demonstrate the benefits of using digestate in agriculture. Poor weather made conditions for the trials challenging in 2012 but the project continues to make progress. Results to date have shown the importance of applying digestate during the growing season where significant benefits to the crop are demonstrated. Results from the work are also clearly showing the effects of the timing and the method of application on the overall fertiliser benefit and the potential environmental impact of the digestate. The project has therefore reinforced the need for adequate digestate storage so that the digestate can be applied at the right time.

The trials will be largely complete by March 2014 but Defra has agreed to extend one element of the trials for a further year. This will look further at mitigating ammonia emissions from digestate application.

The trials are combined with an extensive knowledge exchange programme, involving guidance, tools, events and learning materials. Information on all aspects of the trials and the knowledge exchange programme can be found at www.wrap.org.uk/dc-agri.

There is also a suite of projects through which WRAP is identifying market opportunities for digestate in other sectors such as landscaping and regeneration. Field and demonstration trials are examining the viability of using digestate in sports turf and turf production, energy crop establishment and soil improvement and manufacture. These trials also include a knowledge exchange programme – see www.wrap.org.uk/content/digestate-use-landscape-and-regeneration

Four feasibility studies are also underway to assess the options for the use of digestate in horticultural applications.

WRAP's work on assessing the safety of digestate and responding to market concerns aims to produce a bio-fertiliser matrix – similar in approach to the long-standing safe sludge matrix. This aims to provide clear guidance on the use of digestate in a simple format. WRAP aims to publish the matrix this financial year.

One area of ongoing work is on the markets for digestate in organic production. The action plan included one on defining the expression 'household food waste' in the European Organic Production Regulations (EC 889/2008). The 2008 organics regulations are

currently being reviewed although the timetable for doing so is unclear. The follow up work will fall to the Defra organics team supported by WRAP.

WRAP's work on digestate can be accessed via:

www.wrap.org.uk/category/subject/anaerobic-digestion

Raising awareness of AD - community AD and localism

Actions in this area were largely to have been completed though the development of a toolkit for AD but this has not been done because of the failure of an EU funding bid. Discussions between the action owner, ADBA, and other partners are continuing on how to take this action forward. ADBA is now progressing the development of a best practice scheme, which will take this work forward over the coming year.

As reported last year, WRAP has set up the "Driving Innovation in AD" programme.

WRAP - working in partnership with the Small Business Research Initiative (SBRI) and the Royal Agricultural Society of England (RASE) - held an investor day in summer 2012 to disseminate the key attributes of each project. 15 projects were presented covering aspects such as their concept/technology, projections, attributes and proficiency. WRAP developed the programme further during this year and are funding six projects to demonstration phase.

WRAP launched a second phase of the programme during the year focused on areas such as processing and enhancing digestate and using the heat from AD.

WRAP's work on DIAD can be accessed via:

<http://www.wrap.org.uk/content/driving-innovation-ad>

Driving innovation in anaerobic digestion (DIAD) - Small Scale Modular Pasteurisation

The Aardvark DIAD feasibility and demonstration project aimed to design, build and test a small scale pasteurisation unit which was simple to use, cheap to run and would achieve all the required standards of the Animal By-Products Regulations (ABPR). The unit is a 50Kg batch system, which simultaneously macerates and heats the feedstock. The pasteurisation unit is an addition to the company's small scale digester aimed at processing farm feedstocks.

Building markets for biomethane for transport fuels

The actions in this area led by the Low Carbon Vehicle Partnership and the Department for Transport (DfT) have largely been overtaken by other developments such as the low carbon trucks demonstration trials (£11m of funding allocated in August 2012) and the work of the joint Government and industry Taskforce on Low Emission HGV Technologies which is chaired by the DfT.

Since the funding for the Low Carbon Truck Trials was allocated, 7 projects trialling over 100 dual fuel HGVs are currently underway with more to follow. The dual fuel vehicles use a combination of diesel with either LNG or CNG, with some projects using an element of biomethane.

In 2012, the Low Emission HGV Taskforce commissioned a report⁸ into the opportunities to overcome the barriers to uptake of low emission technologies which found that long haul and regional delivery duty cycles accounted for around 70% of emissions from HGVs and that using gas as a fuel had the potential to deliver greater savings than the other technologies considered. The Taskforce is therefore working to identify and overcome barriers to greater use of gas, and in particular biomethane, as a transport fuel for HGVs.

The Environment Agency has developed a Quality Protocol for the use of biomethane in engines (static and mobile) and for injection into the gas grid⁹. The Protocol sets out criteria for establishing the point at which biomethane is considered to be fully recovered, and no longer waste under the terms of the Waste Framework Directive. Following two rounds of stakeholder consultation, the Agency finalised the Protocol. The Government has submitted the Protocol to the European Commission for clearance under the Technical Standards Directive. Subject to there being no problems with that procedure, the Protocol will come into effect in late 2013.

In June 2013 the Gas Vehicle Hub¹⁰ was launched, to provide information on the location of gas powered fleets and refuelling infrastructure, case studies and vehicles available in the UK. It was developed as a partnership project between the Royal Borough of Greenwich, ADBA and the Transport Knowledge Transfer Network, and funded by Defra.

⁸ <http://www.lowcvp.org.uk/assets/reports/Opportunities%20for%20low%20emission%20HGVs%20-%20final%20report%202012.pdf>

⁹ <http://www.environment-agency.gov.uk/aboutus/wfo/epow/124111.aspx>

¹⁰ <http://gasvehiclehub.org/>

AD in the rural community

There is developing interest in the part that anaerobic digestion can play in the rural community, particularly in the role that small scale on-farm AD can play in helping farmers to manage the wastes on their farm. In April 2013, Defra held a workshop with stakeholders to identify the particular challenges that small-scale AD faces and how these might be overcome.

WRAP is administering the £15m Rural Communities Energy Fund which will offer funding to community groups in rural areas in England for feasibility studies and to assist in the preparation of planning applications for renewable energy projects. Anaerobic digestion is one of the eligible technologies. The Fund will aim to ensure that local technologies deliver benefits for the local communities where the installation is sited.

The Government's Bioenergy Strategy lays out the framework for the support of bioenergy in the UK, and the importance of robust sustainability criteria and lifecycle analyses. While there are only six crop-only AD plants in the UK currently, Ministers continue to be concerned about the effect that the widespread use of crops as a feedstock for AD might have as the industry grows.

Defra and stakeholders have agreed that a guidance document is needed to provide practical advice for farmers, and address the concerns raised at Defra's workshop (in November 2011) on the sustainability of growing crops for AD. The industry is therefore developing Best Practice Guidance which collates and highlights existing farming best practice on the growing of crops, to ensure that farmers growing crops as a feedstock for AD know how to mitigate the potential environmental risks. The guidance will also explain how farmers can best realise the agricultural and environmental benefits which can come from integrating crops for AD as break or cover crops in their rotations, taking into account their local geography, topography and other factors, to maximise the sustainability of land use.

Finance

The actions in this area have been completed except for two ongoing activities:- the provision of up to date due diligence templates and regular meetings with the finance community. ADBA's Finance Forum is continuing to meet, with Defra and WRAP participation.

It is clear from the growth in the sector that there is money available for new AD capacity where a project can readily meet the requirements of potential funders. While this indicates that there is no longer a true market failure in the sector, it is still an immature industry with the hallmarks of such. Banks continue to struggle to finance AD projects with the majority of new installations built on equity. Debt is traditionally secured on past performance with equity investments based on the promise of future performance so the structure of most deals reflects the current status of the market.

The Anaerobic Digestion Loan Fund made a second loan this year to Emerald Biogas. The loan of £850,000 will support the development of capacity to process 53,000 tonnes of food waste. Two further loans have been offered subject to due diligence.

Since the Loan Fund was set up, the Green Investment Bank has started to operate. The Bank published, in June 2013, its first market report on anaerobic digestion. The report found that while the sector was growing, it remains highly fragmented and immature with most facilities in the UK having been in operation for less than 3 years.

The report found that the critical factors for project success were feedstock selectivity; deep understanding of, and access to local markets for digestate, dedicated operating personnel and active process management. The report concluded that the risk profile for AD meant that equity funding continues to be the best option for initial funding of projects. The better performing facilities may be suited to debt refinancing. The Bank is investigating the opportunity to provide up to £50m of debt financing for AD projects which meet the criteria in the report.

The Bank will also continue to make equity investments in new AD facilities, through its nominated waste fund managers, Foresight and Greensphere, both of whom have already made investments in the AD sector. In September 2012, Foresight announced that it was investing £2 million in a £21 million project to build a food and green waste processing plant in Dagenham. This will be the first joint anaerobic digestion and in-vessel composting plant to be built within the M25 and is expected to be operational in 2013.

Regulation

During the year, the Environment Agency, with Defra support, established a Biowaste Regulatory Forum to help ensure that the regulatory framework and regulatory practices maximise the benefits gained from biowastes, whilst minimising their impact on the environment. The Forum brings together representatives of those in the composting and AD sectors to consider the performance of the biowaste sector and, where possible, make recommendations for improving biowaste regulation.

There have been a number of pollution incidents involving AD plants. The Environment Agency is working with industry and will publish a report on lessons learned from incidents on site to help improve future performance across the industry.

The Agency also continues to progress the actions on regulation from the AD Action Plan. This year it completed its work revising the Standard Rules that apply to anaerobic digestion. The Agency has also made recommendations to Defra on the rules that apply to the use of digestate where part of the feedstock consists of crop residues. These recommendations were underpinned by WRAP-funded research into the effectiveness of AD in killing pathogens and weed seeds.

At the European Union level, the European Commission's technical experts (the Joint Research Centre) have continued to develop proposals for possible EU-wide end of waste

criteria. If adopted, such proposals would replace the current UK criteria - set out in the Quality Protocol for Anaerobic Digestate and in the specification for digestate quality (PAS 110) – in determining when digestate is no longer classified as waste. Defra, the Environment Agency and WRAP are continuing to work with industry stakeholders to analyse and influence any proposals that may emerge.

There is no certainty that the EU will adopt end of waste criteria or, if they do, when the criteria would come into effect. The Environment Agency and WRAP have, therefore, continued to maintain the Quality Protocol and PAS 110. Following three Environment Agency/WRAP workshops in 2011, WRAP carried out three pieces of research to inform a review of PAS 110 on (i) the test within PAS 110 on the stability of digestate (ii) pasteurisation requirements (iii) the PTE (Potentially Toxic Element) limits. On the basis of this research, WRAP carried out an informal consultation on possible changes to PAS 110 in spring 2013. The British Standards Institute is now administering a formal review of PAS 110.

A Biomethane Roundtable hosted by the Energy Networks Association has been established to work on the remaining regulatory barriers to injecting biomethane to the gas grid. This is particularly building on the Ofgem-led Energy Market Issues in Biomethane group, which finalised a report on barriers in 2012, and involves DECC, Defra, Ofgem, HSE and EA alongside the trade bodies. A significant change this year was the introduction by the Health and Safety Executive of a class exemption to Gas Safety Regulations (GS(M)R). This increased the level of oxygen allowed in biomethane when it is injected into the grid.

Appendix A- Implementation of the Anaerobic Digestion Strategy and Action Plan

Steering Group

Terms of Reference

Objective: To oversee implementation of the Action Plan in order to increase energy from waste through anaerobic digestion

Role:

- To oversee implementation and ensure that the desired outputs are achieved to deadline
- Deal with any synergies and links between different actions and policy areas
- To provide a sounding board for action owners to seek guidance from the Steering Group
- Identify and mitigate risks
- Keep the Action Plan under review to ensure that it remains relevant
- Provide progress reports to Government on delivery of the Action Plan

Process and Meeting Frequency

The Secretariat will ask Action Owners to complete a simple one page report on each action every two months. The Secretariat will collate this information into reports for the Steering Group. The Steering Group will conduct most of its business by telephone or email but will meet as a group approximately three times a year. The Group will review issues and risks to delivery of the Action Plan as identified in the Secretariat's reports and by Group members. It will not review progress on every action at every meeting. The Secretariat will propose for the Group's agreement a list of the actions that are the highest priority in achieving the Strategy's aim. This will help to focus the Group's attention on the most significant actions.

The Secretariat will prepare and clear with the Steering Group any periodic reports required by Government on progress.

Timescale for project

The Group will review progress in 2013.

Membership

The proposed membership of the Steering Group is one representative each from the Royal Agricultural Society of England, the Renewable Energy Association, the Anaerobic Digestion and Biogas Association, Water UK, the Environmental Services Association, the Country Land and Business Association, National Farmers Union, National Grid,

Department for Business, Innovation and Skills, Department for Transport, the Department of Energy and Climate Change, Department for Communities and Local Government, Environment Agency, NNFCC, WRAP, Chartered Institution of Wastes Management, EU Skills, Low Carbon Vehicle Partnership, National Energy Foundation.

Other people identified as having an interest in particular actions (e.g. AFOR, LGA) will be represented by the action owner.

Defra will chair and provide the Secretariat for the group.

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