

United Kingdom Interim Report

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2003 Energy White Paper

- To reduce CO₂ by 60% by about 2050
- To maintain reliable energy supplies
- To Promote competitive energy markets,
- 15.4% renewable electricity by 2015-2020

NB Biomass at that time < 1.5% of UK electricity production

Composition of the 1.5% (in Gwh_e)

Wind, solar & hydro (all)	2,014
Bio- fuels:	
● Landfill gas	3,276
● Sewage sludge/gas	345
● Co- firing wood, palm kernels, etc	602
● Other – Slurry, straw, poultry litter, SRC, meat & bones (combustion)	937
Total bio-fuel renewable electricity of which biogas amounts to 70%	5,160

October 2004

Biomass Task Force set up to:

‘assist Government and the biomass industry in optimising the contribution of **biomass energy** to renewable energy targets and to sustainable farming, forestry and economy objectives’

NB **Energy** NOT only electricity

Brief of the Biomass Task Force

- Primary focus - heat and power from energy crops, agricultural plant and animal wastes
- **Bio-fuels for transport and other non – food uses of crops**
- Examine the barriers – frailty of supply chain, technical factors, planning restrictions and environmental factors relating to land use.

Evidence presented of energy potential (Gwh/yr)

Source	Gwh
Animal manure and crop residues	4,250
Food production, retailing & consumption	5,244
Farmyard manure (dung on straw)	3
Theoretical potential	9,497

Theoretical potential energy for crop growth from nutrients (kt/yr)

Source digested	T/ N	P ₂ O ₅	K ₂ O
Manure& crop residues	48	30	31
Agri – food ,retailing and consumption residues	37	20	19
Total	85	54	50
FYM (cattle, pigs & horses)	190	122	206

Evidence of potential CO₂ equivalent avoidance

Removal	m/ t /year
Equiv. from wet wastes manure, agri- food processing, retailing & consumption	17.20
Digestion of FYM (dry AD process)	15.80
Mineral fertiliser use (NPK)	0.61
Fossil fuel displacement (electricity & heat)	2.30
Deduct CHP engine emissions, 35% CO ₂ in biogas & from new manure transport	3.33
NET POTENTIAL AVOIDED CO₂ EMISSIONS	35.91

Government response to Biomass Task Force recommendations

- Recognises AD as means of waste management, to generate energy and income
- Review approach to AD alongside Methane to Market Partnership Waste Strategy and Climate Change Programme
- Build up economic, environmental & practical knowledge to underpin & support policy
- Economic & environmental review of AD to establish viability of on farm biogas as diesel substitute and mechanisms to integrate it into RTFO with fuel duty rebate of 41p/l

2005 Biomass Task Force recommends Government

- To review current strategy & consider practical & financial mechanisms for expansion of AD but ensure balance between biogas production and uncontrolled methane escape
- **To give urgent support for a digestate standard**
- To carry out economic & environmental assessment of AD potential as an alternative renewable fuel to displace diesel

Methane to Market Agricultural Task Force formed 2004

- Core members : Argentina, Australia, Brazil, Italy, Japan, Korea, Mexico, **UK, Canada** (**IEA Task 37 members**) , USA, and joined by China, Colombia, Ecuador, India, Nigeria, Poland, Russia, Ukraine and Vietnam
- **2006 UK Co-chair with Argentina & hosted conference in UK November 2006**
- **Conference Report available May 2007**

Schedule of M2M

November 2005 (in Buenos Aires) Agricultural Task Force (ATF) concluded:

- **Agriculture is a significant source of CH₄ emissions**
- **There is opportunity to capture and utilise CH₄ from manure management**
- **ATF Recommendation accepted – Agricultural Sub Committee formed under co chairmanship of UK & Argentina**
- **Meeting in UK Nov. 2006**

Methane to market aims and activities

- Bring together AD specialists to **exchange information**; share information about research
- **Technology** – **bring technology developers and users together**, identify & implement demonstration & technology transfer events
- **Policy** – quality controls (**digestate standards**), legislative & fiscal measures
- **Identify** project development in partnership states to feature in Expo Beijing 2007

Policy needs identified

- **International workshop on fugitive emissions and development of interim guidelines**
- **Internationally agreed LCA methodology**
- **Joined up thinking between energy and environment on policy measures**
- **Acknowledge the value of AD for soil management, public health (& *animal health*)**
- **More work needed for co-digestion of agricultural waste & MSW**

UK Supporting measures

- DEFRA's Energy Crops & Rural Enterprise Schemes, Regional Development Agency project funding
- **Range of small grants for local communities**
- Renewables Obligation on electricity producers below target and buy out auction price at currently £50/MWh
- **Climate Change Levy** rebate for purchase of renewable electricity rising to **£0.0456** in 2008
- Renewable Transport Fuels Obligation (Due shortly)
- **Renewable Heat Obligation ?**
- Enhanced Capital Allowances

Whither the UK ?

- David Miliband MP & Secretary of State for the Environment replied thus to a Parliamentary question:
 - ‘ The Government is committed to making the most of anaerobic digestion to contribute to a number of key objectives, notably reducing greenhouse gas emissions from waste management and agriculture and improving air and water quality as well as a source of renewable energy’

May/June Publication of the Government's Biomass Strategy



The Biomass Strategy

Government detailed proposals (June 2007)

- **How to work with stakeholders to drive faster growth in the use of AD**
- **To work with the National Waste Strategy (due shortly) to set out the important contribution of AD to achieving UK waste management goals**
- **Environment Agency is working on standards for AD digestate (bio-fertiliser)**
- **Publication of the Climate Change Bill - enshrines UK target of 60% reduction in CO₂ 2050 in legislation**

On farm digester on the shore of Solway Firth



THE PORTAGESTER for handling dry material - FYM



Northern Ireland activity

Agri-food Biosciences Institute: planned 600m³ demonstration plant for dairy slurry to determine :

- **Baseline performance of farm mesophilic digester**
- Mass balance of on-farm slurry digestion
- **Contribution of system to nutrient planning**
- Life cycle benefits
- **Methods for enhancing digester performance**
- Research into pre & post digestion treatments

Other activities since 2005

- **Plants under planning - 70+**
- **Resource studies eg. Leicestershire, Eastern Counties**
- **Road Shows include AD inter al. renewable technologies**
- **Renewable Energy Association Biogas Sub Group**
- **National Forum : Bio-methane as a transport fuel
(25% NGOs, 25% academics, 25% industry and 25% other)**
- **Task 37 (UK)**
- **REA/DEFRA AD Working Group**

Where we are now

- **Plants in operation :**

1000 + in waste water treatment including some with co-digestion

15 + Built '75-'90 on farm- some enlarged to take ABPs

24 Built since 2002/3 (9 slurry +ABPs, 8 MSW, 7 slurry only)

13 + Waste water treatment CHPs @ 0.5 – 2MW_{el}

- **Planning in progress:**

1 ABP only + **35** including cow slurry, silage maize, ABPs, etc sizes range 20-130kt/year **over 18 counties**

25 on farm 300kW_{el}

Drivers

- Rising energy prices
- Renewables Obligation
- Landfill Directive and diversion targets
- Landfill Allowance trading Scheme
- Organic material diverted from landfill
- Diversification enterprise on farms
- Nutrient management planning
- Carbon trading

Barriers

- **UK application of EU waste regulations**
- **NIMBYs and some planning authorities**
- **Long term waste management contracts between local authorities and waste management companies- diverts material from existing facilities - incinerators, composting**
- **Ignorance of technology and benefits at all levels**
- **Bureaucratic delays, costs of licensing and local politicians fear of the ballot box**
- **Existing waste hierarchy and preference for composting**
- **Lack of profit in farming- lack of investment finance**

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