COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 3.12.2008
SEC(2008) 2936

COMMISSION STAFF WORKING DOCUMENT

accompanying the

GREEN PAPER

On the management of bio-waste in the European Union

{COM(2008) 811 final}

EU legal instruments regulating the treatment of bio-waste

Revised Waste Framework Directive[1]

The Directive requires that all waste be treated in a way that protects the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing the overall impacts of resource use and improving the efficiency of such use. Waste policy has to apply a five-step waste management hierarchy as a priority order. Highest priority is given to waste prevention, followed by preparation for re-use, recycling, other recovery and disposal. Policies may diverge from the hierarchy in the interests of minimizing overall environmental impact.

In particular, the Directive sets a 50% recycling target for at least paper, metal, plastic and glass from households - and possibly from other similar origins - to be met by 2020. This can work in favour of bio-waste recycling since bio-waste is the largest single fraction of household waste and Member States can include appropriate parts of it in the calculation of the 50% target. The target is subject to review by 2014.

In addition, the Directive envisages the possibility of setting EU-wide "end-of-waste" criteria for compost. These can include quality and safety requirements so that composted bio-waste is no longer waste but a safe product, thus strengthening confidence and the market. Currently, national rules regarding compost quality and safety and even if compost is product or waste differ between Member States (see also Annex II).

Facilities for the biological treatment of waste require a waste management permit. For recovery facilities Member States may derogate from the permit requirements provided they ensure environmentally sound waste management by laying down general rules for these facilities. Furthermore, it will allow the Commission to set minimum standards concerning health and environment for recovery activities not covered by the IPPC Directive.

Directive 1999/31/EC on the landfill of waste (Landfill Directive)

This Directive is a primary driver for the better treatment of bio-waste as it requires the diversion of biodegradable municipal waste from landfills to 75% in 2006, 50% in 2010 and 35% in 2016 of the amount of bio-waste generated in 1995.[2] Countries with high reliance on landfilling (over 80%, including most of the new EU12, but also the UK and Greece) may postpone the targets by a maximum of 4 years.

While no requirements are set for the management of the diverted biodegradable waste the environmental costs need to be taken into account and the costs of landfilling are increasing rapidly.

Directive 1996/61/EC on integrated pollution prevention and control (IPPC Directive)

This directive lays down the main principles for the permitting and control of installations based on best available techniques (BAT). It currently covers biological treatment of organic waste only if it constitutes pre-treatment before disposal. In the ongoing revision the Commission has proposed covering all biological treatment of organic waste above a capacity of 50 tonnes/day. This will increase the IPPC coverage of composting capacity from 81% to 89% and of anaerobic digestion from 89% to 99%[3].

---

1 Revised Waste Framework Directive (2005/0281(COD))

2 Or in the latest year before 1995 for which standardised Eurostat data is available

3 Vito, 2007

Waste Incineration Directive 2000/76/EC

The incineration directive regulates the technical requirements for the operation of incineration plants, including emission limit values for selected potential contaminants (e.g. NOx, SOx, HCl, particulates, heavy metals and dioxins) in order to prevent, as far as practicable, negative impacts on human health and the environment. It is relevant for bio-waste treatment as it covers incineration of most of bio-waste[4] (including mixed waste containing biodegradable fractions).

Regulation laying down health rules concerning animal by-products not intended for human consumption 2002/1774/EC (The Animal By-products Regulation)

This Regulation lays down detailed rules for the protection of public and animal health that apply to the use of animal by-products in biogas and composting plants. Category 1 and Category 2 animal by-products are either excluded from such use or may only be used under strict conditions and following processing. Pending the adoption of harmonised requirements for the processing of Category 3 classified catering waste, Member States may adopt risk mitigating national rules for the processing of such material which must be at least equivalent to the standards set by the Regulation for the processing of Category 3 material of the same nature.

The Directive on the promotion of cogeneration

One of the best ways to use energy in an efficient way is by making use of cogeneration of electricity and heat (also known as combined heat and power or CHP), thus limiting waste heat. This is the objective of Directive 2004/8/EC., and it also applies to waste incineration. The heat developed in the incineration process can be used for district heating but also for industrial purposes, pre-treatment of fuel and for biogas production. In order to calculate if the cogeneration process is highly efficient under Directive 2004/8/EC, harmonised reference values have to be used as defined in Commission Decision 2007/74/EC. The list there includes reference values for electricity and heat from solid biodegradable (municipal) waste, liquid biodegradable waste and biogas, in order to promote the use of high efficiency cogeneration with such fuels. A qualification as high efficiency cogeneration may lead to guarantees of origin for CHP electricity and to (extra) state aid for operators of such units.

The proposed RES Directive[5], repealing Directives 2001/77/EC and 2003/30/EC

This proposal considers the use of biomass, i.e. the biodegradable fraction of products, wastes and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste, to count towards the renewable energy targets, but leaves it up to Member States to decide how certain renewable energy resources are to be supported. In the Commission's estimation, around half of the EU's overall 20% renewable energy target will be met from bio-energy. Furthermore the RES Directive sets sustainability criteria for the use of biofuels and bioliquids, while encouraging the use of bio-wastes, e.g. cooking oil or bio-methane, for developing so-called second-generation biofuels. The RES Directive also foresees reporting on a need for sustainability criteria for all other uses of biomass for energy purposes.

---

4 The excluded fraction includes vegetable waste from agriculture and forestry as well as non-contaminated wood waste

5 COM(2008)19

Differences in compost policies between the Member States

Compost policies differ substantially between Member States. The following tables show the differences between quality classification types of compost (table 1), quality standards for composts (table 2) and registration regimes (including waste/product differentiation) (table 3).

Table 1. Compost classification types and number of classes adopted in national compost standards and legislation.

	Number of classes or categories			
Criterion	1	2	3	4
Heavy metals	BE, DK, FR, GR, HU, LT, NL, PL, SE, UK	DE, SK	AT, CZ, ES, IE, SI	LV
Input materials	**UK**: Quality compost from source separated organic waste	**BE**: Vegetable, Fruit, Garden compost; Green Waste Compost **IT**: Green Waste Compost; Mixed Compost (may include sewage sludge) **FI**: Green Waste Compost; compost from digestate		**AT**: (1) source separated org. waste (2) sewage sludge (3) bark (4) mixed municipal solid waste
Application types			SI: (1) Agriculture – no restrictions (2) Agriculture with restrictions (3) Agriculture excluded	**AT**: (1) agriculture (2) landscaping (3) landfill coverage (4) bagged compost **DE**: (1) compost for Agric./landscaping (2) substrate compost (3) mulch compost
Stability		**DE:** (1) mature compost (2) fresh compost **IE** requirement		

		within licensing **LU** (1) mature compost (2) fresh compost		

The table include both statutory (legislative) and voluntary standards.

Source: ORBIT/ECN, 2008, Compost production and use in the EU, Final report of ORBIT e.V. / European Compost Network ECN to European Commission, Joint Research Centre (for more details see table 3 of that report).

Table 2: Maximum, minimum and mean limit values of potential contaminants for composts in Europe.

Limit values for Compost from source separation (BWC & GWC)									
	Cd	Cr	CrVI	Cu	Hg	Ni	Pb	Zn	As
	mg/kg d.m.								
min	0.7	50	0	25	0.2	10	45	75	5
max	3	250	3	600 (1,000)*	3	100	280	1,500 (4,000)*	50
mean	**1.4**	**93**	**0.9**	**143 (184)***	**1.0**	**47**	**121**	**416 (587)***	**23**
max/min	*4.3*	*5.0*		*24.0*	*15.0*	*10.0*	*6.2*	*20.0*	*10.0*
Limit values for Composts from MSW									
	mg/kg d.m.								
min	3	250	0	450	3	100	200	1,000	10
max	20	1,000	10	1,000	16	300	800	4,000	25
mean	**8.0**	**473**	**6.7**	**625**	**7.1**	**168**	**456**	**2,000**	**17**
max/min	*6.7*	*4.0*		*2.2*	*5.3*	*3.0*	*4.0*	*4.0*	*2.5*

* Limits for Cu=1,000 and Zn=4,000 mg kg^{-1}d.m. stem from the Danish *Statutory Order on Application of Waste Products for Agricultural Purposes* where sewage sludge is covered as well as compost. This explains the high thresholds.

Source: ORBIT/ECN, 2008.

Table 3. Compost registration or certification for marketing and use under national PRODUCT or WASTE regimes.

Compost may become a PRODUCT	
Specific compost regulation within waste & environmental legislation with extensive QM and external approval scheme for compost	AT
Compost related regulation within the waste and environmental legislation or based on standards but with **simple registration scheme**	LT, FR, SK
Regulation within the waste and environmental legislation rolled out by the way of the **licensing procedure**	IE, LU (+ obligatory QAS*); UK (only with voluntary QAS) **
(Simple) **fertiliser registration** within the fertiliser legislation	CZ, ES, FI, GR, HU, IT, LV, NL, PL, PT, SI
Compost remains WASTE	
Waste – but specific compost standards available	BE/Fl (+ obligatory QAS), DE (+ voluntary QAS)
Compost derived from source-segregated or 'residual waste' animal by-products that does not meet 'product' requirements, but is spread on land (ABP and waste management licensing regulations apply).	UK
Waste – no specific compost legislation	BG, CY, CZ, DK, EE, HU, MT, PL, RO, SE
Compost derived from source-segregated, non-ABP bio-waste that does not meet 'product' requirements or 'Compost-Like-Output' from Mechanical and Biological Treatment of residual waste that is disposed of (not spread on land).	UK

*QAS: Quality Assurance System.

** In England and Wales this means independent certification to PAS 100 and the QCP (Environment Agency, 2007). In Scotland and Northern Ireland this means certification to PAS 100 (BSI, 2005 or an equivalent standard) and meeting the other requirements summarised in table 10 of that report.

Source: ORBIT/ECN, 2008.

List of studies and legislation

Community papers and legislation:

- **2006/2293(INI)** European Parliament resolution of 13 November 2007 on the Thematic Strategy for Soil Protection;
- **COM(2001) 264 final** *EU Sustainable Development Strategy (SDS)*; Communication from the Commission A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development (Commission's proposal to the Gothenburg European Council)
- **COM(2005) 666 final** *Thematic Strategy on the Prevention and Recycling of Waste* Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and The Committee of the Regions - Taking sustainable use of resources forward - A Thematic Strategy on the prevention and recycling of waste {SEC(2005) 1681} {SEC(2005) 1682}
- **COM(2005) 670 final** *Thematic Strategy on the Sustainable Use of Natural Resources***,** Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Thematic Strategy on the sustainable use of natural resources {SEC(2005) 1683} {SEC(2005) 1684}
- **COM(2006) 231 final** *Thematic Strategy for Soil Protection*; Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Thematic Strategy for Soil Protection [SEC(2006)620] [SEC(2006)1165]
- **COM(2007) 59 final** Communication from the Commission to the Council and the European Parliament on the Interpretative Communication on waste and by-products
- **COM(2008) 19 final** Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources COD 2008/0016
- **COM(2008) 397 final** Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan {SEC(2008) 2110} {SEC(2008) 2111}
- **COM(96) 557 final** STRATEGY PAPER FOR REDUCING METHANE EMISSIONS - (COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND TO THE EUROPEAN PARLIAMENT)
- **Decision 2006/799/EC** *The eco-labels for soil improvers* ; Commission Decision of 3 November 2006 establishing revised ecological criteria and the related assessment and verification requirements for the award of the Community eco-label to soil improvers (notified under document number C(2006) 5369) (Text with EEA relevance) (OJ L 325, 24.11.2006, p. 28–34)
- **Decision 2007/64/EC** *The eco-labels for growing media* ; Commission Decision of 15 December 2006 establishing revised ecological criteria and the related assessment and verification requirements for the award of the Community eco-label to growing media (notified under document number C(2006) 6962) (Text with EEA relevance) (OJ L 32, 6.2.2007)
- **Directive 1999/31/EC** Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (OJ L 182, 16.7.1999, p. 1–19)

– **Directive 2001/77/EC** Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market (OJ L 283, 27.10.2001, p. 33–40)

– **Regulation (EEC) No 2092/91** *The Organic Farming Regulation*, Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs - (until 31/12/2008);

– **Regulation (EC) No 834/2007** Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91 - (as from 1/01/2009)

Data sources and studies:

– **ACR+ (2008)** ACR+ BIOWASTE CLUSTER – *Reduction of Municipal Organic Waste* – Technical Report, Final Draft

– **AEA, 2001** A. Smith, K. Brown, S. Ogilvie, K. Rushton, J. Bates, *Waste Management Options and Climate Change*, Final report to the European Commission, DG Environment, by AEA Technology, 2001 (http://europa.eu.int/comm/environment/waste/studies/climate_change.htm).

– **BREF Waste Treatment** http://eippcb.jrc.ec.europa.eu/pages/FActivities.htm;

– **Brussels, 2001** APPLYING COMPOST BENEFITS AND NEEDS, Seminar Proceedings, Brussels, 22 – 23 November 2001; http://ec.europa.eu/environment/waste/compost/seminar.htm

– **Copenhagen, 2007** Nordic Council of Ministers: Biowaste. Decision support tool for collection and treatment of source-sorted organic municipal solid waste. TemaNord 2007:602,

– **COWI 2004** Preliminary Impact Assessment for an Initiative on the Biological Treatment of Biodegradable Waste**;** http://ec.europa.eu/environment/waste/compost/pdf/ia_biowaste_directive_report.pdf

– **DEFRA 2004** Review of environmental and health effects of waste management: municipal solid waste and similar wastes (DEFRA, May 2004); http://www.defra.gov.uk/ENVIRONMENT/waste/research/health/index.htm

– **EEA 2006** EEA report No 7/2006 on "How much bioenergy can Europe produce without harming the environment?"; http://reports.eea.europa.eu/eea_report_2006_7/en

– **EEA 2007 (1)** The *road from landfilling to recycling: common destination, different routes*; http://reports.eea.europa.eu/brochure_2007_4/en

– **EEA 2007 (2)** *Europe's Environment – Fourth Assessment*; http://reports.eea.europa.eu/state_of_environment_report_2007_1/en

– **EEA CSI-16** EEA, Core set of indicators – municipal waste (CSI-16); http://themes.eea.europa.eu/IMS/ISpecs/ISpecification20041007131809/IAssessment1183020255530/view_content

– **Eunomia 2002** *Economic analysis of options for managing biodegradable municipal waste*; http://ec.europa.eu/environment/waste/compost/pdf/econanalysis_finalreport.pdf

– **EUROSTAT, 2008** Data downloaded from Environmental Data Centre on Waste (especially: Structural Indicators on municipal waste and Waste Statistics Regulation):

http://epp.eurostat.ec.europa.eu/portal/page?_pageid=3155,70491033,3155_70531796&_dad=portal&_schema=PORTAL

- **Favoino, 2002** E.Favoino: Myth and reality about costs of separate collection schemes "The biological treatment of biodegradable waste - Technical aspects", workshop proceedings, Brussels, 2002, more presentations at: http://ec.europa.eu/environment/waste/compost/presentations/favoino2.pdf
- **Fowles 2007** M.Fowles, *Black carbon sequestration as an alternative to Bioenergy*, Biomass & Bioenergy, 31 (2007) 426-432;
- **Heidelberg 2002** *Untersuchungen zur Umweltverträglichkeit von Systemen zur Verwertung von biologisch-organischen Abfällen*, Teilbericht ifeu-Institut, Forschungsprojekt unterstützt von der Deutschen Bundesstiftung Umwelt, Veröffentlichung in der Reihe Initiativen zum Umweltschutz Bd. 52, Berlin 2002, cited in: Florian Knappe, Regine Vogt: *Biomassenutzung im Vergleich Auf emissionsmindernde Maßnahmen und eine hochwertige Nutzung kommt es an*, Müllmagazin 2/2003, 19-25;
- Impact Assessment of Proposal of Directive on Industrial Emissions (http://ec.europa.eu/environment/air/pollutants/stationary/ippc/proposal.htm);
- **JRC, 2007** European Commission, Joint Research Centre (Ed.): *Environmental Assessment of Municipal Waste Management Scenarios:* Part I – *Data collection and preliminary assessments for life cycle thinking pilot studies*; Part II - *Detailed Life Cycle Assessments;* JRC Scientific and Technical Reports, Luxembourg, 2007; http://ies.jrc.ec.europa.eu/uploads/fileadmin/Documentation/Reports/RWER/EUR_2006-2007/EUR_23021_EN.pdf http://ies.jrc.ec.europa.eu/uploads/fileadmin/Documentation/Reports/RWER/EUR_2006-2007/EUR_23021_EN2.pdf
- **JRC, 2009** Bart Krutwagen; Jaap Kortman; Koen Verbist: *Inventory of existing studies applying life cycle thinking to biowaste management. Analysis of existing studies that use a life cycle approach to assess the environmental performance of different options for the management of the organic fraction of municipal solid waste*; in: Raffaella Bersani, Rana Pant, David W. Pennington (Ed.) European Commission Joint Research Centre, Scientific and Technical Report, Italy, 2009 (forthcoming);
- **Juniper 2005** *Mechanical-Biological-Treatment: A Guide for Decision Makers*;
- **L.de Baere 2008** *The practice of dry digestion of organic waste in the European context*. Workshop "The future of anaerobic digestion of organic waste in Europe" Nuremberg, January 2008.
- **Lehmann, 2007** Johannes Lehmann, *Bio-energy in the black*, Ecol Environ 2007, 5(7) 381-387
- **ORBIT/ECN, 2008**, Compost production and use in the EU, Final report of ORBIT e.V. / European Compost Network ECN to European Commission, Joint Research Centre
- **Vito, 2007** *Data Gathering and impact assessment for a review and possible widening of the scope of the IPPC Directive in relation to waste treatment activities; Fact sheet E1 Biological treatment of organic waste* – study for DG ENV
- **WRAP, 2008** *The food we waste*, WRAP (2008), at: http://www.wrap.org.uk/retail/food_waste/research/the_food_we_waste.html;