BIODEGRADABLE WASTE MANAGEMENT PERSPECTIVES (2008 -2015)

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Biodegradable waste comprises a large variety of waste flows such as food, park and garden, paper and cardboard, livestock and food industry waste and the residues from processing urban and industrial waste water, etc. The National Integrated Waste Plan (*Plan Nacional Integrado de Residuos – hereinafter PNIR, valid from 2008 to 2015. It is pending approval and should be complete by the end of 2008)* refers to the biodegradable fraction of household urban waste and the sludge from urban waste water treatment plants. The PNIR also includes the "Diversion Strategy of Biodegradable Waste from Landfills" which, in compliance with waste legislation *(RD 1481/2001, of December 27, which regulates waste disposal on landfill sites. This RD transposes Directive 31/99 on the landfill of waste)* presents objectives for biodegradable household waste. The plan does not contemplate other flows of biodegradable waste because better information is required about its generation and management in order to establish objectives and measures to be included in future plans.

With regards to manures, which are not included in the PNIR, a Slurry Biodigestion Plan and RD on Grants and Subsidies are currently being prepared in order to promote better management of this waste, according to type of slurry generating facility, size, location, etc., and the processes undergone after anaerobic digestion.

Legislative framework and planning

Recently approved waste framework establishes a new legislative framework for waste. The obligations derived from this Directive will be added to the PNIR. However, the PNIR was edited considering the Directive, so that the Plan is fully consistent with it.

The Directive includes the concept of "biowaste", which it defines as *biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants.* The PNIR partly covers this term in as much as it includes the biodegradable fraction of household urban waste both in its planning and the "Strategy for the Landfill of Biodegradable Waste".

The Directive promotes:

- Separate waste collection for composting and biodigestion.
- Processing to ensure a high degree of environmental protection.
- The use of environmentally safe materials produced from biowaste.

It also contemplates the possibility of future requirements applied to biowaste management and quality criteria for the liquid waste after anaerobic digestion and compost obtained from it.

Some studies show that certain parts of our country have a shortage of organic matter, so the correct management of this waste aimed at obtaining organic amendments and fertilisers has a fundamental role to play. We also have to consider that their use represents a saving for farmers in the costs derived from the use of fertilisers derived from natural resources, preventing their excessive application. The Plan fosters the selective collection and biological treatment of biodegradable waste, of key importance for obtaining quality amendments, and thus creating a way to fix carbon in the soil, closing the carbon cycle and helping to reduce greenhouse effect gas emissions.

BIODEGRADABLE WASTE OF HOUSEHOLD ORIGIN

Present situation:

The plan required an analysis of the present situation, which in fact corresponds to 2006, the year for which the latest information was available at the time. Although this information can be improved and is not currently up-to-date, it at least provided an estimation providing a view of the quantity of waste collected and its management.

According to the latest figures edited by the Ministry of the Environment, which are shown on the following table, in 2006, 14% of total collected urban waste was deposited in specific container and at classified waste collecting points, with the remaining 86% being collected mixed together. Only 2% represents the selective collection of organic fraction which is taken to specific treatment plants and mechanical selection previous to biological treatment, biomethanisation and composting plants. Most household waste is processed in mechanical selection previous to biological treatment and composting plants.

2006 waste collection

Collection modality		Tonnes	Percentage
Selectively collected waste	Separated in the household:	2,519,340	11%
	Paper/cardboard	934,062	4 %
	Glass	562,000	2 %
		606,200	3 %
	EELL	417,078	2 %
	Disposed at clean points	697,432	3 %
Mixed waste		20,431,260	86 %

2006 biological processing facilities

Facilities	No. of centres	Input (t/year) 2006
Selectively collected Organic Fr. composting facilities	18	160,017
Triage and composting facilities	59	6,991,541
Triage, biomethanisation and composting facilities	13	1,168,565

An analysis of the information obtained shows that:

- There are some missing data which needs to be corrected.
- There is little selective collection of the organic fraction, especially by certain producers and in certain settings for which it should not be a problem. This is true of major producers, tourist areas, small villages and rural areas or islands.
- There are different household urban waste collection models in Spain, depending on the different fractions separated at origin, so they need to be studied and new models should be evaluated in order to increase the quantity and quality of selectively collected materials.
- With regards to the biological treatment applied to household water, the most common is mixed waste composting. With this treatment, however:

- The compost rarely meets the quality criteria established in RD 824/2005 for fertilisers, so this material is often sent to the landfill site without being stabilised.
- These treatments give rise to large quantities of inappropriates with a high content in organic matter. They are also usually discarded with unbalanced organic matter.
- Operative problems have been found in the anaerobic digestion facilities of triage, biomethanisation and composting plants processing mixed waste, with better yields obtained from anaerobic digestion plants focused on the biodigestion of selectively collected organic fraction.
- The number of selectively collected OF composting plants has increased in the last few years, with the largest number found in Catalonia.

National Integrated Waste Plan (PNIR)

Objectives

Based on an analysis of the present situation, the Plan proposes the following objectives:

- Improve the information available and publish regular statistics.
- Foster the selective collection of biodegradable fractions as an efficient way of producing organic quality amendments and/or biogas and helping to improve the yield of biological treatment facilities and waste reduction.
- Quantitative objective: increase selectively collected OF by at least 2Mt for biological processing by 2015, representing at least 10 times the fraction collected in 2006.
- Foster the composting and biomethanisation of selectively collected organic fraction.
- Reduce the quantity of landfill waste, especially the biodegradable fraction, in particular organic waste and paper/cardboard.
- Eradicate illegal waste disposal which damages the environment and human health, by applying the Programme of Action to Combat Illegal Waste Disposal.
- Efficiently apply waste legislation.
- Reduce the quantity of municipal biodegradable waste disposal and meet the quantitative reduction targets established in waste legislation in relation to the quantity of biodegradable urban waste produced in 1995.

Measures

The measures proposed in the Plan to meet these targets are summarised as:

Information:

- Improve the information available concerning waste production and management in general in coordination with the different autonomous regions in order to improve the data, and in collaboration with the National Statistics Institute to ensure reliable statistics edited from forms with the criteria established by the Ministry of the Environment.
- Establishment and application of periodical and systematic characterisation methods, identifying the composition of household waste and, by extension, its content in biodegradable fraction.

Collection:

- Evaluation of current and other possible collection systems in order to improve the quality and quantity of selectively collected materials.

Recycling:

- Adoption of a Spanish standard applicable to the selective collection of organic fraction, biological treatment and production of high quality compost.
- Publication of guidelines for the application of compost to farm crops, gardening, etc.
- Volunteer agreements, collaboration agreements and pilot projects for establishing the selective collection of OF and park and garden waste, major generators, rural settings, isolated areas and islands, etc.
- Establishment of information and awareness campaigns to promote waste separation at origin; they are fundamental for involving the population.
- Continuation and extension of domestic and community composting programmes. More educational impact than significant waste removal.

Treatments:

- Gradual conversion of mixed waste triage and composting plants into mechanical-biological treatment plants prior to removal.
- Reorientation of biomethanisation facilities to treatment of selectively collected organic fraction.
- Establishment of a protocol for the identification of BW routes in treatment plants.
- Collaboration with the Spanish Composting Network for the development of technical advances aimed at optimising the yield of current composting and biomethanisation plants. Publication of guidelines for the operation of such facilities.

Dumping:

- Measurement or estimation of biodegradable waste disposal, and determination of its composition.
- Analysis of the fiscal instruments available for penalising disposal of Biodegradable Urban Waste.
- Establishment of admission criteria for biodegradable waste disposal, criteria for treatment prior to disposal (stabilisation) and a waste biodegradability index.

SLUDGE FROM URBAN WASTE WATER TREATMENT PLANTS

Sludge is waste produced when processing urban waste water in treatment plants. It contains beneficial elements (organic matter, nutrients) but also pollutants. It can be used as an organic fertiliser or as a soil amendment providing it meets the limits established by legislation for heavy metals. It is regulated like waste in which its application to agriculture and fertiliser production has specific regulations.

There are a series of basic aspects involved in its management. First of all, its characterisation identifies its possible use. In any event, sludge requires treatment irrespective of its destination and for sludge applicable to farmland it is essential to consider the dose to be applied according to its content in nutrients, the soil in question and crop needs, in order to prevent the subsequent pollution of ground water.

Present situation

The quantity of sludge has increased as has the number of treatment plants, in compliance with Directive 271/91 relating to the treatment of urban waste water. At the same time, the quantity of sludge applied to farm crops has also increased.

	1998	2006
PRODUCTION (Mt m.s.)	0.8	1.1
AGRICULTURE (Mt m.s.)	0.3	0.7

Objectives for fostering environmentally safe recycling

Although the Plan contemplates all management modalities, as it depends on the size of the treatment plant, its location, its input, etc., the Plan attempts to promote biological treatment of such waste and the agricultural use of all sludge in which the heavy metal levels do not exceed those established in the legislation.

The Plan specifically proposes the following objectives:

- Minimise the quantity of sludge aimed at disposal.
- Improve control of agricultural applications, guaranteeing an appropriate use of sludge in soil.
- Continue to insist that the prevention of pollution at origin is the only way to guarantee that the industrial waste water reaching waste water treatment plants is free of pollutants, to prevent them from concentrating in the sludge produced.
- Guarantee storage capacity for sludge, especially for farming use, as such applications are seasonal.

The Plan proposes the following quantitative objectives:

OBJECTIVES	2015 (%)
FARM LAND	67
USE ON OTHER LAND OR OTHER TYPES OF USE	18
INCINERATION	3
DISPOSAL	12
CORRECT ASH MANAGEMENT	100

Although they are not highly ambitious objectives, we have to remember that the quantity of sludge produced each year is increasing with the number of treatment plants. The Plan therefore proposes attainable objectives.

Measures

As for other waste, the Plan proposes to improve sludge production and management data. In this respect, the review and modification of the annexes to the Order of October 26, 1993 will guarantee:

- Sludge traceability.
- Better information about management and destination.
- Correct application of sludge to clearly identified farm land.

It also proposes:

- To establish integral fertilisation plans.
- To edit and approve technical manuals related to:
    - Good practice code for the application of sludge to soil.
    - Possible treatments of sewage sludge, with their advantages and disadvantages, and pertinent recommendations for each specific practical case.
    - Sludge storage.
- Action to be taken to reduce toxic and hazardous waste in the drainage network, to be specified in the Plan.