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1. Introduction

Waste management has experienced significant improvements in Portugal during the last 6 years due to a combination of the following factors:

- the existence of a defined legal framework that establishes the powers and responsibilities of the key stakeholders;
- the drawing-up of management plans approved by the Portuguese government defining the strategies and targets to be achieved;
- allocation of considerable financial resources in the context of the ii community support framework;
- implementation of the inspection and control of the management conditions for the waste generated; and
- awareness-raising among the public and decision-makers of the importance of proper waste management.

In order to adopt the Framework Directive 75/442/CEE on the development of waste management plans to support the national waste policy, Portugal has developed the following plans:

- the Strategic Municipal Waste Plan that was published in July 1997 (INR, 1999). The strategy was based on closing uncontrolled dumps and implementing composting plants, two incineration plants (in the Lisbon and Porto metropolitan areas), controlled landfills and attaining recycling targets.
- the Strategic Clinical Waste Plan which was approved by the Ministry of Health and the Ministry of the Environment on 5 June 1999.
- the Strategic Industrial Waste Plan was published on 2 December 1999 (INR, 2001). The plan refers to the Resolution of the Council of Ministers No. 98/97 of 25 June 1997, providing for the implementation of substructures to supply the country with facilities for the proper treatment of industrial waste. The aim of the plan is to prevent the production of industrial waste, reducing its quantity and/or toxicity through the development of clean technologies, promoting recovery and recycling circuits, and defining a network of appropriate disposal plants. This plan was revised in 2001.
- the National Plan for Industrial Waste Prevention which was approved in September 2000. The plan was developed for the period 2000–2015, in order to comply with the hierarchy of waste management principles approved at the European Union level (Resolution of the EU Council of Ministers of the Environment No. 97/C76/01 of 24 February) that was reported on the national framework law on waste. The plan aims at reducing the hazardousness and quantity of industrial waste generated, through the application of pollution prevention measures and technologies to industrial production processes. The success of the application of this document shall be intrinsically related to changes in the strategy, behaviour and attitudes of the economic agents and consumers. This plan has also a set of 19 Sectorial Technical Guides. These guides are technical tools to be made available to firms, containing a wide range of information, particularly on prevention technologies and/or
measures potentially suitable for the production processes of each of the industrial sectors analysed.

Finally, the preliminary version of the Strategic Agricultural Wastes Plan was presented on 2 June 1999. The final version is being drafted at the moment.

The level of progress achieved can be observed more notably in municipal and clinical wastes than in the industrial waste stream. A treatment system for hazardous industrial waste has not been implemented in the country, as yet.

The absence of proper treatment for hazardous industrial waste sub-sector penalises the industrialists, who have to comply with the legislative requirements, though they do not have an accessible alternative treatment for some of these wastes within the country.

With the III Community Support Framework, it will be possible to provide the country with the required infrastructure and complementary management systems. This will allow those involved to face waste issues not as a problem but as an area resulting from human activities in which management is possible, in accordance with the rules and principles for preserving the quality of the environment.

2. Municipal waste management perspectives

Waste management was the last environmental issue that was addressed in all the countries that have developed and implemented environmental policies. Problems related with water quality and sewage collection, together with the reduction and control of gas emissions, were solved first. Even in the context of the European Union, waste issues were not the object of specific legislation until the 1970s.

Furthermore, in Portugal, waste management was only considered a priority in the 1990s. As result, the 1995 performance indicators, related to the municipal solid waste (msw) stream, showed an urgent need for the situation to be addressed. Effectively, only 26% of the msw generated in Portugal could be assured the proper treatment, while the remainder was disposed of in more than 340 dumps. On the other hand, selected collection for recycling was not very common, being conducted only in metropolitan municipalities, and even then only for paper and glass.

There was a certain knowledge of the most appropriate solutions for the national situation, and also an updated legal framework resulting from the application of EU directives to portuguese law, clearly establishing the different management obligations and powers for those involved in waste management. In this context, following important political decisions on the allocation of significant financial resources to the msw area, the "strategic plan for municipal solid waste (Persu-Plano Estratégico para a Gestão dos Resíduos Urbanos)" was approved.

This document defined three essential goals:

- construction of an adequate treatment infrastructure for all the msw produced in the country;
- extension of the selected collection network ("ecopontos"\(^1\), "ecocentros"\(^2\) and sorting units) to the whole country, in order to allow the implementation and consolidation of selected collection, mainly for packaging waste contained in the msw stream;
- environmental recovery in the wake of waste disposal in uncontrolled dumps, namely, the deactivation and the closure of all existing dumps sites.

The results of the implementation of such a strategy have been assessed according to the indicators available and show that, at the beginning of 2002, 100% of the msw generated in portugal is disposed of appropriately and almost 70% of the national territory is covered by selected collection programs for recycling.

Currently, the country has:

- 3 incineration plants;
- 7 organic waste recovery plants;
- 37 landfills;
- 77 transfer stations;
- 18 sorting units; and
- 133 "ecocentros" and 13500 "ecopontos".

At the same time the applications for national and eu funds were approved, in order to develop the network of "ecopontos" and "ecocentros" on the basis of one "ecoponto" per 500 inhabitants, which will be implemented by the end of 2002.

It is well-known in this field that a substantial change was made in a relatively short time. For this planning capacity and the implementation of the planning issues were crucial.

However, it is also known that in the short/medium term, complementary measures and action will still have to be taken.

Construction of the infrastructure is almost complete, with the exception of some complementary composting units or anaerobic digestion plants, which will allow a reduction in the amounts of organic waste that are not being recovered now. Construction of the organic sub-sector recovery units, improvement in leachate treatment systems at landfills and the benefited recovery of

\(^{1}\) Ecoponto (Eco-point) — Technical Portuguese word for central "drop-off-point"; consists of a group of containers prepared to receive sorted material

\(^{2}\) Ecocentro—Center of ecopontos.
biogas from landfills will allow management of the MSW stream, in accordance with all the requirements of environmental law.

Moreover, for the development of the infrastructure, the Ministry of Cities, Territorial Planning and the Environment contains the bodies and the mechanisms that allow the efficient management of MSW within the perspective of environmental sustainability. Through the competence and professionalism of the management entities of the msw treatment systems (about 30), as well as the implementation of control, inspection and auditing operations carried out by public authorities, it is essential to assure that the investment (about EUR 1500 million in this area by the end of the III Community support framework—2006), has effectively and usefully provided the portuguese population with high levels of waste management and contributed to an improvement in their wellbeing (INR, 2000).

Among the challenges for an improvement in MSW management is the development and construction of new recovery units for the organic sub-sector, allowing accomplishment of the targets for a reduction in organic sub-sector disposal in landfills.

The consolidation of the selected collection network, together with the Green Dot System (Sociedade Ponto Verde) activities, a management entity licensed to promote the environmental and financial sustainability of packaging-waste management, will allow the ambitious recycling targets established in Directive 94/62/EC and its amendments to be attained.

The management of MSW will improve in line with an improvement in the management of other streams, for instance, clinical waste, end-of-life vehicles, industrial waste, electric and electronic equipment waste, and construction and demolition waste.

Action related to the streams mentioned is being prepared on several fronts, namely the construction of treatment units, the preparation of complementary legal documents and the establishment of management systems set up on the polluter-pays principle with the implementation of the “green-dot systems”.

At the moment, MSW management in Portugal is taken care of by business-related entities which charge the municipalities the real cost of the treatment per tonne of the waste that is managed.

Nevertheless, municipalities levy taxes on the citizens, covering only a part of these costs, by integrating them into the price of the water supply or in the tax for sewage treatment. These are the most frequent options observed, due to questions of simplifying the invoicing.

A campaign for promoting public awareness is in progress, with a view to recovering the total costs of the MSW management from users, this being a contribution to the prevention of waste generation and to the citizens adopting this option.

3. Clinical waste

According to Order No. 16/90 of 21st August, clinical waste was classified as infectious (Group A) and non-infectious (Group B), and hospitals were the only health care units obliged to report their waste generation.

On 13 August 1996, the legal document Order No. 242/96 was published, and established a new classification for clinical waste, grouping it into four classes:

Group I—Similar to municipal waste, not subject to special treatment;
Group II—Not subject to special requirements in its treatment, so it can be classified as similar to municipal waste;
Group III—Consisting of contaminated wastes, or potentially contaminated;
Group IV—Consisting of several types of wastes that must be incinerated.

Wastes belonging to Groups I and II are non-hazardous waste. Waste belonging to Groups III and IV are hazardous waste.

Regarding clinical waste treatment and disposal, waste from Groups I and II (non-hazardous waste) are managed as municipal waste, since they are similar.

In order to promote the recycling of packaging and packaging waste, the Strategic Clinical Waste Plan sets out that all hospitals, clinics, and health care centres should have equipment for depositing this type of waste.

The clinical waste of Group III (hazardous waste) can be pre-treated and then disposed of in a municipal landfill or it can be incinerated.

There are two national treatment facilities for autoclaving this kind of waste and a company that deals with waste proceeding from health care units that produce small amounts of waste. It uses a chemical process for clinical waste treatment. This enterprise upgrades its capacity in relation to the needs of the market.

It can be expected that the incineration needs for this kind of waste are only going to be covered by two incineration plants.

The amount of Group III and IV clinical wastes incinerated decreased to 11.1 tonnes in 1999, and to 7.6 tonnes in 2000.

References