

WASTE MANAGEMENT AT AZORES ISLANDS: CHALLENGES AND OPPORTUNITIES

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Abstract

An overview of the solid waste management practices in Azores is provided along with the guidelines and the waste projects comprised in the new Strategic Plan for Waste Management of Azores (PEGRA), under discussion. The Plan focus on waste valorisation, efficient use of resources and protection of human health and ecosystems, under six thematic areas: i) eco-efficiency and consumption; ii) waste infrastructures; iii) economical and financial regime; iv) legal and institutional framework; v) human resources qualification, and vi) knowledge, education and public participation.

1. Waste Characterization in Azores

Management of waste is a major challenge in the Azores archipelago. Transportation costs between the nine islands and mainland are very high. Landfilling option is questionable in terms of life cycle analysis and land availability is scarce. Several islands have no waste treatment infrastructures at all. Therefore, illegal disposal of waste poses a significant threat for habitats and species, and constrains recreational uses in touristic areas along the coast (Depledge *et al.*, 1992; Morton & Cunha, 1993).

Municipal solid waste production in Azores amounts to 130 000 ton/year (1,46 kg/per capita) with a similar amount of other wastes (e.g.: construction and demolition, forest and hazardous and non hazardous industrial wastes). The heterogeneous population distribution among islands, associated with low population density, imposes significant constrains for an optimized design of an integrated waste management system in Azores. The municipal waste production along the nine islands is highly asymmetrical, has can be seen in Figure 1. The irregular distribution and small waste production in most islands are the main difficulties for achieving a positive result in a financial cost-benefit analysis. However, social factors and the potential of the coastal area for the economical development of Azores are becoming important factors for a new vision in the area of waste management.

Waste collection is, generally, not selective and the willingness to recycle is poor (less then 5% of the population has separating source mechanisms). The final disposal is in landfills when available, but some of them have environmental hazards. Industrial waste fails on producer's unruliness over stocking areas, recycling and/or final disposal. Therefore, landfill and packaging EU directives are not in compliance in the Region.

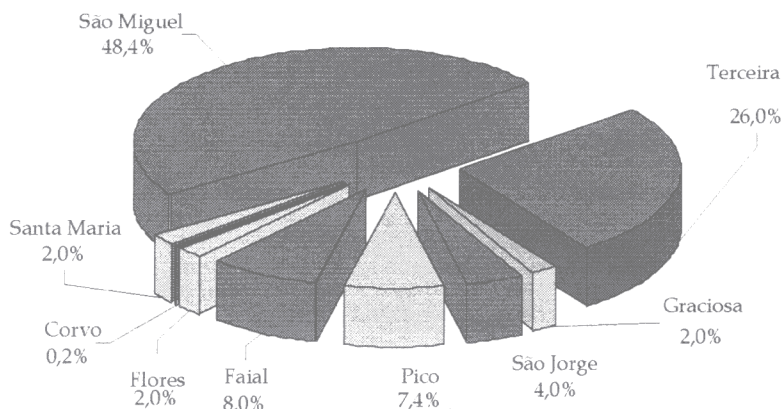


Figure 1. Municipal waste distribution in Azores islands.

2. The Strategic Plan

The Strategic Plan for Waste Management of Azores (PEGRA) provides a vision according to each island's characteristics and references. Some of the priority lines are prevention and promotion of reuse/recycling, source-separation and the consideration of waste as a product, avoiding landfilling practice whenever feasible, as required by the Thematic Strategy for Prevention and Waste Recycling (COM/2005/0666 final). A new legal and financial framework and a stronger regulation and inspection are also sought, as well as the encouragement of public participation, information and communication. Table 1 summarises the strategic domains of the Plan.

Several types of technological systems will be integrated in PEGRA - processing and sorting, mechanical biological treatment plants, composting and waste to energy plants - and two phases are scheduled until full implementation. Now under discussion, the draft version of the plan comprises an investment around 120 million euro (phase 1). The main reason for having a phased implementation is a possible reinforcement of the waste to energy option. Currently, the energy option is based on a biogas plant, but a new methane producing system or other technology could be considered, if environmentally, economically and socially acceptable. The well known fossil fuel depletion and Kyoto Protocol, as well as the biofuel directive and carbon market implications, may become drivers for such energy based approach. The global mass balance for municipal solid wastes fluxes in Azores, considering phase 1 options, is depicted in Figure 2.

Table 1. Thematic Areas of PEGRA.

Eco-efficiency and consumption
Waste infrastructures
Economical and financial regimen towards sustainability
Legal and institutional framework
Human resources qualification
Knowledge, environmental education and public participation

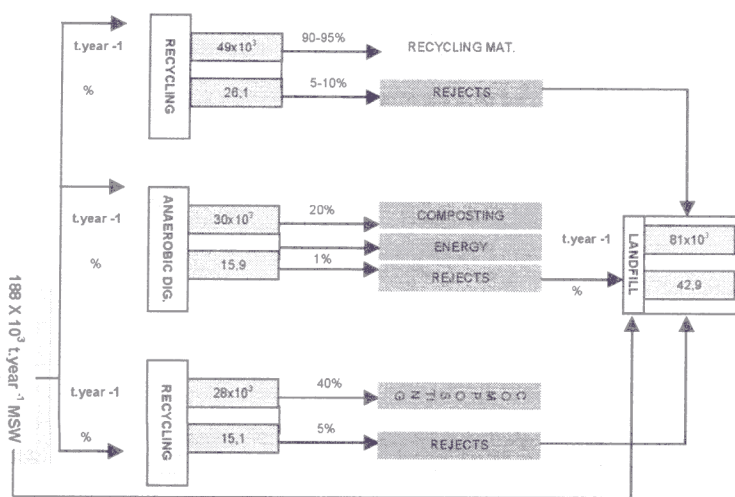


Figure 2. Mass balance of Municipal Solid Waste fluxes in Azores (2016, if option 1).

Based on Figure 2, the mass balance of municipal solid wastes will comply with the UE directives 1999/31/CE and 2004/12/CE, the landfill and packaging reuse directives.

3. Conclusions

A new vision for waste management in Azores is necessary and the strategic plan for waste management of Azores (PEGRA) is thought to play an important role in this subject, in a near future. PEGRA will focus on waste valorisation, efficient use of resources and protection of human health and ecosystems, in a sustainable way, throughout appropriate technological systems.

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