



Extended producer responsibility policy in Portugal: a strategy towards improving waste management performance



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ABSTRACT

This article provides an assessment of waste management evolution in Portugal, with a particular emphasis on the performance brought by the adoption of several EPR schemes, namely the ones developed for packaging (general, medicine and plant protection products), used tires, used mineral oils, end-of-life vehicles (ELV), waste electrical and electronic equipment (WEEE), portable batteries and car and industrial batteries. Further, a particular focus is placed on the drivers that influenced the development of such EPR schemes in the country and the challenges facing EPR schemes' development in Portugal.

The results achieved in a short period of time suggest that the evolution of the implementation of the EPR concept in Portugal was, so far, successful, not only in quantitative but also in qualitative terms (contributing for a reduction of environmental performance). However, there is still room for improving EPR impact in the long-run and this is largely dependent on policy instruments (of fiscal, information and supervision natures) that can positively influence the context in which EPR schemes operate.

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1. Introduction

The extended producer responsibility (EPR) is one of the mechanisms highlighted by the EU waste framework Directive (Directive 2008/98/EC) to support its objectives, namely the reduction of waste production and management performance. In fact, more than 20 years after the implementation of this policy strategy in the EU (Forslind, 2009) – whose legislation covers actually packaging, end-of-life vehicles, waste electrical and electronic equipment and batteries – it may be stated that it has been a major contribution to shift waste management in the direction of more recycling allowing to decrease impacts from disposal of end-of-life of products (e.g. Fischer, 2011; Gerrard and Kandlikar, 2007; Barba-Gutierrez et al., 2008; McKerlie et al., 2006).

The EPR strategy has also been one of the main pillars of the Portuguese waste policy since the 1990's. Like in most of the European countries, the implementation of this waste management strategy in Portugal stems from the adoption of the EU legislation and not from a national initiative (Cahill et al., 2011).¹ The waste

framework Directive was directly transposed to the Portuguese legislation and for the most part, a pooled take back approach was adopted. Producers were mandated to create a non-profit producer responsibility organization (PRO) to organize and manage the collection and recovery of specific wastes (Lifset and Lindhqvist, 2008).

Many articles have dedicated to assess the EPR approach associated to certain flows – WEEE (e.g. Hischer et al., 2005; Magalini and Huisman, 2007; Turner and Callaghan, 2007; Barba-Gutierrez et al., 2008; Manomaivibool, 2009; Walther et al., 2010; Zoeteman et al., 2010), ELV (e.g. Forslind, 2005; Ferrão et al., 2006; Forton et al., 2006; Gerrard and Kandlikar, 2007; Santini et al., 2011; Xiang and Ming, 2011), Tires (e.g. Ferrão et al., 2008; Milanez and Bührs, 2009), among others – but very few articles have dedicated to assess the EPR policy approach of a country (e.g. McKerlie et al., 2006; Nash and Bosso, 2013), particularly in Europe. Therefore, EPR based articles usually do not provide an integrated perspective of the benefits and constraints associated to implementing this strategy, or its impacts in the waste management performance of a particular country.

In this context, the research presented in this paper seeks to bridge this gap in the literature, by developing a case study within a particular context, to attempt the answer of the following research questions: 1) what is the impact of EPR implementation in waste

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¹ Exceptions are Germany, Austria, Belgium and France that developed national initiatives prior to the first EPR based Directives (Cahill et al., 2011).

management performance?, 2) what are the main context conditions associated to EPR implementation?, and; 3) what are the potential drivers that are able to improve EPR systems' performance?

This research uses a case-study methodological approach (Eisenhardt, 1989; Yin, 1994), by which quantitative and qualitative data specifically referring to the object of the research question – EPR implementation and impact in the Portuguese context – is compiled and analyzed. This supports the characterization of the context, identification of benefits and constraints from which the potential drivers of EPR performance can be extrapolated. Moreover, the authors' own experiences in assisting the implementation of these systems, and the convergence of multilateral observations, enhances the confidence in the findings, as stated by Eisenhardt (1989).

The paper is organized according to the objectives/research questions established. Section 2 sets the context, by providing an assessment of waste management evolution and performance in Portugal up to the introduction of the several EPR schemes (e.g. packaging waste, used tires, mineral oils, end of life vehicles (ELV), waste electrical and electronic equipment (WEEE), portable batteries and car and industrial batteries). Section 3 details the context specifications associated to the EPR functioning and performance. Section 4 takes into consideration the previous results to suggest further policy instruments that may improve EPR system's performance. And finally Section 5 presents the main conclusions of the paper.

2. The evolution of waste management in Portugal

2.1. Main policies

In Portugal, waste management began to be perceived as a priority during the 1990's. This became more evident with the disclosure, in 1995, of the first performance indicators, particularly the ones related to the municipal solid waste (MSW) stream. At the time, proper treatment was only assured for 26% of the MSW generated in Portugal, mainly consisting of disposal in controlled landfills,² while the remainder was disposed across 340 uncontrolled dumping sites. Also, separate collection for recycling was limited to metropolitan municipalities and for paper and glass waste flows only (Pássaro, 2003).

A major shift to this scenario came in the end of the nineties, when new strategic orientations for waste management were implemented through a series of specific plans (Table 1), the most relevant being the Municipal Solid Waste Strategic Plan (PERSU, Plano Estratégico do Resíduos Sólidos Urbanos, in 1997 and reviewed in 2007), the Hospital Wastes Strategic Plan (PERH, Plano Estratégico dos Resíduos Hospitalares, in 1999) and the Industrial Waste Strategic Plan (PESGRI, Plano Estratégico de Gestão dos Resíduos Industriais, in 2001).

In seven years these policies fostered a large investment in infrastructures. For example, the most important results of the first Municipal Solid Waste Strategic Plan (PERSU I, 1997–2006) were the closure of the uncontrolled dumping sites and the implementation of composting plants, two incineration plants (in Lisbon and Porto metropolitan areas), the construction of controlled landfills, and the development of the first measures to achieve recycling targets.

² A "controlled landfill" is a landfill which is developed by taking into account the operational and technical requirements, measures, procedures and guidance's set by EU Directive 99/31/EC – also known as the Landfill Directive – to prevent or reduce as far as possible the negative effects on the environment during the whole life-cycle of the landfill.

Table 1
Waste management plans, Portugal, 1997–2011.

Waste category	Acronym	Name
MSW	PERSU I (1997)	Municipal Solid Waste Strategic Plan
	ERB (2003)	National Strategy to Reduce Biodegradable Landfilling
	PIRSUE (2006)	Intervention plan for MSW and equated wastes
Industrial Waste	PERSU II (2007)	PERSU I revision
	PNAPRI (2000)	National Prevention Plan for Industrial Wastes
	PESGRI (2001)	Strategic Plan for Industrial Wastes Management
Clinical waste	PERH (1999)	Strategic plan for Clinical waste
Agricultural waste	PERAGRI (in progress)	Strategic plan for Agricultural Waste
All	PNGR (in progress) ^a	National Waste Management Plan

^a As consequence of the new framework directive (Directive 2008/98/EC) a National Waste Management Plan (PNGR) has been developed and, after a period of public discussion will be published by the government. This plan settles the national strategic objectives of the waste management policy and the guiding rules that assure the coherence of the specific plans and the creation of an adequate and integrated network of recovery and disposal infrastructures. The other plans will then be assessed and if needed changed according to the PNGR objectives and targets.

2.2. Overall waste management performance

From 1990 to 2009 the production of Municipal Solid Waste (MSW) in Portugal increased from 3.0 Mt to 5.2 Mt, and between 1998 and 2009 non-urban waste production increased from 21 Mt to 23.7 Mt (APA, 2010; IA, 2005). This represents, for 2009, an average 2.7 t/cap.year, well below the EU average of about 6 t/cap.year (EEA, 2010). Despite the registered growth in waste production, the infrastructural and organizational development of waste management in Portugal has improved considerably in these last two decades, allowing for 100% coverage of the population in terms of collection and adequate destination of their waste, against 25% in 1996.

Between 1997 and 2002, the most prominent outcome of the mentioned policies was that all the MSW generated in Portugal was disposed-off appropriately and almost 70% of the national territory was covered by glass and waste packaging collection for recycling. Between 2002 and 2009 (Table 2) the recycling and organic recovery rates developed favorably, respectively achieving 11.5% and 8.1% of the MSW destination in 2009, gradually approaching the EU average (16.4% and 9.8%, respectively) (INE, 2010).

In terms of average annual growth, the separate collection of multi-material wastes for recycling grew the most, at an annual increase rate of 15% between 2004 and 2009. However, landfilling still represents the destination for 62% of wastes arising from the non-separate collection, which is 10% above the EU average (INE, 2010) and 30% above the target established by PERSU II for 2009 (MAOTDR, 2007). According to the National Council for the Environment and Sustainable Development (CNADS, 2011) these values are the result of a waste management policy that has mainly relied on technological solutions, with the construction of a large number of infrastructure and equipment, involving large investments, often at the expense of solutions that embrace changing attitudes and social practices. This leads to high and increasing costs of collection and transport, a limiting factor to a faster progression of MSW recycling.

2.3. The impact of EPR schemes

Currently, waste streams covered by EPR represent almost 1.6 Mt of wastes, about 6% of all the wastes produced in the country

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