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"Gheorghe Asachi" Technical University of Iasi, Romania

ENVIRONMENTAL TAXES TO PROMOTE THE EU CIRCULAR ECONOMY'S STRATEGY: SPAIN *vs.* ITALY

Alfonso Andretta[1], Filippo D'Addato[2], Francisco Serrano-Bernardo[3], Montserrat Zamorano[3], Alessandra Bonoli[2]*

[1]Department of Engineering University of Modena, Via Pietro Vivarelli 10, 41125 Modena, Italy
[2]Department of Civil, Chemical, Environmental and Materials Engineering (DICAM), University of Bologna, via Terracini 28, 40131 Bologna Italy
[3]Department of Civil Engineering, ETSI, University of Granada, Campus Fuentenueva, s/n 18071 Granada, Spain

Abstract

As it is widely known, according with European directives, the correct approach for waste management is based on a strict hierarchy of prevention, reuse and recycling, energy recovery and final disposal. In that way, all the countries have to strongly move in urban waste reduction and recycling promotion.
The principles of the Circular Economy have become part of the European and other extra Europe Countries regulations. The European pack on Circular Economy suggests ambitious objectives by 2030 in terms of urban waste reduction and recycling.
Among the different tools, taxation of waste production or dumping, or of other environmental issues can be considered as a stimulus and an interesting support to achieve these goals contributing to implement the environmental knowledge and attention.
In this issue, a research on urban waste management and taxation was carried on to analyse the situation in Europe and specially to compare two similar southern Europe Countries as Italy and Spain. Waste management environmental taxes can be adopted and applied at regional and even local level, with different approaches and a high level of regulatory dispersion. This heterogeneous situation can lead to market fragmentation and economic inefficiencies. In order to have a full picture on waste management strategies, the main questions to which we would response with this research can be related with what the fees for waste disposal or incineration at landfills were and which effects can they produce on the market.

Key words: environmental tax, incineration, landfill, recycling, waste management

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1. Introduction

The integrated approach of the European Community with regard to waste management is based on a stringent hierarchy, based on Prevention, Reuse and recycling, Energy recovery and Final disposal, according with the Waste Framework Directive (EC Directive, 2006) and its following revised version, EU EC Directive, 2008), in which they are stressing the idea of reduction in waste production, optimizing recycling rates and aiming at the goal of zero waste. The integrated waste management systems are designed to organize waste streams, methods of collection, treatment and disposal, with the goal of achieving important goals in waste reduction and recycling rate in a general frame of sustainability by environmental benefits, economic optimization and social acceptability (Bamonte et al., 2016; Bonoli, 2014). Because of the variety of these factors, solid waste management is a complex, multidisciplinary problem involving economic and technical aspects, normative constraint about the minimum requirement for the recycling (Ghinea et al., 2014). The so called "4R framework" in waste management, reduce / reuse

* Author to whom all correspondence should be addressed: e-mail: alessandra.bonoli@unibo.it; Phone: +390512090234; Fax: +390512090308

/ recycle / recover, that fit perfectly with the EU hierarchy, represents now the main key words of the concept of Circular Economy that can be defined as: "an economic system based on business models that replace the end-of-life concept with reducing, alternatively reusing, recycling and recovering materials in production / distribution and consumer processes" (Kirchherr et al., 2017) or, considering the most prominent definition provided by Ellen MacArthur Foundation (www.ellenmacarthurfoundation.org/assets/downloads/higher-education/EMF_Priority-Research-Agenda-copy.pdf),), as an industrial system that suggests re-storing, for the elimination of waste.

Economic aspects have a great influence on choose of the end of life destination of urban waste because of the costs related. For instance, from an economic standpoint, in Spain the implementation of "Waste to Energy" (WtE) systems reduces the cost of other waste final destination (Bacenetti et al., 2016; Fernández-González et al., 2017) while in other countries recycling and composting can be better solution both by economic and environmental point.

Many tools are proposed to analyse waste management efficiency or waste production or waste recycling rate. Just to mention one of them the interested tool for waste production forecasting proposed by Ghinea et al. (2016). However, it should be interesting to find an economic and financial incentive to promote a strategic integrated waste management system that is moving towards a "zero waste" goal (Raworth, 2017).

As it is known "zero waste" represents today another concept that fit perfectly with EU directive in waste management and circular economy perspective. Many different market-based instruments, including environmental taxes and charges, can support a circular economy and can be relevant at different stages in the circular economy (EC, 2012). For example, taxes and bans disincentives are used quite frequently in relation to waste management or in some cases are applied (or could be applied) in relation to upstream extraction of resources (Withana et al., 2014). Among the different tools, taxation of waste production or dumping, or of other environmental issues can be considered as a stimulus and an interesting support to achieve these goals contributing to implement the environmental knowledge and attention (European Commission, 2016)

According with European Commission (2016) definition an Environmental tax is *a tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific, negative impact on the environment*. Or else, those that meet all of the following principles (Speck and Paleari, 2016): the tax is explicitly linked to the government's environmental objectives and it is structured in relation to environmental objectives and its major goal is to encourage environmentally positive behaviour change. That ***could be*** the main aspect, suggesting a relationship between tax and Circular Economy objectives.

Taxes on energy, carbon and transport (vehicle), urban waste management and disposal, electrical electronic waste, air pollutants (SO_2 and NO_x emissions), charge on packaging (plastic bags and bottles), tax on environmental damage or environmental protection, etc. are largely applied in European Countries, but it's clear that the most important result is to face environmental issues and not to generate some revenues. That is an important subject in terms of circular economy approach and resources saving awareness.

Although the actual number of environmental taxes implemented in EU Member States has increased, in the last decade, the revenues generated as a proportion of Gross Domestic Product (GDP) have in general decreased (Eurostat, 2015) (EEB, 2015). In Table 1 the main environmental taxes distribution in Spain and Italy, according with European Statistics Data in Eurostat 2015, in comparison with %of GDP.

A research on urban waste management and taxation can help to understand the true mechanism in Circular Economy achievement also by tax incentive and disincentive.

Table 1. Spain and Italy environmental taxes: EU statistics (2015)

	Environmental tax revenues % per category			***% of GDP***
	Energy	***Transport***	***Pollution/ Resources***	
Italy	82	1	17	3,6
Spain	84	4	12	1,8

2. Case study

The research was carried on waste management in Europe and was started by the comparison between two similar southern Europe Countries as Italy and Spain and with some other different European Countries. In relation with the definition of a tool to promoting Circular Economy, the main questions to which we would response with this research, in order to have a full picture on waste end of life or final disposal method, and the method we followed, can be related with what the fees for landfills waste disposal or incineration were and which effects can they produce on the market. That could be just a first step to find interesting indicators for Circular Economy.

In the case of Italy and Spain, the study was based on primary data directly collected by the Italian Regional Agencies for environmental services (i.e Atersir in Emilia Romagna Region or ATOs in other Regions) and by Spanish local public environmental services (i.e Ecologia, Urbanisme i Mobilitat office in Catalonia, etc.). All data were integrated with the updated 2015 pro capite data survey performed by Eurostat (2017) (Eurostat, 2017).

Fig. 1 is showing urban waste production per capita during the period from 2000 to 2015, for Spain and Italy, while Table 2 reports a comparison between waste management at the same two different years, in

which it is reported the Urban Waste management trend in incineration, recycling and composting, and a landfilling percentage.

In Table 3, urban waste management data are shown, for some European Countries, where percentage of urban waste destined to landfilling, incineration or recycling are present. All data are referred to 2015. In Table 4, they are reported the gate fee and the tax rate related with incineration and landfilling for ten European representative countries.

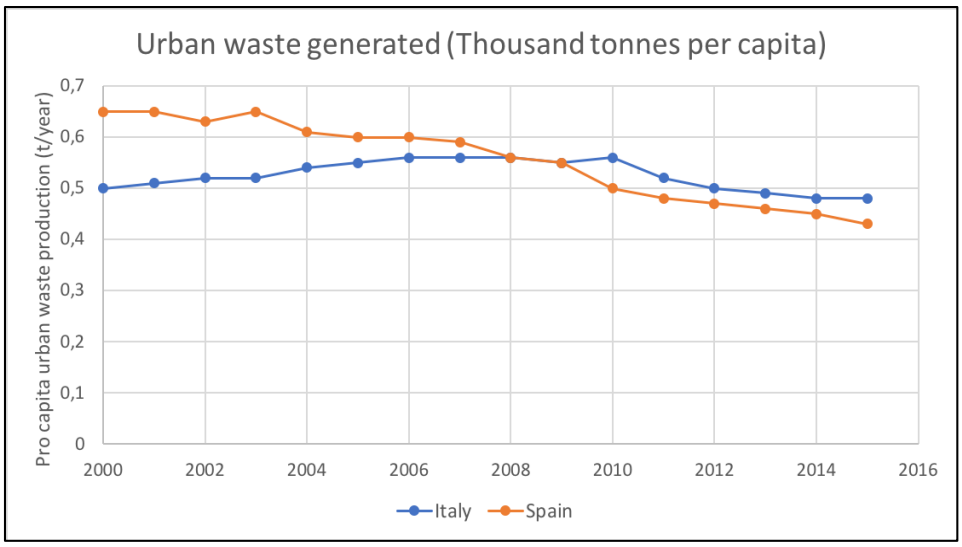

Fig. 1. Waste production in Spain and in Italy (years 2000-2015)

Table 2. Spain and Italy waste management in 2000 and 2015 (by Eurostat Data)

	Urban waste management and disposal (%)							
	Incineration		***Landfilling***		***Recycling***		***Composting or Digestion***	
year	2000	2015	2000	2015	2000	2015	2000	2015
Italy	8	21	78	29	10	29	4	21
Spain	7	12	68	55	9	17	16	16

Table 3. Some European Countries waste management data (%) in 2015

	Urban waste management and disposal (%)		
	Incineration	***Landfilling***	***Recycling and Composting***
Austria	40	1	59
Denmark	52	1	47
France	34	26	40
Germany	32	0	68
Greece	1	84	15
The Nedherlands	48	0	52
Italy	21	29	50
Portugal	20	50	30
Romania	3	82	15
Spain	12	55	33

Table 4. Some EU Countries maximum tax and gate fee (2015) (Eurostat, 2017)

	Incineration		***Landfilling***	
	Tax rate (€/t)	***Gate fee (€/t)***	***Tax rate (€/t)***	***Gate fee (€/t)***
Austria	26	150	26	219
Denmark	44	36	63	95
France	11	120	15	76
Germany	0	250	0	220
Greece	0	/	/	23,5
The Netherlands	0	120	108	30
Italy	0	125	50	90
Portugal	0	/	3,50	10,50
Romania	/	/	/	3,50
Spain	16,50	57	21,60	32,75

3. Results and discussion

In Europe, waste management environmental taxes are adopted and applied, sometimes also at regional and even local level, with a high level of regulatory dispersion and different approaches for the different Countries. This heterogeneous situation can lead to market fragmentation and economic inefficiencies. Data analysis highlights the discrepancy in urban waste production between Italy and Spain: in 2000, a better situation in Italy than in Spain, but in 2015, Italy produces much more waste than Spain. Despite that, Italian waste management policies are much more oriented on a waste valorisation technology devoted to produce secondary raw materials, delivering almost the 50% of the total waste to recycling or composting plants. In the last fifteen years, in fact, a robust reduction of the use of the landfill occurred and a growing recycling and composting percentage were increasing significantly. At the contrary, in Spain, the taxation has been applied late, and not in all the Country but in an inhomogeneous way, just only in few regions. Furthermore, the very low gate fees for landfilling are contributing to the fact that a very high amount of Spanish urban waste (more than 55%) are even today disposed in landfill. The same behavior in Romania or in Greece: in correspondence with a very low landfill gate fee, more than 80% of the total amount of urban waste is landfilled. They were not considered other aspects as economic development or economic crisis in Italy and in Spain because of the similar condition of the two analyzed countries.

In order to understand the role of taxation of urban waste disposals, it's necessary to make a distinction between taxes, that is a levy charged by a public authority for the disposal of waste, and gate fee, that is a charge set by the operators for the service's provision. The sum of tax and gate fee represents the total charge for the waste disposal.

In Italy there are no taxes for incineration, but the gate fee is really high, while in Spain, both taxes and rate are really cheap and they are present only in a couple of regions, the Autonomous Communities of Catalonia and Castile and León. The total charges applied to incineration result higher than in the case of landfilling both for Spain and Italy.

Considering the different analysed Countries, there are really different values in "Tax rates" and "Gate Fee". That could be in relation with each Country technological development but mainly because of differences in local institutional requirements. In Germany, for instance, there are no tax rates but only the gate fee. The management of the charge on the landfilling waste is up to the plant.

Landfilling high taxations in Italy, Austria, Germany and The Netherlands seems to encourage waste recycling and composting. These Countries show the highest gate fee and/or taxation and in general their landfills' costs are over 130 €/t. At the same time, in these Countries, the percentage (over 50%), according with EU objective for 2020, in recycling or composting has been already reached and for some of them, as Austria and Germany, the "zero waste" goal has been already reached (Eurostat, 2017)

4. Conclusions

The environmental taxation could be considered an important instrument to implement waste management and to actually implement circular economy approach. By the comparison between the two similar southern Europe Countries as Italy and Spain and with some other European countries, it can be said that a better behaviour, improving recycling and composting, can be more advantageous by economic point of view just if taxation become too expensive both for landfill and incineration. At the same time, the Countries having the highest landfilling costs have already reached the EU waste percentage recycling goals and they are fastly achieving the "zero waste" goal.

It would be important to harmonize regional taxes in waste management, inside the same country and for all European Countries, and could be important to introduce new environmental taxes on resource use, waste disposal and, in general, environmental damage and pollution. A similar tax reform will be a significant milestone on the way to promote a correct waste management, to improve recycling rates, to reduce landfilling and to have the opportunity to move effectively towards Circular Economy European objectives.

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