WASTE PREVENTION: FROM CONCEPT TO PRACTICE

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ABSTRACT

According to the revised European Union (EU) Directive on Waste (2008/98/EC), widely known as Waste Framework Directive (WFD), waste prevention embraces all the measures taken before a substance, material or product has become waste, that reduce the quantity of waste, the adverse impacts of the generated waste on environmental and human health, and the content of harmful substances in materials and products. These measurements should be taken before a product, a material or a substance become waste. Waste prevention is distinct from recycling and other waste management efforts which are applied only when products and materials are inevitable or voluntarily discarded.

In order to counteract the growing waste generation, policies providing robust guidelines on waste prevention and suitable regulating framework are deemed a necessity. Waste prevention is at the top of the European Union waste hierarchy (Article 3, Waste Framework Directive) and is increasingly considered as the key component of contemporary waste management.

In many parts of the world it is the top issue in the waste policy agenda, while in the European Union, which might have the most elaborated legal framework for waste management worldwide, it is now a legal obligation for member states to adopt National Waste Management Plans by the end of 2013.

Moreover, the need for sustainability and the limited availability of resources in a world of increasing population and growth are shifting the focus from waste management to resources management, drastically changing not only the waste sector, but also the way we produce and consume. This paper will address these developments, clarifying definitions and presenting the best practice cases. The conclusions could be useful for the development of future waste prevention plans in the context either of waste or resource management.

Keywords: waste prevention, assessment, best practices

1. INTRODUCTION

Waste prevention is interpreted in slightly or highly different ways from one place to another. Yet, on a definition level, all parties share as a starting point the concept that waste prevention underlies a complex of actions and measures taken before a material or a product is characterised as waste. According to the revised European Union (EU) Directive on Waste (2008/98/EC), widely known as Waste Framework Directive (WFD - Article 3, clause 12 & 13), these actions and measures ought to reduce the quantity of waste, the adverse impacts of the generated waste on environmental and human health, and the content of harmful substances in materials and products. They also should be taken before a product becomes waste. Thus, waste prevention is distinct from recycling...
and other waste management efforts which are applied only when products and materials are inevitable or voluntarily discarded.

A common point of dispute in the aforementioned (and any other) definition is the word "before", as it raises boundary issues. At times it is not easy to discern when a material/product exits its “tailored” useful life and enters a plain where it is treated as second hand material/product or waste.

Taking a step forward, the Organisation for Economic Co-operation and Development (OECD) distinguished the term "waste prevention" from "waste minimization", considering the former as a component of the latter: Waste minimization was outlined as a broader term, encompassing waste prevention and all the material recovery options, such as recycling, which can be applied only after a product/material has been "labelled" as waste (OECD, 2002).

In order to counteract the growing waste generation, policies providing robust guidelines on waste prevention and suitable regulating framework are deemed a necessity. Up to date, waste prevention has turned into an element of waste management and environmental policy frameworks, on regional, national and supernational (i.e. EU) level. To comply with the provisions of these policies, several countries have attempted to institutionalize waste prevention.

Currently a different perception and at the same time a big challenge is debuted: a transition from waste management approach to efficient use of resources. Against this backdrop, the concept of waste prevention should probably be “relocated" from waste management to the wider field of resource management. This transition mainly stems from the results of many waste management programmes/policies, which have boiled down to figures and evaluation indices lower than the ones expected. To some, the rise of this discrepancy is attributed to factors such as inconsistent definitions, measurement limitations, lack of a comprehensive strategy and/or a conflict of interests (Salhofer et al., 2008).

This paper reviews the best waste prevention practices (i.e. Waste and Resources Actions Programme –WRAP- in the United Kingdom) that have been adopted worldwide, and investigates the issues and the solutions that have arose during their implementation and assessment. The conclusions could be useful for the development of future Waste Prevention Plans (WPP) in the context either of waste or resource management.

2. TACKLING WASTE GENERATION

Whether one refers to an industrialised or a developing country, to an economically affluent or an impoverished region, the increasing waste amounts pose indisputably a major issue of concern and ought to be squarely contemplated. Although the accurate estimation of the overall waste generated per capita is so far elusive - mainly due to shortage of data, methodological uncertainties and definition differences (Wilson et al., 2012; Tonjes & Greene, 2012, OECD, 2002) - the overall trend is steadily on the rise. In EU alone, 1.8 billion tonnes of solid waste are generated per year. Approximately 550 kg of municipal solid waste are annually produced by each EU citizen. The European Commission (2011) reports that in most EU-Member States (EU-MS), waste generation presents an increasing –or at best – a stabilising trend. In the OECD countries, the waste generation increase between 1995 and 2007 was 18% (OECD, 2010). Tonjes and Greene (2012) reported that in the United States of America (USA), 226.4-353.4 million tonnes of Municipal Solid Waste (MSW), which amounts to 744.6 – 1160.7 kg capita-1 year (2.04 – 3.18 kg capita-1 day-1) were generated in 2008 (the variation is due to methodological differences), indicating that “the two primary collection efforts disagree on many statistics and on basic waste infrastructure facts".
Curbing waste burden cannot successfully be addressed without acknowledging the drivers that shape and dictate it. According to the relevant literature (Brook Lyndhurst, 2007; OECD, 2002) these drivers fall in six main categories: the rising trend of the world population, the affluence, the production and consumption patterns (strongly depended on the lifestyle, social class, behavioural traits, shopping habits), the technology used, households’ characteristics (size, age, presence of children, pet), and seasonal variations (affecting food waste, garden waste and paper). Waste prevention focus on the last four of the aforementioned categories, giving special emphasis on the production and the consumption patterns.

Against the backdrop of production and consumption patterns, when waste generation is addressed, the critical issue of decoupling the economic growth from the associated adverse environmental impacts arises (Fell et al., 2010; Sjöström & Östblom, 2010; Mazzanti & Zoboli, 2008). Decoupling was embraced by the EU as a policy in the Thematic Strategy on the Prevention and Recycling of Waste and the WFD. Waste prevention “can contribute to the reduction of environmental impacts of waste management” as well as to the improvement of the resource efficiency, and thus become an efficient option for decoupling economic growth from the environmental impacts associated with waste generation (European Commission, 2012).

3. BEYOND DEFINITIONS
Waste prevention can be achieved through two different pathways: strict avoidance of waste and extending a product’s lifetime. In the first case, it encompasses goals such limiting unnecessary consumption and designing or/and consuming products that generate less waste (European Commission, 2012). Extending a product’s life includes options such as re-use (for the same purpose as it was originally designed), refurbishment and repair. “Preparing for re-use", which is ranked in the second place in the waste hierarchy, right below waste prevention, is considered by some “contributing to waste prevention in a wider sense” (European Commission, 2012).

Another important parameter to consider when assessing the waste burden and waste prevention is the waste composition. The production chain uses at large a variety of synthetic materials that are not found in natural ecosystems. The qualitative side of waste prevention concerns the elimination of the hazardous content of waste (European Commission, 2012).

4. WASTE PREVENTION PLANS
In order to counteract the growing waste generation, policies providing robust guidelines on waste prevention and suitable regulating framework are deemed a necessity. Lately, waste prevention has shifted to an element of waste management and environmental policy frameworks, on regional, national and supranational (i.e. EU) level. To comply with the provisions of these policies, several countries have attempted to institutionalise WPP. In EU the WFD stipulates Member States to prepare and introduce waste prevention plans by the end of the year 2013, attempts to clarify the end of waste criteria, to take measures for separate collection of biowaste and enhances the extended producer responsibility.

An efficient WPP has to comprise all materials and products flows, from cradle to their discarding. Therefore, it has to be linked to the waste manager sector, to the mining sector, the industries, the product designers, the service providers, the retailers and the consumers. A point of dispute in the development of a waste prevention plan is the issue of boundaries. At times it is not easy to discern when a material/product exits its “tailored” useful life and enters a plain where it is treated as second hand material/product or
waste. This brings intractable issues on the measurement of waste prevention and consequently in the environmental assessment.

5. WASTE PREVENTION STRATEGIES

The EU MS have mainly applied 3 waste prevention strategies, with different levels of engagement of central or local authorities: diffusion of information, promotional campaigns and setting regulations. According to the European Commission (2012), “these strategies are complementary and can be integrated into other relevant existing policy areas [...] or can compose a stand-alone national waste prevention programme”. This paper assembles indicatively some of the available best strategies/practices per waste stream from a range of literature sources (i.e. journals, Waste Prevention Plans, reports).

5.1 Biodegradable waste – Food waste

Love Food Hate Waste (WRAP 2007, UK)
WRAP’s Love Food Hate Waste has proved to be one of the most successful food waste-related awareness campaigns. Over the first two years of its application (from its launch in 2007 to 2009) in UK, it contributed to the prevention of approximately 137,000 tonnes of food waste. The campaign aims at: raising awareness, personalizing the issue of food waste prevention, and developing “encourage and enable” actions. Consumers are its target group and are approached in both direct and indirect (via strategic partners i.e. local authorities, institutes and retailers) ways. The focus point of the campaign is to provide simple, easily adoptable solutions, which will cause small changes in consumers’ daily routine and lead to waste prevention (http://lovefoodhatewaste.com).

Approved Food & Drink Company (Private sector 2009, UK)
Approved Food & Drink Company is a food redistribution programme, which provides through its website dry food products that are near or past their “best before” date at a lower price (http://www.approvedfood.co.uk).

Buon Samaritano (a range of stakeholders 2005, Italy)
The “Buon Samaritano” (Good Samaritan) project was launched in 2005 by the municipality of Torino and Amiat. It is a food redistribution programme, which ensures that uneaten but still edible meals from school canteens and super markets are collected and distributed to charity organizations. It is estimated that approximately 150 kg of bread and 50 kg of fruits are recovered every day from school canteens. In 2008, the project is said to have recovered over 81,000 kg of food. (http://ec.europa.eu/food/food/sustainability/gp_food_redistribution_en.print.htm#4-2).

Réduisons nos Déchets (National Authority 2005, France)
The awareness campaign “Réduisons nos Déchets” (Reducing our Waste) was developed by the ADEME, the French Environmental and Energy Management Agency, in order to provide information to households about waste generation and prevention. This campaign also participates and promotes the European Week for Waste Reduction (EWWR) initiative (http://www.reduisonsnosdechets.fr).

Eurest restaurant food waste campaign (Private sector 2010, Sweden)
The chain of Eurest restaurants has developed a scheme in order to quantify food waste and publicize the measurements to staff and customers, explaining in parallel the impact of food waste on the environment and providing information about waste prevention. The 150 restaurants of the Eurest publicize a spreadsheet with a graph showing how much waste they produce every single day. The scheme has resulted in 23% reduction of waste generation in the chain
Anti-waste workshops (Local Authority 2009, Belgium)
Cooking workshops with the aim to reduce food waste are offered by the Bruxelles Environment (with no fees), to the local community. In 2009, approximately 1,000 citizens were trained (http://ec.europa.eu/food/food/sustainability/gp_awareness_information_education_en/print.htm#2-1).

5.2. Junk mail

Stop Pub (National Authority 2004, France)
The “Stop-pub” operation is a key feature of the “Réduisons nos Déchets” (Reducing our Waste) awareness campaign (please refer to 5.1), with the aim to reduce junk mail using a post box sticker and to stipulate public engagement in waste prevention actions. Over the first year of its implementation, 2.6 million stickers were requested. Seventy percent of the participants claimed that they received less junk mail (http://ec.europa.eu/environment/waste/prevention/pdf/Stop_Pub_Factsheet.pdf)

Fighting advertising paper (Local Authority 2006, Italy)
In 2006, the municipality of Dogliani (Italy) promoted a no junk mail sticker on a pilot scale, within the framework of a public awareness campaign on waste reduction. It is reported that this action resulted in the reduction of 3.6 kg/ca/year (Dohogne & Collado, 2009).

5.3. Green business

Green Business Initiative (National Authority 2008, Ireland)
The Green Business Initiative was developed and organized by the Irish Environmental Protection Agency. It commenced in 2008 with a flagship project: the development of the ‘greenbusiness.ie’ website and the “Green Hospitality” project (EPA, 2012). The website features interactive waste auditing tools, allowing small- and medium-sized business to gather data on resource use. By 2011, 479 active members and up to 6.1 million euros of potential savings due to resource efficiency activities were recorded (EPA, 2012). Members may request a Resource Efficiency Assessment (REA). Up to 2011 forty five REAs have been completed (http://greenbusiness.ie).

Green Hospitality (National Authority 2008, Ireland)
The “Green Hospitality” scheme is the only Irish programme recognized internationally. It constitutes a step-by-step guide to environmental management within the sectors of hospitality and catering. Up to 2011 it counts 221 members (EPA, 2011). The efforts of its members have led to 50% reduction of waste going to landfill, 50% reduction of water consumption and 30% reduction of energy consumption. The scheme offers the “Green Hospitality Awards” (over the first year of its implementation approximately 200 hotels had signed up - 80 out of these hotels were awarded), the Green Hospitality Eco-Label, Green Hospitality Workshops, networking, conferences etc (http://www.ghaward.ie).

6. CONCLUSIONS
The waste prevention strategies implemented worldwide can fall in three categories: informational (awareness campaigns, provision of information, training sessions, labelling), promotional (promotion of reuse and repair, environmental management systems, clean production and consumption, voluntary agreements) and regulatory (EPR, taxes, green public procurement, eco-design, measures such pay-as-you-throw).
However, independently of their category, they should aim at changing attitudes and behaviours towards waste generation.

The acceptance and successful implementation of a strategy depends on the policy and the financial circumstances of the State, the behaviour and attitudes of the public and the involvement of the suitable stakeholders. The waste prevention strategies play a crucial role in the successful implementation of a Waste Prevention Plan.

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