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AN EVALUATION OF CURRENT EUROPEAN PACKAGING REGULATIONS ON THE CORE LOGISTICS OPERATIONS OF A PAPER PACKAGING MANUFACTURER IN GREECE

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ABSTRACT

This paper focuses on the packaging sector in the Greek logistics market. It seeks to evaluate in the broader sense the packaging operations and the potential problems such as barriers that a number of local laws, based on the European Packaging Directive 94/62/EC, might be generated in the individual markets. More specifically, the Greek market is a special field, where the effects caused by a number of measures formulated by the European Union, generate discrepancies compared to other member states, partly due to the geographical position of Greece and the distance from the central European market.

This paper also includes an investigation of a specific paper packaging supply chain, where paper packaging acts as a significant factor for the individual companies that participate within it.

INTRODUCTION

Packaging is defined as any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer (European Parliament, 1994). It can be categorized into three types: i) sales or primary packaging, ii) secondary packaging, iii) transport packaging.

Packaging has developed to a large extent in response to social and economic changes affecting consumers (Waste Online, 2005). The continuous economic growth in the western world that is translated in an on-going increase in consumer goods and the demand for more, new and innovative products has boosted packaging operations and transformed them into a vital factor for the whole supply chain.

Paper as we know it today was developed around 1867 and originated from wood pulp. Commercial paper bags were a real innovation for the second half of the 19th century. The first decade of the 20th century also signals the most dynamic starting point of the paper industry with the invention of machinery for the automatic production of in - line printed paper bags and boxes.

Kellogg Brothers were the first to use cereal cartons, protecting and advertising in this way their products and establishing paper as a well promised packaging material for the future (Berger, 2002).

PACKAGING ISSUE

Despite of the fact that the paper industry blossomed during the 20th century, the advent of plastics caused a strong shock to the paper sector during the late 1970's and the early 1980's. However, during the late 1980's new environmental concerns and the creativity of various designers stopped this trend and paper packaging again gained its strength, allowing new innovations and improvements in the sector.

In the late 1980's environmental issues emerged as an important factor and in many cases it became an increasingly important political issue (Livingstone and Sparks, 1994). Many countries that considered the significance of the problem tried to create a framework to determine how companies might operate in a more ecological way and protect the environment. The European Union has become involved in environmental legislation. However, despite the fact that until the end of the 1980's there were nearly 200 EC/EU directives concerning environmental areas, at least by 1990 more than 50% of these directives had not been implemented (Prendergast and Leyland, 1996).

In 1994 the European Union adopted the Packaging and Packaging Waste Directive (94/62/EU)¹. This directive aimed to harmonize national packaging waste management measures, in order to reduce their impact on the environment and at the same time ensure that packaging laws did not create any obstacles to trade or restrictions to competition within the Community (The European Organization for Packaging and the Environment, 2000 and EUROPA, European Commission, Environment, 2005). This directive impacts not only on the internal market (EU) but the external market as well, since it puts specific features and details to the products manufactured and imported, from countries outside of the European Union.

However, although the specific Packaging and Packaging Waste Directive should ensure the avoidance of any obstacles to trade or restrictions to competition within the Union, there are complaints that the Directives create trade barriers. Furthermore, many believe that the directive and the new procedures that its implementation entails, are financially prohibitive for companies. It is obvious that the packaging issue needs careful attention since the balance between the implementation of a directive and the corresponding financial problems is fragile.

THE 94/62 EU PACKAGING AND PACKAGING WASTE DIRECTIVE

As cited above, the specific directive describes and integrates the European Union's strategy on packaging waste. It mainly aims to harmonize national management measures concerning packaging and packaging waste in order to reduce its impact on the environment and to efface any obstacles to trade or restrictions to competition across European Union member states, caused by the individual packaging laws (EUROPA, European Commission, Environment, 2005). It covers all packaging and packaging waste placed on the market in the EU, regardless of the materials used. The measure involves packaging manufacturers and importers and includes all packaging used or released at any level (industrial, commercial, service, household etc).

Member states are also required to:

- Create those facilities that ensure the return and collection of used packaging and packaging waste from the consumer, other final users, or from the waste stream, in order to channel it to the most appropriate waste management alternatives.
- Create those facilities that ensure the reuse or recovery of the packaging and packaging waste collected, in order to meet the objectives laid down in the specific directive.
- Encourage the use of materials obtained from recycled packaging waste from the manufacturing of packaging and other products (FOE, 1999).

The revised targets of the Directive are the following (European Commission, 2008):

- by no later than 30 June 2001, between 50 and 65% by weight of packaging waste to be recovered or incinerated at waste incineration plants with energy recovery;
- by no later than 31 December 2008, at least 60% by weight of packaging waste to be recovered or incinerated at waste incineration plants with energy recovery;
- by no later than 30 June 2001, between 25 and 45% by weight of the totality of packaging materials contained in packaging waste to be recycled (with a minimum of 15% by weight for each packaging material);
- by no later than 31 December 2008, between 55 and 80% by weight of packaging waste to be recycled;

¹ In 2004, the Directive was reviewed to provide criteria clarifying the definition of the term "packaging" and increase the targets for recovery and recycling of packaging waste. In 2005, the Directive was revised again to allow new Member States transitional periods for attaining the recovery and recycling targets. (European Commission, http://ec.europa.eu/environment/waste/packaging_index.htm)

- no later than 31 December 2008 the following targets for materials contained in packaging waste must be attained:
 - 60% for glass, paper and board;
 - 50% for metals;
 - 22.5% for plastics and;
 - 15% for wood.

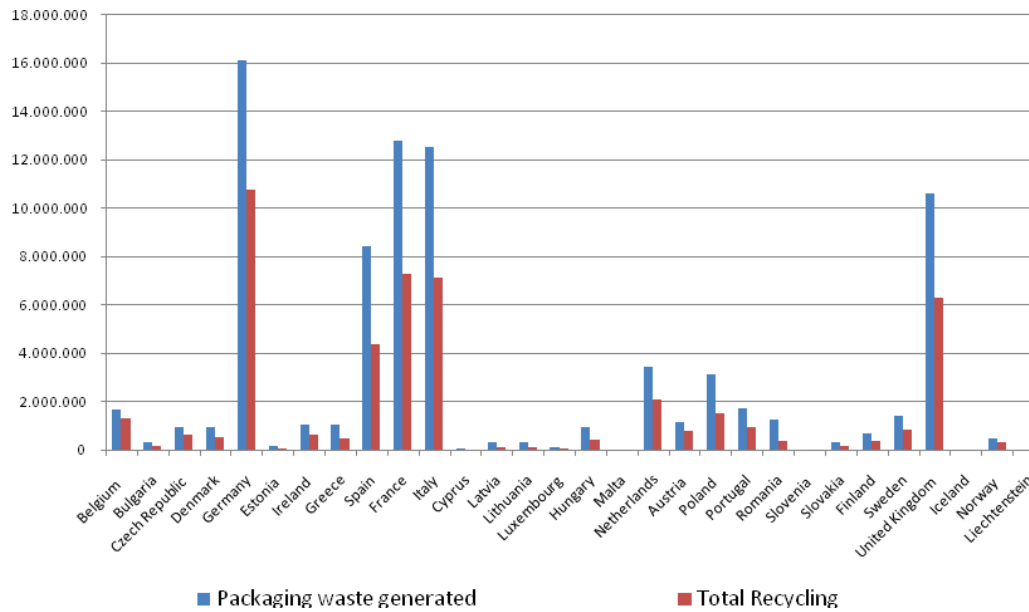


Figure 1 : Packaging Waste Generated and Recycling per Country (Weight)

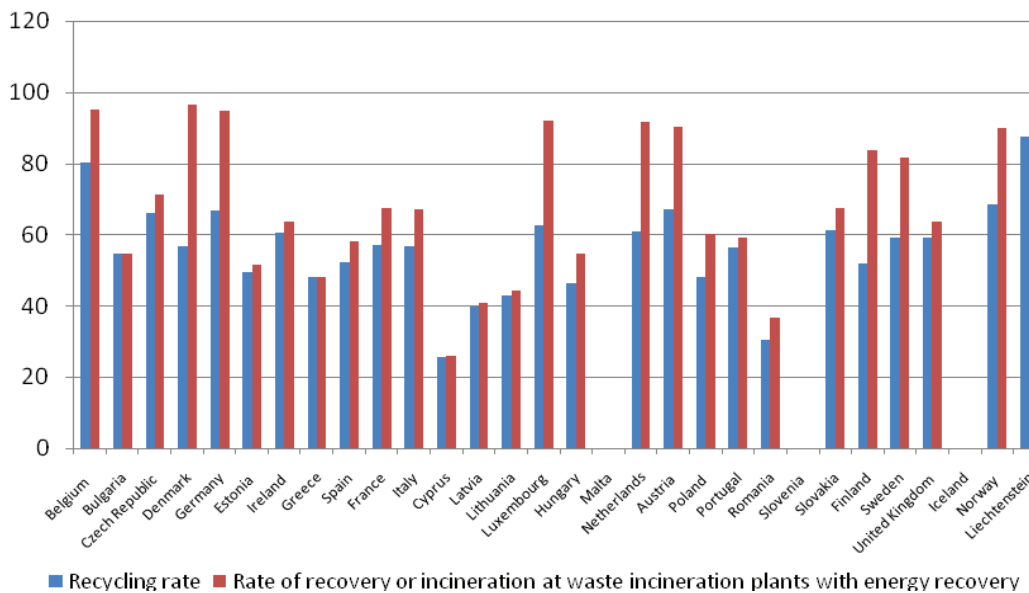


Figure 2: Recycling Rate and Rate of Energy Recovery per country (Proportion)

Data obtained from: The European Commission Environment, Packaging and Packaging Waste, "Results of packaging recycling and recovery in the Member States and in the EU", Available at: <http://ec.europa.eu/environment/waste/packaging/data.htm>

The 2006 Report on the implementation of Directive 94/62/EC on packaging and packaging waste concluded that almost half of the Member States held derogations applying until 2015. Nevertheless, the objectives set for 2008 in Directive 2004/12/EC were to remain valid, even after 2008.

The most recent results of the Directive to Member States published by the European Commission, concern the year 2009 and are presented in Figure 1 and Figure 2.

Especially for the following countries:

- Greece,
- Ireland, and
- Portugal,

the Directive concludes that: *"because of the large number of small islands, the presence of rural and mountain areas and the low level of packaging consumption respectively, will not be bound by the targets until 2011."*

Directive 94/62/EC lays down essential requirements with which these countries should comply regarding the composition and the reusable and recoverable nature of packaging and packaging waste. The Commission is to promote the development of European standards relating to these essential requirements."

Finally, for the new Member States, the European Commission decided the following:

"Directive 2005/20/EC sets a later deadline for the 10 new Member States (the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia, Slovakia) to meet the targets of this packaging directive. These derogations are valid until 2015. Romania and Bulgaria have also been granted specific derogations, defined in their respective Treaties of Accession."

The main aims of the specific Packaging and Packaging Waste Directive and the individual laws enacted by other countries (e.g. Green Dot in Germany – trade mark protected in ~170 countries (Duales System Deutschland AG, 2005), are:

- to reduce packaging impact on the environment, and at the same time,
- efface any obstacles to trade or restrictions to competition within the Community,

There are complaints that these legislations create trade barriers.

For example, groups like Industry Council for Packaging and the Environment (INCPEN) and Alliance for Beverage Cartons and the Environment (ACE), at the end of the 1990's demanded the EC to take measures against Germany's refill quota, *"which put a 28% ceiling on drinks in single use packaging"* (Packaging Magazine, 1999). Because of the fact that the German system promotes the use of refillable containers, the system of deposits for non-reusable bottles is thought to be unfair for the foreign industries who in order to avoid these extra charges have not only to change their bottles transforming them into refillable but also to organize reverse, longer and expensive channels of transportation (comparing with the local manufacturers) in order to take back the empty bottles (UKEN Archive, 2001).

RESEARCH METHODOLOGY

Exploratory research has been used in the first part of the investigation to:

- Explain current practices in the packaging sector concerning packaging materials that are in use, reverse logistics issues such as methods of operation and costs, relevant legislation and in what proportion the packaging industry is affected by packaging laws.
- Investigate the recycling and recovery methods and operations that are in use in the European Union and to assess the extent to which they are appropriate from an environmental protection standpoint.

In order to answer the research question, a comparison was necessary between existing theoretical elements and the reality (including operations, methods and knowledge). For this reason, case study research of a general packaging supply chain was preferred, since this method enabled a more schematic and clear approach, allowing for a more in depth analysis and understanding of the research object (Yin, 1994, Miles and Huberman, 1994).

Questionnaires were sent to all different links of the supply chain, including Suppliers of raw materials, Packaging Manufacturers, Industrial Customers, Wholesalers and Retailers and Final Consumers. These five different questionnaires were designed and developed based on:

- a. the specific needs and characteristics of the different links of the supply chain, and
- b. the type of data required to be collected for the investigation,

including questions, especially designed for each link.

Of the 407 questionnaires totally sent, 368 questionnaires were finally returned (Response Rate: 90,42%), (2 from Suppliers, 4 from Packaging Manufacturers, 89 from Industrial Customers, 2 from Wholesalers-Retailers and 271 from Final Consumers). Common questions such as:

- *"Have you ever heard about the Packaging and Packaging Waste Directive (94/62/EU)?"*,
- *"Do you think that the use of take-back programmes, for the collection of packaging from the Supply Chain is going to be affordable by the individual companies?"*

were used in all different questionnaires in order to have a better view of the situation. At the same time, the cost issue concerning the push of the industrial cost, by the individual participants to the final consumer, generated by the implementation of the Directive, was included in all questionnaires, except from the one developed for the investigation of the Final Consumers, who instead were asked for their buying habits and decisions with the following question:

- *"When you buy a product, you mostly base your choice on:*
 - *Price*
 - *Quality*
 - *Price and Quality*
 - *The Origin of the product*
 - *The environmental friendliness of the product*
 - *Other"*

From the data collected, the following can be concluded: 65% of the respondents were not aware of the Packaging and Packaging Waste Directive, 78% believe that the use of take-back programs is not affordable and is financially prohibitive for the individual companies, while 82% of respondents admitted that after the implementation of the Packaging and Packaging Waste Directive and the taxes that are going to be generated, they will try to push the cost to their customers through higher prices.

An interesting issue is that all of the Suppliers use their own vehicles for the collection of waste paper from the supply chain. At the same time all of them admitted that it is more environmental friendly in terms of energy and natural resources to produce new paper materials from virgin pulp, despite of the fact the recycling process consumes high volumes of natural resources such as water. Furthermore, 75% of the Paper Packaging Manufacturers support that nothing should be changed in the current procedures of collection of waste from the supply chain, since the market has already created those mechanisms ensuring that most of the paper waste generated is collected and sent for recycling.

Another interesting aspect is that 100% of the Paper Packaging manufacturers admitted that in case of a weight based taxation system² they would try to change the packaging they produce into lighter packaging, in order to decrease the amount of money they will be called to pay because of the taxation. However, in such cases the deterioration of the quality of the secondary packaging may cause serious problems due to damage to the product itself.

Concerning Industrial Customers, the most popular packaging material used is paper 94,4%, compared to 79% for plastic, 23% for glass and 24% for metal. At the same time 68% of them admitted that they have noticed damage to products during the handling process underlining in this case, the packaging quality issue.

What is relevant to Final Consumers is that the most common packaging material they recycle is paper with 54%. However only a small proportion of just 12% recycle all the packaging they use while 63% of them recycle only some of the packaging materials they use. A big proportion (75%) cited that they have bought/received a destroyed product at least once in the past, caused by destroyed or improper packaging. Most of the respondents (76%) answered that Price and Quality are the two most important factors affecting their buying decisions.

BARRIERS AND PROBLEMS

The research describes the present situation that exists in a supply chain, investigating the role of packaging, combining many different vital links, including producers of raw materials, packaging manufacturers, users and final consumers. The participants, contributed to an understanding of the problems that occur or might occur, in the specific supply chain after the implementation of the Packaging and Packaging Waste Directive (94/62/EU). The supply chain, consists of at least six different links, each one representing the different phases through which packaging reaches the final consumer.

More specifically, the supply chain includes the following different links:

- a) The Supplier (the first link that undertakes to supply the whole supply chain with the necessary raw materials that will be used in packaging production),
- b) The Packaging Manufacturer (the second link that is in direct connection with the supplier of packaging raw materials and its purpose is to transform raw materials into final packaging. In our case study, we describe a paper packaging manufacturer),
- c) The Industrial Customer (the one who receives the packaging, in order to use it for the containing of the product),
- d) The Wholesaler (although not ever present in a supply chain, the wholesaler acts as an intermediary for the product),
- e) The retailer (the one who uses and receives the advantages of packaging and in many cases unpack the products from their secondary and transport packaging), and
- f) The final consumer (the final link of the supply chain, that although in many cases does not see or use at all, the transport packaging and only receives the product contained in its primary or in some cases the secondary packaging, is the basic reason for the creation and use of packaging itself).

The diagram below clearly shows what is going to be the general structure of the case study. The flat lines indicate the original flow of packaging: raw materials, manufacturing process, final product, customer, 'retailer', final user while the dot lines indicate the reverse flow of packaging to the disposal or further to recycling centers.

² A system where the producers or users of the packaging, are charged with a fee, estimated based on the weight of the total packaging they use or produce.

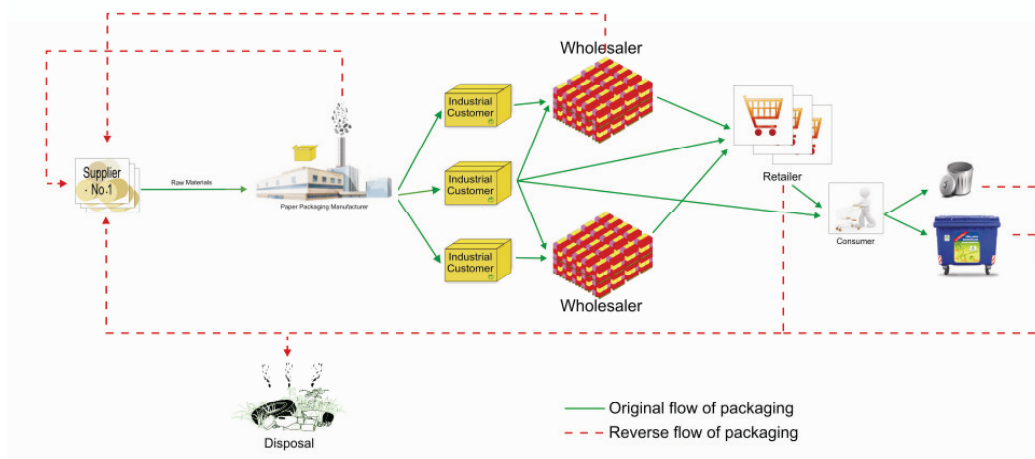


Figure 3 : The packaging Supply Chain

This research aims to investigate the role and importance of paper packaging in the supply chain and at the same time, to collect genuine data concerning the way in which the paper packaging materials aggravate the environment. Furthermore, it seeks to analyse the current recycling procedures concerning paper materials. Investigating the issue, it also aims to provide a critical assessment of current European packaging regulations, their success or possible problems generated by their implementation in different countries with lack of homogeneity and market conditions. It also covers the issue of trade barriers that might be generated from the implementation of relevant packaging directives.

In addition, through an extended supply chain case study based on the Greek market, the present research aims to provide an in-depth analysis of the role and performance of paper packaging. The quality of the packaging combined with the special characteristics of each individual supply chain, are of the most important factors for the transportation of products in the market with minimum damage or other logistical costs. The research also deals with the environmental issues that are relevant to packaging deterioration and various predictions are made concerning the relation of packaging quality and destruction.

Finally, another important aim of the present research is to evaluate the extent to which the packaging regulations, affect the prices of the packaged products to various EU-25 countries. (Especially here, the case of Greece has been used.) The push of cost is a matter of great importance affecting the competitiveness between domestic (European) and foreign (overseas) markets where regulations or other restrictions might be more elastic or less demanding, concerning environmental issues.

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