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# **Environmental Practices of the Auxiliary Companies to the Spanish Automobile Industry**

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## **ABSTRACT**

The automobile manufacturing industry plays a very important role in a country's economy. The importance of automobile manufacturing industry lies in its sheer size and complexity in terms of the direct and indirect influence it commands across many other industries. While millions of people are employed in the automobile manufacturing industry, it is estimated that more than two and half times that number are employed in the auxiliary companies that supply parts to the automobile manufacturing companies. The auxiliary companies represent a group of businesses of various sizes, types, and geographical locations, producing a vast variety of products ranging from the very simple to the extremely intricate. In this study, the current environmental practices of management in the core Spanish auxiliary companies that do business with the automobile manufacturing industry (and thus form a large part of the automobile manufacturing industry's supply chain) are investigated. We show that while automobile manufacturing companies are under scrutiny to become more and more environmentally friendly, not only at their manufacturing stage but also at their products' useful and EOL stages, there appears to be no such burden on the auxiliary companies. Our conclusion is based on an elaborate survey conducted during the fall of 2004 of Spanish auxiliary companies with questions about the characteristics, environmental practices and reverse logistics related activities carried out by the companies.

## **INTRODUCTION**

The automobile manufacturing industry as a whole has played a very important role in propelling advanced countries towards industrialization. The importance of automobile manufacturing industry lies in its sheer size and complexity in terms of the direct and indirect influence it commands across many other industries. While millions of people are employed in the automobile manufacturing industry, it is estimated that more than two and half times that number are employed in the auxiliary companies that supply parts to the automobile manufacturing companies [Dicken, 2003]. The auxiliary companies consist of a complex assortment of businesses of various sizes, types, and geographical locations, producing a vast variety of products ranging from the very simple to the extremely intricate.

The automobile manufacturing industry produces some of the most resource intensive and influential consumer products in large numbers. The ensuing polluting image has created an unfavorable environmental profile of the industry causing environmentalists to cry foul. For this reason, in recent years, the environmental issues pertaining to the automobile manufacturing industry have drawn a lot of attention from the regulatory agencies and consumers.

Automobile is possibly one of the most recycled products in the world. For example, over 95% of the end-of-life (EOL) vehicles in the United States enter the recycling stream and about 75% of the materials of each EOL vehicle are reused or recycled (mostly for profit) [Isaacs and Gupta, 1997], [Cobas-Flores et al., 1998], [Bandivadekar et al., 2004]. The remaining materials, called the automotive shredder residue (ASR), are sent to landfills (for typical composition of ASR, see [Kim et al., 2004]). Its classification as nonhazardous or hazardous waste is a subject of controversy and has a definite impact on the overall profit from recycling.

In addition, there is growing pressure to improve fuel economy through the use of secondary materials and hence increased incentive to find alternative recycling schemes for these vehicles. However, because of the profit motivation, there is a fear that this might lead to an increase in the amount of ASR sent to landfills [Boon et al., 2000, 2003]. During the last decade or so, this fear has spread worldwide which is evident by the regulations that have been enacted in Japan and Europe. Since automobile manufacturers have a global presence, the regulations have a wide-reaching impact, especially in the industrialized countries. Currently, for example, Japan and most of Europe require an 85% recovery rate by weight while a 95% recovery rate by weight is expected by 2015 [Bandivadekar et al., 2002, Smink et al., 2003].

There are a large number of auxiliary companies that do business with the automobile manufacturing companies forming an intricate supply chain that precedes the final manufacturing and assembly of automobiles. It is interesting to note that, while automobile manufacturing companies are under scrutiny to become more and more environmentally friendly, not only at their manufacturing stage but also at their products' useful and EOL stages, there appears to be no such burden on the auxiliary companies.

In this study, the current environmental practices of management in the core Spanish auxiliary companies that do business with the automobile manufacturing industry (and thus form a large part of the automobile manufacturing industry's supply chain) are investigated. The results presented in this paper are part of a joint project carried out by Carlos III University of Madrid, the University of Granada and the University of Oviedo on the practices of management of the companies that are auxiliary to the automobile manufacturing industry.

## **APPROACH AND METHODOLOGY**

There are 473 auxiliary companies in Spain that supply parts to the Spanish automobile manufacturing companies. To investigate the current management practices of the auxiliary companies, particularly as it relates to the environment, 157 out of the 473 companies (representing 33.2% of the supply chain) were queried regarding their characteristics, environmental practices and reverse logistics related activities. The data collection started in October 2004 and was completed by January 2005.

## **RESULTS AND DISCUSSION**

### **Characteristics of the Auxiliary Companies**

#### **Work Force**

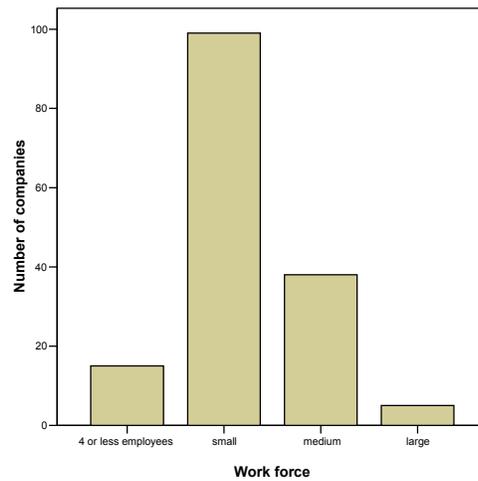
The majority of auxiliary companies (63.1%) can be classified as small companies (5 to 49 employees). The second largest group of companies (24.2%) are medium sized companies (50 to 249 employees). 9.6% companies have 4 or less employees while only 3.2% companies are large companies having 250 or more employees (see Figure 1).

#### **Sales**

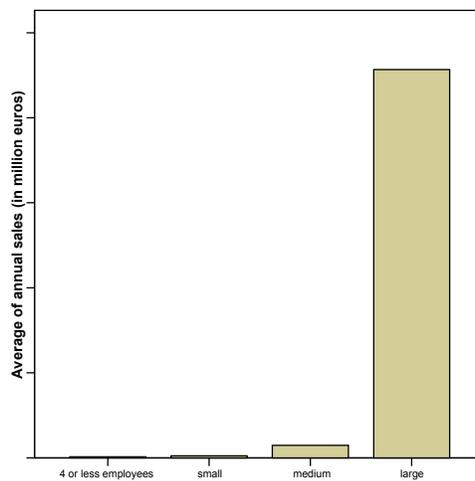
The annual sales of the auxiliary companies range from a minimum of 670 thousand euros to a maximum of 2,080 million euros with an average of 39 million euros. Figure 2 highlights the differences between the companies of different sizes.

#### **Outreach**

Each auxiliary company sells some or all of its products in Spain. In fact, about three quarters of the companies derive 75% or more of their incomes from Spain (see Figure 3). In other words, 38 companies sell more than 25% of their products in countries other than Spain. Out of these 38 companies, 34.2% are small companies, 47.4% are medium sized companies, 5.3% have 4 or less employees and 13.2% companies are large companies. The average number of employees for this group of companies is 445 with average annual sales of 913 million euros. The differences in annual sales between companies of different sizes for this group of 38 are shown in Figure 4. The group of 38 companies sells an average of 43.1% of their products in European Union countries other than Spain, 13.0% in the rest of Europe, 6.1% in USA and Canada, 8.9% in Australia and New Zealand and 10.2% in the rest of the world.



**Figure 1.**



**Figure 2.**

### **Leadership Role**

When the companies were asked if they considered themselves as leaders (in the sense that they are the ones who normally initiate actions to which competitors respond), 57.96% identified themselves as leaders and 42.04% admitted that they usually do not play a proactive role. A further examination showed that there is no statistical difference between the profiles of the two groups of companies as far as their sizes and annual sales are concerned.

### **Formal Training**

In general, almost all workers across the companies were either well or somewhat trained in industrial safety laws. On the other hand, almost all workers had little or no training in Life Cycle Assessment (LCA). However, training in other areas was mixed. For example, there were less number of workers who were either well trained or somewhat trained in ecodesign and reuse and recycling of materials than workers who had little or no training. There was, however, an opposite phenomenon prevalent with training in the reduction of waste. The workers were almost equally divided between those who were untrained and those who were trained in ergonomics (see Figure 5). When asked what

motivates companies to train workers, the most prevalent reasons given were customers' demands, internal policy of the company to improve human capital, technological advancements and government regulations.

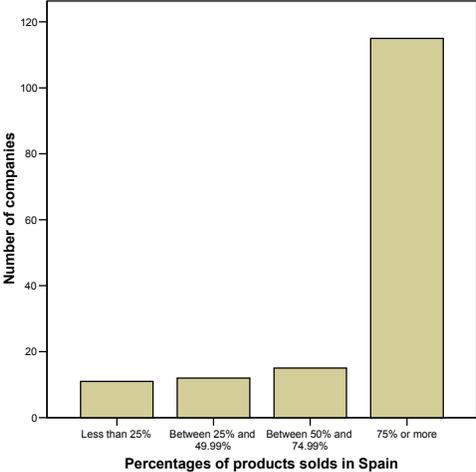


Figure 3.

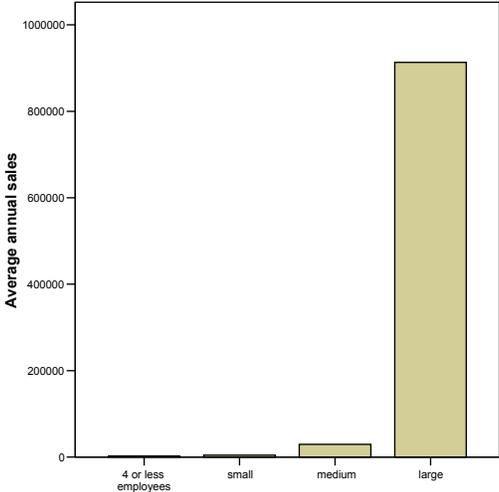


Figure 4.

**Technological Renovation**

When asked what would be the reason that would motivate the companies to renovate their technologies, almost all of them agreed with the following reasons: to change old technology, to be competitive, to improve efficiency, to improve the safety of workers and to address environment related issues.

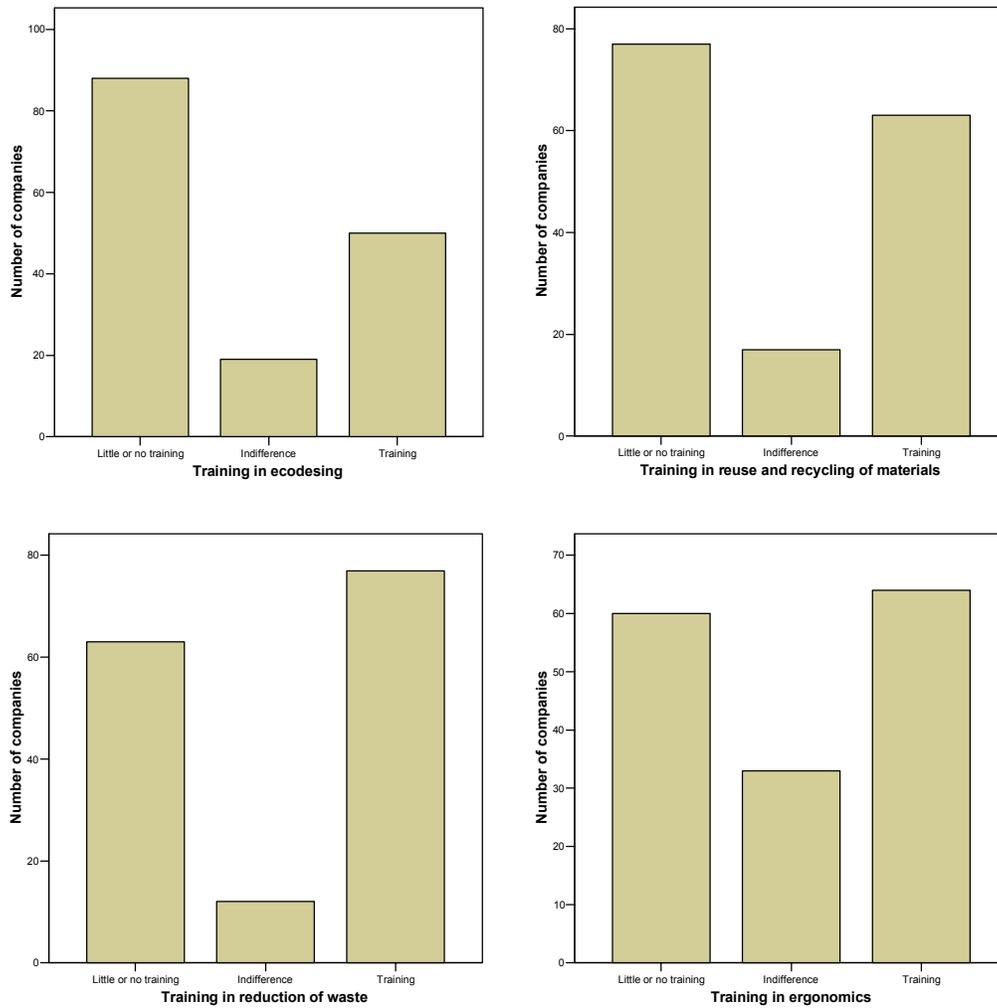


Figure 5.

## Environmental Practices in the Auxiliary Companies

### Material Used in Products

Most of the auxiliary companies do not pay any attention to the material used. For example, no special effort is made to reduce the variety of materials used, or increase the use of recycled materials. In fact, no effort is made to use materials that may be necessarily good for the environment. The only concern is that the materials used should be in compliance with the law.

### Design of Products

Here too, the auxiliary companies do not take environmental factors into account when designing their products. For example, they do not practice LCA, do not necessarily use joints that are easy to disassemble, do not necessarily identify the types of materials used in the products for ease of disassembly and do not necessarily use standardized components for possible reuse.

### **Production Process**

On a scale of 1 to 3, with 1 being “no” and 3 being “yes”, the interpretation of the responses by the auxiliary companies to the environmentally related production processes questions are as follows. With an average of 2.32, it appears that these companies are likely to have systems in place to respond to possible accidents and environment related emergencies. Similarly, with an average of 2.23, they tend to have filters for emission control. The companies are somewhat in the middle as far as controlling the use of energy (average 2.01) and the implementation of standardized containers for reuse (average 2.06) is concerned. These companies fair relatively poorly when it comes to recycling their water (average 1.50).

### **Organizational Culture**

The auxiliary companies do not leverage on environmental reasoning for marketing purposes. However, as a group, they do recycle their wastes. In general, they are likely to have written manuals for environmental practices. They also have a tendency to adhere to safety practices at work.

### **Reasons for the Return of Products from the Customers**

The two main reasons that the products are brought back to the company are to either get minor repair work done or to return the product because the client is unsatisfied with it. It is very unlikely that a product is retrieved by the company to be worked on and put back in the supply chain or to salvage spare parts or recycle the product.

### **Other**

The companies have not been able to attribute any new business that might have resulted because of their involvement in environmental practices. About 65% companies have no environmental certification such as ISO 14001 or EMAS. Almost 60% of the auxiliary companies do not make any environmental demands on their suppliers. The remaining 40% make environmental demands of their customers because of prevailing laws or future requirements. To a lesser degree they do it because they are truly concerned about the environment or they would like an image of being environmentally friendly.

### **Reverse Logistics Related Activities**

Reverse logistics here refers to managing “product returns” with the intention to repair, reuse, remanufacture, recycle or dispose of them appropriately (Figure 6).

### **Reasons for Practicing Reverse Logistics**

The reason the auxiliary companies would get involved in reverse logistics has to do with the image the companies want to create towards their clients, shareholders, workers and community. Of course, they have to get involved when there are regulations in place to do so.

### **Difficulties in Implementing Reverse Logistics**

Some of the reasons that the auxiliary companies identified as barriers for implementation of reverse logistics are: “it is not included in the company policy”, “there is no competition from other companies”, “too expensive”, “the current information system of the company cannot support it”, “the company is neither knowledgeable nor has any experience with reverse logistics”, “the manager of the company does not think it is important”, “the personnel cost for implementing such a process would be prohibitive”, and “using the returned materials would reduce the quality of the company’s products”.

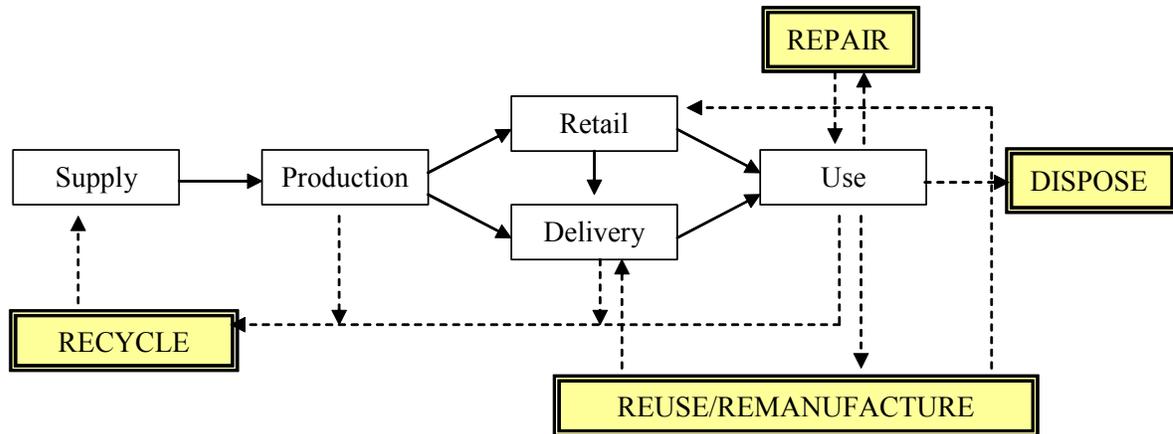


Figure 6.

### Companies Practicing Reverse Logistics

A large number of auxiliary companies (73.2%) have never practiced reverse logistics. Of the remaining 26.8% companies who practice reverse logistics, among the reasons identified by them include being the first company in that sector to do so, or reacting to or preempting the demand made by the interest group (e.g., customers, shareholders, workers, government and community) or to reduce costs and/or increase profits. Finally this group of companies that practices reverse logistics felt that the practice of reverse logistics has helped them in fulfilling the regulatory obligations, in improving the relationship with the customers, in product recovery, in controlling costs and in improving profits.

## CONCLUSIONS

The automobile manufacturing industry has always been credited with the significant role they have played and continue to play in contributing to the economy of many countries. Its importance comes from the considerable portion of the economy the industry commands. The existence of hundreds of auxiliary companies that supply part to the automobile manufacturing companies is well known. The automobile manufacturing industry produces some of the most resource intensive and influential consumer products in large numbers. These are some of the reasons that the automobile manufacturing industry is often in the spotlight. The spotlight has created an unfavorable environmental profile of the industry. For this reason, in recent years, the environmental issues pertaining to the automobile manufacturing industry has drawn a lot of attention of the regulatory agencies and consumers. However, as is clear from this study, the auxiliary companies that supply parts to the automobile manufacturing industry seem to have gotten away with less than desirable regulatory attention even though the auxiliary group consists of a complex assortment of businesses of various sizes, types, and geographical locations, producing a vast variety of products ranging from the very simple to the extremely intricate.

One could extrapolate from the survey that the auxiliary companies seem to only respond if the law requires them to do so. This is especially true when it comes to environmental practices. For example, when it comes to the choice of using materials in their products, they tend to use the materials that are allowed by law and cost effective rather than the one that might be better for the environment. Similarly, when the products are designed, the environmental factors are ignored. The companies seem to be convinced that incorporating such practices would lead to significantly higher costs. A major part of this perception could be attributed to the lack of education and training in environmental practices in such companies. Another reason stems from the way laws are created. There are a lot of exceptions in the law and many small companies are exempt from many regulations because of either the perceived cost burden on such companies or because of the naive thinking that such small companies cannot be detrimental to the environment. However, the point that needs to be stressed here is that just because these companies are small, it does not automatically mean that they could not be harmful. Since there are hundreds of such small companies, they together form a group that is even bigger

than the automobile industry itself. Consequently it is imperative that environmental education and training be emphasized throughout the industrial domain not just in the large companies. Otherwise, there is a danger that the auxiliary companies will be responsible for the bulk of pollution and will end up representing the weak link in the ecological chain.

## ACKNOWLEDGEMENT

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