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Reverse Logistics on bottles recycling.

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RESUMEN

Hoy en día existe una tendencia de optimizar los procesos productivos debido a la conciencia social por proteger el medio ambiente. Esto se debe a la creciente contaminación del agua y del suelo provocada por los residuos plásticos, y a la reducción de sitios adecuados para la disposición final de residuos sólidos urbanos. Por ello, resulta fundamental apostar por nuevas estrategias encaminadas a reducir los residuos que acaban en vertederos. Las empresas, a su vez, comienzan a asumir la responsabilidad social corporativa como estrategia y política empresarial, hecho que se ve agravado por el desafío que enfrentan las organizaciones para reducir costos. La situación descripta genera un escenario idóneo para el estudio de medidas que permitan la reutilización de botellas o el reciclaje de su materia prima.

En este contexto, es fundamental que la industria cree estrategias de producción que reduzcan el impacto ambiental, y no sólo como parte constitutiva de sus procesos internos, sino también como ventaja competitiva.

ABSTRACT

Nowadays, given the social awareness to protect the environment, there exists a tendency to optimize production processes. This is due to the increasing water and soil contamination caused by plastic waste, and to the reduction of suitable sites for final disposal of urban solid waste. For this reason, it results essential to focus on new strategies aimed at reducing waste that ends up in landfills. Companies, in turn, begin to assume Corporate Social Responsibility as a business strategy and policy, fact that is worsen by the challenge faced by organizations in order to reduce costs. The situation depicted generates an ideal scenario for the study of measures that allow the reuse of bottles or the recycling of its raw material.

In this context, it is essential for the industry to create production strategies that reduce the environmental impact, and not just as constituent part of its internal processes, but also as a competitive advantage.

PALABRAS CLAVE

Logística inversa, botellas, medio ambiente, competitividad.

KEY WORDS

Reverse Logistics, bottles, environment, competitiveness.

INTRODUCTION

A responsible and adequate management of industrial waste began to show greater importance during the last decades. Since the adoption of sound legislation in terms of waste generation and management, both at a national and international level, the implementation of cleaner production processes began to be developed with the purpose of reaching a reasonable use of energy and reducing both, the amount of raw material used, and the waste produced. Although no significant advances have been made in this area, the tendency to optimize production processes and the increasing social awareness on environment care, converge in an ideal scenario for the study of measures that allow the reuse of bottles or the recycling of its raw material.

One of the key tools to achieve this change is `Reverse Logistics`, which consists in a process by which companies can become more efficient at environmental terms through recycling, reusing and reducing the amount of material they use. Reverse Logistics covers a combination of logistic activities such as collection, removal and dismantling of already used products or their components, as well as materials of different types and nature, in order to maximize their value, in a broad sense of their sustainable use and at last instance, its destruction.

RESEARCH PROPOSAL

The proposal is focused on deepening this topic in terms of development and application of reverse logistics as a key tool for reducing the environmental impact, both in the economic and productive scope, and in the environmental sphere through processes and results that may be implemented in the local industry.

With the purpose of extrapolating this experience to other beverage industries, the use of returnable bottles, especially plastic ones, in the Argentine brewing industry will be used as reference. This research aims at creating a proposal of basic principles so as to set up an adequate legislation for the regulation of these processes in Argentina.

The research is made up by the following objectives:

- Analyze the current household waste management and adapt it to recycling tasks.
- Study the existing reverse logistics system of the brewing industry and its management, including the necessary resources to implement it.
- Study the economic impact on the industry and its hidden costs, in a way they do not influence decision-making.

- Analyze the feasibility of extrapolating this operation to other bottling industries of plastic bottles, for the drafting of regulations.

METHODOLOGY

The case analysis method will be used. This method seeks to study, describe and analyze the operation of reverse logistics in the brewing industry and its bottles supply.

The information achieved shall be extrapolated to the distribution processes of other beverages, in order to assess the implementation of reverse logistics, reuse and recycling of bottles by means of in-site visits, interviews with responsible staff, and the analysis of literature and documentation (national and international) available on this subject matter.

In-site visits are intended not only to beer bottling plants, but also to PET and glass bottles manufacturing sites, with the purpose of accomplishing a better understanding of these bottles production processes, and of those aspects which involve the use of recovered material.

In order to reach the most accurate and fair information, interviews will be addressed to managers of bottling companies, distributors, representatives of the Chamber of Industrial Food Products, representatives of the Argentine Chamber of Distributors and Wholesale Stores. This will help to understand their assessment on the environmental problem, the responsibility of companies, the complexity of logistics operations and the viability of the proposed use of reused and recycled bottles.

ADVANTAGES AND DISADVANTAGES OF GLASS

Recycling of glass bottles is completely viable if we consider that said bottles can be fully and indefinitely recovered, apart from producing a lower amount of waste. It further reduces air contamination by 20%, given that each ton of recycled glass waste prevents 315 kilograms of carbon dioxide from being released into the atmosphere.

Glass recycling brings approximately 30% saving in terms new glass firing. This would result in a double benefit, economically and environmentally, whose current rating is quite accurate.

Besides, if we further consider "reusing" the improvement is even greater, as for each reused bottle, the amount of new bottles to be produced and transported from factories to bottling plants, and consequently, the amount of raw material to be transported, are directly decreased. This means not only an economic saving, but also a substantial

reduction in terms of CO2 emissions, as no emissions are caused due to transportation, whereas the pressure in the road transport system is further reduced. Moreover, if we take into account that for bottles return, the same beverages distribution transport is used, returns of empty bottles is thus avoided.

The beverage market is not limited to alcoholic beverages; the other major segment is made up of bottled waters, juices and carbonated beverages. In this sense, consumption is on the rise and Argentina has a consumption rate of 131 liters per year and inhabitant.

Bottles within this market are made with plastic, more precisely PET, which due to its low cost and weight, resistance to impacts and high shape versatility, offer various advantages over glass bottles. The logistical problems in terms of collection and transport of waste represent the other side of the plastic low cost. In this sense, bottles are not the exception.

The success of a recycling program depends on the existence of consumers of recycled material and on the market prices of such material, which should be sufficient to cover costs of collection, transportation, labor and processing energy.

Logistics costs have a significant incidence; the reduction of said costs will result essential at the time of studying the viability of the operation. When a store buys beverages from a distributor, a deposit amount is paid for each bottle, whereas each consumer who buys a bottle from the store pays that same amount which will be only refunded when the empty bottle is returned to the store. The amounts corresponding to unclaimed deposits through bottles return are used by the state to conduct researches and programs on environmental policies.

In the absence of specific regulations in Argentina addressed to this topic, the most suitable option to encourage companies to carry out this type of programs is to achieve efficiency, in such a way that it becomes a possibility to reduce costs and increase profits.

EXPECTED RESULTS

The benefits achieved from the reuse of bottles, would be not only a reduction in the production costs of bottled beverages, but also would allow the amortization of expenses derived from the return of empty bottles in trucks.

It is almost inevitable in short distances, even when the "nearest neighbor" scheme is used, where the trip from the last customer location to the plant is usually an empty return trip (except for eventual product returns).

The implementation of this operation will also have various positive economic, social and environmental side effects:

- It would allow to increase the supply of recycled materials and consumables to a growing demand market, such as the bottled beverages market, without need of setting up new production lines, a more expensive option which would imply an extra demand on the Argentine energy matrix. Taking into account the strong framework of Law 27191/15 to increase energy production through renewable sources, raising the annual percentage of the use of renewables from 1% to 8% in 2018.

- Energy conservation is shown through a lower consumption of fossil fuels, if we take into account that most supply and distribution operations are made by diesel trucks, in addition to a logistics optimization that allows to reduce the amount of trips.

- The possibility of reducing costs in the final disposal of solid urban waste would reduce waste volume, as both glass and plastic have very long degradation periods. In case of plastic, we should note the addition of toxic substances emissions, which could contaminate not only the soil, but also underground rivers water (it should be remembered that not all waste ends up in legal and properly controlled landfills).

Finally, the environmental cost should be considered, as both glass and plastic have very long degradation periods, and in the case of plastic, emissions of toxic substances could contaminate not only the soil, but also the water of rivers.

SCOPE OF THE INVESTIGATION

The social and ethical scope of the research will be definitely reflected in the environmental impact, resulting in the reduction of contamination. This improvement will lay the foundations so that similar processes can be applied to other industries.

The social impact could be expressed in the reduction of loads exerted by transport. Furthermore, it should be considered that the development of bottles recovering and recycling may result not only in the growth of the bottled drinks industry, but in the generation of new organizations supporting this activity, giving rise in both cases to the creation of new job positions.

LEGISLATION IN TERMS OF RECYCLING

Apart from the constant concern of companies in reducing costs in an increasingly competitive environment, it is previously noticed that there exist opportunities that would result in economic benefits for organizations, and would further reduce the external costs that both the environment and the society must face.

The key point lies in the creation of a legislation sets out a legal framework to regulate and oblige bottling companies to recover PET and glass products, in order to reduce environmental impact, showing the opportunities and benefits that would consequently arise.

These opportunities are proven to be clearly wasted; first, due to the lack of a legal framework that regulates and obliges bottling companies to recover their products; secondly, due to the general idea existing in companies, that setting up such operations would produce unnecessary complications, as well as very low profit margins to make it worthwhile. The lack of legislation is aggravated by the absence of an appropriate household waste management, which makes recycling difficult and leads to the current situation, in which thousands of tons of PET and glass are buried annually.

CONCLUSION

When studying the reuse of bottles, it is observed that industries benefit from the reduction in the production costs of bottled beverages, and there further exists an amortization of expenses of empty return of trucks. Concerning the environment, there is a lower generation of solid urban waste and consequently, a volume reduction in final disposals, thus reducing the risk of environmental contamination. The environmental cost will decrease proportionally as the generation and emission of toxic substances produced by processes of decomposition of solid waste is reduced. In view of the above mentioned arguments, and considering the limitations encountered in a rather unclear market due to the absence of legal regulations governing chain and actors, it is concluded that a legal framework to motivate and encourage bottling industries to implement productive circuits based on reverse logistics results necessary, both for PET and glass products, in order to reduce their impact on the environment and to optimize resources.

Taking into account the economic, environmental and social benefits exposed, we consider it necessary to develop a self-sustained circuit for the plastic recycling process under legal rules given by a bill.

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