



2012 International Conference on Applied Physics and Industrial Engineering Green Packaging Management of Logistics Enterprises

Guirong Zhang^a, Zongjian Zhao^b

aShandong Jiaotong University, Jinan, Shandong, China

bChang'an University, xi'an, Shanxi, China

Abstract

From the connotation of green logistics management, we discuss the principles of green packaging, and from the two levels of government and enterprises, we put forward a specific management strategy. The management of green packaging can be directly and indirectly promoted by laws, regulations, taxation, institutional and other measures. The government can also promote new investment to the development of green packaging materials, and establish specialized institutions to identify new packaging materials, standardization of packaging must also be accomplished through the power of the government. Business units of large scale through the packaging and container-based to reduce the use of packaging materials, develop and use green packaging materials and easy recycling packaging materials for proper packaging.

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1. Introduction

Shortage of resources in society today, the resources available for human use has become increasingly scarce. To packaging, for example, most packaging products are single-use, and turn to waste after use, and the product life cycle of them are very short, so consuming large amount of resources consumed, in the same time, the ecological environment has also been an unprecedented threat. In China, the pollution caused by packaging waste has become the fourth-largest source of pollution, only followed to water pollution, lake and ocean pollution and air pollution. The development of green packaging, protection of the ecological environment and promoting sustainable economic development have become the consensus in the world's packaging industry in many industrialized countries.

2.The content of green logistics

2.1.The concept of Green Logistics

Green Logistics is a logistics activity, which aimed to reduce pollution of the environment and consumption of resource, using of advanced logistics technology planning and implementation of transport, storage, packaging, handling, processing and distribution. It is an effective and efficient flow of goods that connecting the main green supply and the main green demand to overcome the obstacles between space and time and green services activities in the process of economic management, also known as environmental logistics.

2.2.The contents of green logistics system

Green Logistics System includes the following six aspects: green transportation, green storage and safekeeping, loading and unloading system of green, green packaging, green distribution processing, collection and management of green information.

3.The negative impact of packaging

3.1.Package on the consumption of resources

The packagings of product have different levels. Packaging that directly contact with the product is the inside packaging, usually is disposable packaging. In order to make easier for transport, storage and loading and unloading, sometimes it needs for secondary packaging or even packaging several times. There are many different types of logistics containers, such as with different materials, different structure as well, typical of such trays, containers, container bags, corrugated boxes, cans, buckets and other utensils. Both products' loaded package and logistics' package were needed to consume a large amount of resources and produce large amounts of solid waste. Thus, the impact of packaging to environment is very large.

3.2.Pollution generated by packaging

- Solid waste pollution

Packing and consumption of resources in large numbers will generate a lot of waste. From a global point of view, packaging waste generated an important component of solid waste. At present there are about 10 million tons of solid waste annual in the world, and packaging waste accounts for about the total 1/3. Waste packaging materials include paper, plastic, metal, glass and other ingredients. To deal with these solid waste not only need to spend a lot of manpower, material and financial resources, but also caused serious pollution of the natural environment and threatened the survival environment of the human.

- Liquid and gaseous pollution

Abandoned chemical residues in bucket will flow into the nearby villages and farmland follow the rain, causing large areas of water and soil serious pollution, and even the growth of plants will be contaminated. The health of residents and living environment will be greatly affected.

- The spread of bacteria and pests

In international logistics, the traditional natural packaging material may not only carry a variety of crop pests, but also carry various types of bacteria, which may spread and endanger the local forests and crops, and even affect human and livestock's safety.

4.Green package

4.1.The conception of green package

Green package, can also be called “ ecological package” or “environmental friendly package”, is defined as environmental friendly package, which is completely made by natural plants, can be circle or second use, be prone to degradation and promote sustainable development, even during its whole lifecycle, it is hurtless to environment as well as to human body and livestock's health. In short, green packaging is the appropriate packaging that can be reused, recycled or degradation, corruption and does not cause pollution in humans and the environment during the product life cycle.

4.2.The 4RID principles of green packaging.

Green packaging is not only a package of general performance, but also with two main functions such as protecting the environment and renewable resources. The two main functions achieved by the principles of 4RID, these are reduce, reuse, reclaim, recycle and degradable.

Reduce, that is packaging reduction. For the premise packaging products to meet the protection, facilitate the logistics, sales and other functions, it try to use as little material as possible. European and American countries will develop packaging reduction as the preferred measures of package .In order to implement the measure of appropriate amount of packaging, the company should design to try and make the package of thin, lightweight, and never use packaging without the need for it.

Reuse, that is repeated use of packaging. After simple treatment, the containers can be reused. Reuse of containers can significantly reduce waste volume. To use reusable containers as much as possible will enhance recycling rate of packaging waste reuse.

Reclaim, also calls recyclable. Refers to the use of packaging waste combustion to obtain new energy sources, and does not produce secondary pollution. Through the recycling of packaging waste, production of renewable products, such as the use of thermal incineration, composting and other measures to improve the land condition, to achieve reuse purposes.

Recycle, calls can be reused. As far as possible to use low power, low-cost, low-pollution raw materials as packaging material, in particular, the selection of recycled materials should be expanded, which can not only reduce environmental pollution but also saves raw materials, and be propitious to recycling resources, such as production of recycled paper board and plastic.

Degradable, is the ultimate packaging waste that can not be reuse of, should be able to degrade, corrupt and do not form a permanent waste. For example, select biodegradable packaging materials of paper as more as possible. "Take paper on the plastic's place"

5.Green packaging management strategies

5.1.Government level

Government should play the guiding role of the management, through the development of a series of policies and regulations or the use of economic instruments to limit or encourage manufacturers use in product designing and packaging processing behavior in order to promote green packaging.

- To promote the development and application of new packaging materials through the legislation way. The development of green packaging materials use and the development of green packaging, if there are only good wishes but not mandatory requirement for the government and regulation, are difficult to achieve the desired effect. Currently, under manufacturers and users are still relatively weak in the sense of environmental protection, to pass legislation to manage the production and the use of green packaging materials is still needs, in order to promote green packaging materials and the development of green packaging. Green packaging regulations should include environmental standards for green packaging materials, control quantity emissions of total administrative regulations, and environmental purification technologies (mainly including packaging waste recycling technology) which prevent and eliminate pollutants discharged into the environment, It should also build on the reuse system of using recycled packaging waste.
- Establish the law of the recycling or reuse. The basic characteristics of circular economy are to recycle waste resources. The key to recycle packaging waste is recycling and the key to recovery package is through legislation that requiring manufacturers and distributors take financial responsibility for recycling of packaging waste and recycling compulsory payment. In China packaging industry has rapidly developed over 20 years; many companies already have this tolerance, so the establishment of "the restriction law of packaging waste" has basically met the conditions. It should be the priority.
- Adopted legislation to prohibit the use of certain packaging materials. The relevant government agencies should adopt legislation that prohibiting the use of packaging materials that containing lead, mercury, tin and other components and that do not reach the required percentage of recycled.
- Establish system of storage and return. Develop a number of industry standards, providing for daily necessities, beverages such as beer, mineral water, etc, which all use reusable packaging materials. When consumers buy these goods, they should deliver a certain margin to the store, and their deposit refunded by the store when they return the container. Such a system could be further extended to other reusable packaging materials' production and sales such as washing and painting.
- Full use of leverage on tax. Tax authorities give duty-free, low tax benefits or charge higher taxes to the production and use of packaging materials manufacturer based on whether all or part of its product packaging and packaging materials make use of recyclable packaging materials, to encourage use of recycled resources.
- Restrict excessive packaging. Excessive packaging is excess packaging on the function and the value. It is in the form of materials through consumption of too much, taking up too much volume, decorating with luxurious decoration to the product being packaged. Excessive packaging meets parts of consumer's blind psychological satisfaction, but does not take green factors into consideration. It is not only a waste of resources but also pollution to the environment, and contrary to the concept of green packaging. Country should make legislation

to limit excessive packaging from the perspective of environmental protection and consumer protection.

- Establish several of research institutions to assess packaging materials. The development of professional research organization for packaging materials is used to assess the various packaging standards, and the research system provides two optional recycling channels: The first one is that suppliers recall their packaging, and the second one is to set up an private and non-profit organization dedicated to recycling packaging. Suppliers can apply to join, and pay certain management fees to become a member. Member companies print same recyclable symbol on the packaging. Recycled logo printed on the packaging for recycling by the organization.

5.2. Firm level

For enterprises, the development of green logistics is the trend. Logistics managers should assess the situation and actively respond to shorten the gap of the green logistics operation, and make a further green recycling of logistics processes.

- Green packaging materials. Green packaging materials are the recycled materials causing the minimum of burden to the environment and maximum coefficient of utilization in the whole process of the life cycle. Green packaging material is the core of green packagings, which not only reduce and eliminate the environment pollution, alleviate the pressure on the ecological environment, but also conserve or replace some of the expensive or lack resources in order to reuse waste resources. Based On sustainable development strategy, environmental performance must be as an important aspect to study when used of packaging materials. The strategy of sustainable development must proceeded from, considering the material's three elements, performance, economy and environment (including resources, energy, environmental protection). Using green packaging materials is the fundamental way to ensure the sustainable development strategy angle from the material.
- The lower costs of packaging. The largest proportion of packaging cost is the packaging material cost, so lower costs should start from reducing packaging material cost first. And because of this; organizations need reasonable packaging materials procurement, under the premise of ensuring the basic functions, to minimize the grade of material. Using common packing that does not have special arrangements for the return of the use. With turnover packaging that can be used repeatedly, such as drinks, beer bottles; Repetition utilization is that the packaging turn to another material after the first use by a simple treatment. Using simplified packaging and reach appropriate packaging. Packaging reduction, to reduce packaging waste from source, is world idly recognized as the preferred means of packaging green. The formation of excessive packaging waste is also a cause unnecessary pollution.
- Package unit large-scale and containerization. Large-scale packaging of logistics system conducive to mechanization process in handling, removal, storage and transportation, and speed up the operating speed of these links; It helps to reduce the unit packaging, and to save packaging materials and packaging cost; It also helps to protect the cargo body, such as the use of container bags, containers, pallets and other container means.
- Development of new packaging materials and packaging equipment. To develop packaging materials of lightweight, thin, fluorine-free, high performance is an important direction of the green packaging materials, mainly into the existing packaging materials. On the basis of guarantee the implementation of the three big functions, we should reform excessive packaging and develop proper packaging, as well as try to cut down the use of wrapping and packaging costs and save the

packaging material resources, in order to reduce the produce of wastes and to develop a lightweight, thin, fluorine-free, high performance of the new packaging materials.

- To minimize the type of material that used. In order to simplify the manufacturing process of the packaging, and make packaging more easy on disassembly and recycling, sorting and recycling, packaging design should try to avoid using many different types of materials and should be designed easily separated by the structural for the complex packaging.
- Put green packaging signs in practice. Under the concept of green consumption, people not only concerned about the quality of the goods and weather packaging is beautiful, but also care about if the product compliance with environmental requirements and if the packaging has a green flag in the purchase of goods. Also, if products do not have green flag, some developed countries refused to import them, and do not give preferential price and tax. Therefore, the development of green is a powerful symbol and one of the necessary ways tends towards the world to the enterprise. China's export enterprises need to carry out the related comprehensive green certification to promote environmental labeling system. First, we must actively promote ISO14000 international standards. Through the establishment, implementation of environmental management certification system to control pollution generated from the source, saving energy, reducing pollution treatment costs, and enterprises will be integrated benefited in the social and economic. The second is to actively implement the system of environmental labeling products to allow more exports in carrying out environmental standard, based on greater access to develop countries, environmental labeling, and making exports more than "green barrier", out of the international product.

6. Conclusions

The development of green packaging is to enable packaging of lightweight, recyclable, re-use, recycling, biodegradable materials, and to prevent the use of non-ecological materials. To develop the green packaging, the government can adopt legislation prohibiting certain packaging materials use, establishing of storage refund system, drawing up the recycling or reuse laws, giving a discount or punishment in tax, limiting over-packaging, founding sundry research institutions to evaluate packing materials, legislation to promote the development of new packaging materials and the use of such measures; In enterprise level, you can package units large-scale and containerization, lower costs of packaging, proper packaging, green packaging materials, reduce the types of materials used as far as possible, use materials that easy to recycle, development of new packaging materials and packaging equipment as well as making efforts to adopt measures to achieve ISO14000 certification requirements of green packaging.

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