

The Strategy Investigation of the Garment Industry Based on Low-Carbon Economy Situation

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Abstract: Low-carbon and sustainable development are the global hotspot at present and it is an inevitable method for all the garment industries to select the low-carbon development road. This paper reports some feasible measures for garments faced to the low-carbon economy. First, this article introduced the original steps should be adopted in the clothes making from selecting fabrics and accessories in order to deduce the carbon use. Secondly, according to the theory of the body engineering and comfortable of the garment, it reported the handling and innovation methods in the traditional fashion style from style and drafting design. Through these methods, it could be reduce the extra need to the environment after putting on the clothes in order to deduce the carbon discharge. Thirdly, the article reports the methods which could be reduce the carbon usage in the clothes making. Finally, it introduced the possible low-carbon ways in the logistics, sales and after-sales services of the garments.

Keywords: low-carbon economy, fashion design, fashion making

1. Introduction

Low-carbon economy is the hotspot in the world and the realization of this economic model depends on the action of the individual and the enterprise. Our government had put forward that in the 2020, the carbon emissions per GDP unit must be reduced 40%~45% at the level of the 2005's, and this target which should be as binding index had been included in the national economic and social development of the long-term planning. To accomplish this goal, it needs all professions efforts, including clothing. By 2020, it is the golden development of China's garment industry, and clothing production and related textile industry is labor-intensive industries, although both at home and abroad, there is not a "carbon emissions standards" about garment industry, but with the concept of low carbon emissions penetrating deeply, in the future ,carbon emissions will be taken to China textile clothing as a new kind of non-tariff barriers in trade by the west, thus developing low carbon clothing will become the hot spot and the new economic growth point^{[1][2]}.

2. The Meaning of The Low-Carbon Garment

Low-carbon garment means the clothing products, the production and the consumption reached the lower or lowest level in all production and consumption of carbon emissions compared with conventional dress, it included selection of the garment with low total carbon emissions, clothing made of recycled materials, and increase the total consumption of the clothes in order to reduced clothing utilization methods, etc. From the clothing production process, it should include the following aspects: low carbon measures about the fabrics and accessories, low carbon measures taken in costume design and structure design , low carbon measures on clothing manufacture process, low carbon measures on sales and logistics of clothing and, after-sales service and maintenance of low carbon measures taken, etc.

3. The Approach Analysis of The Realization of Low-carbon Garment

The ways of realizing low-carbon garment includes not only the selection of environmental protection material, but also closing to the environmental protection principles, namely regular save energy and reduce pollution, reevaluate, reuse, classification recycling and reuse, and ensure coexist with all rescue.

3.1 Fabrics and Accessories

It should choose the fabrics which can reduce carbon emissions, such as using cotton, hemp, silk, wool fabrics of natural fibers, less with leather, and choose new sustainable utilization fabrics, such as ECO-CIRCLE, etc, to reduce clothing carbon emissions at certain extent. Specific measure is:

3.1.1 Choose Fabrics and Accessories Made With Natural Fiber Preferentially

Apparel fabrics and accessories go back to the source of fiber, has been consumed numerous resources which including labor. Fiber through spinning, dyeing and finishing process become into yarn, fabrics, and the process of the garment production, logistics and consumer use, the final burning, degradation, carbon emissions have occurred in each sectors which had been referred to above. By weight of 250g/piece making with cotton and chemical fiber respectively, without any dyeing and printing processing, carbon emissions of the cotton clothing totaled approximately 224kg, the carbon emission of the fiber clothing is about 1504kg. If the clothing with color and patterns, together with leather, wool and other materials, the carbon emissions would reached the level which far more than the conservative figure. In contrast, the consumption of energy and pollution generated by cotton, hemp and other natural fabrics is relatively small, while hemp fiber and bamboo fiber levels than traditional cotton material is more environmentally friendly. Hemp fabrics is less than 50% on the ecological impact contrast to the cotton clothes. Bamboo fiber fabric consume less water and pesticides than the cotton's. So the garment design and production process, in effect to meet the style premise, should give priority to use fabrics and accessories making by natural fiber.

3.1.2 Choose Fabrics and Accessories Made With Chemical Fiber by Low-carbon Methods

Chemical fiber includes two parts, namely man-made fibers and synthetic fibers. Man-made fiber were made through artificial chemical with a natural resources, such as wood and other raw materials. In the same processing conditions, the carbon emissions and pollutions to the environment of the man-made fibers, such as Tencel, Modal, were less than synthetic fibers. All the methods, for example, the use of man-made fiber units can be improved through technological innovation, make full use of kapok and other short fiber, improving yields, etc., can greater reduce the carbon emissions and conservation of land.

Low-carbon clothing is sometimes subject to restrictions on the design and consumer trends, such as the feel, gloss, grade of the man-made fur is lagging far behind than the fur garments. Sometimes high-tech fabrics containing chemical fibers must be selected in order to ensure a certain degree of texture of clothing. So, the choice of fabrics with pure chemical or blend fibers, should pay attention to whether the manufacturing take the methods by environmentally friendly way in the initial.

3.1.3 Choose Fabrics and Accessories Made With Optimal Dyeing and Printing Methods

The fabrics and accessories used in both natural fibers and chemical fibers, will go through the necessary dyeing and finishing process. So linking in the procurement of fabrics and accessories should focus on its methods and materials which be used in the finishing process. The fabrics not only should be paid attention to environmental protection, but also to consider such as reducing the waste of water resources and other follow-up and deep-seated problems.

3.1.4 Choose Fabrics and Accessories Could Be Recycled and Reused

Teijin Fiber Co., Ltd. of Japan successfully developed a new type of environmentally friendly fabrics-ECO-CIRCLE in 2002. Its advantage is sustainable use. The recycled polyester clothing (uniforms products) after through grinding, chemical reactions and polymerization step was made recycled polyester fabric, then it was cut into fashion. When these above mentioned clothes were dirty and old, the wearer could put their back to the designated collection location, once again they were crushed, made into clothing, so the cycle unlimited. Use waste recycling clothing fiber technology has existed for many years in the United States and Europe. Many well-known international brands are already

prominently display of clothing made from recycled products in the stores in the stores, domestic companies have also introduced the use of such environmentally friendly apparel fabrics.

In addition to the above link, selection of apparel fabric and accessories should also pay attention to whether the factory use solar energy, wind, biomass and other low-carbon renewable energy or other clean energy alternative to traditional high-carbon fossil fuels.

3.2 The Methods in The Style and Drafting Design

The costume designer should advocate green fashion culture, establish the concept of low-carbon, responsible design. On the assumption of meet the requirements of the premise, unnecessary decoration part should be abandoned and over "design" should be avoided. In the field of fashion design and consumption, simple principle must be consciously advocated, and luxury design and production also ought to be opposed.

In terms of design for the dress, complete simple will contradiction with itself function, so in addition to select low-carbon environment materials and meet the dress function requirements, it should as far as possible be used less decorative techniques and materials, such as large lace, beading, embroidery, etc.; it should be actively promoted the fitted outline, appropriate application of panniers and a long tail care; unless absolutely necessary, it should be use little or no material made with fur leather.

For professional and daily wear clothing, simple addition, it should be make rational use of structural design to provide a more comfortable, healthy and science wear effect in addition simple. The quantity, position and shape of the dart and structure lines could be researched and reset according to the theory of the body engineering. Through these methods, the finished garment could give not only fitting well with the body curve so as to cover the shortage of the human, but also providing an appropriate space for action and the environment under the garment. This would reduce the man-made demand for the air-conditioning, heating equipment and other resource-dependent equipment. According to the conclusion of the comfort of the garment, the difference of the part of body on the cold-hot sensation should be fully used. Open design or more action space should be applied in the sensitive area to the summer clothes, and winter clothing is to the contrary measures. Based on the different heat emission in the different part of the garment, it could be consciously open large at the collar and disconnect at the sleeve cap line and armpit position, so the heat could be dissipate faster in the same conditions. With ensuring the beautiful and stylish, winter clothes should be closed or reduced the amount of openings in the cuffs, neckline, hem, etc. Designers should also change the traditional design mode and boldly innovate to the traditional clothing style, such as do clever opening processing under the collar position to the summer men's shirt.

3.3 The Methods in The Garment Making

In the apparel production process, first thing is selected low-carbon renewable energy or other clean energy alternating the traditional high-carbon fossil fuels; Second, the new control equipment must be strively used to reduce the human use of the garment processing; third, it should be paid attention to science and technology innovation, so as to improve the corporate of the digital clothing's processing capabilities and rapid response of the enterprise; fourth, the details should be noticed in the production process in order to minimize carbon consumption, such as washing standard, and trademarks could be used with 100 percent recycled paper and soy ink printing system, the necessary washing and ironing process in the production process could be used a small amount of chemical substances and simple washing or pressed methods; finally, packages links should be used biodegradable non-woven bags for packing, etc.

3.4 The Methods in The Garment Logistics and Sales

It should be reasonable plan and achieve to the materials required for production. The using of the computer-aided management to existing materials could save human use in storage. For clothing manufactures, it could be entrusted with professional logistics companies having credit management, or

use new clothing logistics concepts and methods to strive to achieve zero inventory.

To the session of apparel sales, it ought to be adhered the low-carbon conception of environmental design and construction of exhibition, focus on innovation, abandon luxury, reduce waste, protect the environment and save expenses, carbon consumption of the final apparel products would be reduced.

The traditional lighting of the store should be replaced, lighting system could be improved and in accordance with the time pattern of consumption customers, a new lighting plan period was able to be achieved in the purpose of saving electricity

Clothing enterprises should take the initiative to apply for the carbon label in the products, so that consumers could priority purchase the lower carbon emissions products. In promoting products process, it should be pay attention to guided consumers to establishing low-carbon and responsible concept of consumption, rather than the concept with the character of stimulate, rapid consumption in the fashion.

3.5 The Methods in The Services

Various measures could be taken in the after-sales service, such as training the collocative skills of the customers, like a ride, mix and match of the old and the new clothing, etc, in order to increase efficiency; to help customers to recycle the old clothes; organizingl customers to use old fabrics making hands-on production of apparel.

It should be introduced the washing and maintenance-related knowledge to the customers, The low-carbon consumption concept, such as selection the enviromentally fabrics, buying the procurement of environmental models, reduceing washing times, selecting the green washing, hand washing instead of machine washing, drying naturally and other low-carbon consumption of natural philosophy. Some enterprises could also provide professional clothing cleaning, renovation, maintenance services, to reduce carbon consumption of the garment after the sale.

4. Conclusion

Nearly half of the textile products of the whole global come from China, the garment manufacturers should be first resolved the problem fo carbon emissions in clothing consumption in facing to the new opportunities. This paper repoted the possible methods of the low-carbon garment from the aspects of materials selection, style and structure design, apparel production process, garment logistics, sales and services after sales, etc. Garment industry's low-carbon reforms could not only depend on individual organizations, small number of enterprises and consumer, but also depend on the garment manufacturing, the education industry of garment and related research institution looking for a new road, and constructing a completely cyclic regeneration system which meet the need of the environment, that is, the low-carbon and sustainable development method.

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