Feature: Promotion of “ECO-CIRCLE®”

Aim for a recycle-based society
Teijin’s “ECO-CIRCLE®”

In 1992, the Teijin Group established the “Global Environmental Charter” utilizing chemical technology to create business models for the compatibility of both environmental and financial issues. One of the models was “ECO-CIRCLE,” which allows polyester products to be converted back to its raw material, and the raw material is used for new products. We are contributing to the realization of a sustainable society by completely recycling these materials.

The significance of the development of “ECO-CIRCLE”
Teijin’s Group development of the world’s first chemical recycling technology for polyester allows polyester fibers and PET bottles to chemically decompose and be converted into new polyester raw materials equal in quality to those made from petroleum.
According to the Ministry of Economy, Trade, and Industry’s 2001 Fiber industrial activation measure investigation, in Japan, 1.74 million tons of fiber was buried or burned. The Teijin Group believes that by recycling these fibers, we move one step closer to contributing more to build a sustainable society.

LCA Evaluation of recycling Polyester material
The LCA evaluation of ECO-CIRCLE regarding the preservation of natural resources was that it can expect the reduction of crude oil and natural gas by using recycled polyester products as raw materials. For example, by having the “ECO-CIRCLE” in full operations, it is possible to reduce 30 thousand tons of crude oil and 24 million N3 of natural gas in one year.

Compared to when manufacturing raw polyester material (DMM) from petroleum, it is possible to reduce the CO2 by 50% and about 80% when CO2 produced from burning materials is added when it concerns the depression effect of global warming of CO2. So, with 1 ton of polyester, it is possible to reduce CO2 by approximately 3.2 tons.

About 80% of reduction is estimated compared with the case where raw polyester material is produced from petroleum by the reduction effect of the energy.

Aiming toward activities which reaches to the consumer
For these companies that approach the ECO-CIRCLE, the Teijin Group has three companies register as an ECO-CIR- CLE member, and we cooperate to develop, commercialize, retrieve and recycle products that answers the customers needs for products that are considerate to the global environment. This movement is now expanding into the recycling of uniform, undertaker, train seats, train or bus passes and other products. In the future, we hope to expand our “ECO-CIRCLE” system to general consumers.

Not only do we consider the environment for product development; we cannot forget the views and opinions of the consumer, where we will develop products that will emphasize an additional value of functionality and design so that our customers will purchase these products with an “ECO-CIRCLE” incentive.

To increase the recycling of polyester
Chairman Oshibu (abbreviated hereafter): I feel it is important to greatly expand the scope of Teijin’s “ECO-CIRCLE” as a business model. In order to do this, I think the panel needs to look at the way society is organized and how it behaves in regard to recycling. Do you have ideas on this?

Hattori: We should try to wear clothes for as long as possible, based on the 3Rs (Reduce, Reuse, and Recycle). Unlike PET bottles, which have a short life from consumption to disposal, in most households, clothes are worn until they cannot be worn anymore and thrown out; so it is difficult to collect them. However, for uniforms and other clothes that are only worn for fixed periods of time, it should be possible to collect some of them. Another issue is that consumers tend to put greater value on design than on environmental considerations. In order to persuade consumers to purchase ECO-CIRCLE products, we need to provide some incentive for them to do so. SoTo: For most consumers, it is difficult to persuade them of the merits of recycling clothes. Rather than saying “recycle clothes”, it may be more effective to stress that this material “should not be thrown away as garbage.”

Umeda: If we consider the increase in volume of material that needs to be processed, we not only have to consider B2B (Business-to-Business) recycling that is at the core of ECO-CIRCLE, but we also have to include B2C (Business-to-Consumer) recycling as well.

Enhancing the appeal to ordinary consumers
Teijin: For example, in the case of Teijin’s B2B recycling, we just need to talk to their business partners, but whom should we speak to about B2C recycling.

Hosoda: In addition to enlightening consumers of the merits of recycling, it is also important to improve the labeling for polyester products to increase consumer’s awareness of the need to separate these products from other waste. We also need to think about how we can best explain the flow for the separation of these products. Moreover, the collection of polyester is inefficient. We need to consider how we make it easier to extract polyester from existing recycling routes. For example, if there is clear labeling about separation for recycling agencies, then it should be possible to use existing routes.

Sato: As you can see from this LCA (Life Cycle Assessment) graph, even if we only eliminate the polyester from waste that is incinerated, we can reduce CO2 emissions by 50%. The other point we need to stress is that this will not mean a reduction in quality. We should point out to consumers that this reduces CO2 emission without affecting the quality of products.

Hattori: The problem is that unlike the disposal of PET bottles or empty cans, the recycling of fiber is not regard- ed as a social problem, so consumers are not aware that fiber is included in garbage.

Oshibu: If there is a way to raise the awareness of con- sumers, who are the users of these products, of this problem, then we can use that to strengthen legal requirements.

Sato: It is important to get consumers to think about the environment when buying clothes. For example, by includ-
Since fiber has not become a social issue, consumers are unaware of the amount of waste fiber.

Working for the enactment of a “Fiber Recycling Law” that covers imported products

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Oshizu: The vast majority of fiber products are imported from China. Working out how we can get China involved in helping to resolve this issue is a major consideration.

Teijin: This is an issue that cannot be resolved by Teijin alone, but requires the involvement of industry as a whole.

Hosoda: As a national strategy, we can consider the introduction of a “Fiber Recycling Law” for imported products. This could be done by applying a recycling fee to all companies, including importers. This amount could all be considered as a recycling charge. Raw material producers who possess recycling technology would process their own products for free, but process those of other companies for a fee. In this way, raw material producers could fulfill their social responsibility, while also completing their EPR (Extended Producer Responsibility) as a business that can coexist with the environment. Not only that, it would help Japan’s fiber industry shoulder this responsibility. By the way, do you know which fields use polyester the most?

Teijin: Uniforms, sportswear, school PE garments (jerseys), etc. Ladies black formal wear is usually made of polyester. Also, fleecewear and linings tend to be made of polyester. Cutting edge dustproof clothing, which has to have a fine mesh, also uses ultrafine polyester fabric.

Teijin: As for how we can best collect this material, we think it is important for Teijin to work for the rapid introduction of a system that encourages retailers to recycle material in the future.

Sato: What is needed is a campaign to promote the image of a responsible society. For example, a campaign that promotes a social awareness for material that encompasses long use, the reuse, and finally the recycling of material.

Hosoda: The long use and reuse of material is important, but in the end it is Teijin’s responsibility to carry out recyclable material. If a company reduces waste as much as possible, it cannot but help business and the environment to coexist.

Oshizu: These ideas cost money. Are there any cases by which we can reduce this cost?

Umeda: While we need to constantly appeal to consumers, companies need to start with cooperation with other companies in the same industry and also need to approach fiber recycling agents.

Hattori: It is difficult for consumers to change their behavior just on an idea. We need a way of explaining to people in simple terms that by recycling fiber, we can avoid using oil.

Oshizu: Finally, could I ask each of address a few words towards Teijin.

Umeda: As a raw materials producer, introducing such a system would be very welcome. I would like to see Teijin set an example of how this could be achieved. On the other hand, I would also like to see you see a recovery system that includes imported products. By pursuing a pioneering strategy, in the same way that the recycling of cars and home appliances is done, I am sure this will be profitable for the future.

Sato: For general consumers this is not the first time they have been asked to recycle materials, and it is just a question of finding a means of successfully convincing them that this does not mean any loss of quality. By cooperating with the industry as a whole, increasing awareness, and reducing transportation costs, it should be possible to get consumers to accept this idea. Since Teijin is a upstream company, I would like to see it cooperate with clothing stores and shopping malls to communicate this message more directly to consumers.

Hattori: I feel it is important for Teijin to expand its innovative fiber-to-fiber recycling system to the whole industry. It is also a question of persuading consumers to choose environmentally friendly products, and to understand the significance of the ECO-CIRCLE system. I hope that “Teijin will introduce advances that help the environment, not only now but in the future, and hope to see a constructive exchange of views between industry and NPOs, despite their different viewpoints.

Battori: First of all, it is important to decide on the basic concept. For example, when promoting the 3Rs, we need to consider how this can be positioned so that it appeals to consumers. Next, there is a need for a methodology and data to help people implement this within a business. Also, for a raw material producer it would be helpful to view this from a manufacturer’s perspective. With the realization that 85% of imports come from China, the distributors bringing those fiber products into Japan should bear some responsibility for recycling them. The EU is pursuing this strategy. Connected with the basic concept, mentioned earlier, “I don’t think anybody can object to the statement” working as a business while protecting the environment is best.”

In the end, joint coordination between different companies in the same industry and clothing manufacturers is important. Through this vertical cooperation it would be possible to create a network that can solve the various problems involved,

Creating a recycling system that also covered imported products would be great

Yasushi Umeda
Graduate of and PhD in engineering from University of Tokyo, Faculty of Engineering. Outlining how eco design can be used to produce products that are environmentally friendly.

Teijin: Implementing each of these recommendations from the specialists on the panel may be difficult, but I would like to see them implemented over time.

Results of the stakeholder dialogue

We have heard various views on constructing a recycling society from some Japanese specialists in this field. The aspects that struck home for us, was our lack of consideration for the consumer’s viewpoint, the need to increase society’s understanding of our ECO-CIRCLE recycling system, and the need for the industry as a whole to make a stronger approach to recycling. Although this is a serious problem, the opinions and ideas we received through this dialogue will be very useful for our future efforts.

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Hosoda: The long use and reuse of material is important, but in the end it is Teijin’s responsibility to carry out recyclable material. If a company reduces waste as much as possible, it cannot but help business and the environment to coexist.

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In the end, joint coordination between different companies in the same industry and clothing manufacturers is important. Through this vertical cooperation it would be possible to create a network that can solve the various problems involved, including recovery and delivery, of recycled material. At the moment, Teijin is taking a lead in this area, but on a national level some legal procedures will need to be implemented. For example, a revision could be made to the Law for Promotion of Effective Utilization of Resources to encourage the recycling of fibers.

Oshizu: Implementing each of these recommendations from the specialists on the panel may be difficult, but I would like to see them implemented over time.