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## Development of used materials as an example of business management with regard to the ecological aspect – Canon case study

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### ABSTRACT

The paper presents the concept of re-use of used materials at Canon. The possibilities of re-use of previously used products are described, as well as the ecological aspect of business management. The processes related to the re-development occurring in the Canon company were analyzed. Canon is a Japanese company specializing in imaging and optical products, such as cameras, cameras, photocopiers and computer printers. He is one of the pioneers in the reuse of printer toners.

**Keywords:** Business management, environmental aspect of organization management, reuse, management of used materials

### 1. INTRODUCTION

The growing consumerism and the increasing degradation of the environment have resulted in the emergence of new solutions and concepts that raise the ecological aspect of the company's operation. This has led to an increase in the importance of ecological conditions in both the functioning of enterprises and the entire economy (Pachura, Ociepa-Kubicka, 2014, p. 143-144). This conviction has a significant impact on taking management actions.

It enables the development of an ecological approach to the functioning of the enterprise and the inclusion of management considering the environmental aspect into the business management system.

Organizations more and more often seek compromises between environmental protection issues and rational use of resources and the effective operation of the enterprise (Schaltegger, S., Synnestvedt, T., 2002, pp. 339-346). Contemporary views on the role of environmentally friendly behavior of enterprises in their functioning cause that ecological considerations are more and more often perceived as a factor in the development of enterprises. Organizations are looking for balance in the simultaneous implementation of economic, ecological and social goals.

More and more often, one can notice the criticism of inadequate practices of business entities, aimed at reducing operating costs while having negative impact on the environment and the use of technologies harmful to the natural environment (Iraldo, F., Testa, F., Frey, M., 2009, pp. 1444-1452, Ekins, P., 2005, pp. 12-14).

## **2. ECOLOGICAL ASPECTS OF MANAGEMENT OF AN ENTERPRISE**

Ecological aspects in organizations are connected with the intentions of modernizing the ecological world economy and strategic changes in the company's operation (Morrow, D., Rondinelli, D., 2002, pp. 159-171). The ecological approach is related to the need to preserve the natural environment, threatened by the negative effects of running a business. It can be observed that at the turn of the 20th and 21st century, pro-ecological attitudes and attitudes develop (Balan, Dragolea, p. 12), relating, inter alia, to voluntary pro-ecological activities that go beyond legal regulations and represent a chance to stand out from competitors. In enterprises, these behaviors may be treated as a source of competitive advantage. These activities gain in importance due to the increase of ecological awareness of societies (Schaltegger, S., Synnestvedt, T., 2002, pp. 339-346).

The involvement of enterprises in pro-environmental issues results from many factors (Kassaye, 2011, p. 444). It belongs to them:

- increasing social pressure to improve the quality of the environment,
- growing environmental requirements of consumers who are becoming more and more sensitive to environmental issues,
- loss of value of technologies and products that do not meet ecological standards,
- the growing importance of organic products,
- taking into account the requirements of the international market, including the EU market, where it is not possible to sell goods that do not meet the standards,
- striving the market to eliminate products harmful to the environment,
- tightening environmental protection regulations and increasing costs related to the discontinuation of related activities,
- changing the position of enterprises on the market applying pro-ecological management (eg operating in accordance with ISO 14001 or EMAS (EcoManagement and Audit Scheme),
- achieving a favorable position in the environment, including by creating and maintaining with him the best possible relations (public relations).

In recent years, there has been a complete change in the approach to production and consumption from the point of view of environmental protection. Enterprises have adopted a new concept of environmental management. This approach seeks to reduce or minimize pollutant emissions associated with the generation, sale, consumption or operation of a product. It is also necessary to plan the management of waste generated as a result of product consumption at every stage of the product life cycle (Kaiser, F. G., Fuhrer, U., 2003, pp. 598-613).

One of the manifestations of business management including ecological aspects is the striving for re-use of used materials. This practice is used by Canon, which is described in the empirical part of the study.

### **3. RE-ASSESSMENT OF MATERIALS IN CANON**

The re-use of used materials is the supervision of waste flows and information from the place of origin to the destination for re-use, value, treatment or disposal. Product recovery concerns disassembly and re-use of components and parts whose technical condition does not raise any contraindications in the field of safety of use. The implementation of this process in activities is becoming more and more common, however, despite numerous benefits coming from it, many enterprises do not use this concept.

In Poland, toners for printers, multifunctional devices and copiers on a very large scale are sold every year. This is due to the fact that almost every company uses this type of equipment. The number of used toners is large, and only half of them goes to recycling, the rest goes to landfills even though environmental law prohibits such activities. The Waste Act informs that every activity has the obligation to dispose of hazardous materials (such as toners and printer inks) when it is not possible to recycle them, but not all companies comply with this requirement. In the case of environmental inspection inspections, each company that has a printing device (whether a printer, photocopier or multifunctional device) is required to present a document confirming the passing of used toners or inks. Such a document is called the Waste Transfer Card, in which the weight and date of transferring the waste are listed.

Canon was founded in 1937, has gained recognition all over the world and operates in various markets. The essence of the activity is to provide customers around the world with the most modern solutions in the field of photography.

The company also deals:

- business solutions,
- production of consumer products mainly in the field of photography and printers,
- services in the field of broadcasting and Communication,
- medical systems,
- manufacturing of industrial products.

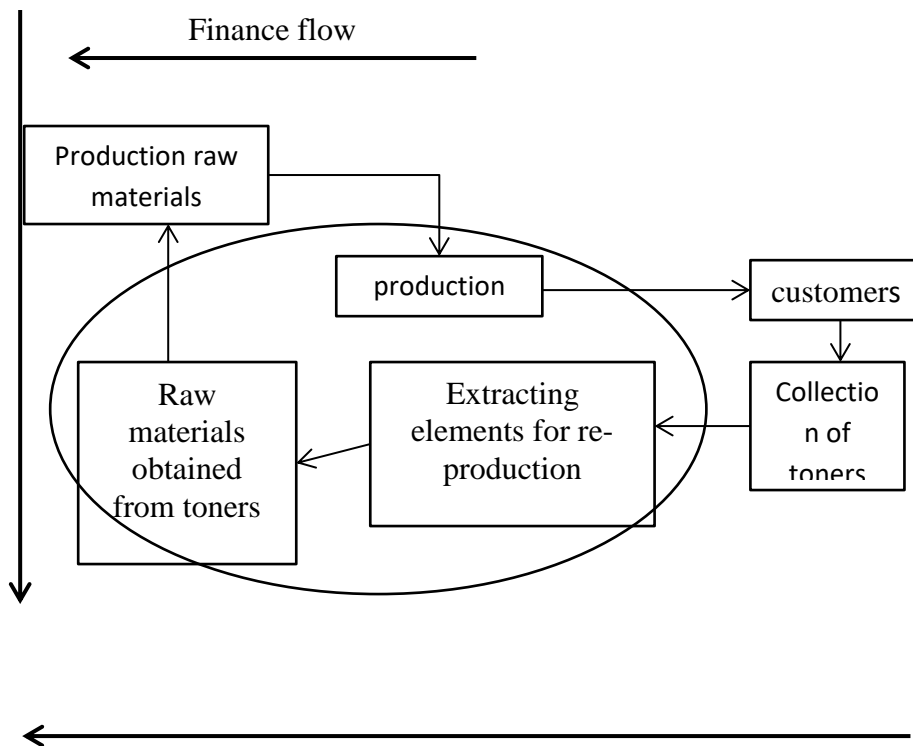
Annual sales profits of 3.467 billion yen and around 118 thousand employees in 200 branches around the world make Canon one of the most recognizable companies in the world.

The implementation of new and innovative ideas makes Canon a leader in its industry. The company emphasizes that applied business solutions focus on reliability, design and advanced technologies, which translates into high quality and customer satisfaction.

Canon implements activities for the protection of the environment. This is reflected in the rankings and global publications:

- Business Week has placed the Canon brand in 35th place among the best global brands,
- Fortune put Canon in place 30 in his All Star list of the most admired companies in the world in 2005 and in place 5 in the computer industry. The rankings were based on a global survey of 10,000 directors, managers and analysts in the largest companies,
- Financial Times puts Canon in 25th place among the most respected companies in the world,
- President and CEO of Canon Inc., Mr. Fujio Mitarai was named the 10th most-respected corporate leader in the world. The ranking was provided by over 1,000 respondents from 25 countries.

Canon has numerous processes related to re-use. Used toners for printers flow in the opposite direction of flow in traditional logistics. They are taken from the market and returned to the enterprise again.



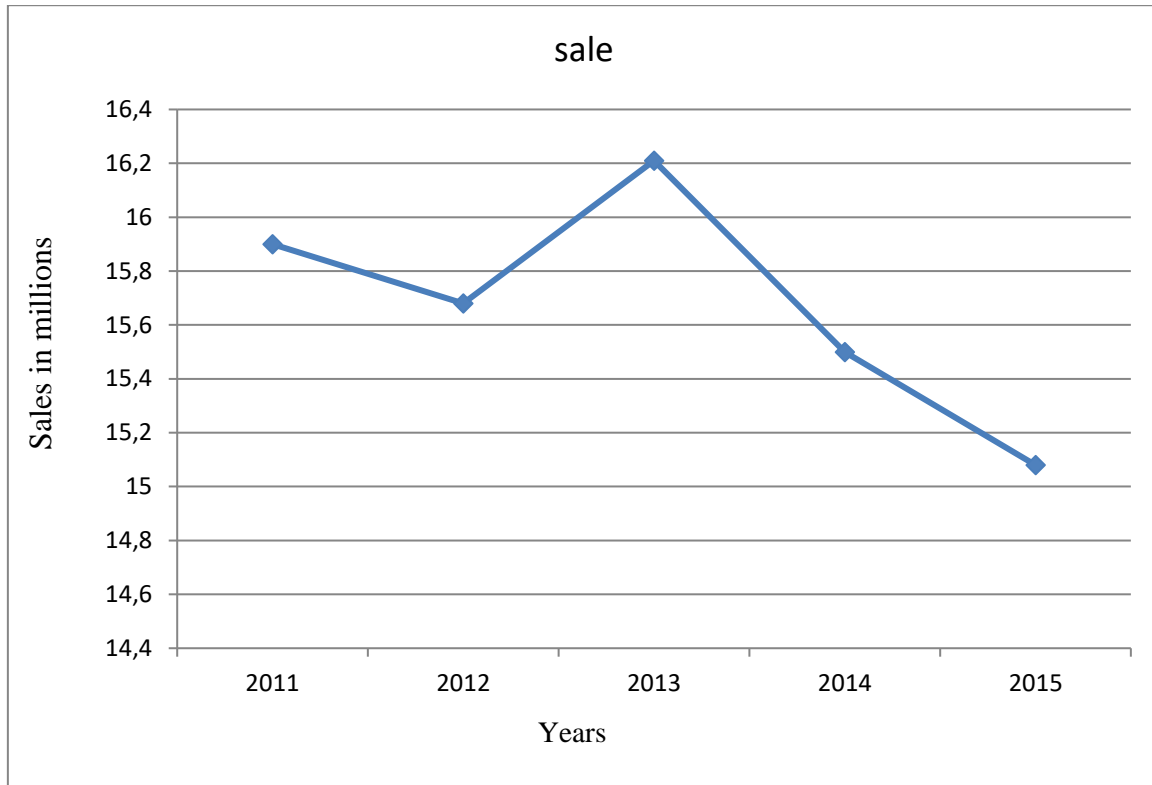
**Figure 1.** Finance and information flow at Canon

[Source: [www.canon.pl](http://www.canon.pl) access 25.05.2018]

One cartridge of ink or toner decomposes on a landfill for around 1,000 years. This happens often because of the ignorance of users. The problem is increased by the fact that companies selling consumables: service centers, computer companies or distributors and

importers do not receive empty cassettes. These companies do not have the appropriate permits to collect and dispose of empty toner containers. It is an expensive logistic and organizational process for them.

There is no pan-European recycling and recycling program for toner containers. In most cases, toner containers can be recycled together with other plastics. These are products that have lost their functionality. Their recovery is customarily imposed on enterprises by laws on environmental protection. Metal and recyclable materials are most often recycled in the recycling of these materials. The recovered ingredients are reused by the companies that have focused them



**Figure 2.** Dynamics of toners sales in Poland  
 [Source: [www.canon.pl](http://www.canon.pl) (access 25.05.2018)]

**Table 1.** Toner sales in Poland  
 [Source: [www.recykling.pl](http://www.recykling.pl) (access 25.05.2018)]

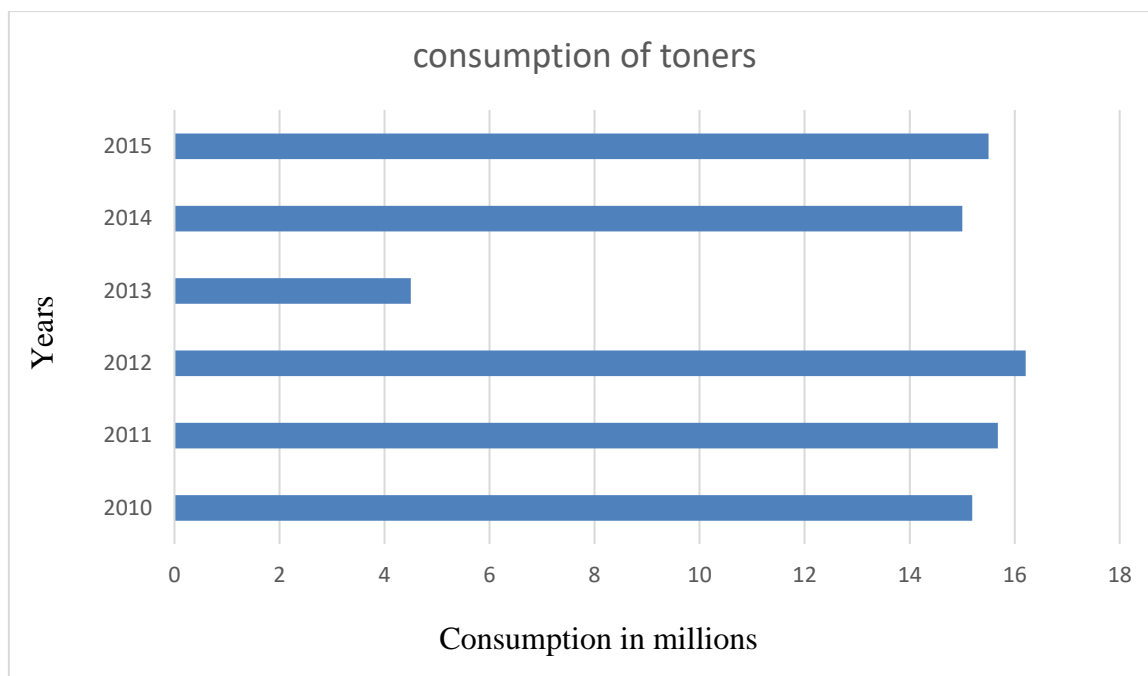
Year	2015
Value-added sales in Poland	1,5 mld PLN
Re-use of raw materials (quantitative)	70%
Re-use of raw materials (by weight)	93%

Toners reused by Canon in the world	344 000 tons
Reduced demand for raw materials by Canon	232 000 tons
Toner production cost	30 PLN

**Table 2.** The total costs of selling toners in Poland

[Source: [www.recykling.pl](http://www.recykling.pl) (access 25.05.2018)]

Year	The cost of products sold (million PLN)
2011	455,7
2012	470,4
2013	486,3
2014	465
2015	452,4
first half-year 2014	210



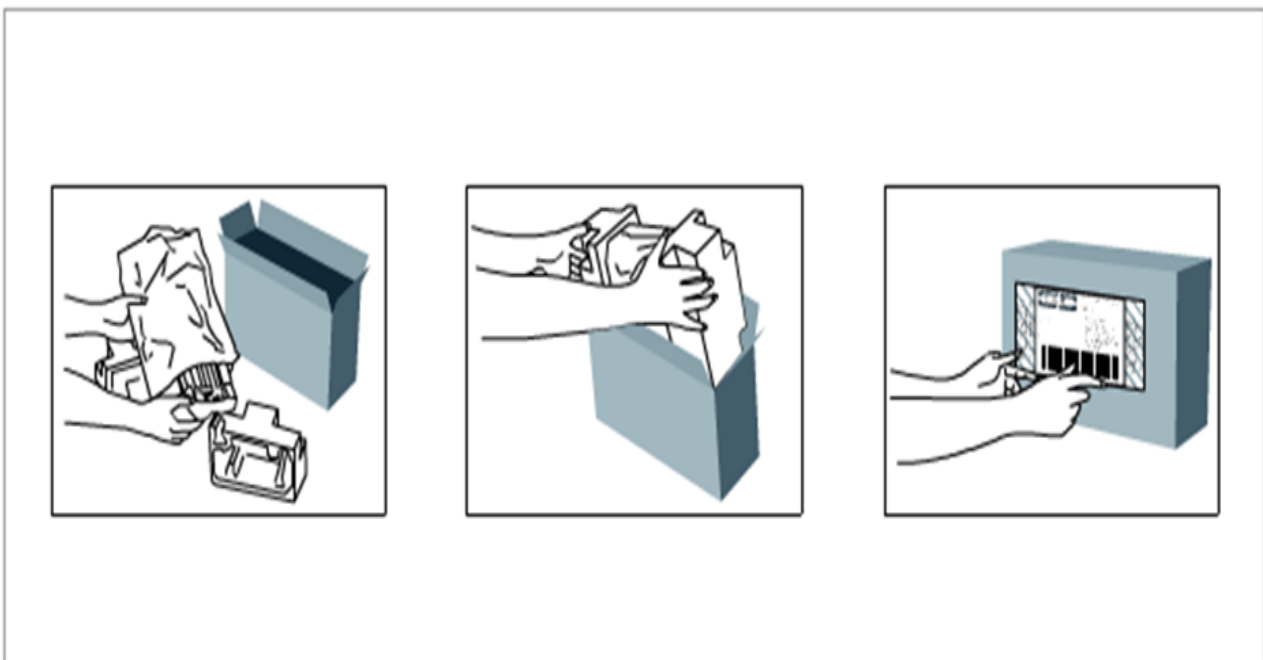
**Figure 3.** Toner consumption in Poland

[Source: [www.recykling.pl](http://www.recykling.pl) (access 25.05.2018)]

Canon offers solutions that make it easy to reuse cartridges. Canon carries out activities that are designed to facilitate the collection of used products. It belongs to them:

- collection and selection of used toners throughout the country,
- providing a free opportunity to return used toners,
- signed contracts with large companies, especially those conducting office activity,
- providing a one-time return option by submitting a shipping order on the website
- the opportunity to establish permanent cooperation with companies.

Customers can return used cartridges for free. They are then wholly re-used or recycled. The Canon toner cartridge recycling program is only for returning empty Canon original toner cartridges. Canon runs a re-usable toner program in 16 European countries and begins when you remove the print cartridge. Canon has obtained the global ISO 14001 certificate for environmental management systems in 800 locations in 39 countries. Each new toner cartridge is provided with instructions for returning old cartridges. Place the used toner cartridge in the package that contained the new cartridge and secure the package. Then you should download the paid return labels, stick them on the packaging and send them. If returning more than 10 toners, the option of a wholesale return should be chosen. After registration in the program, you can order returnable packaging to send cassettes in bulk. For companies where a significant number of toner cartridges are used, Canon can provide large returnable packages.



**Figure 4.** Instructions for returning used toners

[Source: [www.canon.pl](http://www.canon.pl) access 25.05.2018]

The company determines in detail which toner models can be returned. However, you can not send products whose code begins with the characters below.

**Table 3.** Types of returned toners specified by Canon

[Source: [www.canon.pl](http://www.canon.pl) access (25.05.2018)]

<b>Toner containers</b>	<b>Ink cartridges</b>
C-EXV	BCI
NPG	BX
CLC	CL
GP	CLI
-	PGI
-	PG

The toner consists of the following elements that can be re-used (<http://ekoswiat.eu/recykling-i-utyliczacja-tonerow-i-tuszy-z-drukarek/> access 25.05.2018):

- cassette housing (plastic),
- photosensitive drum (aluminum),
- rubber rollers consisting of metal and rubber,
- collecting strip (mainly metal with rubber),
- magnetic shaft (metal covered with flint),
- magnetic strip (metal and rubber),
- screws (metal),
- powder (toner that covers the card).

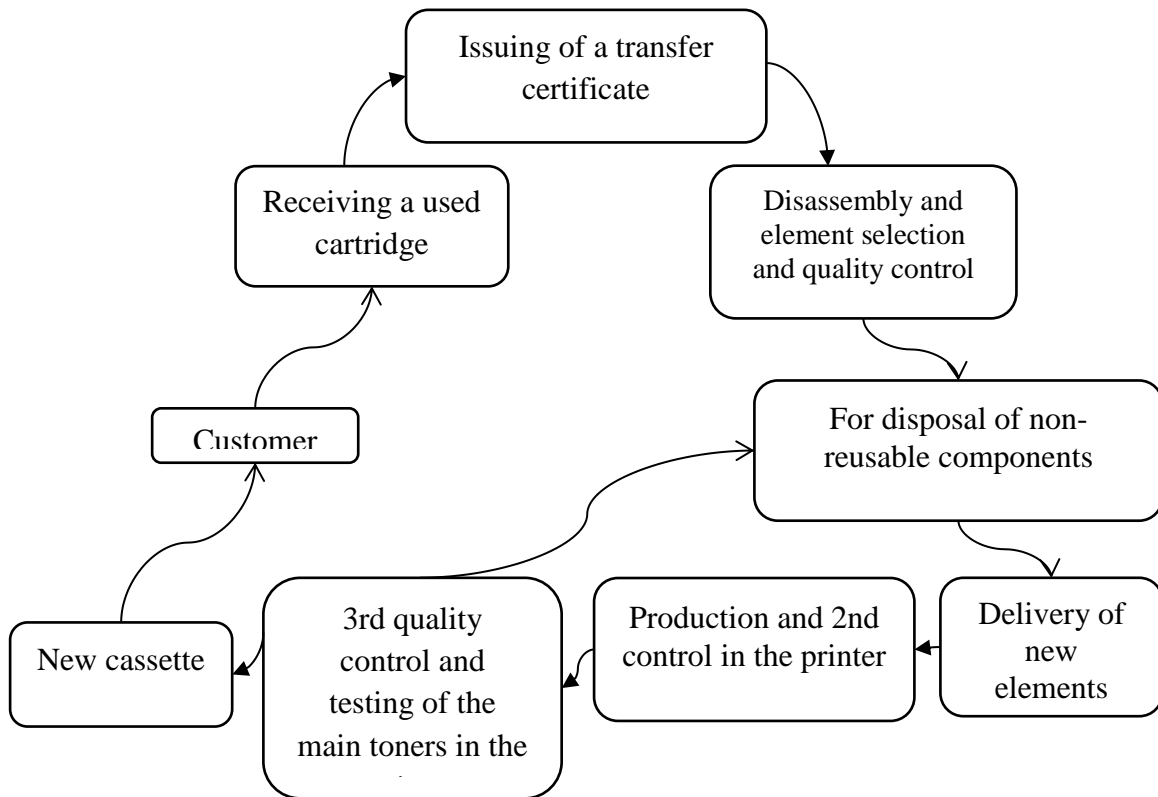
Powder in the form of powder is considered dangerous for the environment. It consists of resin, pigment and iron, it is very fine, its balls have a diameter of 0.1 to 100 micrometres. The spent toner does not remain entirely on the printed pages, it goes in some quantities to landfills. The used toner is not empty, so the chip indicating the toner yield shows the approximate value, and it often turns out that the toner cartridge contains 5 - 30% of the toner. Airborne toner particles are inhaled by humans and animals, which can lead to pneumoconiosis or other diseases. Used toner getting into a normal waste bin, threatens the environment and health of people, that's why it is so important to transfer this type of waste to the company where the product was purchased). In 1982, Canon was the first to introduce all-in-one toner cartridges, and shortly thereafter all-in-one toner cartridges for laser printers. All-in-one toner cartridges cause the printer to replace the cartridge as efficiently as the new one, as all the main components of the cartridges are replaced at the same time. Canon was not only the creator of toner cartridge technology, but also the first company to become a pioneer in the recycling of toner cartridges in 1990.

The toner cartridges delivered to the recycling plant are sorted by model before dismantling. Then the reusable parts are cleaned and recovered. After cleaning, the re-used parts are subjected to a rigorous inspection process - the same quality standards apply as for



the new parts. The parts reused in the new toner cartridge are the charging roller, the sleeve and the magnetic roller.

The flow of used toners in the company is shown in the picture.



**Figure 5.** Circulation of used toners at Canon

[Source: [www.canon.pl](http://www.canon.pl) access (25.05.2018)]

The toner processing process is in a closed loop. Thanks to this, you can re-use the cassette materials continuously without compromising the quality of the plastic. Toner cartridges that contain recycled items are of exactly the same quality as the new ones, so there is an inscription on all toner cartridges to inform customers that the cartridge can contain treated or recycled items. Due to the accepted quality standards, it is impossible to distinguish between a toner cartridge containing recycled elements and a cassette that does not contain these elements.

Canon is involved in a zero landfill strategy. Each item of the returned toner cartridge is reused as part of a new toner cartridge, as a raw material in other industries or as a substitute for fossil fuels.

The benefits of reusing toners include:

- The problem with used toners is taken over by Canon. No cassette returned under this program lands on the dump,
- Full compliance: All agents employed by Canon have the required permits to ensure that they handle the waste properly,

- The recycling process allows you to use parts and materials from an empty cartridge for reuse in the production of new cartridges
- The amount of waste will be limited.

The FMNM program from Canon was created as a customer service strategy with maintaining ecological responsibility at the highest possible level. The company chooses models that have sold the best in recent years and then rebuild them at the Canon factory in Germany. FPNM devices (formerly referred to as "regenerated") is a new edition of the original model, which was created on the basis of new and existing elements. Original devices are collected from customers, sent to the Canon factory and dismantled on individual items. Disassembled components are thoroughly cleaned and undergo a full test procedure. Then each renewed device undergoes the same quality control procedure as the newly manufactured device and receives guarantees of the same quality and parameters as the original device .. The old data is deleted, the software is updated, the counter is reset and the device receives a new serial number. Such devices are available for sale throughout Europe, the Middle East and Africa. Re-use of parts and materials allows you to reduce the price of equipment. This is related to the flow of raw materials, which are also valuable for the company, which contributes to lower costs. Canon again uses waste from the production of equipment. The material is processed from returned devices - it goes to new devices, such as products from the image RUNNER ADVANCE series or calculator cases. Blisters for packaging ink cartridges are currently made at least 70% from recycled plastics



**Figure 6.** Example of a product made from recycled parts

[Source: [www.canon.pl](http://www.canon.pl) access 25.05.2018]



**Figure 7.** Example of a product made from recycled parts  
[Source: [www.canon.pl](http://www.canon.pl) access 25.05.2018]

## 5. CONCLUSIONS

The increase in requirements relating to environmental protection is related both to raising the environmental awareness of the society and the ongoing integration process with the European Union. Organizations adapt to legal requirements, however, they are increasingly pursuing an active environmental policy, because they are aware that such attitude affects the competitive advantage (Adamišin, 2012, p. 10). This contributes to the implementation of appropriate environmental management strategies. Environmental protection activities more and more often create the company's image and become an important determinant of its success on the market. This affects the development of a new approach to ecological issues. The implementation of pro-environmental activities began to be treated not only as a cost, but also as an important factor in the promotion of the company (Wiśniewska, 2004, p. 97-98).

Re-use of parts, elements and materials used for production has a significant impact on the amount of waste irretrievably stored in landfills, and above all on resource efficiency. Taking into account the environmental aspect, the reuse of used elements leads to the limitation of their negative impact on the environment. Products withdrawn from circulation have been recognized as a valuable raw material that can be re-used (Romański, Kowalczyk, 2010, pp. 149- 150).

Companies more and more often boast of products that were made from recycled raw materials. It is an element of an advertising campaign emphasizing the responsible approach of producers to the issues related to environmental protection and sustainable development. In this way, they want to identify with care for future generations. An example is Dell, which released computer systems known as ecological. The manufacturer praises that the products were manufactured with the intention of protecting the environment, and the construction of

these devices was made of recycled materials. At Canon, the reuse concept is applied. The company was one of the first to introduce the recycling process of toners. Processes occurring in reverse flows create value added for the enterprise. They are a valuable raw material and allow you to reduce costs.

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