

# Problems in a product life cycle environmental sciences essay

[Environment](#), [Ecology](#)



Global alteration has an impact on climate, demographical and socio-ecological alteration worldwide, and humanity has an influence on planetary alteration. As a consequence of natural catastrophes, eventually climate arguments came up which drew public attention. These arguments showed that something demands to be done. ( Tan, 2008 ) The industries can seek to bring forth environmentally friendly merchandises, extend the merchandise life rhythm, and make a solution for the end-of-life stage of a merchandise. This chapter demonstrates the job of the merchandise life rhythm and gives an penetration into the transmutation.

The industrial revolution set up a additive theoretical account of material watercourses, a system that takes merchandises and throws them off. Toxic stuffs trickle into the nature systems. Furthermore, the waste burning locally generates energy, nevertheless, besides this much more energy is required for new stuff production. ( Hennings, et al. , 2008 )

The whole procedure is named an open-loop supply concatenation. By and large talking, it maps the way from the stuffs to the providers to the terminal consumer. There is no reversal rate from the consumer. There is no return of stuff. The company does not offer any return or recycling system. However, consumers use the merchandise and so at the terminal of the merchandise life rhythm, they throw it off. ( Lebreton, 2007 )

Another possibility is to donate the old apparels to charitable organisations which resell the old apparels to commercial retail merchants in the 3rd universe or in east Europe. In Germany the biggest fabric aggregation is `` Deutsche Rote Kreuz '' with 40, 000 dozens collected each twelvemonth.

( Weissinger, 1999 ) In Switzerland there are four large fabric aggregation houses: Texaid, Contex AG, Solitex and Satex. Texaid is the biggest 1 in Switzerland ; it recollects 17, 000 dozens of old fabrics per twelvemonth. The company 's gross goes to relief organisations. The gathered fabrics are classified in different quality categories and removed from waste.

( Truninger, 2005 ) The reselling of these apparels ignited a large treatment, as the pattern destroys local concerns which produce traditional apparels. The effects are that the local fabric industry nearby wholly collapsed, and reorganisation is non possible anymore. Some states have imposed import prohibitions. ( Weissinger, 1999 ) This complex job is good documented in the movie `` oburoni wawu - dice Kleider der toten Weissen, '' which deals with the inquiry of who needs old apparels and how the concern of old apparels works. The movie shows the way the old apparels take and what happens to them when they arrive in the preset state. ( Strobusch & A ; Terpinc, 1995 )

A farther option is the Climatex Lifecycle. This procedure is an innovation from the endeavor Rohner. Out of old fabrics, they produce felt, which is used to mulch and to cover the vegetable spot. As a consequence, the landfill is less to a great extent loaded and the old fabrics have a concluding responsibility. ( Weissinger, 1999 ) As it can be seen from the illustration of Rohner Textiles, end product went up 30 % and was accompanied by a drastic lessening in cost after they launched the new sustainability scheme. The Rohner illustration shows the positive

consequence for a concern if they launch a closed-loop recycling scheme.

( IEHN, n. d. )

There is a new innovation to recycle polyester curtain. Teijin is a recycling company which specializes in polyester recycling. Today the company is a Recycling Network. Under the mark 'ECOLOG, ' are all companies committed to bring forth fabrics in mono-material polyester. 'ECOLOG ' fabrics can be recycled easy, as there are no assorted fibres and it can be made easy into a new stuff. ( Outdoortrends, n. d. )

The last possibility in fabric recycling is down recycling. This procedure has been done for old ages now because the rate of return of polyester fabrics was really low. In this instance the recycling companies downcycled the merchandises to knobs. ( Weissinger, 1999 )

To offer recycled merchandises and the usage of recycled stuffs is an environmentally friendly facet of assorted companies. Nowadays the positive environmental impact of merchandises gives a company a competency border ; it is a must, non merely an option. Companies secure themselves a great hereafter with a strong sustainability scheme. The `` C footmark '' of companies is set to diminish, as they are under force per unit area from different stakeholders, like non-governmental organisations, consumers and authorities, to make so. This force per unit area on companies encourages them to cut down their C footmark with different commissariats like green merchandises, sustainable procedures and societal duty plans ( CSR ) . However, good communicating and labeling towards consumers is

indispensable, to allow them cognize about the green attempts made by the company. ( Jo, 2010 )

## **Focus on Outdoor Industry**

Harmonizing to the study of Luscombe ( 2010 ) , 59 % of participants buy the purchased point for functional usage and for general every twenty-four hours usage. Merely 3 % bargain it for mundane usage. There is a displacement from utilizing out-of-door merchandises in the athleticss sector towards mundane life usage. The study of EOG shows that quality has the highest impact on the purchasing determination, followed by the trade name name. The 3rd factor impacting the determination is the monetary value. This ranking is for Germany. In Switzerland, the ranking is similar. Quality is the victor, followed by comfort, so the proficient characteristics, and last is the monetary value. Recyclability of the merchandise influences the purchasing determination for 62 % of Germans ; whereas merely 60 % of people are interested in purchasing merchandises made of recycled stuff. In the Swiss study, 67 % are influenced by the recyclability of the merchandise in the purchasing determination and 64 % bargain recycled stuff. ( Luscombe, 2010 ) Nowadays, there is a broad scope of reclaimable stuff. It is possible to recycle polyester, polymeric amide and polyurethane. There are two different recycling methods: stuff recycling and chemical recycling. The undermentioned four possibilities are often used in the industry. ( ISOPA, 2001 )

PET-Recycling ( Material recycling )

PET-Recycling became more widespread, as the environmental considerations gain importance. PET bottles have a really short life rhythm, and moreover they are made of rough oil, which causes environmental jobs, as most PET bottles are destined for landfills. As a consequence, a recycling procedure to recycle the valuable primary resources is a perfect thought. The recycling procedure is non really hard with PET bottles. The stuff to be recycled is 'polyethylene terephthalate ' . ( Evans, 2010 )

A short recycling procedure description:

Colored bottles need to be sorted out. Just crystalline bottles can be used for this procedure.

The selected PET bottles have to be cleaned and dried and crushed.

These crushed pieces will be heated.

Through this warming procedure, the crushed pieces are melted and a crimping machine gives the ensuing polyester narrations their texture.

The polyester narrations need to dried.

The quality control has to be passed.

( Evans, 2010 )

This procedure can be performed one time. If there is a jacket made out of this PET recycled narration, the used jacket, which is non functional any longer, ends in a landfill. Nevertheless, some natural stuff has already been

saved thanks to PET recycling. In the following paragraph are some illustrations about the measure of PET bottles needed to do certain points. ( Heimann, 2010 )

`` With 20 PET bottles, a ski jacket can be produced. A jumper needs about 63 PET bottles and a sleeping bag is made of 83 PET bottles. " These are facts found on the bright hub home page ( Evans, 2010 ) . There is besides a negative facet to PET recycling. Since PET can merely be recycled one time, 360A° recycling is non possible. On the other manus, PET recycling is cheaper than polyester recycling, which is explained in the following point. ( Heimann, 2010 )

#### Polyester Recycling ( chemical recycling )

A Nipponese company has developed the first polyester recycling system named ECO CIRCLE. This is a closed-loop recycling for polyester points. Old polyester merchandises, which are made out of 100 % polyester, can be chemically converted into new polyester natural stuff. ( Teijin, 2009 )

Products which are reclaimable in this manner have the undermentioned label on them:

#### Figure 6: ECO CIRCLE Logo

( Beginning: [hypertext transfer protocol: //www. ecocircle. jp/en/index. htm](http://www.ecocircle.jp/en/index.htm) )

Fleece coats are easy to recycle as they are 100 % polyester. Other coats are frequently a combination of different stuffs. The status for recycling is that the merchandise has 100 % screening truth. The polyester recycling

procedure is similar to PET-recycling, but there are some differences as this is a type of chemical recycling.

Collected polyester merchandises are broken down into little pieces.

Granulated stuff is made.

The colouring is removed from the pellets. This procedure requires high energy and important clip.

Through chemical intervention, new polyester natural stuff is created.

New `` Eco Circle '' fibres are created to bring forth reclaimable merchandises.

( Teijin-Fibers, n. d. )

There are different merchandises made by this closed-loop recycling procedure: underwear, T-shirts, jackets, baseball mitts and so on. Swany produced the first closed-loop reclaimable baseball mitt. The list would ne'er stop, as there is an limitless possibility to bring forth pro-ducts with 100 % polyester. ( Teijin, 2009 ) This procedure is criticized, as the fibres are produced utilizing crude oil. Critics say that these fibres should non be produced any longer given the turning trouble with crude oil supplies. However the outdoor industry is acute on utilizing polyester fibres, as this fabric is high quality and stopping points long clip.

Figure 7: CO2 Reduction



There is less ecological harm with this recycling procedure than with the production of new fibres, as per an analysis conducted by the Suedwind Institute ( n. d. ) . This fact is besides apparent in this Figures 10. 77 % less CO<sub>2</sub> is released utilizing the recycling procedure than is released bringing forth new natural stuff from crude oil.

( Beginning: [hypertext transfer protocol: //www. patagonia. com/pdf/en\\_US/common\\_threads\\_whitepaper. pdf](http://www.patagonia.com/pdf/en_US/common_threads_whitepaper.pdf) )

This closed-loop polyester recycling reduces the dependence on rough oil, produces less pollution as there is less godforsaken burning and progresses the reuse of old polyester apparels. ( Patagonia, 2009 )

Nylon/Polyamide Recycling ( chemical recycling )

Old fishing cyberspace and rugs can be used for nylon recycling. This recycling procedure is similar to the polyester recycling, but polyamide recycling is more cost- and time-intensive, as the procedure is more sophisticated. The recycled narrations are largely, but non wholly, used for back packs or for bags. The quality is non affected by the recycling procedure. ( Klattermusen, n. d ) The statute law in some states will perchance forbid the disposal of rugs in landfills. With this action, the client will be forced to recycle old rug, but this statute law has non yet passed. However there is a committedness by different companies which supply industrial rugs to take part in a nylon recycling plan. Furthermore there are different roll uping points for old rug in each state. ( Greener-Industry, n. d. )

There are some illustrations of companies which already offer a recycling plan:

### Klattermusen

Since March 2009 Klattermusen offers a new recycling and recovery system, `` rECOver. " Each point which is reclaimable has a sedimentation of one, five, 10 or 20 Euros. If the client brings these merchandises back to the shop, they get the sedimentation back. Each merchandise has an note of the sum of the sedimentation. Another portion of the plan is that used and patched merchandises are donated to a public trust. This recycling plan consists of the following reclaimable stuffs: nylon, polyester, polypropene and metal. It is one of the lone outdoor companies which recycles nylon and polypropene, as it is hard to retrieve these two substances and every bit good as dearly-won. ( Klattermusen, n. d. )

### Goretex

In 1993 Gore launched a undertaking named `` Gore Balance Project, " which received the European Outdoor Award for Innovation. It was the first possibility to recycle in the dress industry. The purpose of this plan was to recycle fabric laminate, but the clients were non ready at that clip to take part in the undertaking. As a consequence of the low engagement degrees, Gore had to halt this recycling undertaking. Gore company coined the term `` balanced-project. "

Old Goretex-coats will be deconstructed into their belongings and reused.  
( Gore, 2007 )

#### VAUDE /Sympatex

This company is a rival to Goretex. They invented a 100 % reclaimable membrane which is made of O, C and H. These constituents are easy reclaimable, like PET bottles. Additionally there is no fluorocarbon used, and they have the bluesign standard enfranchisement. The bluesign standard will be explained in Chapter 3. 5. 2. VAUDE is the official spouse of Sympatex. They produced a new out-of-door aggregation under the slogan ``Reduce, Re-use, Recycle. `` The aggregation is high quality, therefore long-lasting, and it made of 100 % reclaimable polyester.

#### Fjallraven

In 2012 the first reclaimable coats will be sold. ( Fjallraven, 2010 ) The company has three different constituents in their recycling plan, ``ECOSHELL. `` First, fluorocarbon is non used any longer in the coats. This chemical substance was used in the membrane for impregnation. It is a really effectual substance, but on the other manus it has several negative effects. One point is the substance is found in the nutrient concatenation, secondly, the decomposition clip is over 30 old ages and last but non least it is really hard to recycle. That 's why they now use a new substance which is natural. It is a new process invented by Rudolfgroup. The name of the new substance is BIONIC. Second the company is cognizant of the planetary heating, which is besides affected through the recycling plan. `` That 's why

they support an environmentally friendly aureate criterion undertaking, they have non-polluting energy production every bit good they cut down the dependence on fossil fuels " ( Fjalleraven, n. d. ) . Last but non least, they employ the `` Eco Circle " recycling system for polyester. The combination of all three points are indispensable to the company, as all influence the environment. ( Fjalleraven, n. vitamin D. )

### Figure 8: Recycling Program of Patagonia

Patagonia Inc.

( Beginning: [hypertext transfer protocol: //www. patagonia.](http://www.patagonia.com/web/eu/popup/common_threads/index.jsp)

[com/web/eu/popup/common\\_threads/index. jsp](http://www.patagonia.com/web/eu/popup/common_threads/index.jsp) ) In 1993 Patagonia produced Synchronia® jackets from sodium carbonate bottles. In 2005 the `` Common Threads Garment Recycling Program " was launched. This take-back plan collects old polyester merchandises to recycle into new narration. Customers have two different possibilities to take part in the recycling plan of Patagonia. One would be to return the points to the shop - frequently they have a box there - and the 2nd possibility is to direct it straight by station to Patagonia. They collect all the garments and direct them by ship to Japan, where the recycling procedure happens. ( Patagonia, n. d. ) `` Wear it out ; drop it off ; we recycle it ; it lives on! " is the claim of Patagonia 's recycling system, as it can be seen in Figure 11.

## Recycling Companies

Teijin

The whole company has different sections. The biggest portion is the scope of man-made fibres. Teijin is the lone company that provides a recycling plan in polyester. These recycled polyester fibres can be used for fabrics in the car, outdoor and dress industries. `` Eco Circle " was launched in 2002. This recycling plan is environmentally friendly. Nowadays 200 companies are involved in `` Eco Circle. " The tendency is that different states such as the U. S. , China, Europe and Japan have a higher environmental consciousness than all immature clients, which increases the reclaimable market.

( Shrestha, 2009 )

#### Polartec

This company produces utmost conditions protection fabrics, insularity beds and lightweight wicking base beds. Polartec is used in many countries, like the Marine Corps, Navy, Army and Air Force, every bit good as in the out-of-door industry. Thankss to coaction with companies which offer recycled narration, the recycled merchandise line has risen from less than 1 % to over 30 % in over four old ages. This fact leads besides to a decrease in emanation and energy ingestion. Since 2010 they have partnered with Unifi, as they produce 'Repreve ' narration which is made out of recycled PET bottles. Polartec is confident that with this partnership the recycled merchandise line will turn steadily. ( Polartec, 2010 )

#### Unifi

It is a company which produces multi-filament polyester and nylon textured narrations. These man-made fibres are non merely produced from natural

stuff but besides from PET. This fibre is on the market with the name 'Repreve. ' They produce polyester fibres every bit good as nylon fibres. The nylon fibres are made out of consumer fibre waste, whereas the polyester fibres are made out of both consumer fibre waste and consumer plastic waste like PET-bottles. In a lb of 'Repreve ' narration, there are 27 processed PET bottles. These sustainable and recycled fibres are chiefly used by the dress industry, but they are besides used in the furniture and auto industries. A partnership between Polartec and Unifi shows the tendency in the outdoor industry to utilize ecological narration. ( Repreve, 2008 )

## **Recycling Ecologically Worthwhile?**

The contention environing recycling is large. On the cyberspace there are different forums where this issue is being discussed. In this chapter merely some statements out of assorted web logs, web sites and interviews held at the OutDoor Freidrichshafen will be highlighted.

Maverick ( n. d. ) is convinced that presents planetary heating, natural instability and H2O deficits are scare tactics. This fact, that the universe is stoping, needs to be stopped, through recycling. This is a crutch, because people who recylcle believe they are profiting the environment, but the recycling procedure itself consumes a batch of energy and causes sometimes more pollution than natural stuffs, harmonizing to Maverick.

Maverick ( n. d. ) describes the crutch as follows: `` In a mode similar to medieval Christians purchasing indulgences from priests to be forgiven for their wickednesss without really making anything, recycling may be

something we believe to be right and effectual merely because we 've been told it is. "

The consequence should be, that people reuse merchandises and alter their consumer behaviour. ( Maverick, n. d. ) Furthermore, a web log from May ( 2007 ) describes the PET recycling as an unuseful pattern. First of wholly, a batch of C is emitted anyhow, as the bottles need to be shipped to China and the new apparels back. Second the apparels made out of the old PET bottles are non recycable any longer and will stop in a landfill. The apparels are at that place for over 24, 000 old ages until they are smoldered. About the transportation cost, Heimann ( personal communicating, July 17, 2010 ) comments that presents, Europeans are so addicted to Asia and to America, that the ships are geting anyhow. These ships have to return to the state of beginning, and it makes no pots to make so without lading. ( Heimann, 2010 )

The company Teijin conducted a research survey about the energy ingestion in a closed-loop recycling system with polyester. The consequence indicates that with the resources saved, energy and CO2 emanation is besides reduced. This computation is made by mensurating the CO2 emanation and energy needed for the recycling procedure, every bit good as that emitted and needed by the production with natural stuffs. To have new polyester, rough oil is needed. To bore rough oil, far more energy is needed than the sum recycling requires. The consequences are shown in the figures below.

Figure 9: Decrease of CO2 Emission thanks to Recycling

( Beginning: Leaflet Teijin, Japan " ECOCIRCLE " )

The laminitis of the `` Red, White and Green " Blog, Jennifer Grayson, is convinced about the positive facets of the recycling procedure. In 2005, recycling saved an one-year norm usage of energy of 9 million families. This has a direct impact on planetary heating. There is another positive point which concerns employment. The recycling and remanufacturing sectors account for about one million occupations. ( Grayson, 2009 )

The outdoor industry has been criticized for the environmental harm the concern causes, every bit good as for the bad on the job conditions. However the industry has made an attempt to antagonize these negative facets by cut downing their C footmark and by using societal policies every bit good as back uping environmentally friendly undertakings. Some illustrations of eco-conscious methods to accomplish betterment are shown. ( Jo, 2010 )

## 1. CSR

Corporate societal duty ( CSR ) is an of import manner for a company to demo its duty towards the societal and ecological environment. A competitory border is received by utilizing CSR as a scheme to separate between trade names. ( Jo, 2010 )

## 2. Life Cycle Analysis

The entire impact on environment has to be understood if the company is interested in bring forthing green merchandises. This impact can be analyzed thanks to the cost construction. This is possible through analysing



the life rhythm of a merchandise. All has to be considered, the natural stuff, fabrication, the distribution, every bit good as the usage of the merchandise and last but not least, its disposal. With each measure of the procedure, costs are associated. ( Ciambrone, 1997 ) A cost illustration is shown by Ciambrone ( 1997, pp. 1 ) :

Design costs

Stocking/handling costs

User/operating costs

Disposal costs

Fabrication costs

Shipping/transportation costs

Reuse/recycle costs

Compliance/licensing costs

Reducing the cost besides reduces the environmental impact. A company should seek to cut down the life rhythm costs of their merchandises.

( Ciambrone, 1997 )

### 3. Ecological Footprint

It is a mensurating tool to sort merchandises and services, a company, an organisation, industry sectors, single life styles, vicinities, metropoliss, parts

or states. In an LCA, the ecological footprint is ever calculated. What impact a merchandise or a company has on the environment and on the society will be measured. An analysis of the merchandise or the company will be done. There are different standards, such as recyclability, emanation used to bring forth the merchandise and resources used. All factors are evaluated and a computation shows the consequence. The thought behind this is that clients have the possibility to compare the merchandises or companies based on their environmental friendliness. ( Global-Footprint-Network, 2010 )

Goverments and consumers play a active function in forcing frontward the demand for an ecological footprint. ( Jo, 2010 )

#### 4. Bluesign Certificate

To cut down the environmental footprint of the fabric industry, the bluesign criterion was created. Each fabric and yarn maker can use for the certification, but to measure up, it needs to run into the high criterion defined by bluesign. Each company is analyzed exactly. The points evaluated by bluesign ( 2010 ) are the undermentioned:

Resources productiveness

Consumerism

Sewage H<sub>2</sub>O

Discharged air

Job safety

( p. 24 )

Retailers and clients can acquire a good orientation about assorted companies thanks to this alone criterion from bluesign. ( bluesign, 2010 )

In the hereafter, companies have to take the duty for cut downing their C footmark. Additionally if the credibleness has to be steady, companies have to be crystalline with their sustainability steps. ( Jo, 2010 )

## **Drumhead**

From the recycling position, a rethinking is besides taking topographic point. Closed-loop supply concatenation are needed in all industries. The open-loop supply concatenation does non hold a long life any longer. The best scenario would be if merchandises are used and reused until the merchandise loses its map, at which point it should be recycled. This manner, the merchandise does non complete as waste at the end-of-life stage but has a possibility to last in another merchandise ( downcycling ) or as the same merchandise ( upcycling ) . These procedures help to protect the environment.