



# Eco-effective fashion design

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A different mindset



- Fioen van Balgooi

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Fashion design  
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*'When it comes to innovation, we are looking down the wrong end of the telescope:*

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*away from people, toward technology.'*

John Thackara





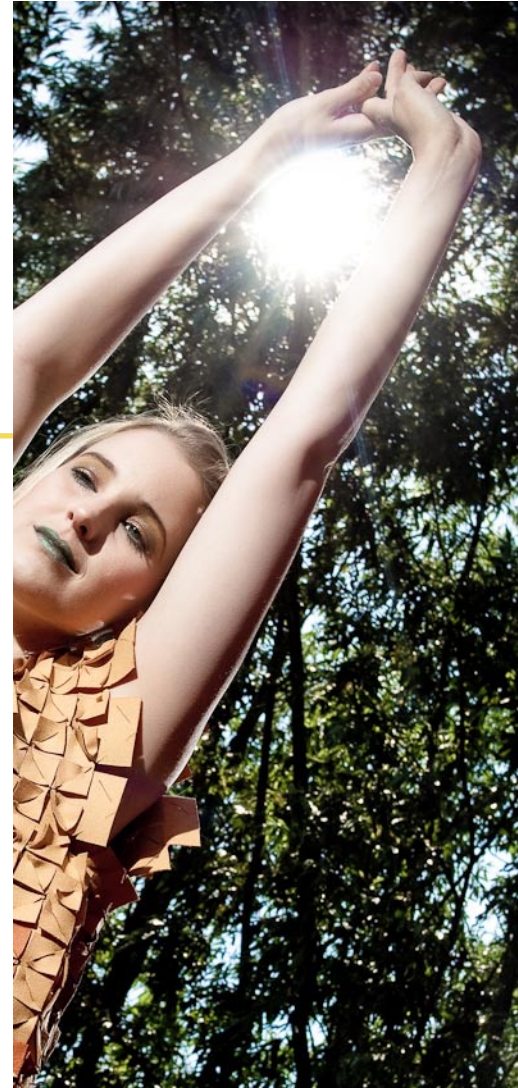
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*'The world will not evolve past its current state of crisis  
by using the same thinking that created the situation.'*

Albert Einstein



## Introduction

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- 'When nature looks at us it must be able to say: Nice that you are here, instead of saying, oh no, not a human being again:[Braungart,2008]? Almost everybody is aware of the fact that we need to change our living pattern; otherwise we simply destroy the earth. We are just one part of this planet; we do not possess it, but need to evolve together with the planet and enjoy life.
- When I was a child, every time I slammed the door at home, my father used to say; 'Be careful with that door, it could have been your grandfather!' Now I understand the reason behind these words what my father means is that life is a circle. Our door is made out of wood and therefore originates from a tree, this tree grows from sunlight, water, CO2 and the vitamins in the earth, in which my grandfather once was buried. My grandfather might have been the food for our door. And from that moment I tried to treat products the way I would have treated my grandfather, with care and kindness.
- About two years ago, on the 25th of June 2007, I saw a documentary about the Cradle- to-Cradle (C2C, founded in 1994) process. I had an immediate interest in this process, as with C2C the ideal is the possibility to make every product harmless for the environment. To me it seemed the solution to live a happy life not feeling guilty of doing something wrong with designing and taking away nature for the next generations. A year later I decided to base my graduation project on C2C, because it inspired me to think differently about products and designing in the future and I could not find much information about C2C in fashion.
- Fashion companies only think about the production process of a garment when talking about environmental friendly developing. They forget the total lifecycle of the garment, which includes usage.
- There is a need for a mind shift; I want to achieve this through the fashion designer. When a fashion designer is more aware of what the user actually needs, the fashion designer on his turn will be able to provoke a change of perception on users' level. E.g. the way people treat their clothes, the perception of cleanliness and how they want to fulfil their needs through clothes. It is time to think about the effects that the garment has on the environment.
- Therefore, my main question is;  
**How can a fashion designer create a different mindset in order to design eco-effective?**
- While writing my essay I set up four case studies. I collaborated with four designers who I invited to start designing with thinking about the effects that their choices of aspects (material, technique, colour, form, usage and service) have on the ecological, economical and social/cultural environment. I investigated the effects of their choices, while they continued designing. During the design process, we ran into some questions that needed to be answered. You will find those questions in the appendix. I cooperated with the following designers; Berber Soepboer, Eco Couture, Mieke Cuppen and Gary Symor.

*Eco comes from 'oeco' (latin) and 'oikia' (Greek) which means 'household'*

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*Therefore eco is the circle of life, as a 'household' is a group living together.<sup>1</sup>*

● In this essay environment means the surroundings in which things happen. Thus the ecological environment is about the surroundings of nature. Something becomes economical when people need it and it is not freely available for everybody, then people start trading. The social/ cultural environment includes human activities, for example the way people communicate and use things.

● The life of a product nowadays is a descending line from the cradle to the grave. Within eco-design and sustainable design the most important strategy is eco-efficiency. It is about doing more with less. Important terms are; reduce, reuse and recycle. This is a good start, but not the solution. Reduction means you slow down the process, but in the end there will still be waste. Reuse is a nice idea, but if you reuse products that are not meant to be reused you still have hazardous chemicals in the end product. Recycling is mostly downcycling. The quality of a material reduces every time you recycle it, because products are melted together. There are chemicals needed to make them into a good quality product again.<sup>3</sup> That is why recycling is not always environmental friendly.

● Eco-efficiency is a good concept, but 'reducing the damage we already have, will not be enough on the long term'(designer eco couture, 2009). With eco-efficiency in mind, the best way to make clothes is to only make basics in one colour, because clothes are worn for protection and warmth. But a world with only basics is a boring world; complexity and diversity is needed to create enjoyment, happiness, empathy and dependency, which are also very important ingredients in life to feel good. When ecodesign and sustainable design are used in fashion, most of the time the design process does not go further than using environmental friendly materials in basic forms and thinking about a friendly production process.

● The life of a product should be a circle, from cradle to cradle. Now we throw away useful materials, because we don't think of their next life during fabrication at the start of the product. With using harmless ingredients and reusing these ingredients after the product lost its function, you can create a product that is friendly for it is environment.

● With using clean ingredients there is a difference between the Biological- and the Technological cycle. These two cycles need to stay separated, only then it will be possible to upcycle all the materials again. If the cycles do mix, the technological materials get weak and the biological cycle will be infected with non-biodegradable materials.

## Chapter 1

### Eco-efficient versus eco-effective

*'Recycling isn't bad, it's useful, because we already have a lot of waste.'* Designer Eco couture, 2009

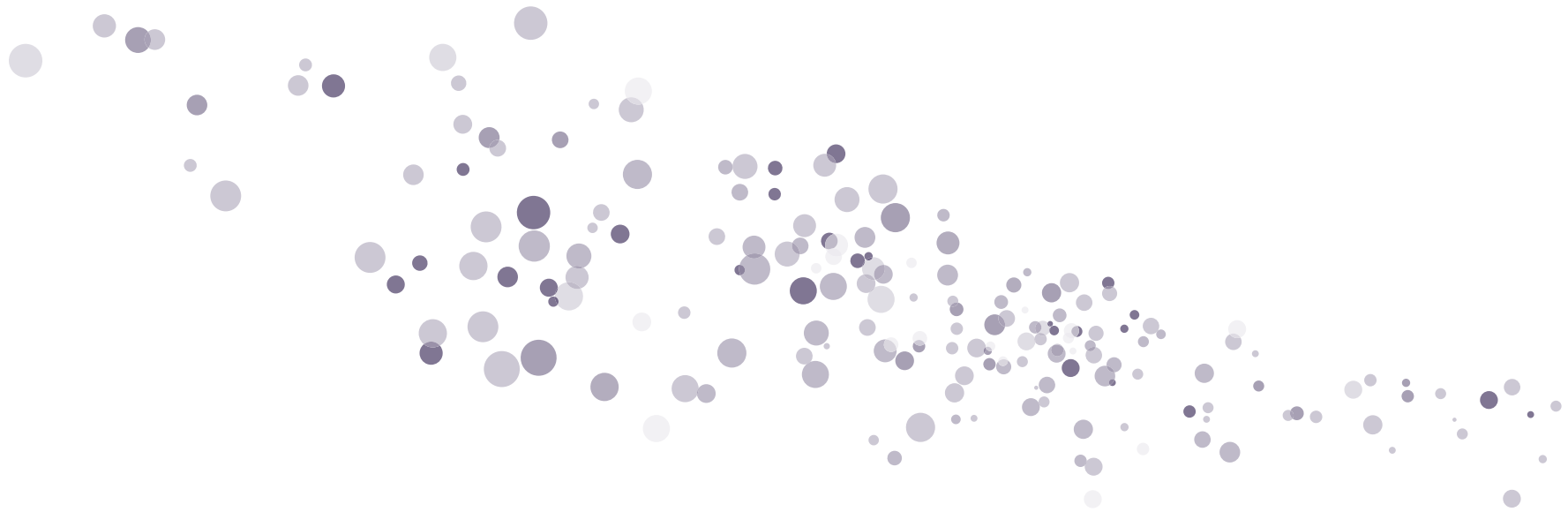
## *Refinity & Mieke Cuppen*

*Work with biodegradable and synthetic materials to show they can be used together as long as they are easy to separate. Refinity and Mieke Cuppen made an item on the verge of jewellery and garment. The garment is made of three wires, which can be rewound into three bolls of reusable yarn. The materials are Tencel (a synthetic material from a biodegradable eucalyptus tree), Bamboo and Morphotex (a yarn that has colour without dying. It is a bio-mimicry from the morpho butterfly. It uses the illumination angle in combination with carvings to show colour)*



- Eco-effectiveness is what the C2C concept wants to achieve. Think about the effects of what you make, for instance the way we use things. Rubber is a toxic material when it leaves little parts in nature, e.g. a car tire wears out or someone walking on rubber shoe soles. But as isolation it does not harm the environment. **Eco-effectiveness forces you to make a mind shift towards circular thinking.** Important is to give something back to nature, instead of making it less harmful. This can be achieved with a lot of abundance, like a cherry tree with his extravagant blossoms. This is not efficient, but it is effective, because “waste” of the tree (the blossom) becomes food for the earth.<sup>4</sup>
- In fact, you do not have to choose between eco-efficiency and eco-effectiveness; you need to combine them. The natural resources are not infinite, even if we could reuse all materials, we still have the same amount to use, therefore we cannot consume eternally.
- Until now companies have worked following the 3P's (planet, people, profit). This contained the question how can I work on planet and people, **without losing** too much profit. C2C is about the 3E's (ecology, equality, economy). It contains the same values, but the question is formulated differently; how can I make profit (economy) with a positive contribution to ecology and equality? Here ecology and equality are in the core-business of a company and while working with this you gain profit. It is a different point of view.
- C2C is one way of inspiring people; you will find more options in the following chapter. Nevertheless you need to look for the best possibilities and methods for each specific problem.





## Chapter 2

### Technique versus creation

● When you think about fashion, the circle consists of a fibre supplier, designer, factory, store, user and waste/ raw materials management (what is waste now can become new materials in future). Each of them needs to think about the effects of their actions on the environment before they contribute to the process. Below I will explain examples of technical solutions that could be applied. At the moment there is less creation involved, which will be enhanced when the needed mind shift occurs.

● The Factories and suppliers need to fabricate the clothes without hazardous ingredients, use healthy employee circumstances and think of the health and reuse of field, water and energy. It is needed to consider materials that are easy to use and have quality, so washing, drying and ironing do not have a huge impact on the environment. A store must think about the effect on its surroundings as well, the work environment and what can be done with the clothes that are not sold. A customer needs to consider why he buys a garment. He also needs to think about effects on the environment while using the garment like washing, drying and ironing. When a user is finished wearing the clothes he could give it to charity, then it can go to another user. When the garment cannot be used anymore, the customer could throw it in the recycling bin, or give it back to the designer/company. When the garment is back at the company it will be taken apart and used again. The Dutch company KICI has made a machine called Identitex. This machine is able to scan fabrics and it separates the fabrics into the different fibres and colours, so they can be easily used again.

● C2C is a process for the whole company to make “good” products and services. It is possible to certify a product as C2C, but it needs to meet a lot of standards including harmless ingredients, water and energy reuse and a good work environment. In the future it will be possible to certify an ingredient on specific qualities. Then designers can work with “proved ingredients” to make their clothes. Certifying isn’t the end goal, but just to show to the outside world what you have achieved. The inventors of the certifying system actually started this idea with handing out the certificate as an award after achieving good results in the optimisation process.

● There are also a lot of other certifying systems like Öko-tex, GOTS, Bluesign which are working on certifying non-hazardous materials and certify the process of these materials, which can be used for eco-effective designing. These certifying systems do not work on fair trade and multicultural integration. Nowadays Made-by is the most integral working method in fashion. It is a certifying system that covers work environment, fair trade and certain ecological material. C2C works integral on different standards, whereas GOTS and Bluesign only achieve high standards on non-integral level and Made-by only achieves low standards on integral level. Until now closed loop systems did not have certifications. Currently with C2C upcycling and deconstructing has become a certifying system. And this change is still developing as new certifying systems are in progress. E.g. I read an article<sup>5</sup> about a certifying system called SMART (founded in 2000). SMART is a transparent, independent certifying system and is engaged in non-hazardous materials and product reuse/ reclamation.

● C2C is becoming very popular because it works with positivity “enjoy life” as where sustainability mostly works with “doing less, using less”. Sustainability works also with “durability” but durability isn’t always best, for example the life of packaging needs to be very short. Therefore C2C works with “Defined user periods”. C2C is a philosophy on itself. There are three ways of working with it.

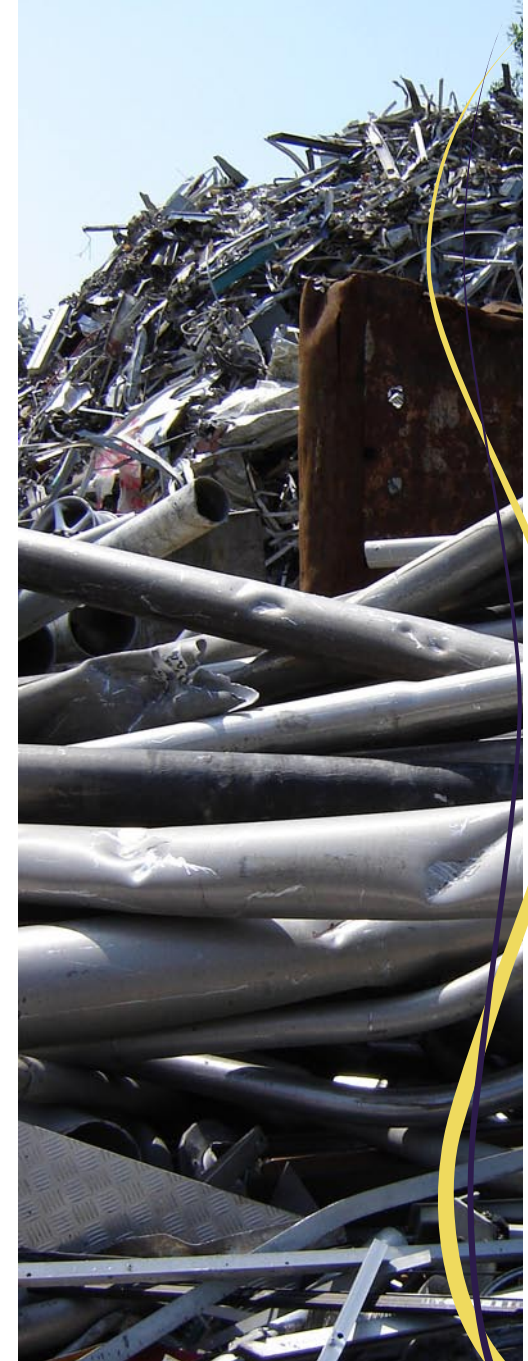
Optimalisation; you have a defined product and want to make it C2C by going to the optimisation process of working together with EPEA and finding the right materials, techniques and services.

Certification; You have a finished product and want it to be certified without optimising.

Innovation; Join the club of companies who want to innovate and start working with EPEA on C2C from scratch.

● I think C2C (until now) is too much focussed on the optimization part. Problems can be solved with new technology or good materials, however there are more options. Preceding the technical part there is a whole process of designing involved. A fashion designer needs to think about the effects of its garment on the social/ cultural, economical and ecological aspects. Sometimes, people tend to forget the impact of our own choices and behaviours on our surroundings. Important here is the shift in perspective. That is why I will continue my essay from the designer point of view and his mind shift.

● What we define as fashion is different than clothing. Clothing is the production of materials that can be worn. Fashion is a way of living, the definition of time and space, which deals with our emotional needs. Our fashion clothing choice shows who we are. It is readable according to a certain system. Different cultures have different systems and we need to keep notion of the signs our clothes give.



- Fashion designers in general look at what is going on in the world and give their opinion expressed in garments, performances and show. **Fashion is the mirror of social, economical and cultural involvement.** But mostly the “world of fashion” does not try to solve problems. They only judge them, or draw attention to them as you can see with the famous slogan garments of Vivienne Westwood<sup>6</sup> and Viktor&Rolf.

- With environmental issues the perception started to change. At first fashion designers judged the fact that it is going bad with the earth through their clothes, performances and shows, as they judged many other issues. At the moment they also start to think about the consequences and start to connect it to their own field, like Katharine Hamnett did. As a result, fashion is more aware of the fact they need to change production.

- But as in this case and many others, most of the time we look at the problems. We want to have a lot of clothes, but they are harmful to the environment, therefore we try to make them less harmful. Now the time has come to start looking at the causes too. For example, in what kind of social and cultural environment are we living? And why do we want a lot of clothes? What do we actually need?

- Trends are affecting the quality of clothes in such a way it is not eco-effective. For instance, take a pair of jeans; it is trendy to have one with holes and tears in it, but the quality of this pair of jeans is very low. It will fall apart in a few months or even weeks if it is a kid's trouser. In this way the energy (plants, machine and human) and materials it took to make this jeans are solved in the air very quickly and cannot be reused.

### Cleanliness

- Humans always want new products. It stands for a different life, a new start to do things better than before. The perception of new is that it is clean and someone else did not touch it before. Our perception of cleanliness in fashion has gone too far. Cleanliness was originally motivated to stop diseases. But soon after it came clear that cleaning did little to stop spreading diseases, its opposite arrived; dirtiness was linked to immorality, laziness and ignorance. With the invention of the washing machine, the perception of cleanliness rose further. This caused the link between cleanliness and social/cultural values such as success, acceptance and happiness.<sup>7</sup> If we see a stain or we smell a weird smell we immediately throw the garment at the laundry pile. In actual fact it would be enough to only wash the place of the stain or smell.

## Chapter 3

### Fashion designers' mindshift in the right direction



*Victor & Rolf*



*Vivienne Westwood*



*Katharine Hamnett*

## *Refinity & Berber Soepboer*

*Imagine a garment that can be worn in multiple ways, so you need fewer clothes. Refinity and Berber Soepboer realised it. This garment does not need to be stitched but consists of a click and fold method, therefore the dirty parts are easy to separate and wash. The garment is made out of a Cradle2Cradle wool felt, which is so harmless you could eat it if you want to.*



There are three types of innovation:

- Process focus: having better control of the washing process with improving the washing machines and drying techniques
  - Product focus: designing fabrics and garments to cause less impact as they are laundered. E.g. fabrics that are washable at low washing temperature, the frequency of washing and method of drying.
  - Consumer focus: designing with influencing the habits and values associated with cleaning our clothes.<sup>8</sup>
- An example of the product and consumer focus is a dark dyed garment. It costs more pigments to produce and more water and energy is used to grow the plants that produce the pigment, nevertheless a dark dyed garment will be washed less frequently and on a lower temperature, otherwise it will fade out. Also on a dark surface you do not see stains that quickly.
  - British inventors developed a washing machine that only needs a cup of water to clean a full washing basket and leaving the clothes almost dry. The machine uses thousands of plastic chips that are half a centimetre in size. A cartridge in the washing machine loads the chips, then add a cup of water with detergent and together with heat the dirt solves, which then will be absorbed by the chips. At the end, a grill opens at the bottom of the machine and the chips are removed. The plastic chips can be used a 100 times, which is about 6 months of washing.<sup>9</sup>
  - This cleanliness also shows the virginity of the product, which resulted in the fact that everything needed to be packed. After a new product is unpacked, the packages can be thrown away immediately. Companies who saw this problem started to look for solutions. For example the Herman Miller chair company. If they deliver a chair they unpack it in the office and take the packaging with them, so they can reuse it again. Another nice example is the “De Package Lamp” of David Gardener. The package is actually the outside of the lamp. Put the lamp, holder, cable and plug on the right place in the box, and you have your lamp, without waste. In the end the box, which now is the lamp can be recycled with the rest of old paper.
  - Also a fashion designer needs to think about the consequences of his design on all environments, before he actually makes it. Within every design process there is a goal. Nowadays a designer needs to think what the effect of his goal will be on the environment. Which social/cultural, economical and ecological environment is the garment going to be part of? What will be the effect of the goal on short and long term on these environments? And especially: why?



*De Package Lamp of David Gardener*

- The designers I worked with for my case studies developed a garment while I researched the effects (material, technique, colour, usage and service) on the ecological, economical and social/cultural environment. I talked with them and more designers by mail, telephone and meetings about the problems they bump in to while designing eco-effectively.
- As a conclusion I can state that designers first want to make their concepts eco-effective, because then people use it better, so they think about the social/cultural environment. After having looked at eco-effectiveness, small designers look at the use of harmless materials, because they do not have to make the garments in huge amounts yet and that limits their options.
- An interesting aspect is the fact that most designers of environmental friendly garments are women. I noticed this when I was searching for a male designer to cooperate with, therefore I asked more companies who is responsible for the designing part within the company. I read an article of Wubbo Ockels [Telegraaf, 09-02-09] He says that women feel responsible for long-term sustainable solutions. Men are more self-centred and search for short-term solutions. I also recognise this in how Intoxica thinks about the environment. Intoxica is a jeans brand and a male designs the collection. He is travelling all over the world to collect materials, to sell his clothes and to earn money. His materials, colours, washing techniques and collections are made in different countries. The carbon footprint of his company is so big that all this effort for an environmental friendly product is insignificant.
- Intoxica is a good example, which shows that designers are stuck in their way of thinking. They think of what they have learned and it is hard to change this mindset into reinventing. Sometimes a good option is to reinvent instead of trying to make the existing garment more environmental friendly, because better does not mean it is good, it is only better than before.



*'Less bad is useful! You need to improve step by step, all small bits help to get there in the end'* Berber Soepboer, 2009

**Refinity founded by the author investigates the perception of garment usage and how to change this perception into eco-effectiveness with fashion design as a tool.**

● A designer designs especially for the community. He needs to consider what a user needs, how the culture in which the user lives is developing and how he can connect with the user to start a dialogue. He also needs to consider whether all these inventions we try to make are made for a better garment or a better life for human.<sup>10</sup>

● Manfred Max-Neef identified the fundamental human needs: subsistence, protection, affection, understanding, participation, leisure, creation, identity and freedom. These needs are the same for everybody since mankind started to exist, but the way we try to satisfy our needs is different for every person, also for every time period. For example the need for understanding can be satisfied by studying, meditating and investigating.<sup>11</sup> Fashion designers could think of ways how to satisfy the needs of people, however, this does not necessarily mean they need to make new clothes all the time. 'People do not always want a product. They want a solution for a certain problem. A service rather than a product can be the right solution.'<sup>12</sup>

● A good option mentioned by Braungart and McDonough is trying to reformulate the assignment and start reinventing.<sup>13</sup> E.g. Instead of designing a pair of trousers, you could design something that covers the legs, or keep them warm when needed.



### *Refinity & Eco Couture*

*Refinity and Eco Couture set up a maternity dress service with more lives inside, just like the mother who is wearing the garment. Inside the dress you will find a lasered pattern of a romper and a baby toy. After wearing you can cut out this pattern and make the romper and toy. You can make a shirt of the remaining fabric. The fabrics, including stitches, are made of organic cotton.*

## Relationship

● There are three reasons to throw away clothes; Physical, which is a change of body mass or build, emotional and worn out clothes.<sup>14</sup> **Nowadays products are thrown away easily, because we do not feel attached to them anymore. Humans are evolving, growing and changing, while products are frozen in time. When our products evolve together with us, there will be a stronger relationship.**

● Jonathan Chapman [Emotionally Durable Design, 2005] talks about ways to create a developmental relationship between user and object over an extended period of time.<sup>15</sup> This long-lasting relationship is out of focus, because we have other ways to satisfy our needs at present. It is cheaper to buy new clothes instead of repairing the old ones. That results in having more money for other purchases.

● Money is very important in today's world. Because we are a material based world, we want to save money to buy as many stuff as we can. But with material consumption we will not satisfy our needs. We need to find the satisfying aspects in products ourselves and not think when I buy this I will automatically be satisfied. E.g. when you buy jogging trousers you will not be satisfied, however when you use it to run, you will be satisfied in the need of freedom.

● The way you use a garment/product determines the level of satisfaction. If we are able to use garments in different ways, so they satisfy different needs in an expanding period of time, then the relationship will be developed into a long one. So, do not buy because having new stuff makes you feel "temporary" satisfied, think about which need you want to satisfy and whether buying the garment fulfils that need. Thinking this way does not mean you need to consume less and feel guilty about consuming; you need to consume with awareness, which probably results in consuming less but, with more meaning than before.

● We need to see garments as relatives. One day you like to go to a certain friend, another time you want to spend more time with another friend. It is the same with clothes. Sometimes you want to wear a pair of trousers, another time you feel it is a dress-day. You need to keep up the relationship with your clothes as much as you maintain the relationship with your friends.



## Service

- Service is an important part in environmental friendly designing; the life of a garment actually begins after selling. The company needs to keep in contact with the user and needs to guide the user and its object through life. Thereby the company can literally see the effects his garment has on the environment.
- 'User experience could be defined as the perception resulting from the experiences a person has with a company, its products and its services at every point where that company touches their lives.' [Chapman, 2005,95]<sup>16</sup> User experience, as well as fashion itself, is a way of life. With this experience it is important that the experience is true. Users have expectations, especially with all the advertisements that say you need to buy something to become happy. It is not the product that needs to do what is expected, but it is the way the individual uses the product that brings about the real experience. 'As consumers we do not seek the product (for example towels), but the functionality that it offers us (dry hands).'<sup>17</sup>
- In this way leasing could also be a good option. Now we do not cherish our clothes so much anymore, but more the experience we gain from the clothes; we may be ready to lease the "fad clothes". Instead of throwing our clothes away, we could bring them back to a lease company and lease another one that could be worn by someone else before.... and if it cannot be worn anymore?
- THEN we could upcycle it. The so-called 'waste' from one component of this system becomes 'food' for another component. Waste becomes exchange that helps creating collaboration, interconnectedness and cycles.<sup>18</sup>
- Another point of view could be the change of the company to let the product evolve together with the customer. The company can upgrade, clean, and repair your model every time. You actually buy a service of something you need, and with this service comes a product.

*'We have to change our way of thinking about products; so instead of owning them, share them for example.'*

Eco Couture, 2009

*'Time image can be a strong aspect of a product, and it would be nice to see the evolvment of the product increase the longer it is used.'* Mieke Cuppen, 2009

● The wearer needs to become aware of the way he uses clothes. Why he uses them, how he uses them and also why he always wants new clothes. Every user buys his clothes because of individual needs. But does the wearer actually know what kind of needs he has, and how he can satisfy them? A fashion designer needs to consider how to make the user aware.

● I will take a look at myself as a user. Before I started this research I wanted new clothes, because I like a change, a fresh upgrading of my look toward who I feel I am and to show people my new items, to receive a compliment. But I was not aware of this, until I started thinking about it. When I found out that I wanted new clothes to receive a compliment I started to think why I wanted the compliment. It was because I wanted confirmation. I wanted confirmation to be part of something, to gain affection, to show that I am creative in a way other people like.

● Now I am aware of this, I found out I do not have to buy so many new clothes to fulfil these needs. I still want to look nice, but can receive compliments with the actions I do and the choices I make. Instead of buying a lot of new clothes to look nice I can upgrade them. I can buy second hand clothes or I can buy new clothes that are special and environmental friendly made. This way I will feel better about the clothes and I will feel more confident. Which is confirmation to myself, because confidence makes attractive.

● In my opinion every wearer needs to understand his buying pattern. To have a better understanding of this, the user also needs to be informed about the way his clothes are made. Only then he will see how important it is to buy clothes following a different mindset. At last informing users is beginning to happen in the fashion world.

● The owners of the website Citizen Fashion have a different way of looking at the fashion industry. Their vision is to see fashion in the hands of people instead of big brands. 'They envision a fashion world where people from all walks of life set the pace in fashion trends and share and collaborate with each other to produce apparel that reflects their stylistic sensibilities.'<sup>19</sup> When customers participate on this website, they need to know for themselves why they or others want to wear their garment, so they get a better understanding of their fashion.

## Chapter 4

### Future role of user

Refinity advises; when a designer knows how to design considering the effects of his choices on the environment, a designer can give the user tools in order for the user to have a better understanding of his buying and using pattern.



### *Refinity & Gary Symor*

*Refinity and Gary Symor made a garment which consist of two items. A rough trenchcoat made out of tree bark from Uganda and a soft but masculine vest of local linen. For closing the garment, we chose to use the click and fold method rather than a zipper as this is easier to separate. We chose a dark colour as this will be washed less often as well as it can be washed at a lower temperature, this will save energy.*

## Chapter 5

### Obstacles and chances

**Refinity will consider working locally if the possibilities are there, until transport becomes more eco-effective. But sometimes investing in materials from poor countries can benefit the local people. For example the tree bark from Uganda.**

- First of all it is very difficult to define 'environmental friendly' as it is different for every individual. 'Enhance the durability of a garment through making a timeless design and it is more environmental friendly' (Designer Conny Groenewegen, 2009)
- 'Creating an awareness amongst the consumer which leads to conscious consuming is environmental friendly' (Designer Berber Soepboer, 2009) 'Make people aware of the value of their materials, so they will not throw it away that easily' (Designer Eco Couture, 2009)
- During my project I concluded there are three huge difficulties, which cannot be solved by the designer alone: logistics, energy and transparency. But they can cooperate as much as possible, find partnerships with companies and form communities.
- We live in a system that demands us to deliver very quickly. Hereby we choose for quick transport methods that are not always eco-effective. Containers go back empty, because they cannot wait to be filled up, as they need to ship the next load of materials to another place. Mostly transport also adds a lot of CO<sub>2</sub> to the air. In my opinion there are two possible solutions. Change logistics and distribution in such a way it will become a common good, in that case everybody can share and there will not be empty ships. Another option is to use renewable energy or work locally; try to transport as few as possible as long as companies keep working efficiently instead of effectively. Work with the materials and techniques that are available nearby. When renewable energy is common, the use of transportation is not a problem anymore.


### Results clothing-recycling program Patagonia and TEIJIN

Category	A Without Recycling	B Local Recycling	C Capilene Recycling	Unit
Distance	*	*	7.000	Miles
Fuel for transport	*	*	38	Gallons
Energy (production)	72.422	11.962	11.962	Mega Joules
Energie (transport)	*	*	5.771	Mega Joules
Total Energy	72.422	11.962	17.733	Mega Joules
CO <sup>2</sup> emissions (production)	4,18	0,98	0,98	Metric tons
CO <sup>2</sup> emissions (transport)	*	*	0,226	Metric tons
Total CO <sup>2</sup> emissions	4,18	0,98	1,20	Metric tons

\* These environmental impacts in options A and B are factored into production energy use figures.

- An interesting investigation performed by Patagonia (US), working with a clothing-recycling program, shows us that the most CO<sub>2</sub> emissions come from production, and not transport. Patagonia works with TEIJIN a factory in Japan that can recycle the garments, and they tested three options:<sup>20</sup>
  - A: make synthetic garments with new raw materials
  - B: make synthetic garments with local recycled garments
  - C: make synthetic garments with US recycled garments
- The outcome shows it is better to recycle, and could even be more environment friendly to do this locally.

- Energy is still a huge problem. We consume the natural sources of our planet to have energy. A good solution can be renewable energy, but at present the world is not ready to totally move to these kind of harmless energies on large scale. One of the reasons is the high costs short term.
- The third problem is transparency. Every new invention stays a secret and is only known by its inventors. Companies apply for a patent on new materials, they do not want to share their sources. This is understandable, as companies invest in research and if they share their information, they need to keep inventive to stay on top of the market.
- But as Paul Arden says in his book "If you give away everything you have, you are left with nothing. This forces you to look, to be aware & to replenish. Somehow the more you give away the more comes back to you."<sup>21</sup> A positive thing part of sharing information is that you do not have to start inventing from scratch. You can continue someone else his investigation and therefore discover new ways of continuing in the future, which another person can continue again.
- Besides these three difficulties, my investigation shows that a lot of companies and designers that are working for a longer time said 'no' to the idea of incorporating eco-effective designing in their designing process. The reason is that they are already busy, because following the fashion schedule; they have to show a collection every half a year. The designers do not have time to slow down and reinvent or even reflect on what they are doing. They have to continue the same way to make money. They cannot make something that is different then they are used to make.
- Designers would like to design environmental friendly, but most of the time they do not know how. 'It is very difficult to find the materials you want, because when you search for these materials you find a lot of different opinions and facts.' (Eco couture, 2009) 'It takes a lot of concessions. For example it is very difficult to find elastic and coatings, which are harmless to the environment. Also there is not much variety in colours yet.' (Designer Gary Symor 2009)



**It is important to share information and be transparent. Refinity advises the designer to make a list of materials/techniques he used, so people can easily deconstruct them in the future.**



**Refinity will search for more choice in colours, haberdashery, techniques and fabrics that are eco-effective.**

- The prices are another issue. The materials are more expensive and also the making process costs more, as it needs to be made locally. This results in higher prices of the garment. That means that less people buy it. In the future users need to buy more expensive clothes that last longer in order to be eco-effective.
- The industry of today is not ready for smallness. The business model is based on a cost structure, and therefore day rates that are not small.<sup>22</sup> That is why we have to find solutions to enable small amounts of materials for designers. Maybe starting a community is the right option. 'With the right tools you can start a commune and share resources wherever you are. Connect more deeply, save time and money, and do right by the earth. What's not to like?'<sup>23</sup>

Other changes to improve designing eco-effectiveness are

- More choice in colours, haberdashery, techniques and fabrics that are environmental friendly and eco-effective.
- Share textiles, because now textile companies can only make huge amounts at one time, otherwise it is too expensive. So set up groups of designers that share textiles if you are a small designer.
- Consider working local if the possibilities are there until transport becomes more eco-effective.
- Sometimes investing in materials from poor countries can benefit the people their. For example the tree bark from Uganda.
- Share information and be transparent. For the designer this means making a list of materials/techniques he used, so people in the future can easily deconstruct them.
- The customer must have a better understanding of his buying pattern.



## Conclusion

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- It is possible for every fashion designer to design eco-effective. However there are some problems that keep him from doing so, as you could see in the “obstacles and changes” chapter of this essay. The problems made me even more enthusiastic to come up with solutions on the fashion designers level. The designer must create a different mindset. That is why I started Refinity during my graduation. Refinity is a research & advice service, focussing on eco-effective ways of designing fashion. Refinity investigates the eco-effective possibilities and is an intermediary between factories and designers. While designers use their time to design rather than doing research on environmental issues, Refinity thinks along and converts usefull eco-effective knowledge into their designs.
  - There is a continuously improvement needed for the environment. I do not say one approach is better then the other. There is not a best way of approach or a standard action plan. **You need to look for the best possibilities for each specific problem. So look at the effects of your choices on the ecological, economical and social/cultural environment.** Now my inspiration is called C2C, in the future it will be something else, however there are values that will remain. E.g. working with closed loop systems and non-hazardous materials. We need to continue to work with all the knowledge that is available.
  - We need to make sure there will be no guilt feeling and add happiness, enjoyment and pleasure to our lives. Making unattractive products for environmental friendly reasons is no option, because enjoyment is also important. Enjoyment is part of our identity; the things we enjoy show who we are and that is what needs to be designed.



## Appendix 1

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### Questions for designers to design eco-effective

What are the effects of

- **material**
- **technique**
- **colour**
- **form**
- **usage**
- **service**

on

- **ecological environment?**
- **economical environment?**
- **social/cultural environment?**

For a garment to be eco-effective it's important that it:

- is harmless
- doesn't take from nature
- is made with respect
- is beautiful
- adds to diversity
- is easy to deconstruct

## Appendix 2

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### Questions I asked the designers in interviews

1. Waarin bent u al milieubewust aan het ontwerpen? (voorbeelden: stofgebruik, stof keuze, verven van stoffen, energie gebruik, nadenken wat het effect van uw kledingstuk op de maatschappij is etc)
2. Wat vindt u van het C2C principe?
3. Ziet u mogelijkheden om dit toe te passen op uw ontwerpproces in de toekomst?
4. Vind u het een leuke uitdaging om samen met mij een kledingstuk te ontwerpen in Refinity en vooral met uw eigen visie?

#### Stellingen:

- Minder slecht heeft geen zin
- Recyclen = downcyclen
- Consuminderen is een duurzame oplossing
- C2C is een hype
- C2C gaat verder dan duurzaamheid
- C2C zet aan tot consumeren
- We gooien producten veel te makkelijk weg
- Mensen groeien en veranderen, producten staan stil in de tijd.
- Ik zorg beter voor mijn huisdier of plant dan voor mijn kleding.

1. Hoe ervaar jij deze manier van werken, waarbij je nadenkt over de effecten van het kledingstuk op de omgeving?
2. Wat ervaar je meer als een positieve uitdaging?
3. Zijn er onderdelen waarin je je belemmerd voelt? Wat is het grootste probleem wat je tegen komt? Bijvoorbeeld Materiaal / kosten / technieken / gewoontes van mensen.
4. Wat is er veranderd in je ontwerpproces?
5. Vind je dat het de spontaniteit weghaalt? Van het ontwerpen, of blijft de spontaniteit in het begin en wordt het daarna toegespitst op uitvoerbaarheid?
6. Is je ontwerp gedachte veranderd? Van statements maken naar echt proberen op te lossen? Want ik heb over het algemeen het idee dat modeontwerpers problemen zien, ze beoordelen en een statement maken, maar niet echt nadenken hoe ze het ook echt toe kunnen passen. Bijv. de slogan kledingstukken van Viktor&Rolf.
7. Wat heeft dit project voor effect op jou persoonlijk? Ga je ook anders tegen bepaalde dingen aankijken? Bijv. Kopen van kleding, van eten, gebruik van stroom etc.
8. Wat zou je nog graag willen zien als mogelijkheid in de toekomst? Dit kan een materiaal zijn ... een service ... een verandering van de klant.

## Appendix 3

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### Questions during the design process

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