

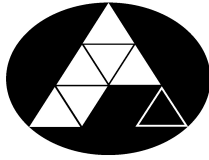
NORTH KARELIA UNIVERSITY OF APPLIED SCIENCES
industrial design

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A STUDY IN ECO- AND TRASH DESIGN

Thesis

May 2012



NORTH KARELIA
UNIVERSITY OF APPLIED SCIENCES

THESIS
May 2012
International industrial design
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Abstract

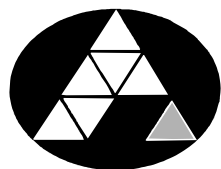
In my thesis I'm concentrating on the ecological industry and it's effects in our society. I will talk about concepts and perspectives of the subject. Ecological industry is a growing field, which makes the subject quite topical. In the future this field will be a significant branch of industry. I will also mention two current crises, financial and climate, from the ecological point of view. As the functional part I will make lamps from recycled materials, from which one is awarded open design lamp.

Language
English

Pages 35
Appendices 3
Pages of Appendices 3

Keywords

eco design, trash design, ekological



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Tekijä
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A study in eco- and trash design

Tiivistelmä

Opinnäytetyössäni keskityn ekologiseen teollisuuteen ja sen vaikutuksesta yhteiskuntaamme. Käsittelen aiheeseen liittyviä käsitteitä ja näkökantoja. Ekologinen teollisuus on koko ajan kasvava teollisuuden ala, joten aihe on hyvin ajankohtainen. Tulevaisuudessa tämä ala tulee olemaan merkittävä teollisuuden haara. Viittaan myöskin ekologisesta näkökulmasta kahteen parhaillaan vallitsevaan kriisiin, sekä ilmasto- että talouskriisiin. Itse toiminnallisena osuutena teen kierrätysmateriaaleista valaisimia, joista yksi on palkittu open desing - valaisin.

Kieli
Englanti

Sivuja 35
Liitteet 3
Liitesivumäärä 3

Asiasanat
eco design, trash design, ekological

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1 Starting point for the thesis

One could make a thesis of defining the word Design but I don't use much space for that. To me, it's more important what you can achieve with good design. Therefore I chose the theme of my study with consideration. Industrial designers are able to form better tools and also have an impact on the environment. I think that design is an effort to achieve a meaningful order. Designers are the ones who solve problems in their field of practise.

I chose Eco- and Trash design because in the future ecological industry will grow significantly and will create new jobs (Jallinoja, 2009, 34-35). This development must be hastened and supported by all means available. Finland has a good basis to create green innovations. Fighting climate change is costly but it will be less expensive than mending the damage. In my thesis I have a possibility to orientate myself better in ecological thinking and ecological industry. In my study I concentrate on the mainline terms of material economy and how we could improve the system. I recount how industrial designers operate in this system and what their role is in all of this I prepare ecological products out of recyclable materials.

At present we live in the midst of two global crises. Economical crisis sows unemployment and climate crisis threatens the whole planet Earth. That is why we should wake up and think. When surveying how material economy system works, of course consumers have a major role. Consumers have indeed become much more conscious when making their choices at shops. In Finland, who has not heard of his/her carbon footprint? Most people have at least an idea what it means. Consumers with their choices in buying and eating are able to have an effect on how the system works and what kind of products are found on the shop shelves. The commission of industrial

designers is to design these products and the task of industry is to manufacture them. Everything is not as black and white as this! We should change our life style. Recycling materials is only a small part of the big picture. In the future I rather want to work on the basis of sustainable development than just be a designer who satisfies only transient brands and needs. The year 2012 design capital -status of Helsinki surely helps to understand the importance of design among the population.

My interest in the title of my thesis arose in 2011 in connection with the Habitare trade fair. Habitare is the most significant event in furniture, interior decoration and design business in Finland. Unfortunately, I was unable to attend the fair myself but in the MTV3 news there was a compilation of the eco- and trash design stand. This was the second time when the stand was on display. The trash design stand will be displayed until the year 2013. It was then that I realized having myself prepared trash design lamp and I thought this is the great theme for my thesis. Besides, I found out that material economy had developed at the same time as advertisements for the youth which I wrote of in my previous thesis. I chose lamps for my eco products and old car's aluminium parts for recycling material. I chose aluminium because it is a challenging material to work with and it has a good recycling value.

There has appeared good and known industrial designers in Finland. One, perhaps the most well-known, industrial designer is Harri Koskinen. "He condenses that industrial design is understanding of the company and the brand" (Angeria, 2011, 16). I myself try to create more understanding as an industrial designer. An industrial designer works on a somewhat wide playing field. In addition to solving problems of the products the work consists of creating concepts. An industrial designer differs from an artisan by the wideness of his/her

know-how. A mere artistic knowledge is not enough. Design is combined with a quality of being artistic and in that way a difficult communication and co-operation. Many times at the end of co-operation prejudices proved to be unjustified.

2 Material economy

The society we have created is undoubtedly one of the most complex our world has delivered this far. "25 percent of all the people ever lived on this globe are alive now and 90 percent of the scientists and the researchers ever lived are living now. The amount of technical data doubles on each decade" (Papanek 1973, 273). The population growth is bound to create problems and birth control actions prove to be effective only when the living standard of the poor have been raised.

But as a designer I would concentrate on the Material Economy because this is a force that presently rolls our society. "The Material Economy—it has been the driving force behind U.S. economics since the Second World War. The name refers to the raw materials from which its products are made. The marketing and sale of these products is what keeps the Material Economy in motion, all the while exhausting natural resources and generating incalculable amounts of waste" (Nicoll 2007).

The idea of the Material economy is to keep material in motion. Companies go always one step ahead of the client creating new needs. The level of your happiness is measurable with the amount of materials. The material consumption is not divided evenly around the globe but exists mainly in the developed countries. "At the sametime the growth of gross debt within the developed countries through the years 2000 thurs 2008 was 40 000 billion dollars " (Ojapelto 2011) . These facts were not generally discussed in the mass media before the finance crisis in the Eurozone. "The mass media didn't tell that for some incomprehensible reason the growth of gross national product GNP has coagulated globally. In the 1960's the growth was a shy 4 percent, in the 1970's an abundant 2 percent, in the 1980's some over 1 percent and in the 1990's 1

percent” (Ojapelto 2011).

(Figure 1) The idea of Linear system is that the product is manufactured, bought, used and destroyed. Natural resources are being destroyed and the environment is being polluted, not to mention about human input of keeping up the linear system. Many people are exposed to great amounts of poisonous chemicals in the production process of goods. A great part of them are females in fertile age who have no choice but to carry out dangerous work.

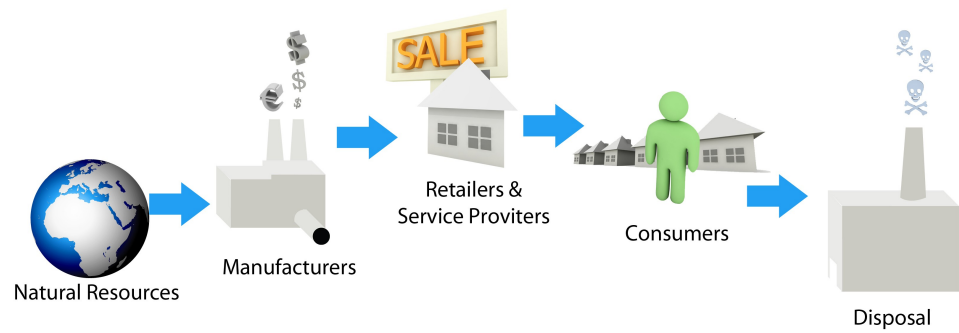


Figure 1. Linear system, Jordan 2007

Probably Europe and North America have been the main guilty ones for the climate change. Industrialisation and urbanisation that begun in the 20th century have led to this. China and India are getting industrialised fast and this doesn't help a bit the climate change. These countries should develop their industry some other way than Europe and the USA. This would create a big market for the green industry. This would be an unforeseen market potential in the history. If developing societies do not choose the path of green industry, the climate change is nearly impossible to stop.

Finnish enterprises have actually developed and sold green industry to the growing market in China. "The main focus in the climate change, in its restrain and in the global climate policy are efficient power plants and motors, frequency transformers, wind power

technologies, electric cars, coal binding technology, energy stingy concrete plants and metal refinery processes” (Jallinoja, 2009, 18). The outbreak of green jobs will improve and uphold the quality of our environment. Green jobs will be created on areas where most of harmful emissions are originated. ”The definition for a green job by the United Nations Environment Programme (UNEP) as freely defined are jobs in agriculture, manufacture, product development, administration or services that essentially effect on preserving and improving the quality of environment. Green jobs are internationally called by terms ”green jobs” and ”green collar jobs” (Jallinoja, 2009, 30). The system we live in is the sum of its parts and if some of the parts is changed the whole system will finally change.

In the more ecological way of thinking one is detached from the Linear system and tries to get as much material and waste as possible for reuse. The priority is to prevent waste originate, secondly one must recycle, thirdly utilize waste in other ways, e.g. in energy and the last thing is to pile it on a dump. ”In Finland our ecological foot print measuring the consumption of natural resources was the third biggest in the world in 2003, 7,6 hectares per inhabitant as ecological foot print of the whole world was only 2,23 hectares per inhabitant and the world's biocapacity would allow only 1,8 hectare ecological foot print per inhabitant” (Hoffren 2006).

Today Finland hauls still practically half of its waste to the dump. Ecological foot print is not a merely a formula but it shows in the concrete on our planet. ”In Finland's present Government Programme this challenge is recognized and the goal is set to increase effectiveness in the use of materials and energy in all phases of the life cycle of products” (Hoffren 2006). Suggestions for action has not yet been put into effect. Actions are needed in production of energy and its use, in traffic, in construction and community planning, in control of emissions in agriculture

and forestry, and in waste management.

(Figure 2) The picture presents green economy and new circulation of material. "Modern ecological thinking in design started in fact by activity of the international student movement. After the Second World War production of consumer goods and the living standard rose swiftly in 1950's and 1960's in the USA and Britain while consciousness of the Third World's circumstances spread throughout the world. A growing gap in the living standards raised criticism in the student movement and questions about developed countries' justification to their living standard rose up" (Heponiemi, 2009, 11).



Figure 2. The new green economy, Jordan 2007

Part of the enterprises have already woken up and they try to raise ecological level of their products. This however is not necessarily enough. The whole structure of the society should experience a change. A mere reuse of materials would not be enough but also the available energy should be recyclable. Clients should be made

much more aware of their possibilities to act and make them think on the basis of green economy.

"The Environmental Protection Agency estimated that in 2005 alone, 125 million cell phones were discarded, leaving behind more than 65,000 tons of waste" (Nicoll, 2007). However our planet is not capable of upkeeping the present system endlessly. "This was the observation of two, chemist Michael Braungart and architect William McDonough. They became friends in New York in 1991. The two have invented the Cradle to Cradle (C2C) -ideology from ecological thinking game. The idea of C2C is to restore the use of material to fit nature's circulation. Instead of raw materials going from cradle to grave, they need always to return to cradle" (Kukkapuro 2011, 15). Another foundation/way of thinking for pursuing ecological thinking is Long Now Foundation. "It tries to become a counter force for now a day's 'faster and cheaper' -thinking by promoting 'slower and better' -thinking" (Taylor and Saarinen 1994, 75).

2.1 The role of industrial designer

Papanek (1973) claims in his book *Useless Or Indispensable* that advertising is a much more harmful profession than an industrial designer. Industrial designing achieves however a good second place! Advertisers create needs for the consumers which industrial designers then fulfill. People have always had a tendency to change their environment and themselves. Along with developed science, technology and mass production we have specialized in different profession groups and this is the way the profession of industrial designer mainly have come into being.

Although history textbooks claim the profession originated in connection with the first tools, I think there was no industrial designing at that time. Inventions for fire, lever, the first tools and guns occurred by observing nature. The profession of industrial designer came up with the industrial revolution. "The first association of industrial design was founded in Sweden in 1849 soon followed by similar associations in Austria, Germany, Denmark, England, Norway and Finland, in this order" (Papanek 1973, 43). Designers at that time were thinking of beauty one could make by machine. The sources of inspiration were nature and art history.

"Thanks to Walter Gropius, Bauhaus was founded in Germany in 1919 and it was then that art and machines got married" (Papanek 1973, 44). Bauhaus design school has indeed been the flagship of taste and design development. It considered design an essential part of production process. The Bauhaus teachings spread quickly to many countries. Today's industrial design is analysing, creating and developing products for the mass production. "When the industrial revolution led us to the age of mechanics, and as we have lived the last 60 years in the age of technology, we are now coming

to the biomorphic age” (Papanek 1973, 229-230). Biomorphic age means technology based on mimicing nature.

Problems result from the fact that certain fields have unfortunately limited themselves and become highly specialized. That is why many fields have developed their own jargon which an outsider has difficulties to decode or understand. Industrial designer often needs to interpret between different professional groups. Industrial designer should work with a manufacturer, engineers and with both production and sales personnel keeping in mind several problems that may occur in production and sale. (Papanek, 1973) He thinks that industrial designer has succeeded in his work if security, convenience, willingness to buy or simply satisfaction of people will increase. On the other hand industrial designer has failed in this work if points of friction arise in contact with a product and a man.

In the course of time designers have become troublemakers in the field of sustainable devopment. ”Designer agent John Thackara suggests for the solution of the problem designer training and cultural values directing the work in practise” (Taylor and Saarinen, 1994, 75). Among of the most useless products I have run into is a banana case that holds only one banana. Design should have a function or a meaning.

Of course products have to be packed into something. Fortunately packages can slow expiring of a product and they can decompose. ”Packages and packing waste are traditionally considered among the biggest polluters of the environment but the fact is that the contents of the package form a bigger carbon footprint. It is estimated that only in one year food packing waste comes about 30 to 50 kilograms per year per person” (Foodchain. 2003). The future task of industrial designers is to create ecological packages, maybe other kinds than fiber packages that turn into methane which is meny times stronger

greenhouse gas than carbon dioxide. "The use of a package made of too scant or wrong kind of material may cause a manifold environmental drawback if the product in the package is damaged" (Foodchain. 2003).

Many industrial designers have predicted that in the future products can be printed at home. These kinds of machines already exist and the price at the lowest is about 1000 Euros. In this way there is no need to manufacture the product in another country and ship it on the self of your nearest shop. When this change will happen, industrial designers' need for knowhow of information technology will be even more important.

The world is developing and I think the role of industrial designer has become stronger along the years. That is why we designers should bear the responsibility of our work. At the beginning of the planning process we should evaluate if we really need to give away our precious time to the product and is it of social use. A hindrance of planning may be designers' associations and characteristic behavior. Hindrances of resolving new problems are inhibitions in observation, culture, emotion and in before mentioned association. Nowadays there are plenty of products in mass production that do not meet the needs of a consumer. Looks in consumer goods mean surely a lot more than what's inside.

(Figure 3) Papanek in his book "Useless Or Indispensable" (1973) shows three graphic images in each of which the role of industrial designer becomes visible. Industrial designer works on top of the pyramid. The first image shows on which area industrial designer and industry work when there would be actual needs to be met. The picture in the middle looks the same as the third one. Let's say there are South American states involved in the picture in the middle. Most of the land is owned by persons who have never

entered the area. The picture on the right shows how power has been divided to a small group of people in the world. Who could claim that designers would not serve all the nations in the world? Industrial designer still works on top of the pyramid. We only design to the minority. As designers we could give out 10 percent of our time to the poor.

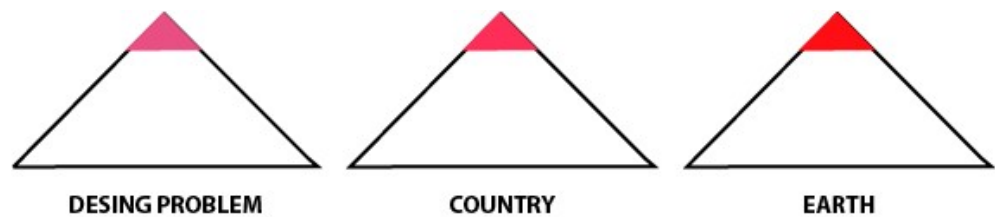


Figure 3, Design problem, country and earth. Papanek 1973, 69,72-73

"In sustainable development there are three pillars: ecological, economical and social" (Jallinoja, 2009, 53). Industrial designers should take these into account in their work. One tries to solve the present economical crisis by means which are not ecological and which affect the climate crisis. One tries to improve the climate crisis by cutting consumption, which in turn makes the economical crisis worse. The state should take notice of this and direct its support to ecological growth. The easiest way to do this would be by supporting already existing green enterprises. In this way there would be a foundation also to the future enterprises. Some of the future ecological enterprises might turn to a flagship to our upcoming growth. Unfortunately the Finnish state does not support this development in the best possible way although we would really need a new Nokia.

2.2 The role of industry

"Because of new production methods and endless new materials available artists, craftsmen and designers today suffer from a tyranny of absolute difficulty to choose. When almost all has become possible and all restrictions have disappeared design and art may easily become a constant search for novelties and designer's need to create novelties causes as strong need for novelties in the onlooker or consumer until novelty because of a novelty becomes the only norm" (Papanek 1973, 54). In this way the market is kept constantly growing but the problem for the design is that it diverges from functionality, usefulness and practicability. We live in a society where creative individuals are punished for their independence. Intolerance plays a part in this. "Up to school age people seem to have about similar abilities to solve problems. After that an inborn creative ability starts to disappear because of inhibitions in observation-, culture-, association- and emotional background" (Papanek 1973, 54).

At present there is a tendency of producing and gaining new no matter the cost. Industry tries to produce goods as cost-effectively as possible. This is not necessarily the most ecological way. I believe that the reign of corporate giants and hero designers is already slightly fading. The function of the industry is based on the fact that when something is created somewhere unfortunately something else is destroyed. Earlier clean water and air has taken for granted but development in the world has shown this is not the case anymore. Pollution in rivers, lakes and seas is complicated but we have to admit that industrial designers and industry are guilty to this all from their part. Water will not run out but we soon have no new water supplies to contaminate. Cars pollute the lower atmosphere, jet planes in turn the upper atmosphere. Car branch is proceeding to hybrid cars and fully electric cars. For some time there has been in different media news of greenhouse effect and horrified scenarios

how it will proceed if we soon don't take it seriously and intervene. There is a possibility that the temperature of the Earth would go up so much that the polar caps would melt and raise the level of seas so much that many countries would partly remain covered by water. It would also be very likely that a change in weight would also have an effect on the position of the axle of the Earth.

In any case all we breathe, eat, drink and dress in have over the course of time gone through billions of digestion systems throughout the history of the Earth. Part of our consumption ends up into seas where large garbage floats lie at the meeting places of sea currents. I realized that the more information of industry's effect on environment I get the more passionately I oppose production of enormous amounts of goods and waste from it. Waste is not merely the problem but energy that is needed to produce it.

We cannot go on living endlessly relying on oil. "According to the latest prognosis from the United States' EIA (Energy Information Administration) world's energy consumption would grow 71 percent through 2003-2030" (Hoffren 2006). Our energy consumption is the major cause of greenhouse emissions. Moving around creates alone huge amounts of emissions, when considering emissions from cars and airplanes.

These emissions can be reduced by improving effectivity in energy production, by using low carbon fuels or by favoring carbonfree energy production. Low carbon energy production methods are wind power and sun power, and older energy sources are water- and nuclear power. Many branches have waken up ecologically. This is also evident in IT-branch

(Figure 3) Shows different technologies of which green technology is on top of the statistics. Enterprises are so called hyped businesses. When talking about ecology in IT branch one means solutions for less energy consumption, reuse of heat and materials suitable for recycling. "Standards like EPAT, Energy Star and TCO make it easier to define green products and help purchase decisions and choices of consumers" (Nokkala, 2009, 7). IT branch is not the only one trying to save in energy consumption. This has been noticed even on the state level.

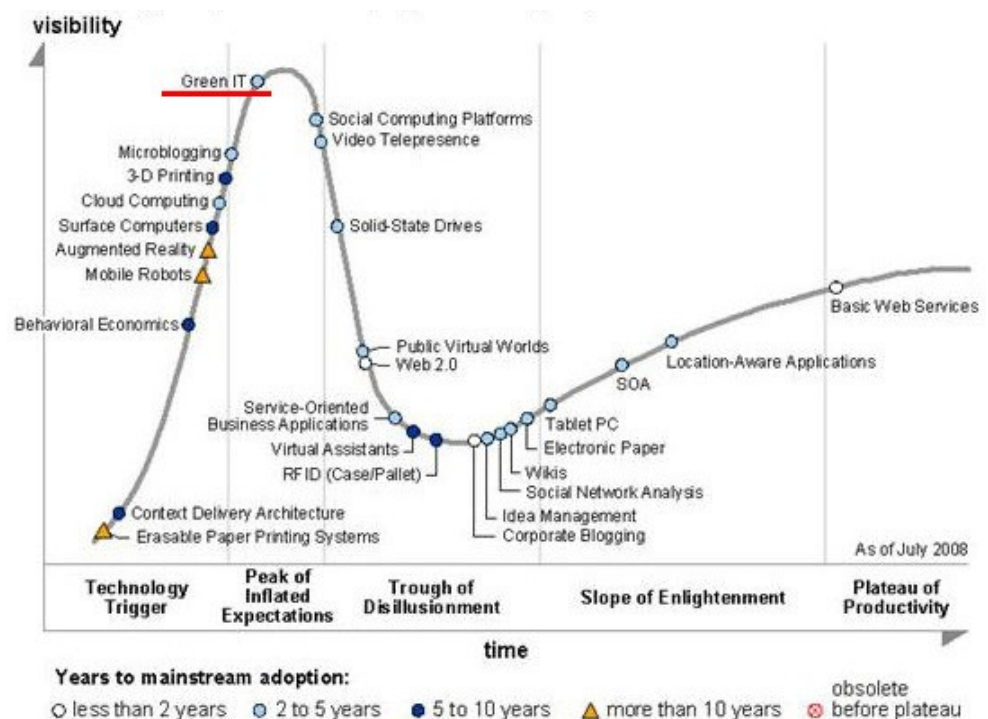


Figure 3. Future technologies hype cycle. Nokkala, 2009, 8

In Finland the law of supporting renewable energy came into effect on March 25, 2011. "EU obliges Finland to increase renewable energy so that its share from the end use is 38 percent till the end of the year 2020." (energiamarkkinavirasto.fi/) Taxation should thusly be decreased so that products would be competitive towards those versions polluting more environment. A consumer needs clear information when a product is natural and low energy user. One

means is e.g. Energy Star -marking (Figure 4.) The marking is used in low emission products in USA. "Energy Star promises consumers and enterprises savings in electricity bills total 1.8 billion dollars for five years and at the same time to reduce greenhouse gas emissions for 2.7 million cars annually" (Nokkala, 2009, 15).



Figure 4. Energy Star, Nokkala, 2009, 15

Another very well-known symbol for recycling is (Figure 5). This may be more famous than above-mentioned Energy Star. The symbol is widely used in products which have deserved it. For instance aluminium cans bear this symbol for recycling. In English this symbol is described by uttering three times character R (RRR).



Figure 5. Re-use, aleanjourney.com/ 2012

(Figure 6) We can manufacture many things, items, medicines and clothes out of oil. Oil gives us energy on which we base our moving, consuming and even ecological growth. Germany has made a decision to give up nuclear power till the year 2022. Germany has

also invested plenty in green energy. That's why green industry is growing fast. "Already approximately a quarter of a million people are working among energy produced by sun, wind or biomass. It is predicted that in the recent future the branch will employ more people than the German auto industry" (Jallinoja, 2009, 33). The Finnish national economy is based on metal-, lumber- and electronics industry. People are believed to work rather in firms that are environmentally friendly. There would be things to improve on these three sectors.



Figure 6. Victim of pollution, Trashmagazine, 2011, 24

(Figure 7) Shows a short time in our history when we have had oil to use. These times are soon gone. We should indeed proceed to different energy solutions in industry and households. I consider myself lucky because up till now I have been living in the era of cheap oil. We need to renew our energy system because old energy models become too expensive at the end.

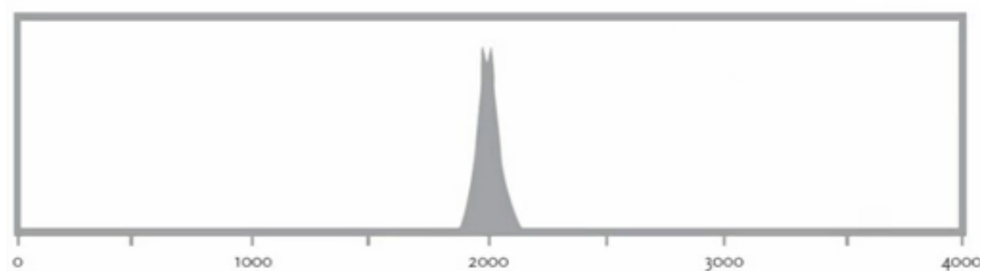


Figure 7. Hopkins: Global oil consumption . 2

In Finland companies promoting renewable energy seek the market behind borders. Sweden, China and USA are countries where the market is more auspicious. "It is estimated that only within the renewable energy branch there are at present 2.3 million jobs and direct support to green jobs seem to be a ballpark figure of 200 billion dollars" (Jallinoja, 2009, 34-35). Finland's strengths in green industry are utilizing our forests and clean processes in industry. Economical recession would be a possibility to move to Green New Deal -thinking.

The assets should be transferred to effect both economical recession and climate change. (Figure 8) "Is a so called share of green investments in resuscitation packages launched by the German Heinrich Böll -Foundation in turn of the years 2008-2009. The biggest green resuscitation packages have been made in Asia where altogether 900 billion euros were used. Also South Korea is on top because there 80 percent of the resuscitation packages goes to green purposes. In Europe share of green investments is 9 percent. Finland was not in evaluation because Finland's resuscitation package was published late 2009. Still Finland resuscitated its economy with 2 billion euros" (Jallinoja, 54-55).

| industry | existing jobs | year | potential for job | year |
|------------------------------------|---------------|------|----------------------|------|
| wind power | 154 000 | 2007 | 377 000 | 2030 |
| solar power | 100 000 | 2009 | 1 400 000 | 2030 |
| energy efficiency of buildings | 340 000 | 2007 | 622 000 1 200 000 | 2020 |
| Low-consumption cars manufacturing | 150 000 | 2004 | 1 000 000 | 2020 |
| local public transport | 3 000 000 | 2007 | significant | |
| railway | 900 000 | 2006 | significant | |
| energy efficiency | | | 1 000 000 | 2020 |

Figure 8. Present and future of green jobs in different sectors of the economy in the EU. Jallinoja. 2009, 62

In order resuscitation packages to benefit they should have an effect on renewal of environment and aim at restoring nature. “We should replan and redesign most of people's tools, products, houses and habitation functions and build human needs to transform, adapt and renew with the environment” (Papanek 1973, 300).

2.3 The role of consumer

Our system is founded on the assumption that we need to buy more, spend more, throw away more and thus destroy the Earth. The globe is a closed environment. Material either does not disappear nor increase so recycling is indeed crucial. If we do not recycle, we exhaust vital resources. Many design products have to be reinterpreted in order to see to which amount they prop up class system and social status. Consumers were happier 60 years ago before the time when industrial designers and advertisers began to modify consumers' consuming habits. "Private consumption makes up half of Finland's gross national product (GNP) so individuals' consumption exert influence upon all environmental problems directly or indirectly" (Heponiemi,13).

A need for a product is created and consumers follow blindly. Well, I myself have also a new, expensive smartphone! Designers plan products to fall apart in the way a consumer doesn't lose his trust in the product. Many products have reached a dead end on the point of continuing development. Designers add to products all kinds of extra devises without seeking to solve the problems at hand.

Many a problem would be resolvent if consumers would start to rent products for their use instead of buying. In many towns for instance cars can be rented for a long period of time cheaper than owning one. Of course we can always use public transportation. Or would you be willing to use for instance a bicycle for short distances.

But we are slaves of status junk. Both designers and planners work as marketing tools for big enterprises. Goods have to be kept on the move and consumers consuming. We have more and more products and we consume faster than ever. Now I would suggest that the

costs of carbon footprint should be added to the price of the product. Thus consumers would see the real price of a product. So they wouldn't always buy the cheapest offer which possibly is made illegally using e.g. child labor and transported illegally over the border on the shop shelf. "Our consuming has led to the fact that at present we consume renewable natural resources 1.4 times annually. Europeans alone would need three globes to fulfill their consuming habits" (MOVIE Home 2009 ja Food ink 2008). "This kind of consuming has led to the situation that youth below 25 years are a fastest growing group of people who go broke" (Quart, 30). Products define social status. Anyway I believe that there is a change in the air when young people begin to make a difference. Consuming habits of youth are different from the baby boomers. "33 percent of the world's population are young consumers at present" (Steffen, 2005). Eventually in the future we may experience much more scanty times which form consumers' consuming habits, too.

"Consumers have waken up to ecological thinking in the winter 2007, which was very warm. Globally awakening can be seen started in 2006. In media awakening took place especially thanks to Nobel prize winner Al Gore" (Jallinoja, 2009,32). Although we have waken up to many crises, for years there has been e.g. nourishment crisis in our hands. I do believe, that crises can be solved in the future if we offer enough political, social and economical will.

How consumers then can have an influence if they want to consume as they've always done before. This has been long discussed in the media and consumers' buying habits have been tried to modify. "Consumers in four persons' household could get visible emissions on the point of nature by reducing the temperature 1 degree. Thus they would save 70 euros a year i.e. 350 kg's CO₂. They would save more than 900 euros would they seal windows and doors, regulate humidity in the house, defrost ice box and freezer regularly, wash ful

washing machine loads, give up prewash and adjust hot water to 60 degrees maximum" (Jallinoja, 2009,56).

3 Open design

Open design is well known in the internet but the phenomenon has become more and more visible also in the design circles. Design is no more a means to make money into a bank treasury but a means to design products for common good. "Open design can be compared to evolution: any inept can take part in development but only the most workable versions of a product will survive" (Storås 2011, 65). The benefit of Open design is that consumers can rely on the quality of a product. Enterprises may also profit from it. "A professor in economics at Berkeley University, Henry Chesbrough, has launched a term open innovation. He says that enterprises should use more ideas and techniques from outside and at the same time offer unused innovations to benefit others" (Storås 2011, 66).

The role of both designers and industry roll around patents. Still we could design products based on licenses. In this way anybody could modify or improve a product. Thereafter the product would be published on the same license. One can make money with Open design, too. Spotify is a good example of this.

The products are usually covered with different patents. (Figure 9) Shows the complex hierarchy of the patents. As the patents are different in different countries, you'll need a decent know-how if you want to protect your products efficiently. Open design differs greatly from the patent-protected products and ideas. E.g. Linux is not as vulnerable to malware as Windows, as anyone can reprogram it to defy the malware. Mostly bigger companies benefit from the patents, and many companies buy the patents to prevent anyone from using them.

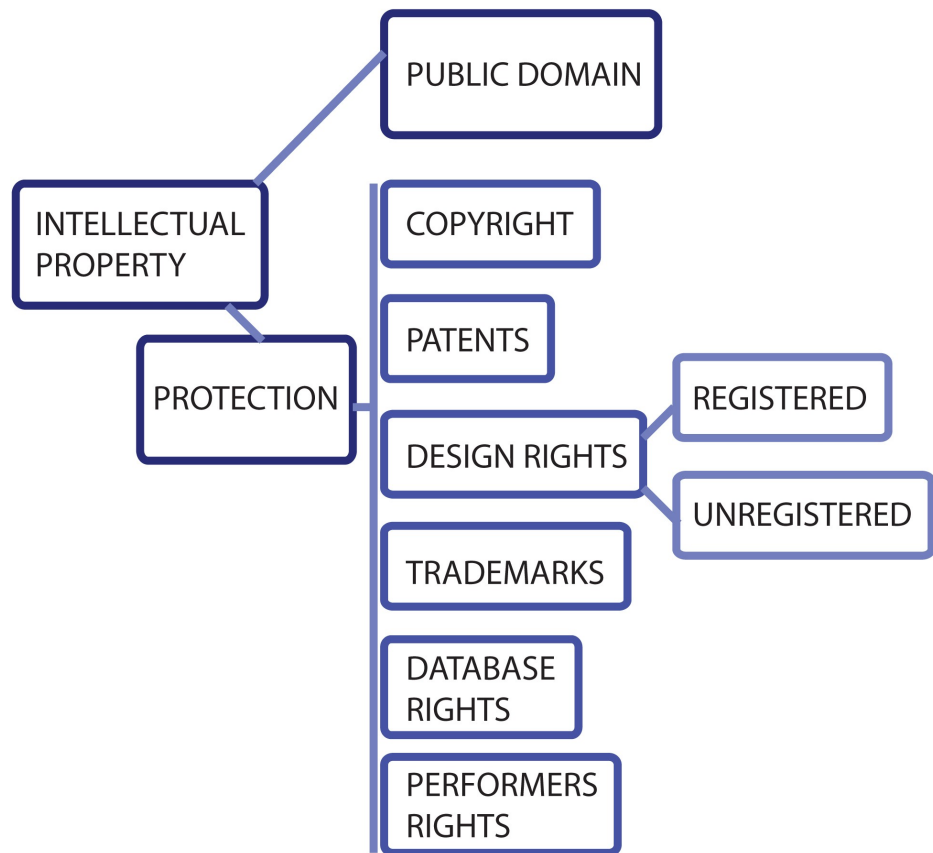


Figure 9, Structure of intellectual property, Abel, Evers, Klaassen & Troxler, 70

4 Trash lighting

"Lds lamp won the first shared price in the Habitare Ecodesign -competition in fall 2010. The lamp was made of a smashed tomato tin by Enbom" (Nelskylä, 2011, 31). I made myself a similar lamp following Enbom's instructions. However I added my own artistic touch to his lamps. Enbom published his design in open design so that as many people as possible could make the product themselves. I concentrated on aluminium car parts. I obtained the parts from a car dismantle shop. My purpose is not to manufacture serial products but only unique objects. My aim is to get a new meaning to old material. In my first lamp I used a car turbo and parts of a charger. The problem appeared on how these parts could be connected to each other. I decided to glue the parts together after sand blowing and chrome painting. Another option to connect the parts would be melting. Welding is out of the question because I do not know the percentage of aluminium in the product.

My first lamp was a table lamp. I decided to make my second lamp a hanging one. I used for it different car chargers, partly same kinds as in my first lamp. My working methods didn't differ from the previous one. "Aluminium is the 3rd general material in the world and comprises 8 percent of the crust of the earth. Aluminium is totally recyclable material and its recycling is technically and economically profitable. In Finland we have no primary production plant. All aluminium used in Finland is imported or recycled" (Teknologiateollisuus ry). Aluminium is not the only recyclable material. "More than 90 percent of the used steel can be utilised. More than half of the world's 1000 Mtons steel production is based on recycling. Compared with the element production recycled steel saves 75 percent energy. With the saved energy 18 million households can be warmed up. In 2006 Finland was the 11th biggest

steel importer in the world” ([trashmagazine](#), 12) ”But paper has the most efficient recycling system” (Vauramo, 2011, 89). Anyway people have produced metals on Earth as much during the last 60 years than the last 6 million years.

”Artificial light sources in inside lighting are:

- Light bulbs
- Halogen bulbs
- Fluorescent lamps and small fluorescent lamps (energy saving bulbs)
- LED's (Light Emitting Diode)
- Light fibres” (Tanhula, Kodin valaistus suunnitelma,2009, 8)

I chose energy saving bulbs for my lamps. I think it is a natural choice concerning my work. However energy saving bulbs are not trouble-free. ”Energy saving bulbs and fluorescent lamps contain poisonous quicksilver, so it is important to take them to reception points of electric- and e-waste or dangerous waste.” (TSJ, 2012)

(Figure 10) Shows the fabrication process of a ceiling lamp. The process is a step-by-step guide to the finished product, and anyone can make a similar lamp following the guide. Although I'm not going to publish the guide anywhere else except in this thesis, it can still be considered as an open design product. The making of the product takes tools that are not found in your common household, which makes it harder for the most to make a similar lamp. Otherwise, the product will remain unique, as I won't be making them in mass production.



Figure 10, How to build lamp.

I did mention earlier that I did make two lamps from the car parts. I wanted to bring forth the shapes of the materials in the lamps, and I wanted to use the pieces so the viewer could recognize the parts. Because of this, I opted for as close to the original colour options as I could, in this case chrome and zinc paints. Several people evaluating the works has indeed said that they were quite masculine. When the lamps are lit, the shapes of the parts are reflected on the walls. (Figure 11) Reflections are made by the holes in the charger.



Figure 11. Reflections

My second lamp was a ceiling light. I was ready to add some iron chain to the lamp if it wasn't able to withstand it's own weight, but aluminium is rather light material, so it carried it's weight quite well. Both lamps make quite similar reflections. I had some problems finding a small enough light bulb for the charger-lamp, as the space inside the charger is quite limited.

I believe there are opportunities for the similar lights. I don't think it'd be impossible that I'd construct ten more lamps and have an exhibition for them in a dark space. If I'd make a bigger amount of

lamps, I think I'd use different kinds of cans with the car parts. As an attachment there is an example work of the lamps in question. If the exhibition would go well enough, I might get more interested about the subject and broaden the material choices to other metal parts as well.

At 2011 I visited the world's biggest industrial design fair in Milan. There was a whole hall reserved only for lamps. When I walked through the hall, I was thinking that everything about lamps was already invented, but thinking back, I can't remember seeing any lights made from recycled materials. It might be worth the trouble to investigate what kind of market there would be for this kind of products. There should be plenty of materials for them, at least. One problem might be finding suitable space for making the products and getting enough recognition for the ecological design.

Ecological design could be expanded for the other products too, but I'd stay on lamps myself. Aluminium, for example, conducts electricity quite well, and the products should be as safe as possible. One of my lamps has an earthing, while the other one lacks it, causing a risk. In future, I will add earthing on all the lamps I construct to minimize the risks.

5 Finally

What I would like to say is that in design education we should concentrate more on social, economical and political environment in which a designer eventually must work on his career than on mere design. In redesign the above mentioned are very important factors. There has been redesign for several years but during the last few years it has really made its way to brink lights. Still it is not a new thing. It has only become visible along ecological thinking.

Consumers want more sustainable and ecological solutions into their homes. When grandma's old dresser has been renovated, it is a valuable piece of furniture at home. In this way a refuse gets a new meaning. "Would trash design be a light and more free version from economical values than traditional staid antique"(Jantunen, 2011, 38). "Trash design expresses a visual and ethical lifestyle that does not cringe modern technology" (aheadhabitare.fi/fi/trash-design). Along with used material comes inevitably its history. Trash design is known mainly thanks to young designers. It is clear that the phenomenon has come to stay. Would furniture shops be ready to take redesign for sale? At least those furniture shops are rare which keep reserve parts for products in case of a break down.

The greatest part of materials for trash design comes from trash cans. "The clause denying taking materials from trash can is not found either in the waste disposal code or in the criminal code. Still littering is defined as a criminal act in the waste disposal code. Breaking in closed trash sheds and containers is also a criminal offence" (Kähkönen, 2011, 25). In the future there might appear same kinds of waste collecting points for energy waste as there are now for bio waste. In the name of ecological durability and ethics we should begin to think what we really need and what is necessary. Trash desing offers an option for throwaway stupidity. Trash

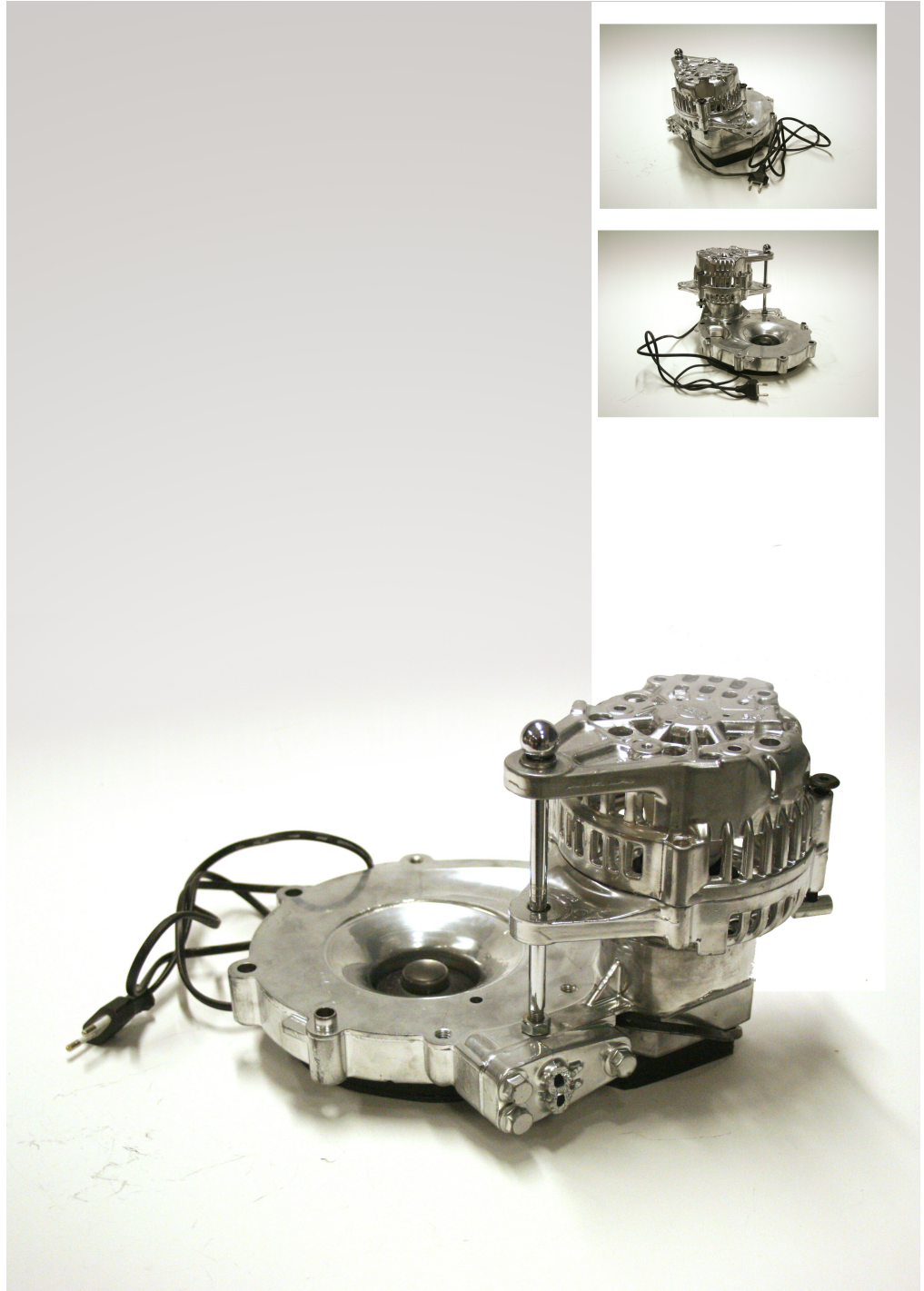
collectors do save plenty of usable material before it ends up on the refuse dump. Although things would be ugly, collecting them gives them a new value. Collecting throwouts is tolerated because it gives them longer life.

Second hand shop is one form of recycling but it would be good to set up centers for throwouts. Throwing things away is difficult because there is no place called away. Therefore, we should get these things recycled. If we do not start to reuse materials we will get it back in some stage as boomerang effect. Everybody can do trash design. Just give material a chance and take it out of its basic context. Still I don't believe the world will be saved by trash design but hopefully it will wake up a few people to think more ecologically. We can unite generations through recycling. I have carpets made by my grandma on my floor. These carpets are made of my old jeans. "We all should learn something of the Japanese concept of aesthetics Wabi-sabi: to find beauty behind horror. There has been moderation behind this thinking. Ingo Maurerin puts it in the poetic form: Do not collect all the fruits, leave also something for the birds" (Embom, 2011, 51).

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Enclosures



Enclosure 1.1



Enclosure 1.2



Enclosure 1.3