

NORTH KARELIA UNIVERSITY OF APPLIED SCIENCES
Degree Programme in Industrial Design


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ECOLOGICAL DESIGN FOR SMALL BUSINESSES

Thesis
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CONTENTS

1. FOREWARD	5
2. FRAMEWORK	6
2.1 Introduction To The Project	6
2.2 Action Plan	7
2.3 Visual Context	10
2.4 Benefits	11
2.5 Government Involvement	12
3 ECOLOGICAL DESIGN ELEMENTS	13
3.1 Design	13
3.2 Materials	14
3.3 Production & Logistics	18
3.4 Recycling & Reusability	20
3.5 Eco Myths	22
4 PERSONAL WORK	23
4.1 Introduction	23
4.2 Visual Framework	23
4.3 Furniture Design	27
5 EVALUATION	30
6 CONCLUSION	32
7 SOURCES	33

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<p data-bbox="178 651 236 683">Title</p> <p data-bbox="178 714 788 745">ECOLOGICAL DESIGN FOR SMALL BUSINESSES</p>	
<p data-bbox="178 837 288 869">Abstract</p> <p data-bbox="178 900 1433 1059">This thesis focuses on how a small business can utilize different ecological design elements and how these elements can benefit the company. This thesis acts as a guide. The ecological design elements discussed ranges from product development, company structure as well as the overall working process of a company.</p> <p data-bbox="178 1090 1437 1211">The importance of ecological matters is also discussed and how these can benefit the company in the current world where ecological factors are becoming more important each day.</p> <p data-bbox="178 1243 1437 1364">The work for this thesis came from a few different projects, Riikka's final work practice at Best Rye, her professional projects relating to ecological design as well as different life examples of companies that use ecological design elements throughout their work.</p> <p data-bbox="178 1395 1437 1554">The research showed how these different ecological design elements are necessary and doable for a large scale of different types of companies. The examples given range from small to large and showcase how each of these are companies have used a different approach, but still maintain a way to be ecological.</p> <p data-bbox="178 1585 1437 1668">Best Rye said they benefitted from this work and will use this as a guide when they open their cafe and focus on all the different ecological design elements.</p>	
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<p>Nimike</p> <p>EKOLOGINEN MUOTOILU PIENILLE YRITYKSILLE</p>	
<p>Tiivistelmä</p> <p>Opinnäytetyön aiheena on ekologisuus ja sen hyödyt ja kuinka ne voivat hyödyntää yrityksiä nyky maailmassa. Opinnäytetyössä selvitetään, kuinka pienet yritykset voivat hyödyntää ekologisen muotoilun elementtejä parantaakseen toimintaansa. Tämä opinnäytetyö toimii oppaana. Ekologisen muotoilun elementit viittaavat tuotekehitykseen, yrityksen rakenteeseen sekä työprosesseihin.</p> <p>Pohja opinnäytetyöhön tuli työharjoittelusta Best Rye:ssä, ammatillisista projekteista sekä esimerkeistä ekologisia muotoilun elementtejä käyttävistä yrityksistä. Taustaselitys osoitti, kuinka erilaiset ekologiset muotoilun elementit ovat pakollisia ja kuinka erikokoiset yritykset voivat saavuttaa ne. Käytetyt esimerkit sekä pienistä, että suurista yrityksistä jaosoittavat, miten nämä yritykset ovat voineet käyttää eri menetelmiä.</p> <p>Best Rye kertoi hyötynensä tästä työstä ja Best Rye tulee hyödyntämään tätä työtä oppaana saatuaan sopivat tilat ja avattuaan kahvilan.</p>	
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1. FOREWARD

This thesis is about how existing and new companies can adapt and benefit from ecological design elements. It is a guide how one can use different elements and become more ecological in their overall business operations as well as developing new products.

The idea for this thesis came from my personal interest in ecological design as well as how green ideas can be adapted with little to no effort while providing benefits that are substantial to the environment. This topic also fits in with my personal Professional Projects and final Practical Training in the United States of America (USA) where I designed and worked on green materials and design for a café.

The aim of this project is to help existing and starting companies to use this as a guide and change their working methods. There are different examples to describe how one's company can succeed and use these different ecological elements.

The thesis work was done in Finland but uses information from different companies around the world as well as personal experiences from working with ecological elements throughout my studies.

2. FRAMEWORK

2.1 Introduction to the Project

At the beginning of the thesis the main starting point was gathering all the information related to ecological design. This included searching through the Internet and looking up books related to green design. Starting the searching process allowed me to begin a clear outline of what the project would fully consist of. The starting point was to introduce the different green elements that influence business the most, and how these can be changed or adapted to become more ecological. Figuring these out helped guide the rest of the outline for the thesis.

I had previous experience in researching information as well as a general interest in the topic. However, there were many subjects that were new to me, such as the technical aspects of the green movement as well as how broad the entire topic is. Setting a clear idea and focus on the topic was one of the more difficult obstacles, as the topic is truly so vast.

Ecological design (EcoDesign) has many names and definitions. Some of them are Sustainable Design, Bio-product, Recyclable Design, Reusable Design, Green Design, Pollution Prevention, Design for the Environment and many more. They all have the same goals, to reduce waste and to be more earth conscious with products.

Green products have more efficient resources, reduced waste, emissions, pollution, materials, disposal- and clean up fees (Hendrickson, Conway-Schempf, Lave, McMchael 1999).

Design relates to anything that has been made. All products, services, ideas have to be designed. Design as a singular term is so vast it can fill multiple theses on its own, but this thesis focuses on ecological design elements that can aid in companies becoming more ecological.

The goals of ecological design would have an effect on the procedures for design and manufacturing, overall to develop environmentally benign products and processes (Hendrickson, 1999). With the different ecological design terms (referred to above), each one has their own specific focus point, and focus on some broader issue. Each of them are just as important as the former, but each one has something to add to the overall process and image of ecological design.

2.2 Action Plan

The method (Figure 1) began with researching and documenting the topic and different elements (materials, design, logistics, etc.). The main theme running through the entire process was how ecological design connects to everything. Each topic always refers back to the main topic of how ecological design can benefit companies. It also showcases the negative and positive aspects of each element throughout the report. The process follows into presenting actual concepts how to do and fulfill the different themes. Examples of different companies that have successfully branched out and use the exact ecological methods are explained. The end showcases how all of these connect together and the final element connects back to design.

There were two different target markets. The first being existing small companies that wish to start becoming more ecological and implementing small changes that will affect the rest of their company strategy. The second is a new company starting from scratch that wishes to have a more substantial affect and influence within their company to be green.

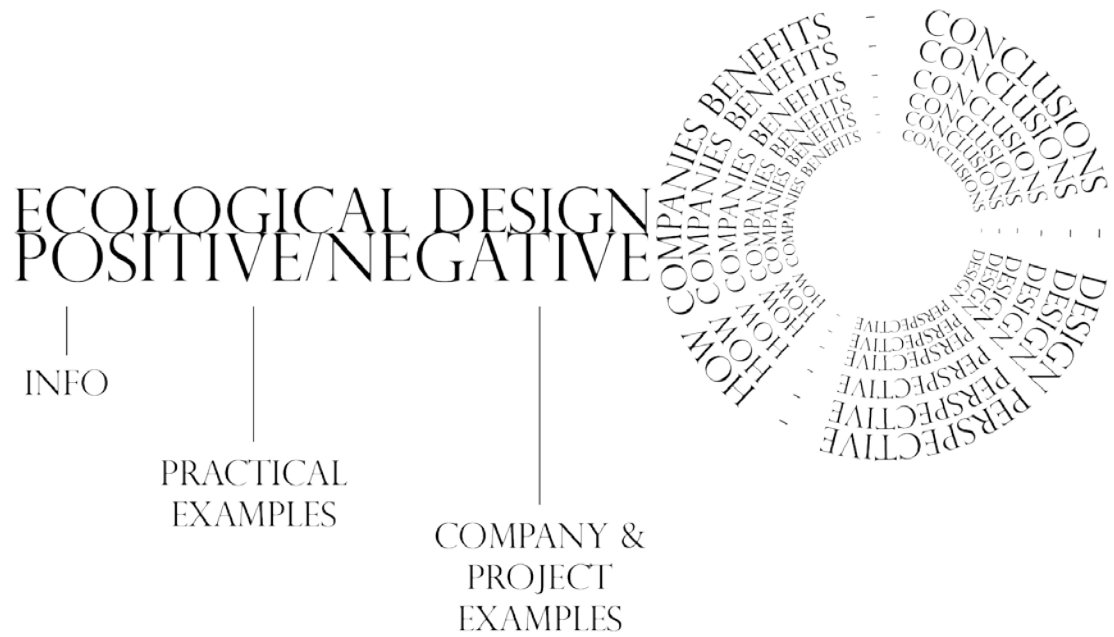


Figure 1 – An overview of the topic

Connecting the different fields (Figure 2) of Design, Ecological Info and Company Needs was the central thinking process. The core of the topic was how companies could use ecological information as well as design and combine them with their own knowledge and utilize ecological design to benefit them. Each different sector (ecological business outcomes, ecologic design, and design within business) connects with each other in a different way and subsequently differs from the others; therefore getting all the pieces to work together was clearly the goal.

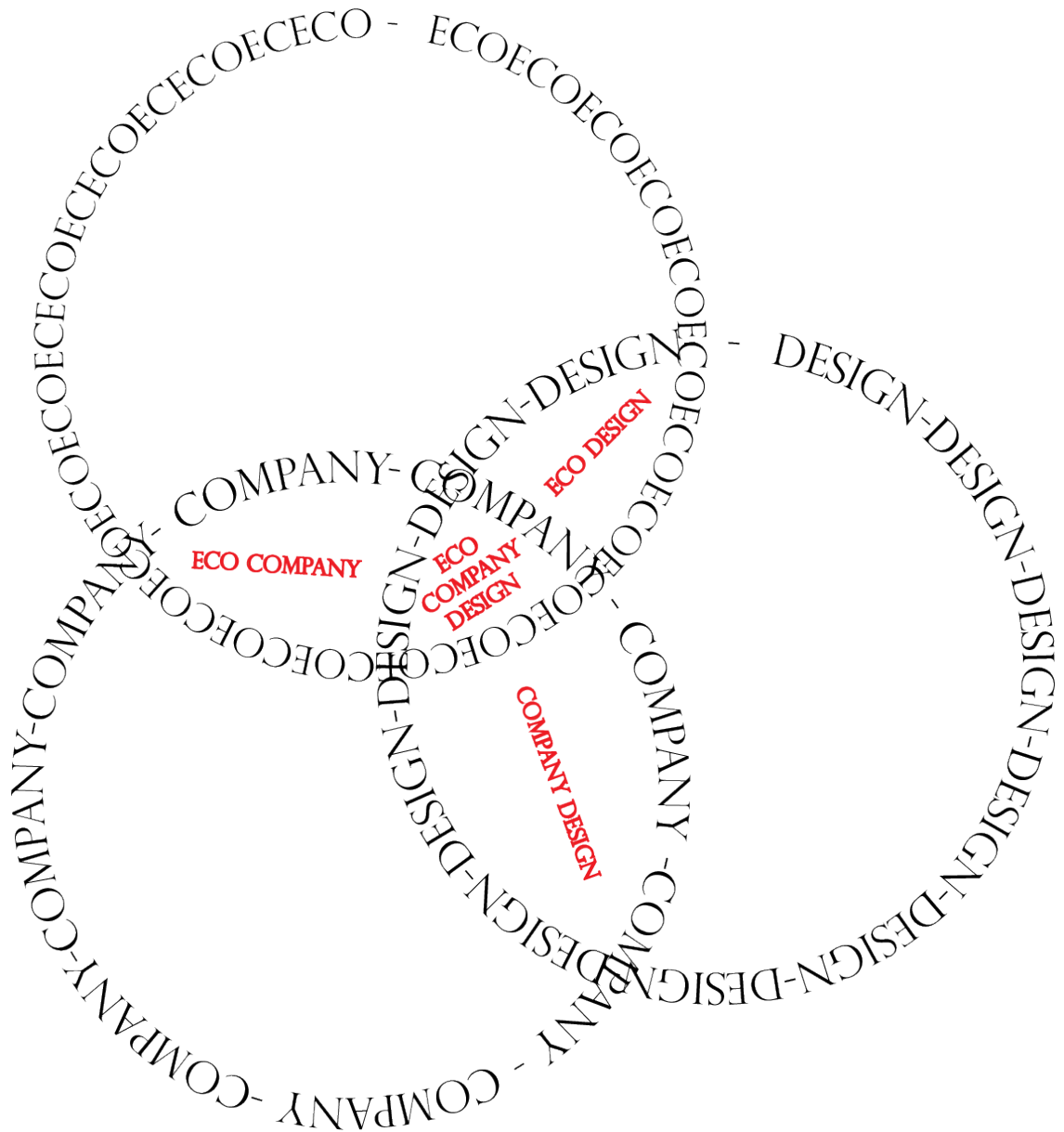


Figure 2 – Different Sectors

The importance of each individual sector is also important to take into consideration. Ecological issues are important to understand and begin living a more ecological lifestyle to ensure a cleaner future. Environmental issues are becoming more relevant and therefore more companies need to start adapting to different ecological methods.

Companies by themselves are important because nothing would work or run without them. Companies are what produce the products that we as consumers buy. When companies start to use ecological methods, the overall consumption

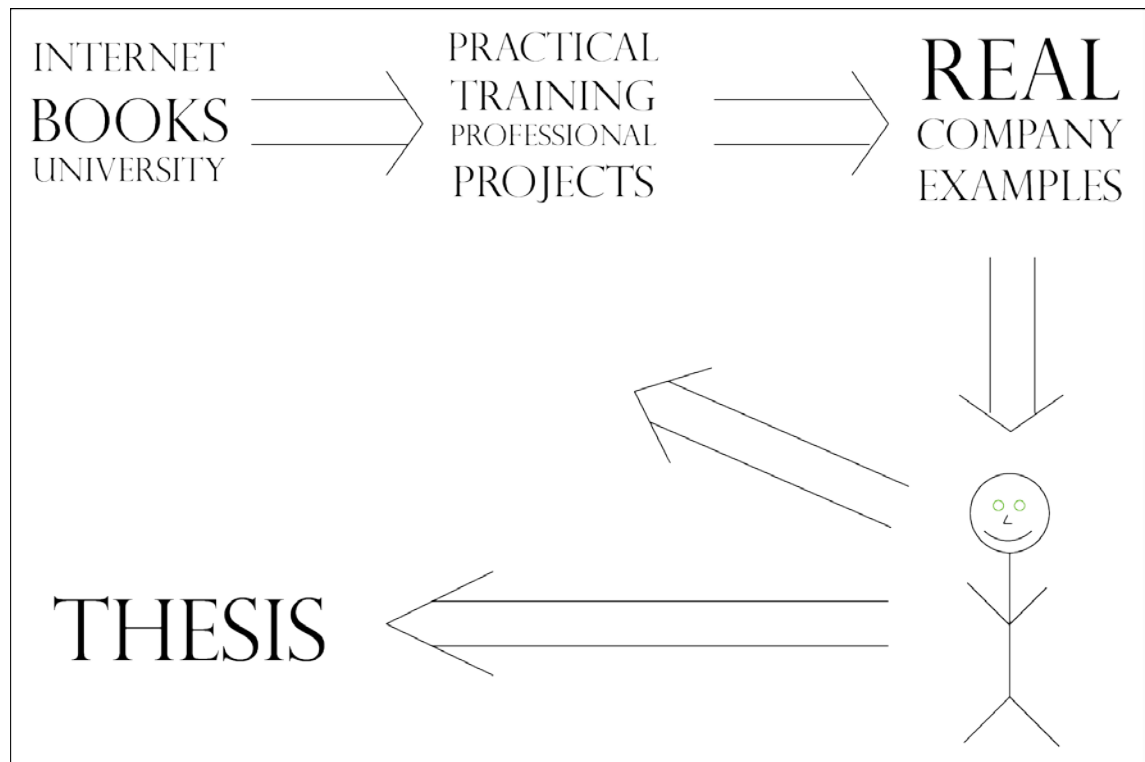
of products and workload will be influenced by those decisions. Because of this it is important to emphasize the importance of ecological thinking and working in different companies.

Design as a whole influences the process. If design is looked at from an ecological standpoint, different thinking methods and outcomes will come from future products. Companies using design can benefit because they are using the strategies gained from business and use design as a selling point.

Being able to connect each section to other sections and in the end all together is vastly important and beneficial for a more greener future.

2.3 Visual Context

The working process (Figure 3) shows what information was gathered and how it fit into my thesis. The first stages were general knowledge acquired from University that was combined with the information gathered from the Internet or from source material found in books. This information was then compared and challenged by my own work placement dealing with ecological design for a café as well as my professional projects I worked on for university. After this process was completed I searched for companies that are successfully using these different ecological design elements in their own work. Comparing how these companies are successful in these different fields allows one to use concrete examples how these elements will work and have been proven. All of this information was then evaluated and analyzed through myself and converged into the thesis.



Picture 3 – Working Process

2.4 Benefits

The main benefits of ecological design is using ecological ideals will overall benefit the environment and planet around us. Having green ideas and utilizing them in the most efficient way possible will have a lasting impression on the world and will ultimately create a healthier and happier surrounding. However, in addition to the natural benefits, there is plenty of business sense to change to a more ecological approach.

Being able to utilize the marketable elements of using EcoDesign has improved business for many companies. Having labels, certificates and information on how a company has been green can ultimately bring more business to the company. As consumers become smarter and more knowledgeable about different options, most will choose a more eco-friendly one.

2.5 Government Involvement

Changes in legislation and new bills have brought out an overall change within the world and it requires companies to take a different approach to their manufacturing worldwide. There are all different kinds of bills, ranging from local to international ones that ensure companies are becoming more “green”. Within Europe, the European Union (EU) has their own ecological standards compared to the United States.

In Germany, manufactures are required to and responsible for the packaging used in their products that they are safely and appropriately recycled – even going so far as to having some companies required to recover and dispose of their packaging in an ecological manner (Hendrickson, et al. 1999). The Netherlands and France also have government agencies that aid in fostering clean technologies (Hendrickson, et al. 1999).

There are immense benefits to using ecological design and products over traditional wasteful ones, and not all of them are as recognized as others.

3. ECOLOGICAL DESIGN ELEMENTS

3.1 Design

Design is the first part of a products life. It is in this phase that everything is determined. What the product will look like, what materials will be used, how it will be produced, where it will go to be sold and what is the end use. The designer has the hardest part of the life cycle of a product, as well as the most important. The designer has the power to dictate the path a product will take. If the designer is aware of all the different paths (as well as the life-cycle of a product) he/she will be able to influence so much in the products affects in the environment.

The main benefit for a company using a designer who knows the methods and ideas of ecological design means the company will have an expert who can aid in the future development as well as informing them what needs to be done. By using a designer who is knowledgeable allows the company to start off the entire product process ecologically. This helps with all the further sections by being able to connect and realize which sections will be the best area to focus towards green aspects.

The main way a company can achieve this is simply by hiring a designer who specializes in ecological design or is prone to working with ecological materials. Another way to work it out is to have someone on the team within the company who begins focusing on the ecological elements and begins to incorporate them into the future products.

One of the best ways to showcase having sustainable products is to get them certified. One of the most recognized and respected certifications is the Scientific Certification System, or CSC. The easiest way to access the information is to visit their website (Scientific Certification System 2012).

There are many design companies and independent designers who are solely an ecological design company. The online website (Living Principles 2012) has a fantastic set up showcasing different designs and companies that have and do ecological design. The entire website is dedicated to showing how and where green design can be done.

Another main focus in any company is websites. A company cannot survive in this day and age without a website. And one of the main ecological aspects of this is to choose a web host whose energy is green. Some of the best web hosting sites that rely on green power are: Host Gator (Host Gator 2012) which relies on wind power for their energy; Ecological Hosting (Ecological Hosting 2012) which hosts using renewable energy; and a company that uses wind power is Green Geeks (Green Geeks 2012).

3.2 Materials

Materials within design are one of the most important factors in having an ecological product. The materials in a product affect so much of the products overall life. It determines how the product will be made, if it will be sustainable and will it be able to be recycled. By evaluating different materials and what their effects on the environment are, it is easier to choose what kinds of materials to use in the future. Each of the examples as well has negative and positive consequences, so using these materials alone requires some effort in making it "green".

Plastic is one of the most used materials in products throughout the world. It is everywhere, mainly landfills. With technology advancing, it is becoming easier to recycle plastic and reuse it. It is still however very hard if not impossible to deteriorate and become a benign material after its use. The only option to make plastic green is to use it again or make something new out of it.

Recycling plastic has become one of the main feats to overcome in green design and with new innovations it is becoming more apparent in new designs and products. There are companies that solely design from recycled plastic and

also mix recycled plastics with natural materials to create something completely new.

An innovative company that has used recycled plastic and has made new products is Patagonia. Their product use post consumer recycled plastic bottles and converts it into outdoor clothing. They were the first company to ever do this.



Figure 4 – Patagonia recycling process. (Patagonia 2012)

Fabric is one of the most important elements in every day use for consumers. Everyone wears clothes – which have to be made from different fabrics. Within fabrics there are various amounts of different types: wool, cotton, nylon, polyester - from natural to synthetic. Each of these has a different ecological factor, i.e. how they are made and processed and how many chemicals are used to produce different garments.

For companies whose production is related to fabrics, 100% cotton products have started to become the most ecologically friendly and sustainable. They are also easy to handle and reuse.

In the United States alone, annually 11.9 tons of clothes, shoes and textiles are thrown away into landfills (Patagonia 2012). Not only does Patagonia use recycled materials in creating their own products, they also have an international initiative to reduce, repair, reuse and recycle them. Patagonia has since 2005 taken back (that users have recycled back to them) 45 tons of

clothing and have created more than 34 tons of new products; the rest is recycled in an ecological manner.

A company that uses the combination of recycled plastic and fabrics is Eco Spun. They mix recycled plastic fibers with polyester fibers and create different fleece fabrics (Eco Spun 2012).

Fruit of the Loom Lady Fit Micro Fleece Jacket



Fruit of the Loom Micro Fleece Jacket



Jerzees HydraPlus 2000 Jacket



Jerzees Ladies HydraPlus 2000 Jacket



Figure 5 – EcoSpun (2012) fleece jacket that are made from recycled plastic bottles.

An average consumer from the United States used 660lbs (300kg) of paper a year, which is roughly 12,000 sheets a year (Poole, B. 2006). An average mid-sized university in the United States uses more than a million sheets of bond

and letterhead a month. The United States is one of the leading users of paper, as well as leading in waste production. The USA is only 5% of the entire world population, but they devour and produce more than 1/3 of the paper in the world (Poole 2006). Paper however is one of the easiest materials to recycle or to reuse. Design companies have begun to use recycled paper more frequently and with more success. Also, recycling spots are more common for paper than any other material.

There have been many discussions on the growing negative and positive connotations on the use of paper versus electronic devices. Many argue that recycled paper products are much greener than any electronic reading devices. The amount of electricity used to keep the devices charged, compared to the amount of energy it takes to make one book, for example, leads the argument for printing being more ecological. If one takes into consideration the amount of books an e-reader is capable of holding, the argument shifts to the e-reader being much more green due to the growing power of the batteries within the devices, requiring fewer charges.

A site that lists companies that takes in and uses paper and fibers and recycles them is DMOZ (2012).

Wood is one of the most organic materials, and has the most ecological benefits. Wood products have less production waste and use fewer chemicals in the end process. Further in the reading, under Recycling & Reusability, an example of how wood as a material is processed and used in an ecological way is demonstrated. There is a detailed guide how Karelia-Upofloors uses wood in their products.

The main goal for selecting materials can be chosen by using a method described by Gaedel and Allenby (1995):

- Choose non-toxic materials
- Choose materials that are renewable and close to nature.
- Have as little different materials in one product as possible
- Choose materials that can easily be recycled

By using these simple methods, less waste and more eco friendly products will emerge.

3.3 Production & Logistics

Production is a key factor in ecological design. This phase is one of the most important in ecological design. If a product is not produced ecologically, the production phase can and does affect the environment the most.

Production includes so many subsections, including waste. Ecological design has been around for quite some time, but only recently has it been the focus of mass media, especially with the knowledge of greenhouse gasses and global warming being a hot topic. It is also becoming much more important to use ecological design because of depleting resources and growing landfills polluting the environment. Surprisingly, about 90% of all waste from a product is created during the phases before the end user even gets it (McAloone & Bey 2011). This includes everything from the design, raw materials, other materials, manufacturing, logistics and selling. Because so much waste is created during the production phase of a product, many companies have dumped their waste in the most opportune way possible, not thinking of the consequences of their actions. This waste could be easily avoided with some alternatives during the production phase (Hendrickson et al. 1999).

Solvent substitution: This is where some of the more toxic components are transferred with less benign options. These can include non-toxic, water based, biodegradable and organic based solvents.

Changes in technology: This is one of the widest areas where waste can be altered. There are so many different options to product energy and still be profitable. Many companies have started to utilize the labels that showcase the use of less energy in their (electrical) products, such as “Energy Star”, which can be seen in products ranging from heating,

cooling, plumbing, electronics, building products and appliances. To see all the different products that are certified with the Energy Star label, go to their website (Energy Star 2012).

Recycling of toxic waste: This one is going back to the main source of waste, which is useless material – this refers even to a product that was once used and useful but whose purpose ends, when its need does. Thus, it turns to waste. Many companies have started campaigns to take in old products and they will safely recycle or get rid of the products with less negative impacts than just throwing the product into the bin. There are great places to find electronic recycling areas: in the USA, Earth 911 (2012) helps one locate an approved recycling centre close to home; in Finland Gigantti (2012) will take old electronic devices and do the same thing.

The largest challenge is for companies to start using less harmful techniques to produce their products and for end users to find alternative locations to recycle products that once were not able to be recycled. Being eco-friendly is not only to reduce the waste of the end product, but also to save raw materials.

A great example of a company that used ecological thinking in their production phase is LEGO (Figure 6). They started early in making sustainable and reliable products. Even though LEGO products are made from plastic, the companies' production philosophy is exactly what ecological design is all about. All the products which are meant for the North American market are all produced in the USA and distributed from there. In Europe the manufacturing is done in Denmark, the place it originated from. They do not produce any of their toys in Asia, and logistics and carbon emissions as well as lower energy use to get the products to their end destination.

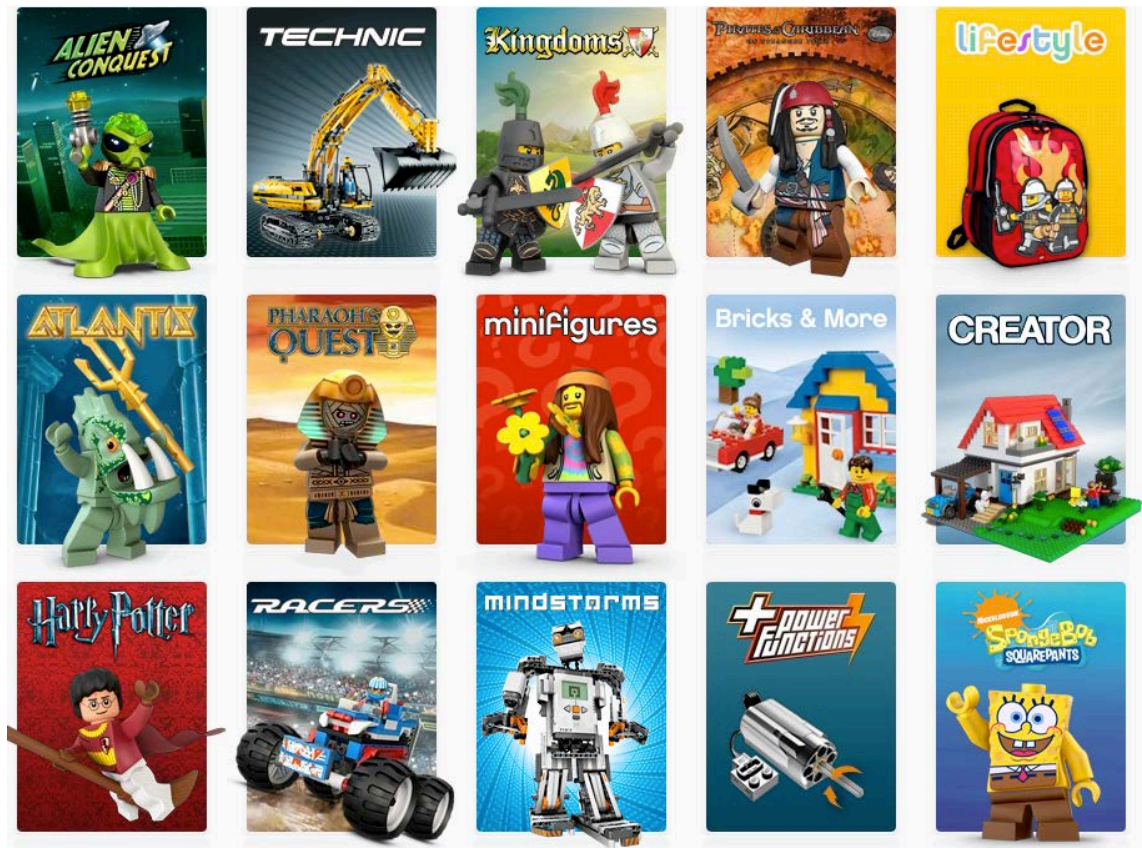


Figure 6 – A portion of LEGO's (2012) products and production line.

Logistics overall is very un-ecological. However, as with LEGO, the way logistics is managed and utilized it can lessen the effects it causes. By shipping products that closer to the manufacturing plants and end user, the logistics become greener.

3.4 Recycling & Reusability

A key to understanding how a product can be reused or recycled is thinking about its full life cycle. Sometimes the overall picture also has to be considered when trying to become more eco-friendly. The production of a product, for example building insulation can help reduce the cost of heating in a home, but during manufacturing and installation the amount of toxins released in the air is substantially higher than the amount saved in energy costs (Hendrickson, et al.

1999). That is why it is so complicated to define any product as green because every aspect from design to end-use has to be thought out.

Because these elements have to start early on, the designer of new products has to be very conscious of these factors. Having more elements to think about will ultimately affect the design process. Being able to utilize all of the different stages in a products life cycle will ultimately make a better designer. As an example of a simple process, which is ecological of making parquet floors, Karelia-Upofloors Oy (2011) made a promotional video showing the process what it takes to make their product and the life cycle is explained below:

- Tree growing in the forest (takes carbon – created oxygen) X years
- Harvested by Karelia-Upofloor Oy.
- It is cut down
- Trimmed
- Shipped with a truck to the manufacturer
- Machines are used to:
 - take off: bark & the first layer of wood
 - cut into: planks, strips, parquet, wood chips.
- Separate pieces taken to different locations
- Lacquered/painted
- Dried
- Packaged (use of waste with plastic wrap & plastic cord to hold during shipping)
- Shipped to shops
- Stored in shops
- Sold in the shop
- Shipped to the owner (either the company ships with their car, or owner takes home with own)
- Used
- Old – turned to waste or either reused as firewood or reassembled in another room. Some even turn into waste.

3.5 Eco Myths

When being ecologically conscious, there are many things that have to be more important than it being ecological. There are many products that when the end use is compromised, there has to be an agreement that safety, health, and long term problems that might arise are more important to think of than the “green” aspect of the product. Even though it is important and new ideas and methods are definitely the ideal, compromising any of those things is definitely not acceptable. For example, if creating more fuel-efficient vehicles causes the manufacturer to use lighter materials, such as aluminum or plastic, instead of steel, how much does the safety of driving become hindered, compared to using old methods (Hendrickson et al. 1999). The safety of the person driving or the passengers in the vehicle is more important than the fuel-efficiency. When thinking of using different fuel types we can take steps solving the problem without compromising the safety of the vehicle.

One must also take into consideration the different green options. For example, a bus is more eco-friendly than a car, but if the bus only has one passenger, than the car is more eco-friendly. The option of being able to walk, bike, or skate instead of taking any vehicle is the ultimate green choice (Hendrickson et al. 1999).

4. ECOLOGICAL DESIGN PROJECTS FOR BEST RYE

4.1 Introduction

During a six month internship at Best Rye LLC. I was able to use ecological elements and help the company design and visualize a future space for their café. Best Rye operates currently as a home bakery and wished to use my work and open a physical space outside from home to launch their products. I was working on the visual work as well as the furniture and product design for inside the café.

Best Rye is an all-organic rye bread bakery. They make three different types of rye bread, all made with 100% organic rye flour. They also produce traditional Karelian Pies (karjalanpiirakka in Finnish). Their main goal is to make healthy and good products that not only are healthy, but taste amazing.

I worked on two main projects in ecological design. Both of these helped me tremendously in this thesis. The first focused on the visual elements of the company, including the website, business cards and other visual content. The second project focused on the furniture and other decorations going into the café.

4.2 Visual Framework

Working for Best Rye allowed me to use a variety of ecological design elements to benefit my thesis work. Starting from the consultation with the business owner, the importance of ecological methods became instant. Starting the designs was the first step in starting the project.

Designing the business card (Figure 7), logo (Figure 8), and the website (Figure 9) was the main focus in the beginning. Using 100% recycled materials for the printing of the business cards was essential. Vistaprint was the ideal company to use for the business cards due to their ecological efforts and their option of having full recycled paper, not just mixed material printing (where normal stock and recycled paper are mixed together). The coherency of the business card allows for easy marketing and connecting the previously designed logo and allows for the customer to connect with the seller via email or their website.



Figure 7 – Business card for Best Rye.



Figure 8 – Logo for Best Rye.

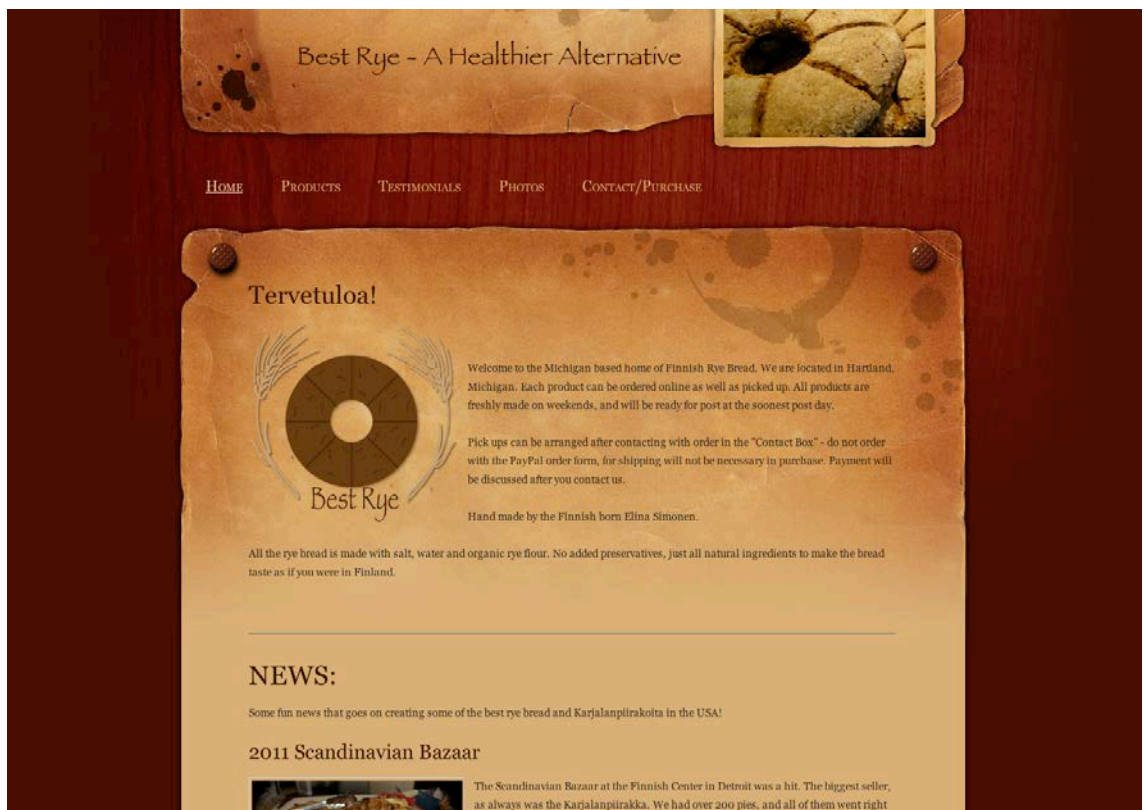


Figure 9 – Home page for Best Rye (2012).

The second phase was connecting everything together with producing and shipping the products. Because the business started as a home bakery, much of the work was done at home. Because the café had not opened, operating from home was limited to weekends and occasional weeknights. Having a set day or two, where all the baking was made allowed for energy consumption, because all the work was done at the same time. If each individual order would have been carried out individually and done separate days, the waste amount would also heighten. Shipping the products was also essential to do in sets. The amount of each product had been measured and calculated to have the most amount of product in one shipping container – therefore allowing less waste with multiple shipping boxes and allowing the customer to get their moneys worth. House pick ups were also encouraged, which lessened postage waste and logistics as well as benefitted the customer by receiving fresher products than what would have been if the product would have been shipped first.



Figure 10 – Image of two different rye breads made at Best Rye.

Due to financial difficulties in the beginning, an actual space for the café could not be bought or rented. Therefore all the designs and ideas were theory-based and could be used at a later date if correct funding was found. Therefore the rest of the work practice was spent marketing and helping sell the products from a home-bakery aspect. However, throughout the working process all the ecological design elements explained earlier were presented and used as a launching point if a space would be found.

4.3 Furniture Design

My second project centered around designing ecological products and furniture for the Best Rye Café. Due to the fact the space was not found, most of the designs were as well left in a design phase. The main focus was using a variety of mixed materials, where a portion of the product would be using recycled- and the rest new material that could be recycled or reused in the end.



Figure 11 – Image of a 3D rendered recycled cork chair (also a version from books is made).

The main project included creating furniture out of old books and magazines. The design included food related books being bought from second hand shops to using old cook books that were not in use any more and creating a coffee table from it. Using hardcover books was the foundation of the tabletop and using wood as a raw material for the legs that could be recycled or used afterward was essential. The idea behind the cookbooks would be that customers would have the opportunity to look through them as they were sitting at it. It would benefit in multiple ways, being a solid foundation for a coffee table as well as entertainment for the guests.



Figure 12 – Image of a 3D rendered recycled cork board.

The overall goal was achieved and the work done was greatly appreciated and helpful to Best Rye and they hope to be able to use my work when they open their café.

Looking at the original visual framework for the thesis (Figure2), Best Rye showcased the different sectors of ecological design for small businesses ideally. The company itself was already functioning and using ecological thinking methods, such as using organic raw materials for all their rye bread. The company then utilized that philosophy and when wishing to expand into a full bakery, they wanted all the design elements to be ecological as well. Having a set ideology and using a designer to work with ecological methods as well as using the history of the company to create a lasting and beneficial end goal was fully showcased.

5. EVALUATION

Overall this thesis was interesting but testing. The topic itself interests me greatly, which allowed me to find information and read through much research. Getting started was more difficult as the topic was so broad and trying to get a clear topic to focus on was challenging to pin point in the beginning. Once the clear topic of ecological design for small businesses, and how they can benefit from it became clear, it became much easier to research and focus on a clear idea.

The aim was to create a guide as well as an informative thesis on what companies can use to use if they are creating a new business or wanting to update their current situation into a more ecological manner. Starting out with the research was a solid base to begin with and then utilizing my personal experiences with the work done at Best Rye allowed for the topics to connect and give real life examples. Finding companies that used these methods was a clear path to show how businesses have already successfully managed and benefited from different ecological design methods.

After these different sectors were evaluated, it was clear how these examples would co-operate with the research done. This would create the notion of the guide for the reader. After reading what and how ecological methods are done, the reader can see how other companies have maintained their business using the methods and then the reader can utilize this information and use it himself or herself.

The end product was a clear outline of different examples and is overall a simple guide that can aid small companies. The thesis turned out as I had hoped and is a benefit for all readers, even if they are not in companies, because many of the topics can be used for any person or design company.

Throughout this process I was able to grasp the overall understanding and knowledge to ecological design and the benefits they showcase. The benefits of having a knowledgeable designer have become more important for companies,

because their work and use of ecological elements will undoubtedly influence and benefit the future design work. Their benefits also include allowing for a talented designer to influence a traditional working atmosphere to become more ecologically conscious and help slow down the decay of the world.

6. CONCLUSION

This was my first thesis I had ever written and it was very challenging in the beginning because I had no concept of how and what to do. I had worked on previous research papers, which helped me understand how the basic principal of the thesis should be outlined. Working on such a large piece did feel overwhelming at times and was challenging to focus on one section at a time. After getting a good rhythm and a sense of how each piece works together and is necessary, it became easier to work and fit everything together.

Time management was also slightly challenging in the beginning. Getting overwhelmed with such a project was interesting and a first experience for myself, so trying to organize and get everything done in time was interesting and a lot of work figuring out.

The purpose of this thesis was to showcase why and how ecological issues are needed and important. The guide aims at helping companies have easily defined sections that can aid them in the process of becoming more ecological as well as showcasing the importance of the topic.

The benefits that were achieved from this thesis included gained knowledge for myself as well as substantial aid for future companies wanting to be more ecological.

The overall experience was beneficial. I learned a lot from this and also have many things to consider when beginning a new project. The experience of working on this thesis was challenging but overall rewarding.

7. TABLE OF CONTENT

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