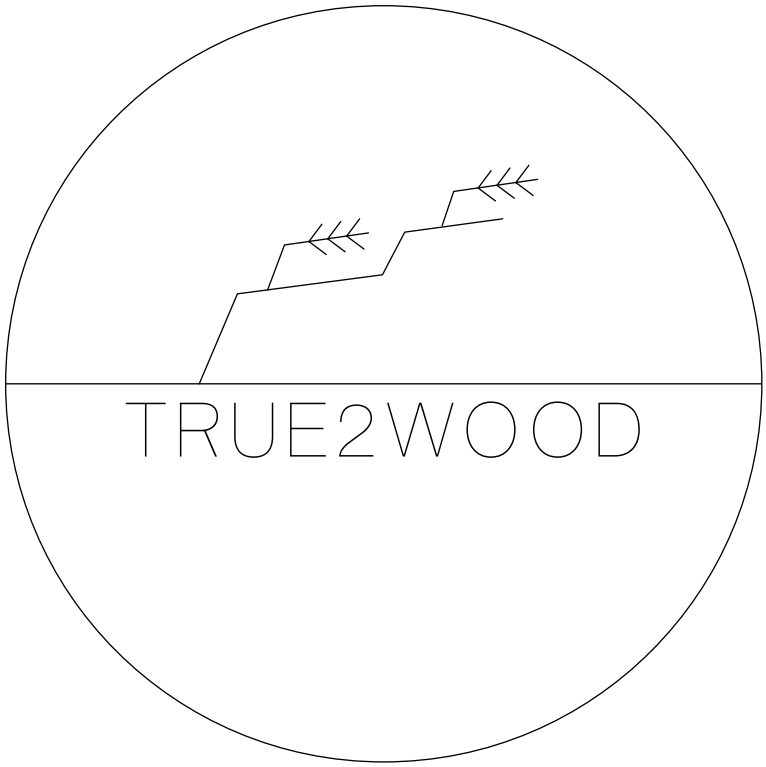

a stick2nature project

process report
master thesis
spring 2015

MSc04ID group 8

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INDUSTRIAL DESIGN
AALBORG UNIVERSITY

TITLE PAGE

TITLE	TRUE2WOOD - a stick2nature project
PROJECT THEME	Furniture from mountain pine
STUDY PROGRAMME	Master thesis
PROJECT PERIOD	01.02.2015 - 27.05.2015
PROJECT GROUP	MScID8
COMPANY COOPERATIONS	
PROJECT CLIENT	
MAIN SUPERVISOR	Kaare Eriksen, Department of Architecture, Design and Media Technology, Aalborg University
SECONDARY SUPERVISOR	Poul Henrik Kyvsgaard Hansen, Department of Mechanical and Manufacturing Engineering, Aalborg University
APPENDIX	
PRINTING : PROCESS REPORT	
PRINTING : PRODUCT REPORT	
NUMBER OF PAGES : PROCESS REPORT	75
NUMBER OF PAGES : PRODUCT REPORT	21

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ABSTRACT

The report is a result of a cooperation with stick-2nature which is an ongoing project. The main objective is to utilize mountain pine from National Park Thy.

The challenge of this project is to create a furniture line that uses the natural curves of the trees. Additionally, a design DNA is developed as well as production methods to comprehend the curvature from the mountain pine and simultaneously include local educational facilities and businesses in the process. The vision of the stick2nature project is to aspire to both social and economic growth in Thy and is supported by business plans and branding from this master thesis.

READING GUIDE

The project is conveyed and explained through three parts: a process report that explains the development and conclusion derived from experiments of the project, a product report conveying the products and their features and an appendix where the experiments and deductions are documented.

The process report is build in sections, each marked with a number, so it is possible for the reader to track the process. Furthermore, the process report is not in cronological order. Instead the reader is presented with the details and information in the order they are used. This means i.e. an interview can performed early in the concept development, but first documentet later on, when the information is used.

The sketches in the process report has been resketched to provide the reader with an easier reading of the process by not having to have focus on the different sketching styles in the project team, but on the concepts at hand. The original sketches is presented in the appendix.

> *Aspects found through the process is added to the project framing, design parameters or similar, are highlighted in separate boxes like this.*

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0 INTRODUCTION

PROJECT CONTEXT

The stick2nature project is initiated in the Thy area in order to promote welfare, economy and growth in the area.

One of the stick2nature challenges is to utilize mountain pine and roving materials in National Park Thy (NPT) in correlation with nature preservation in the park.
In order to create and improve a sustainable environment for the rare species of both animals and plants in the park, NPT decided to eliminate a large number of mountain pine. Mountain pine is an invasive and self-seeding tree planted in order to control the sand drift and preserve the dunes. This specific tree species was chosen as they are hardy and can handle the unique North Atlantic climate present in the area. However today, the sand drift is no longer a threat to the area and the trees are therefore no longer needed.
Seen in a qualitative perspective, mountain pine is not regarded as useful in carpentry because of it's properties and is currently being chopped into wood chips.

The region of Thy is located in the North Western part of Denmark. The area of Thy has a long history of cultural and geological changes. Along the coastline a unique nature has formed which today is preserved and known as National Park Thy. Through history the area has provided extreme difficult living conditions for inhabitants. Due to sand drift and bare landscape dominated by dunes, agriculture has been difficult and one of the only available ways to sustain a reasonable life has been by fishing. Even today the area is growing with difficulty and statistically belongs to the lower middleclass areas of Denmark.

These conditions create a unique habitat for different plants and animals, which only lives in this region. At the same time it creates a hostile environment for the residents.

Combined with the natural material gained from NPT, the mission of the stick2nature project to involve the local manufacturers and benefit the social economy is also taken into account. The vision is to create a supply chain based in the community, which should result in materials being harvested, processed, built, and sold from the local area in and around NPT. This will benefit the involved parties and support a development and growth both commercially and socially in the Thy area.

The primary actors are; 1) NPT, which will provide the natural resources; 2) Elmelunden; a local social economic business who will harvest the resources; 3) local manufactures and craftsmen who can produce the products; and 4) the design team, who will be responsible for creating designs that can fit into this specific supply chain.

Sand migration is believed to have influenced poverty in the area around NPT: the steady migration has caused increasing parts of the fields to be covered by sand. Consequently crops have been destroyed. Therefore the larger farms had to move further in to the country, and every time, money has been lost. Throughout generations the moor has been frowned upon however the gathering of the community to support the moor at a National Park has turned the view on the area as something to be proud of.

Today Thy is classified as the outskirts of the country. This means the economy is below average as well as the growth in local business and population is very slow. During this project it is attempted to use the local human resources and business resources to evolve and grow the area. By including the local population and industries in a project it both produces goodwill towards the community and creates ownership that makes the involved parties more engaged in making the project succeed. [visit, 2015], [Knakken 2006]

PROJECT INITIATIVE : THORBJOERN

Stick2nature is a sustainability project that is initiated in Thy by Thorbjoern Stenholm. He is a visionary promotor taking in hand several challenges from the community in order to establish economic growth in the area as well as nature preservation in National Park Thy.
He has established contact between National Park Thy, the working community, traders, industries and the habitants of Thy. Furthermore there has been created positive awareness towards stick2nature and the NPT.

Additionally an opportunity is created to utilize the large amount of mountain pine that is in need of being disposed off from the NPT as well as other available materials, i.e. lyme grass and bee's wax, found in the park. Furthermore the local businesses are brought into the project by having them cooperate with stick2nature, with their food- and non-food products and create work and work places in Thy.

Prior this project, other projects has already been started such as a natural drying process of the wood, with the stations placed in the national park. Another project that is initiated is a categorization tool formed as an app which should be used to measure the curvatures of the mountain pine and log them to know which kind of curvatures that is in stock and the amount of it.
One of the links still missing in the project is the designers who are going to design stick2nature products, produced from rowing materials and manufactured by local companies, to create an income to the project and the stakeholders.

THE ROLE OF THE PROJECT TEAM

In this master thesis, the objective is to design stick2nature products from the mountain pine and have the properties and features of this unique wood type guide the aesthetics of the products to create a direct link to the unique and wild nature in National Park Thy. The second aspect to the development of the products is the corporation with the local companies that will produce the products. These companies will first of all be carpenters to produce the mountain pine and provide the products with craftsmanship. As the third aspect a business plan will be made to brand and market the products to provide revenue and thereby strengthen the area.

The project team is regarded as designers in the project and is hierarchically equal to the other businesses present in the projects. The top in the organizational structure is stick2nature. The organization is thought to consist of clusters of local businesses sharing experience and knowledge and in that way, create a strong network in the area. For this to happen, stick2nature is in need of some basic rules, which the whole organisation to follow, in order to get a streamlined vision across the organization. The project team is creating overall dogma rules for this purpose. Furthermore a set of demands and wishes are created, concerning only the project team.

METHODOLOGIES

SHARED UNDERSTANDING

The project is initiated bt creating a shared understaning throughout the project team. First, the shared understanding is created by collecting data on the background for the stick2nature project and the involved partners. This data is condensed to a shared vision and mission for the project team.
As the process progresses, the shared understanding is staged through metaphoric sketching, in relation to an interaction vision for the furniture series, to illustrate which kind of feeling the furniture should make the user experience.

PROBLEM BASED LEARNING

The method used is based on a theory where it is identified what you know and which problems is to solved. Subsequently the unknown factors are identified as well as how to reach a solution fitting the stated problem through an active learning process.
Allthough, the project is a continuation of an already initiated project, this master thesis is approached as problem based as a problem is provided from stick2nature. The task of the project team is then to come up with a solution to the given problem for stick2nature to include in their project.

Insights into the problem is collected during the start of the this project to capture the essence of stick2nature and the problem that they are facing in relation to designing furniture from curved mountain pine from NPT.

INTEGRATED DESIGN

Integrated design is a method, where several aspects are incorporated in one design solution to obtain a holistic design approach.

The project meets the purpose of: 1) utilization in a sustainable manner of leftover-wood, 2) incorporation of local communities, 3) strengthening the growth of the community, 4) including socially challenged businesses and 5) Designing furniture that relates to Scandinavian Design Tradion. By taking all these aspects into account, the project is leaning toward a solution that benefits the problem stated and the aspects which are included.

The design process is primarily based on a scientific, iterative and holistic practice. When iterating, the team tested and tried different proposals, analyzing the results and further refined and improved the details, while keeping the holistic parameter in mind. By using a holistic approach, the team ensures that the needs and demands are regarded as a unity above various parts. The holistic process is characterized by the solution taking all the requirements of the project into account by accommodating both the physical and psychological needs of actors, stakeholders and customers.

BUSINESS METHODS

Apart from identifying the problem and create an integrated plausible solution through product design, the team also needed to take the business aspects into consideration as the revenue/investments in the project are dependent of selling the project.

To obtain a plausible plan, the Business Model Canvas [Osterwalder 2010] is used in combination with the Value Proposition Design [Osterwalder 2014] combined with the People Value Canvas [Wildevuur 2013]. These models provides an insight to which customer, selling platforms and image proposition will create the most value towards the stick2natur project as well as the customer. In addition the canvasses also provides tools to identify the customers and where to connect with them.

Besides the canvasses, A market analysis provided prior to the project start, is analysed and used toward finding the actors to be involve in the project. A scientific approach is used in order to analyse and determine which image and brand the team desired for the product and by finding trades possessed by others in order to lean towards these.

PROJECT MANAGEMENT

Fragments of the Scrum method are used in this project. Scrum consists of a team, where different roles are delegated to team members; project owner, the development team, and a scrum master, and furthermore daily meetings to plan 24 hours ahead, and the sprint, where milestones are planed together with the objectives of each of them. [Schwaber 2013]

Due the size of this project team, the roles has not been utilized, but there has been an attempt to plan the sprint and have meetings to plan which kind of tasks to be made and who the responsible should be. In the process of incorporating Scrum a visual board is made to have a shared alignment of tasks during the project.

1 IDENTIFYING THE PROJECT

Prior to the project start, the team is provided with some knowledge about the project stick2nature and its origin in Thy. Furthermore, a market analysis [Market Analysis 2014] is made for stick2nature to uncover the stick2nature furniture potential. A fieldtrip to Thy is also arranged as a kickstart to the project, where the goal is to gain information about stick2nature, its background as a sustainability project, and the stakeholders who are involved. Also the trip expected to provide insights on the interests from the stakeholders, actors in the project as well as the expectations towards the project team.

For clarification additional subjects are researched such as Scandinavian design tradition in relation to aesthetics and the provided market analysis. Furthermore, additional research is conducted about mountain pine, wood in general and blue stain as it is a major concern in relation to utilization of the wood.

In essence, the initial research is performed to frame the project and demands for the project team and furthermore potential dogma rules made for the stick2nature sustainability project in Thy.

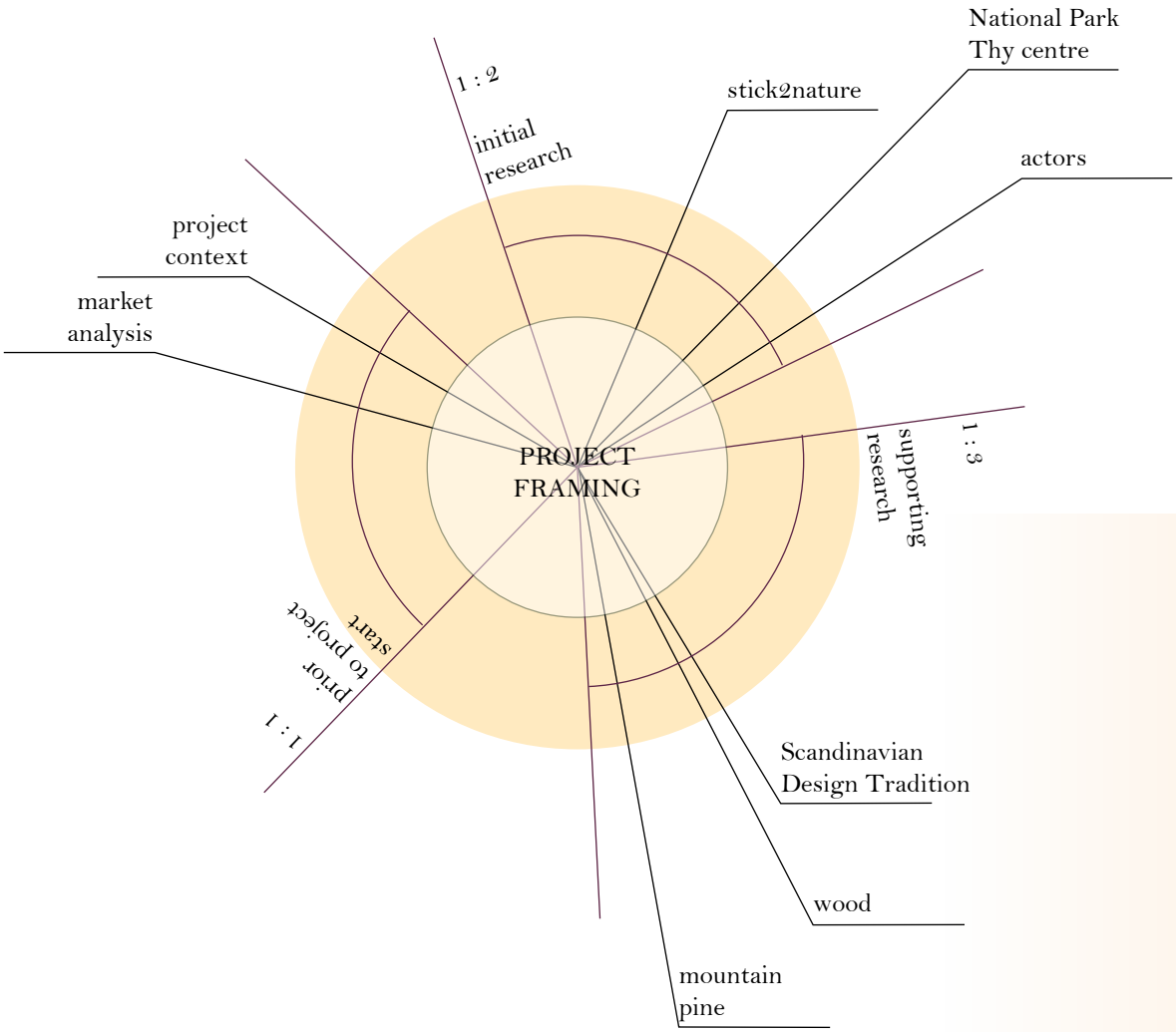
1.1 PRIOR TO THE PROJECT

MARKET ANALYSIS

Prior to the project, the team receives a market analysis commissioned by stick2nature and performed by Thy Erhvervsforum along with a light introduction to the stick2nature project. Participating in the analysis is a group of Danish furniture retailers and magazines of different size and placement in the Danish market as well as in foreign countries. The participants are informed with background knowledge: the furniture should be made of mountain pine, the uniqueness of it, and the reason for utilizing the material from NPT. Furthermore, they are informed that the furniture will be designed with a Nordic design tradition and that the furniture will not be related to traditional pine furniture.
The analysis reveals positivity towards stick2nature furniture as long as Scandinavian design features, such as fair-, and light-weightness, is present in the designs as well as carpentry craftsmanship.

"'New Nordic' er ikke bare mad, det er også en stor interesse for træ-træ-træ uanset sort og farve. Men der skal være dét der nordiske touch af noget let, lysfuldt og svævende. Interesse, også internationalt, har aldrig været større!" – Bo Bedre [Market analysis 2014]

"Markedet har aldrig før været mere hot på snedkerhåndværk, unika og nytolkninger af den klassiske Wegner-Mogensen-stil." – Bo Bedre [Market analysis 2014]



ill. 1: Project Framing - an illustration concerning different aspects that is to be incorporated in the project.

Another feature that should be present in the design is the storytelling. This will add an additional value to the products that are unique for stick2nature and differentiate the products from the ones that are currently on the market.

"Jeg tror på, at der er en niche her, hvor historie og naturpark går op med godt og usædvanligt design." – Vodskov Bolighus [Market Analysis 2014]

There also exists some concerns towards the furniture. However, the success of the furniture is depedent not only of the uniqueness of the origin of the wood but also good design.

"Alt afhænger af veldesignede og spændende producter. Det med det særlige træ, certifikationer og logoer kommer i anden række." – BoConcept

[Market analysis 2014]

Further in the design process, the team's design demands will be aligned with the input from the market analysis in order to meet the market by having the features of well designed Scandinavian furniture containing craftsmanship, lightweight- and fairness principles, to ensure it is incorporated in the final design proposal

1 : 2
INITIAL RESEARCH

THE STICK2NATURE PROJECT

The field trip starts by visiting Thorbjoern Stenholm who has initiated the sustainability project stick2nature in Thy. As an introduction he is referring to the product types that is expected of stick2nature, which is a product line consisting of food and nonfood products. All of these products can be certified as NPT products and additionally the wood products can also be FSC certified [FSC 2015]. Three lines of nonfood products are proposed; furniture, souvenirs, and industrial usage. Of these, the project team will be involved in the design of furniture and souvenirs as well as creating a business plan for the products to strengthen economic growth in the community.

A set of dogma rules needs to be established as a guideline to all stick2nature actors including the design team. Furthermore clusters, of people and companies, that is being established in the community has the role of creating openings for possibilities in terms of production methods, experience and knowledge sharing. [visit 2015]

The main focus in the nonfood department is mountain pine, which usually is seen as nonusable wood for furniture. However, the design team will attemt to change this point of view. The products should be designed as an industrial design that can be manufactures in the amount of 100 pieces. A walk through the national park during the field trip visualised the mountain pine and the challenges followed by the huge amount of mountain pine that causes hard living conditions for some plant and animal species. Furthermore Thorbjoern provided knowledge of the properties of the mountain pine. Its curvature is regarded as one of the essential properties of the pine along with its strength, that makes the mountain pine a unique wood type and differentiates it from ordinary pine. Another problem that is presented is the occurrence of blue stain present in the wood sap, which leaves dark gray/blueish marks in the wood.

Ill.2 : Curved mountain pine

Ill.3 : Curved mountain pine

NATIONAL PARK THY CENTRE

During the visit to the National Park Thy Secretary it is announced that a centre is going to be built in the park area to promote and teach the idea of being close to nature which is enhanced by placing the building within a sand dune that is reaching in to the small city Nørre Vorupør.
The NPT Centre will serve as a learning and experience facility with the NPT as the main theme. The centre will provide possibility of involving the local facilities surrounding the centre. As an example guests can eat at the center if a cooperation with the the local fish monger and smokehouse is established. Furthermore the centre will function as a shop selling certified NPT products.
It is planned that the centre is built within the next two years. [visit, 2015]

1:2

Ill.4 : Location of National Park Thy Centre (in black) in Nr. Vorupør

Ill.5 : Sawmill at Elmelund

Ill.6 : Cut planks, Elmelund

Ill.7 : &woodlab

ACTORS

Elmelund is a social economy business, having an educational facility for mentally challenged young people, who is given an early retirement, teaching them to how to have and maintain a job and helping them perform everyday tasks. One of the activities that the students are involved in is lumbering of the mountain pine as it is impossible to get machinery to the locations. Therefore Elmelunden has become a natural part of this master thesis, in accordance with the stick2nature concept of using labour. From stick2natures view it is imagined to have Elmelund involved in the value chain in the master project. [Visit 2015]

As well as Elmelund as a social economy business other companies are included. One of them is &woodlab and is visited during the trip to Thy. &woodlab is a newly upstarted cabinetmaker company owned by Mathias Hedal who has experience with working with mountain pine. The visit resulted in a proposition of usage of the workshop. Furthermore Mathias Hedal offered consultation in order to obtain a coherence and validity of the products that is to be designed, the usage of mountain pine, and the production methods.

It has to be taken into consideration, not to make the tasks too advanced, in order to have them performed by Elmelunden.

Using Elmelunden also contributes to the storytelling of the product as an emphasis of the social responsibility.

SUPPLY CHAIN AND ACTORS

Key Partners are listed in Business Model Canvas [Osterwalder 2010], in order to create an overview. The canvas is summarized and explained later along with the business plan. Local manufacturers refer to potential businesses that can assist in production with CNC-milling of the wood.

UCN (University College Nordjylland) is *-marked due to the ongoing tests concerning drying wood in ventilated containers and developing an app that can 3D-scan the curvature of the mountain pine. [stick2nature 2015] This is mentioned later on in the production part, as this is part of potential process innovation.

The supply chain visualize the path the wood travels through. From lumbering, drying, cutting into planks, gluing, CNC milling, assembly of the chair, sale and at last ending up in the customer home.

The key activities are chosen based on supporting the local community. It is decided that Elmelunden is going to lumber the wood as well as manufacture as much of the needed product as possible. It is derived into the framing that the production method for processing the commodities should be as simple as possible in order to assigning this task to Elmelunden. Gluing and CNC cutting are performed at a local manufacturer and the assembly is to be done by local capentry (&Woodlab). The sales channels are proposed to be as the NPT Centre and specified retailers.

KEY PARTNERSHIP

National Park Thy
Elmelund
&Woodlab

Local manufactures
UCN**
NPT Center
Specified retailers

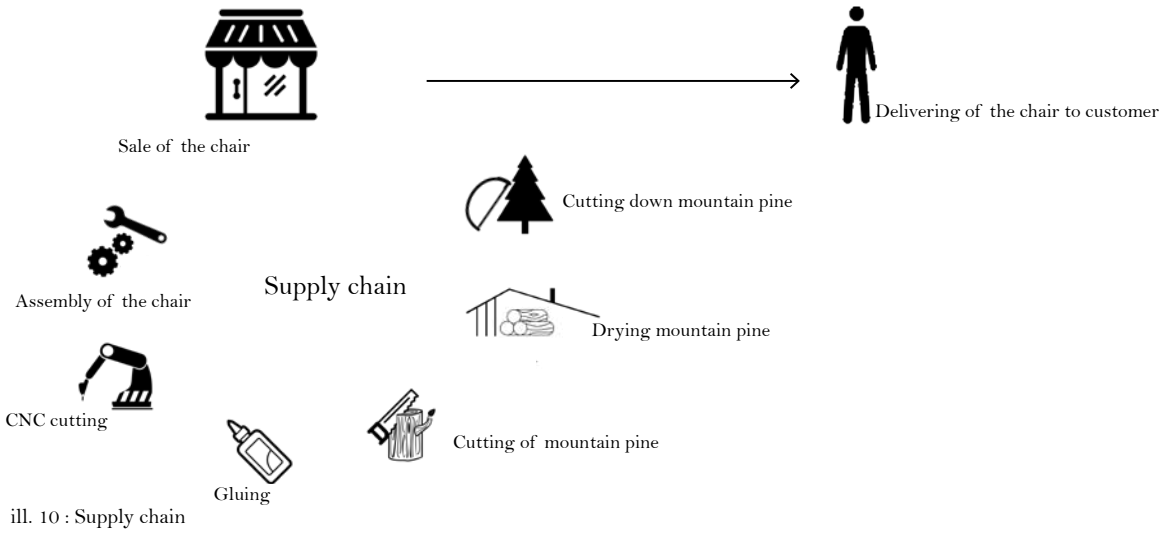
ill. 8: Key partnership

KEY ACTIVITIES

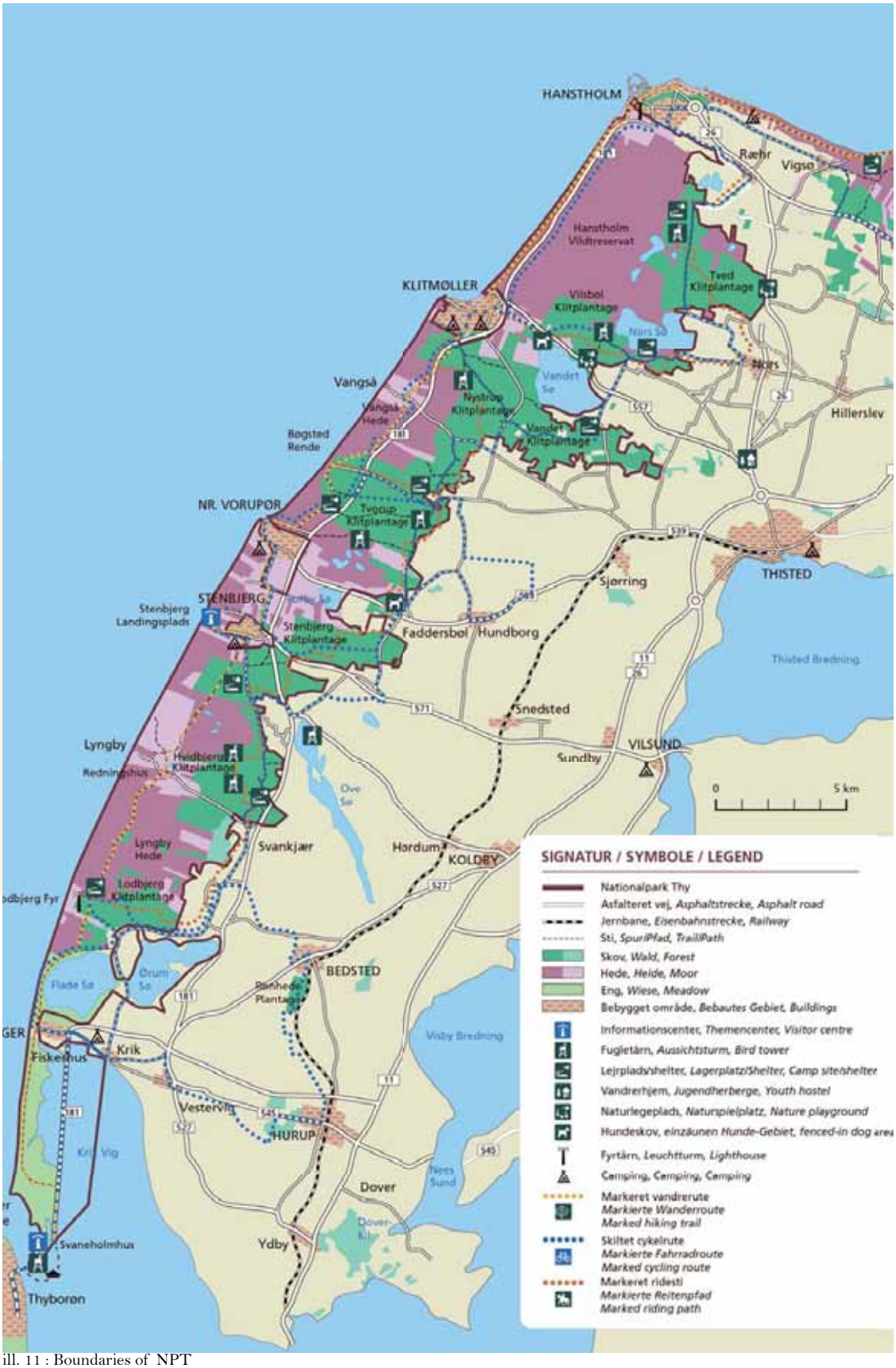
Lumbering
Producing parts for both chair and lamp
Assembling chair

Drying wood**
Scanning curves**

ill. 9: Key activities



ill. 10 : Supply chain



ill. 11 : Boundaries of NPT

1 . 3 SUPPORTING RESEARCH

SCANDINAVIAN DESIGN TRADITION

The demands of the project framing is based on the principals on Scandinavian Design. The research will enlighten the ideals of Scandinavian design and the origin of industrial design as well as the aesthetic and materials used in the products. Additionally, the use of pine in the 1980's popular furniture and how it is used in Finland, will be researched as it has value to the later design process and the handling of pine as a construction material for furniture.

IDEALS OF SCANDINAVIAN DESIGN

Product design and the environmental influence on product development take its origin in the movements in the 19th century with the poet and artist William Morris (1834-1896) who moved against the whole industrialization in England. In his designs he incorporated the craftsmanship, which was missing in the industrial production, but still maintaining the serial production within furniture, textiles, wallpaper and books. With that he created the word *manufacturing*. He moved against the consequences that the industrialization brought to the environment and social groups by creating awareness to the responsibilities that are related to the production methods as well as establishing welfare in the community. [Eriksen 2003]

Stick2nature is seeking to establish the same ideals as William Morris, where local resources, both materials and human, and companies is being utilized to create wealth and welfare and the community.
Scandinavian design has a connection to William Morris as well as it origins in craftsmanship and design. The foundation of Scandinavian design is a social ideal and an idea of improving quality of life through appropriate and cheap products and technologies. [Eriksen, 2003]

SCANDINAVIAN DESIGN AESTHETICS

In the beginning 1950's when exhibitions as "Design in Scandinavia" toured in USA and Canada, the expression, Scandinavian Design, became wellknown to the world. Traditionally, Scandinavian designers aim to produce cheap, beautiful, functional and useful products for homes. Often, the aesthetical aspect often is related to modernism. The principals of modernism are to reach the highest possible balance between shape, function, color, texture, durability and costs to create a democratic design solution. Additionally, the human or the user is prioritized, instead of the machine, not to have the products seem alienating towards the user.
Often the aesthetics of Scandinavian design is seen as a combination of an artistic form and a practical function to reach an emotional enjoyment and enrich the daily life rather than a status symbol. Additionally, the beauty should be unpretentious. [Fiell 2002] Also, the light, and fairness, rawness and simplicity are the modern trades of Scandinavian Design aesthetics, knows as New Nordic.

UNIQUE SELLING PROPOSITIONS

There are different aspects to the design that completes the profile of the furniture.
By utilizing the curves from the NPT mountain pine and by using local manufacturers, a unique furniture story is created. Furthermore, the aspects of Scandinavian Design tradition is applied and combined with craftmanship. These aspects are condensed into Unique Selling Propositions (USP) which are the primary values that are conveyed through the product towards potential customer segments. [Entrepeneur 2014]
The USPs are condensed to be:

- Every piece is unique
- Geographical unique tree
- Craftmanship detailing

THE MATERIALS

Traditionally, the Northern countries have had a deep esteem for the comfort of the home as well as the respect for nature. In general, the Scandinavians has an unique understanding of nature and especially, the inherent properties of the raw materials found in the local nature.[Fiell 2002]

Throughout the history, different materials have been used, in Scandinavian design: tree, steel, leather and fabrics. The usage of specific materials is in general grounded in the history of society. For example, Cuba mahogany ran out in 1942 thereby forcing carpenters to use other material as other types of mahogany, teak and rosewood. In the 1950's the furniture industry started by working together with carpenters in order to create furniture of high quality. In this decade, the combination of wood and steel was starting to gain ground and the primarily wood types was teak and oak. This led to the use of fair wood that got popular in the 1960's. However, still pine was not popular probably due to the wood properties. [Hansen 2003]

1.3

PINE FURNITURE TRADITION OF 1980'S

In the 1980's pine tree furniture was popular to own, but due to its transformation over time with the wood turning yellow and the often heavy look, the furniture is no longer that popular and as one of the companies stated in the market analysis; stick2nature should be careful to use the term "pine furniture". [Market Analysis 2014]

The taget of the stick2nature project is to display the quality and natural beauty found specifically in the mountain pine. Furthermore, the object is to make a renaissance pine furniture by making it attractive in mordern society.

Furthermore Finnish design are investigated as both the pine is a highly accessible material in Finland and, therefore, used in multiple products and due to the world known design tradition origined in the northern country. As the result of the research turns out to be indifferent compared to the information already gathered and unable to provide new aspects, it is discarded.

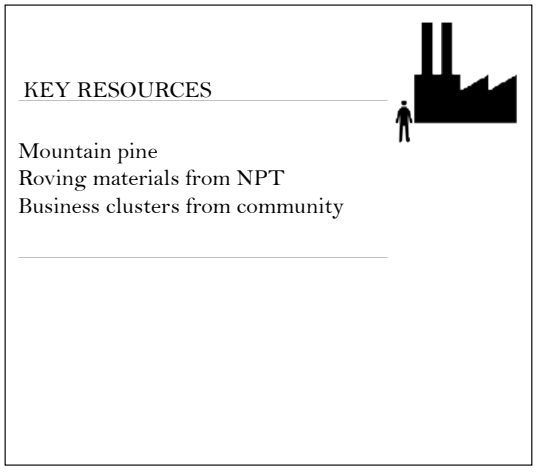
HOW THE TRADITIONS ARE APPLIED

Scandinavian design tradition is applied in the project as a guiding parameter. The ideals of Scandinavian design match the ideals of stick2nature in relations to welfare and growth in communities. Furthermore a market analysis, made by stick2nature prior to the project, showed that stick2nature furniture is likely to be sold if the aesthetics would lean against the aesthetic parameters of Scandinavian design with its fairness, weightlessness and the clear references to craftsmanship traditions in Scandinavia.

The Scandinavian design tradition will also be utilized as a tool for differentiation, so the stick2nature furniture will differ in the range of design classics and modern Scandinavian designs.

KEY RESOURCES

The key resources are, naturally, the mountain pine and also roving materials from the NPT, in terms of potential treatment with beeswax, rope from lymegrass and other solutions that might present themselves.
Furthermore other resources count as experience and capacity from the business clusters. The local manufacturers possesses both experience and knowhow along with machinery and skilled labour that benefits the project and therefore, they are regarded as a great resource for the project.



ill. 12 : Key Resources

ABOUT WOOD

In order to work with wood basic knowledge is crucial. Therefore, the litterature is studied. Furthermore, knowledge is gathered under the research trip to Thy.

The tree trunk parts are subdivided into different categories. The most important being sapwood and heartwood. The sapwood is where the water transport is taking place and is an active part of the tree whereas the heartwood is an inactive part and is old nonfunctional sapwood.[Thomassen 2003]

Furthermore, there are stored dyes, pigments, resins or gums in the heartwood. [Skolesløjd, 1981] In order to use wood in for example furniture production it has to be dried in order to ensure that the wood does not expand or split. The drying percentages should be approximately the same as the surrounding humidity percentages. [Thomassen 2003]

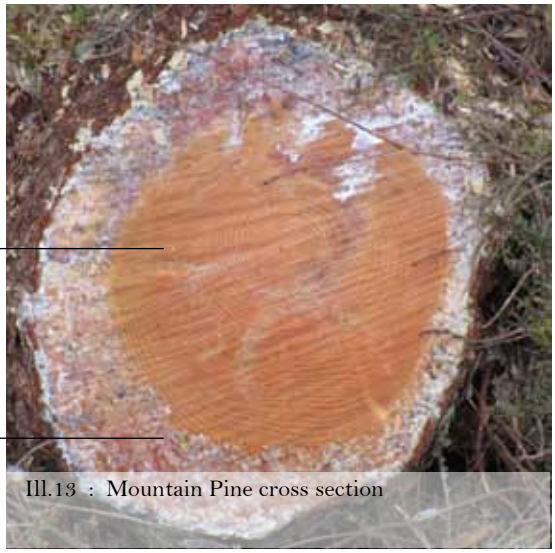
Different drying methods exists. If drying ovens are used it is possible to control the humidity in the wood and the percentages can come down to zero, furthermore, the oven method is quicker than air drying. [Thomassen 2003] Because of the price and availability of drying ovens, instead, the tree from NPT is stored in large containers with a ventilation system. This can dry the wood as good as an oven, is less expensive but takes a longer period of drying time.

Currently, an experiment is conducted by UCN and stick2nature concerning the drying of wood. Large ventilated containers are placed in the NPT containing wood in an attempt to minimize energy waste and reduce costs. The downside of this method is the time consumed before the wood is usable.

MOUNTAIN PINE

In general coniferous is conidered soft wood. Mountain pine is usually, not used as furniture timber. Therefore, the wood is mainly used for fiber pulp, chipboard and excelsior. Even though it is not often used in furniture production, the wood has good qualities. [Risør 2003]

The mountain pine from NPT is exposed to hard wind and extreme weather which influences the end wood by having sand incorporated in the wood. The consequence is that the tools used with the wood are wearing down quicker. Furthermore, the West Wind influences the trees by bending them and therefore numerous degrees of curvatures are created. Another influence of the weather is the close placement of the growth rings which is strengthening the mountain pine that is lumbered in NPT by making it more dense.
Blue stain is often found in the mountain pine and has especially, from carpenters, been seen as aesthetic flaw, and they would therefore not use it. [visit 2015]



Ill.13 : Mountain Pine cross section

FRAMING

As a result of the field trip to visit Thy, the involved and the stick2nature project, a subject is selected. The selection is based on insights provided from the stakeholders and additionally, the necessities presented in relation to stick2nature, NPT and the ideals which the project is based.

Furthermore, demands are derived from the knowledge of Scandinavian Design tradition as well from the comments stated in the market analysis.

The guide setting parameters is a setup as a combination of: dogma rules which are desired from stick2nature as a common guideline for the whole project and demands which are only applicable to this project and is created from the wishes of the stakeholders and the ideals of stick2nature and furthermore, from the ideals of Scandinavian design tradition.

2 : 1 PROJECT FRAMING

SUBJECT SELECTION

The subject is concerning a series of nonfood stick2nature products with the aim of having the products produced from 100% roving materials from NPT to keep the possibility of having the products certified as NPT products. The designed stick2nature series will be a furniture line which will based on the craftsmanship and carpentry. Furthermore, the NPT Centre is going to be a part of the value chain and be one of the places to have the products displayed along with the other stick-2nature products.

The material, which will be in focus, is mountain pine that is found in an area of 30.000 square km (estimated 500.000 pine trees) in the park and needs to be disposed in the most profitable way to enhance living conditions for some of the rare species. Additionally, mountain pine has a range of intere[Visit 2015]sting features such as: variety of curvatures, blue stain, resistance to the weather and sand engraved into the structure of the wood.

The story of the area is an important part of stick-2nature products and is the main aspect of branding as the products are going to be high-end Scandinavian design according to the market analysis. Therefore the incorporation of the mountain pine becomes important to differentiate this furniture

series from the products currently market.

The feature that mainly will create the opportunity to differentiate is the variation in the curvature of the mountain pine as it will guide the shape of the furniture. Secondly, the blue stain could be used as a design feature as it is, normally, banished from Scandinavian design.

As it is impossible to get to the location of the trees with the usual machinery, Elmelund is tasked with the lumbering of the trees. Additionally, it is imagined that Elmelund can apply some treatments to the finished product. To provide the project with craftsmanship, a local carpenter, &Woodlab, is consulted. The carpenter provide knowledge when the products is being designed as well as help to create models and prototypes. When the products are designed it will be decided which local business that is able to perform the production, dependent on the proposed production method.

DOGMA RULES

The project is involving several actors why a set of dogma rules are proposed in order to align expectations and processes to the stick2nature vison. The dogma rules are setup to keep the products within the same framing and make sure that they do not deviate from the storytelling. Additionally, the rules are to be used as the stick2nature DNA, from which the products should be designed and is based on the assets and materials available in the area.

The dogma rules are suggestions from the team and are aimed at all actors in the stick2nature project. The suggestions so far, are made so it is possible to comply whether a producer is food or nonfood products.

DEMANDS

Both dogma rules and demands are set up as general guidelines, which could be used in any project, and then described in the stick2nature context.
Besides the dogma rules which should apply to all actors involved in the project, the team needed to specify a scope that could frame the specific projects product line. As it is decided to design and produce furniture, the dogma rules can not provide a specific framing but are more in line with an overall framing. If the designed furniture should convey the values brought from the unique nature of NPT, a more strict and describing scope must be used.

From actors, dogma rules, desired expressions and values a list of demands is deduced. The demands are directly addressing the team's prerequisites for designing pieces of furniture that meets the desired features such as including and benefitting social economy, only using roving materials and using local businesses for production and sale, while supported by the Scandinavian Design tradition.

The project team derives a vision and a mission from the researched aspects in line with the stick2nature project and desired outcome of the project.

VISION 1.0

2.1

Strengthen National Park Thy and the local network by supporting nature conservation and utilizing local human resources.

MISSION 1.0

Creating a furniture series from mountain pine by incorporating natural curves and blue stain and thereby supporting National Park Thy nature conservation.
The aim of the project is to support the local community by involving local human resources and associated community businesses.

PROPOSED STICK2NATURE DOGMA RULES

1 :
Use local found resources
The products should contain at least 80% roving materials

2 :
Local culture and values should be conveyed in the products
The culture and values of Thy should be imaged through the product design

3 :
The project should benefit the local and social economic businesses
Use of facilities such as Elmelund

4 :
The project should enrich growth in the community
Use of established networks in the community

2.1

PROJECT DEMANDS

1 :
True to nature
Primarily use of mountain pine and its natural found strengths,
such as its curvatures, aesthetical and functional

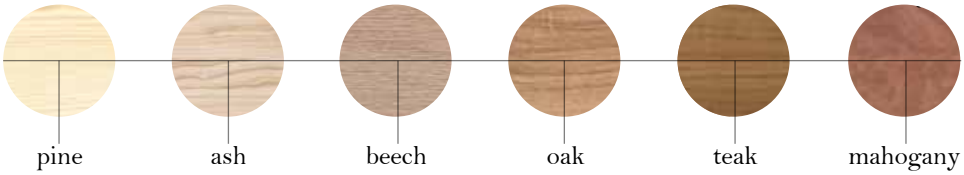
2 :
100% roving materials
The product materials and production process should origin in Thy

3 :
Least viable
Use of the simplest solution and thereby creating an experience

4 :
Scandinavian design tradition
Useof craftsmanship and cabinet maker tradition and the aesthetical
parameters such as fair and light weight in its expression

5 :
Recover the perception of 1980's classical pine furniture tradition
Emphasize fairness and lightweightness in the furniture design

DEFINING LIGHT AND FAIR



Ill.14 : Definition of Fair

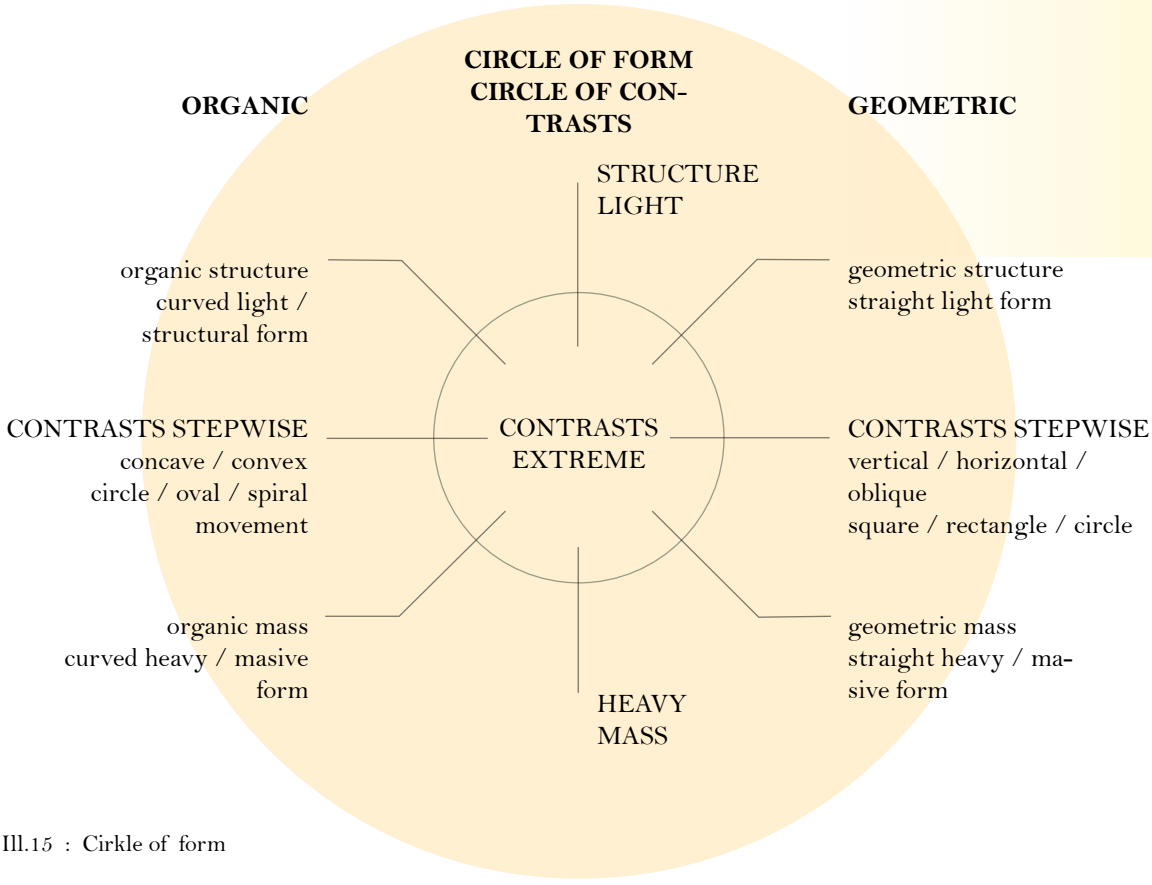
The parameter fair is illustrated above. The scale moves from light wood to darker wood types that are seen in Scandinavian furniture designs. *Fair* is defined by the first three types of wood which appears in it's nature.

As well as the parameter fair is defined, so is light weightness. In order to fullfill the demand of light weightness, creating a definition is needed. Looking at the model below the area of interest is in the top part of the circle.

Additionally, a criteria of creating illusions will enhance the light weightness parameter in relation to designing the shape of the funiture.

The illusions can make the constructions appear as floating allthough a heavy or massive contruction is needed. The illusions by thoughtful use of angles making the objects seem smaller, taller, and even dynamic.
The definition of illusional lightweightlessness is based on a brainstorm session upon the subject.

2.1



Ill.15 : Cirkle of form

3 IDENTIFYING THE FURNITURE SERIES

In this chapter the stick2nature furniture, which are going to be designed by the project team, are defined. Several iterations, sketching and defining the context of the furniture, are made to create two product concepts that match the guiding parameters that are conducted from the initial research. Through the process of defining the series the team has realized that a step back is needed to have products that provide a value both to the NPT Centre and to the home of the customer.

3 . 1 THE INSPIRATION SOURCE

NATIONAL PARK CENTRE AS INSPIRATION

The national park centre is a place where the costumer will be in contact with the stick2nature food and nonfood products. Therefore, the centre is utilized as an inspiration for the ideation on the product series that is to be designed in this project. As the centre is yet to be built and designed, an estimated mapping of the areas has been made to imagine the functionalities of the building. The mapping is made from the information provided from the National Park Thy secretary which was visited during the initial research field trip. The centre will be placed in Nr. Vorupør built into a dune, near the ocean and the local traders. [Visit 2015]

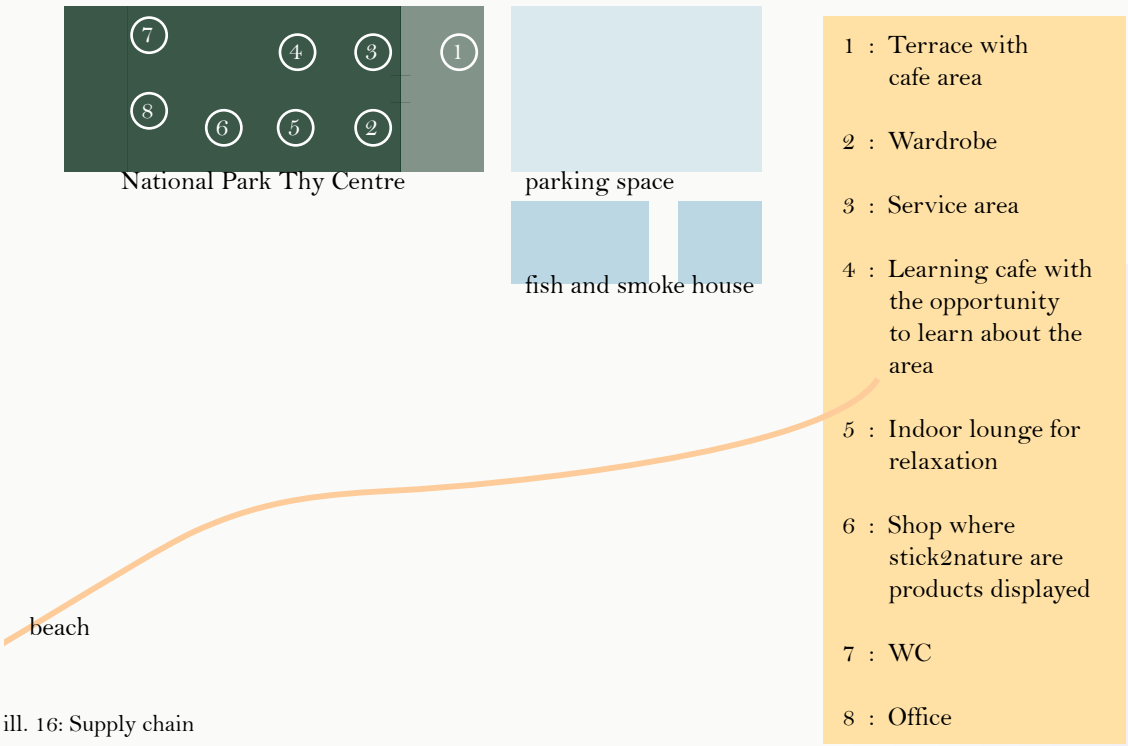
As the centre is yet to be built, the team is looking at similar centres to decide which areas that are going to be planned within the centre. From these areas, an ideation is started.

As the NPT centre is yet to be built, no interior plans are available. The project team decides to estimate a plausible interior plan in order to ideate from the mood and environment to come.[Visit 2015]

From the vision of the future NPT Centre obtained from the visit at the National Park secretariat, the possible mapping and spaces are sketched in the illustration 16.

ESTIMATED INTERIOR PLAN OF THE NATIONAL PARK THY CENTRE

NATIONAL PARK THY CENTRE IN NØRRE VORUPØR



ill. 16: Supply chain

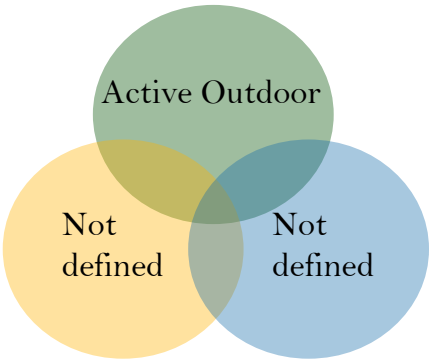
3.1

First in the ideation process the mapping is used to sketch from, but without any real useful result. Areas 1 to 5 are used as inspiration to sketch from, but without any demands of functionalities and needs in the centre. It is therefore hard to select concepts to develop, as everyone of them is useful to some degree. The only way to choose in this part of the process is to choose by interest.

Other methods are then used in the following process to be able to specify demands and values to the products as shown in the following pages.

CUSTOMER SEGMENT

From the NPT Centre visitors, one of the customer segments are derived. The segments are characterized by interest, age, residence and similar factors are not sufficient as they are too versatile to completely describe the segments.



ill. 17: Customer segment

UTILITY ANALYSIS FOR THE NATIONAL PARK THY CENTRE

AREA	UTILIZATION	DEMANDS	PRUDUCTS
TERRACE	a place to be : relaxation : eating : a place to enjoy the sun : a place to plan your visit : lighting	seating for eating and relaxation : placement of things : adjustable : flexible : stabilty : lightning : heating : stacking : resistance toward weather : possibility of information	chair : armchair : table : sunbed : multi functional chair : board : bench : modular furniture : lamp : heating device : blanket : tableware : parasol : windshield
WARDROBE	loading of cloth : placement of cloth and stuff : securing or locking away stuff : seating : opportunity to clean shoes	clothing anchoring : seating : placement of things : cleaning of shoes : locking device : easy to clean : lighting	rack : hall stand : shoe brush : shelf : bench : chair : lockers : empty area : lamp
LEARNING CAFE	seating with tables : exhibition : teaching : a seating for everyone : flexibility	seating : tables : exhibition opportunity : flexibility : reshuffle : lighting	chair : table : bench : shelving unit : desktop : modular furniture : children's furniture : lamp
INDOOR LOUNGE	indoor contact with the outdoor nature : relaxation : breathing space : flexibility	visit spot : seating : placement of things : lighting : privateness : relaxation : calming : flexible	Armchair : rocking chair : coffee table : lamp : lounge chair : folding wall

3.1

ANALYZING THE CENTRE VS. THE HOME

Through a specification and an analysis of the use and drawn needs from both the centre and the home, the utilizations are compared in order to find common denominators. This is to ensure the products can be functional in both settings.

First, the functionalities for the areas is mapped and from these demands are listed, to be able to compare the products into the following process. The demands are based on elements that have to exist to fulfill the functionalities in the areas. Furthermore, the standard products are mapped to see which kind of products that will fit the area and the demands connected to them.

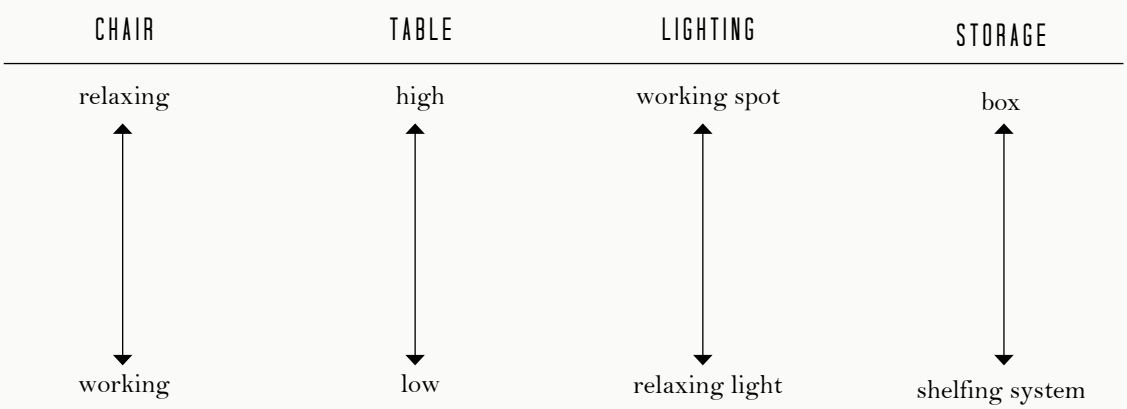
In order to conclude which products and demands that are most essential the subjects are counted to analyze if some products are appearing more than others.

When calculating the occurrence of the needs found both in the home and the centre, the relaxation platform (sitting, lying, sleeping and similar) and storage (table, shelf, coat rack, drawers and similar) prevailed.
Hence, the team continues the ideation leading their focus on these two options.

UTILITY ANALYSIS FOR THE HOME

AREA	UTILIZATION	DEMANDS	PRUDUCTS
TERRACE	a place to be : relaxation : eating : a place to enjoy the sun : lighting : play : grill : get-together : shielding	seating for eating and relaxation : placement of stuff : adjustable : flexible : stability : lighting : heating : stacking : weather resistance : storage : cooking : plants : scalable : sun and wind shield	chair : armchair : table : sunbed : multi functional chair : board : bench : modular furniture : lamp : heating device : blanket : tableware : parasol : windshield
WARDROBE	loading of cloth : placement of cloth and stuff : seating : storage : lightning	clothing anchoring : seating : placement of things : easy to clean : lighting : modulary : adjustable : closed storage	rack : hall stand : shoe brush : shelf : bench : chair : lamp : cabinet : table : drying device : hat shelf : shoe shelf
KITCHEN	cooking : eating : a place to be : rendez-vous : working place : lighting	cooking place : storage : eating place : reshuffle : flexible : easy to clean : lighting : stacking	chair : table : desk : bar chair : kitchen : cabinet : drawer : kitchenware : lamp : modular furniture
LIVING ROOM	relaxation : sleeping : coziness : a place to be : breathing spot : tv watching : lightning : play : get-together	seating : placement of things : lighting : reshuffle : relaxation : calming : flexible : family-friendly	Armchair : rocking chair : coffee table : lamp : lounge chair : storage : shelf : drawer : cabinet : blanket : pillow
BATHROOM	personal cleaning and hygiene : personal care : toilet visit : bathing visit : lighting : storage	storage : easy to clean : running water in toilet, bath, sink : moist resistance : light : placement of stuff	toilet : sink : bath : table : cabinet : drawer : rack shelf : mirror : enclosure : heating device : lamp
BED ROOM	sleeping : relaxation : lighting : darknees : storage	relaxing : calming : sleeping opportunity : lightning : darkening : ergonomical : storage : private	bed : lounge chair : bed table : cabinet : drawer : rocking chair : cradle : lamp : bedroller : folding wall : curtains
OFFICE	seating and work place : storage : hobby : lighting : relaxation : reading spot	structure : seating and work spot : reshuffle : lighting : effective : relaxing : storage	desktop : chair : office chair : shelf unit : drawer : lamp : arm chair : rocking chair

PRODUCT FUNCTION EXTREMES



The model above visualizes the aspects the team needed to take into account during the concept framing. It lists the extremes and thereby reveals the possible compositions to convey the desired values of the found options.

3.1 By taking the extremes into account it is now possible to ensure that relaxation parameters are meet in the means of a clarification on which aspects in the design to follow and which to avoid.

FOR THE AREA DEMANDS

a relaxing platform

modular furniture

somewhere to place stuff

cocking

lighting

made to withstand the environmental factors

CHOOSING THE RELAXING PLATFORM

The relaxing platform is chosen due to the mood and setting the products designed should emit. The decision is primarily based on the numbers of appearance on the demand list from the analysis. From this and the amount of repetition, the relaxation chairs are selected. To support the desired atmosphere, lighting is also selected. The storage product seems to be uncompatible or even indifferent and is therefore discarded at this point.

The relaxed feeling is found in the centre's indoor lounge area as well in the terrace and furthermore in the living room, bed room and terrace of the home.

3 . 2
TWO TYPES OF PRODUCTS

THE TWO TYPES OF PRODUCTS

The team is now focused on a relaxation furniture and a light that can support the feeling visitors get when visiting the NPT Centre and the NPT. It is then investigated which types of user that are potential customers, visiting the NPT and NPT centre.

With the customer in mind two types of product sizes are chosen. As shown in the matrix the customers who will be visiting the centre are mainly tourists and locals who are enjoying the NPT and during their trip they visits the NPT Centre.

In a matrix it is considered which kind of transportation the customers are using when visiting the NPT and the NPT Centre.
One type of the costumers is likely to be transported in some kind of car and for the locals a van could be a possible transportation option when purchasing the stick2nature products. For another type of customer it is more likely for them to visit the centre by bike, foot or public transportation. When they purchase the product they should be able to carry it in a kind of backpack.

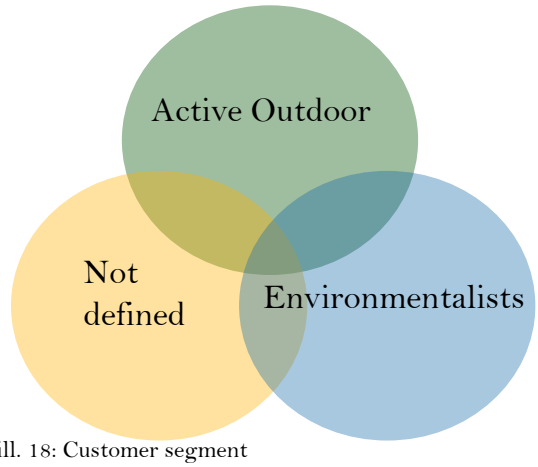
From that the team derived two sizes of products: one that fits in a van and one that fits in a backpack. For the small type of product it could be possible to have an object that can be assembled by the costumer so the product can fit a small space when carried home.
The large product should be bought in the state it is displayed in and should be ready to use as it is, meaning no assembly is needed. It should also be taken into account that it should be furniture produced by carpenters and related to the Scandinavian craftsmanship tradition.

For both of the products it should be possible to order due to the lack of space that some tourists suffer from. Due to these criteria it is decided that the relaxation chair should be sold assembled and therefore be the large item while the lamp should be able to be transported in a small space and therefore be a kit.

The chair is assembled when bought whereas the lamp is bought as a kit.
This is due to the transportation of the products where the lamp can be something tourists or visitors can buy and take home right away.

CUSTOMER SEGMENTS

Another customer segment is identified.
Based on the relaxation focus, promotion of nature preservation and at the same time, the opportunity to have a piece of unique nature at home, the environmentalists are found. The customer segments are based on interests and the environmentalists are driven by the urge to support nature preservation and environmental improving actions.
The furniture will function as a kind of trophy, constantly, reminding the owner of the "feel good" created by "helping" the nature.



ill. 18: Customer segment

DEFINING THE SIZES

In order to defining the size of the two stick2nature products a research is conducted to identify an average size for backpacks and bicycle bags and additionally, for a car's trunk. The outcome is going to be two different sizes, in order to have measurements for both the chair and the lamp when the products are bought.
Through an internet research the sizes has been found: three different sizes for every product.

Size research for the lamp:

Size for backpacks:	Size for bicycle bags:
50*39*15,5 cm	42*32*17 cm
45*27*25 cm	12*30*30 cm
72*32*28 cm	43*36*15 cm

The size that is decided to a maximum for the lamp in the buying situation is 12*30*30 cm, because it is the smallest and therefore it ensures that as many tourists as possible are able to transport the lamp.

Size for car trunks:
The cars that have been chosen are three different vans because these are the most obviously used vehicles for both professional carrier companies and general population moving furniture. The reason for also chosing transport by carrier companys is,that tourists buying the product will have their trunks filled with lugage.

VW Transporter:
Cargo volume 9,3m3
Ford Transit:
Cargo volume 15,1m3
Mercedes Sprinter:
Cargo volume 17m3

In the situation of transporting the chair the minimum of the space the chair could be placed in is 9,3 m3.

*The lamp should be able to fit into a 12*12*30cm box*

3.2

DEFINITION OF BIG VS. SMALL PRODUCTS

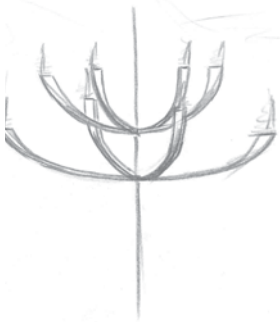
	SMALL	BIG
WHO : Persons who visits the NATIONAL PARK THY	TOURISTS : Persons from Denmark and other countries	TOURISTS : People from Denmark and other countries
CENTRE	LOCAL PEOPLE	LOCAL POEPLE
TRANSPORTATION	WALKING / CYCLING / PUBLIC TRANSPORTATION	CAR / VAN
SIZING :	SHOULD BE POSSIBLE TO FIT IN A BACKPACK	SHOULD BE POSSIBLE TO FIT A VAN
STATE WHEN BUYING	PRODUCT NEEDS ASSEMBLY	PRODUCT IS READY TO USE
ORDERING	POSSIBLE TO ORDER	POSSIBLE TO ORDER

3 . 3
PRODUCT IDEATIONS

IDEATION 1

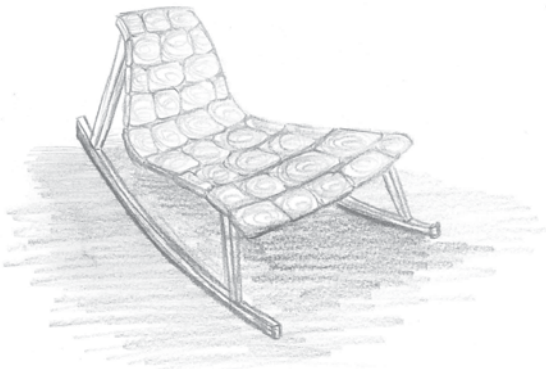
Sketches from earlier ideations are revisited in order to ideate further with the new size of boundaries. The sketches found are explaning principles and functionalities as well as meeting the demand of the desired utilization of the curvatures from the mountain pine.

Ill 19: Table lamp \\ Lamellae



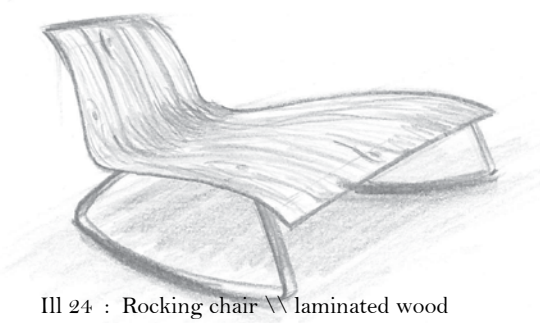
Ill 20: Chandelier \\ click on

Ill 21 : Chandelier \\ rope pull \\ enlargement

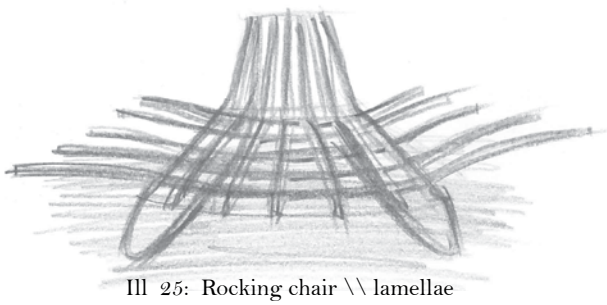


Ill 22 : Rocking chair \\ mosaic

Ill 23 : Ball \\ Lamellae



Ill 24 : Rocking chair \\ laminated wood



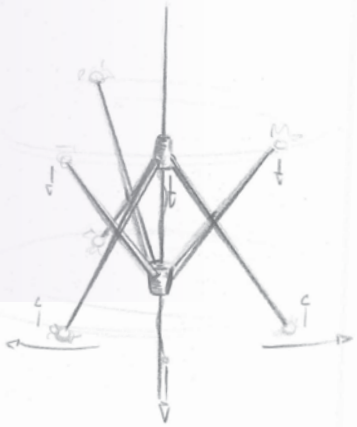
Ill 25: Rocking chair \\ lamellae

With the chosen relaxation platform and the two types of products a new ideation round is started with the aim of creating concepts to fit the larger laid back chair and the small lighting product.

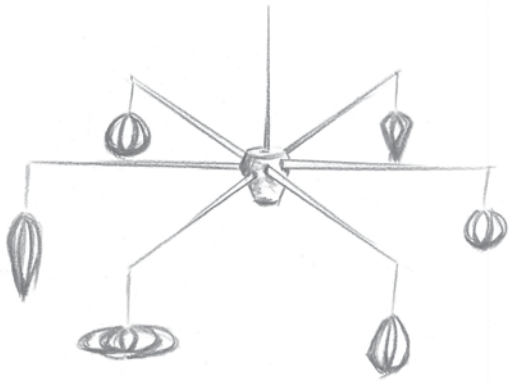
Ill 25: Pendle \\ Lamellae \\ click on in sets

Ill 26 : Rack \\ changeable angles

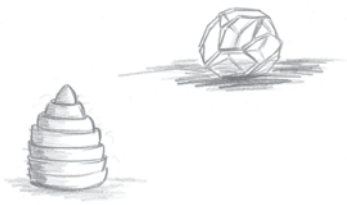
3.3



Ill 27 : Chandelier \\ rope pull \\ enlargement



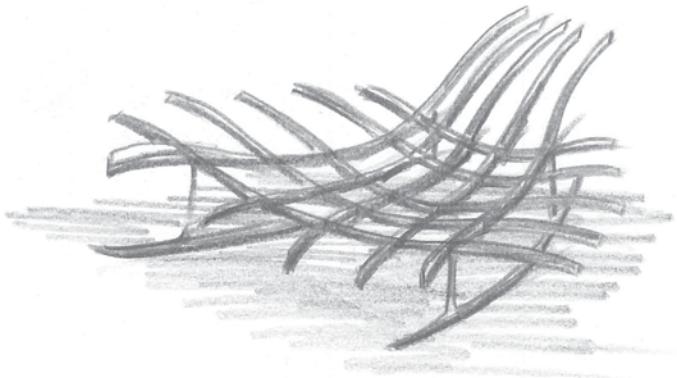
Ill 28 : Baby mobile \\ add on



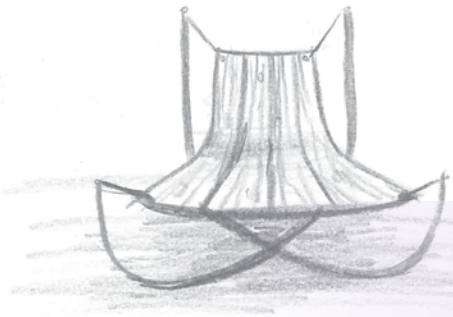
Ill 29 : Structure \\ Lamellae

Ill 30: Floor stand \\ add on

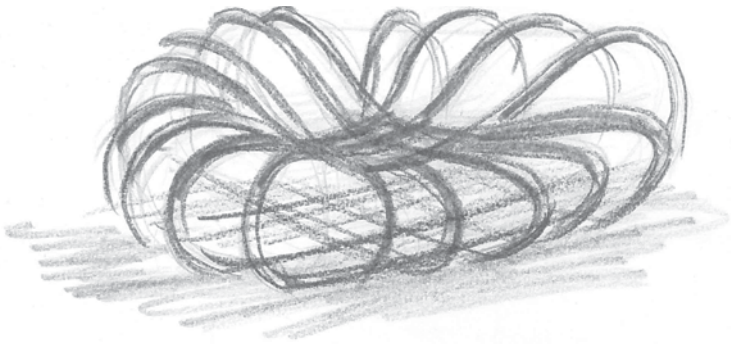
Ill 31 : Wall lamp \\ add on



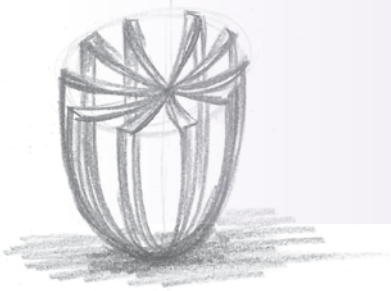
Ill 32 : Rocking chair \\ Lamellae



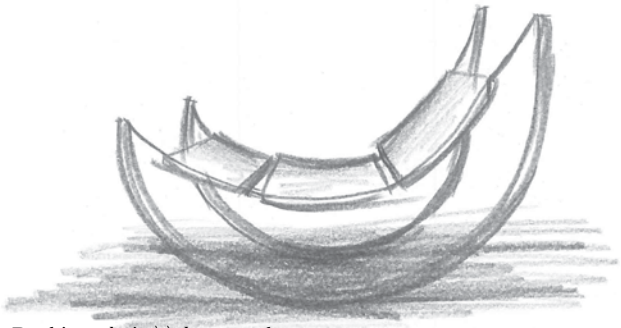
Ill 33: Hammock chair \\ elastics



Ill 34: Rocking chair \\ spherical \\ lamellae



Ill 35: Rocking chair \\ spherical \\ lamellae



Ill 36: Rocking chair \\ hammock

Ill 37: Rocking chair \\ chair

THE IDEATION LIST

From the first and the second ideation a list is created to create an overview of the possibilities within the concepts.

It is obvious that the chair should be some kind of rocking chair but it is less clear which kind of product the lighting should be.

IDEATION LIST

PRINCIPLES	PRODUCTS
LIGHTING FROM EARLIER ROUND	LIGHTING FROM EARLIER ROUND
Assemble yourself lamellae unfolding	chandelier table lamp pendle
LIGHTING FROM EARLIER ROUND	LIGHTING FROM EARLIER ROUND
collecting object mobile expanding angling rearrange	wall lamp table lamp floor lamp pendle chandelier
CHAIR FROM EARLIER ROUND	CHAIR FROM EARLIER ROUND
gluelam lamellar mosaics nest cave wings	ball rocking chair lounge chair
CHAIR FROM PREVIOUS ROUND	CHAIR FROM PREVIOUS ROUND
rocking in several directions, curves suspension bridge string pulling	lounge chair hammock rocking chair

3.3

SHIFTING FOCUS TO THE LIGHT

Besides the chair, for which it is chosen to use the rocking principle to obtain the relaxing feeling, the project group now shifts focus towards the lighting concept, as it is important to develop both products simoultaniously in order to ensure a coherence between them. Therefore other aspects are investigated in order to select a suitable lamp for the relaxation setting.

Part 1 :
The table lamp is deselected because it is desired that the lighting and chair should create the relaxed feeling without having to support the products in the setting. To be able to use the table lamp a table is needed for support.

Part 2 :
Investigate trends on the market in terms of which kinds of light providing products that are most popular within the market of Scandinavian design. From this it is expected to conduct demands to create a popular light providing product.

Part 3 :
Arranging a mood board of lamps that the project team finds interesting in relation to the relaxed feeling and from that pin point the features that make the lamp interesting. Along with a list with the possibilities of the materials at hand can be made. From this the method forced relations can be utilized to design the product.

Part 4 :
Linking the chair and light providing product together by a principle or shape. This is done by looking at both chairs and lamps and deducing a common expression that can fit them both.

Part 5 :
Having a storytelling session to find and create the story for the behavior and feeling that should be present in the current area of the centre and from that derive demands, so that the products are able to provide the customer and user with the intended feeling and behavior.

EXPLAINING THE PARTS

The parts two, three and five are iterations that provide the process with further knowledge towards which kind of concepts to have in the furniture series and what kind of demands that these should be able to fulfil. Part one is a deselection tool to remove some of the lighting concepts from the concept pool which has been created at this point in the process. As for part four it is a tool to utilize when the two concepts is chosen and the further development starts.

PART NO. 2

To obtain further insights in which kind of lamp and chair to design, a quick voxpop is initiated in the furniture and interior stores: Brdr. Sørensen and Kalejdoskop are visited. As this is a quick and dirty research, random sales managers are asked about which kind of products, within the two types of furniture, are the most sold. Furthermore, what they were is asking for, get insight in the most popular products within the product range.

From Brdr. Sørensen it is said that the classics of Danish design are the most popular within both types of products. "Den spanske stol" designed by Børge Mogensen in 1958, "Ægget" designed by Arne Jacobsen in 1958 as well as "flagermusstolen" is the most popular. For the lamps "Flowerpot" designed by Verner Panton in 1968 and the PH lamps in different shapes and sizes are mentioned along with a series of bedside lamps and architect floor lamps. Additionally, a point was made towards the parts of Denmark had different preferences. The sales manager stated that in Northern Jutland, customers are more likely to buy classics rather than the other designs that they have in the shop. Another aspect that is pointed out is that campaigns can make products popular in the time frame of the campaign and so that they are the most sold products in that period.

As for Kalejdoskop, mostly, Hay chairs and products are mentioned as the most popular due to the low price combined with the designs. Concerning lamps, the sales manager states that it depends on the time of the year, whether it is summer or winter, dark or light. In the summer time the customers are most likely to by the smaller lamps for coziness, but when it gets darker outside during fall and winter, the customers would buy a bigger light source to float above the dining table. It is also mentioned that the type of lamps, in which the light bulb is hanging freely on the cord, are very popular to their customers.

It should be noted that Brdr. Sørensen mostly deals with Danish design classics and not alot of new designers. With that the customer who visits is more likely, if not determined to wanting to purchase a design classic in contrary the customers who visits Kalejdoskop are more likely to chose new and unknown designers.

Through the visit at Kalejdoskop and Brdr. Sørensen different statements were noted. In order to evaluate and figure out if the impressions given in the voxpop are sufficient and find supporting information that could lead to the popularity, further research is conducted.
Through a quick internet research future trends in 2015 leans towards:

3.3

"Nature will continue to have a great place in the Danish home in 2015. branches, feathers, wood, fur, driftwood and cones."
Birgitte Vosper from Busybees interior stylist. [bedreboligliv.dk 2015]

"We have had nature as a theme in our home for a long time, and now it's just a new way - perhaps a more unique and elegant version of the nature."
Luise Lyngby from VIDA LA LUU interior stylist [bedreboligliv.dk 2015]

When looking at lamps, currently, on the market it can be concluded that the trends seem to be a visible light bulb with a socket that is neutral but decorative. In these products it is the light bulb that is the focus point and is often detailed in some way.
This is characteristic for modern Scandinavian Design known as the New Nordic trend.

Another trend is the lamp cord is in focus and used

Visible light bulb, geometric shapes and naked wood are considered the further design of the furniture.

as an aesthetic detail of the lamp. The shapes of lamps are various geometric forms but the edges are rounded, thereby, giving a softer look and feeling. [madogbolig.dk 2015]
The trends in chair design lean towards light and simple which supports the notion of Scandinavian Design found in the initial research. Furthermore, the chairs that are desired seem more of statement pieces meant to be able to stand alone and be the main focus of the space they posses as they stand out from the rest of the furniture in the home. [Elle]
When focusing, specificly, at Hay´s design of lounge chairs, it can be concluded that their expressions are of clean and simple while the edges in the chairs are rounded [Hay.dk 2015].

TRENDY PRINCIPLES AND EXPRESSIONS

An overview of different examples that characterize principles and expressions found in lifestyle magazines are visualised through a handfull of images;

3.3

Ill.38

Ill.39

Ill.40

Ill.42

Ill.38: A work lamp designed by Form Us With Love. Inspired by clip-on garage workshop lamp. Focus is on the geometric shapes and the visible bulb.

Ill.39: Petite Machine Lamp designed by Lindholdt studio. A simple table lamp with a special statement and a balanced expression, in the way the stand is fixed to the edge of the shade.

ill.40: Studioilse w084 designed by Ilse Crawford for Wastberg. The stand being made from wood and the shade in glossy white finish. This lamp is expressing for its functionality opposed to a statement.

ill.41: Lady chair designed by Marco Zanuso in Italy in 1950. The retro look being underlined in the slight curves and thin legs - almost as they would not be able to hold a person.

ill.42: Pure and simple chair, designed by Alvar Alto. The chair frame is curved in natural wood and posesses a dynamic, nude expression.

ill.43: A lounge chair designed by Tobia Scarpa. A chunky expression using natural looking wood and leather reminiscence the 1980's furniture trends.

Ill.41

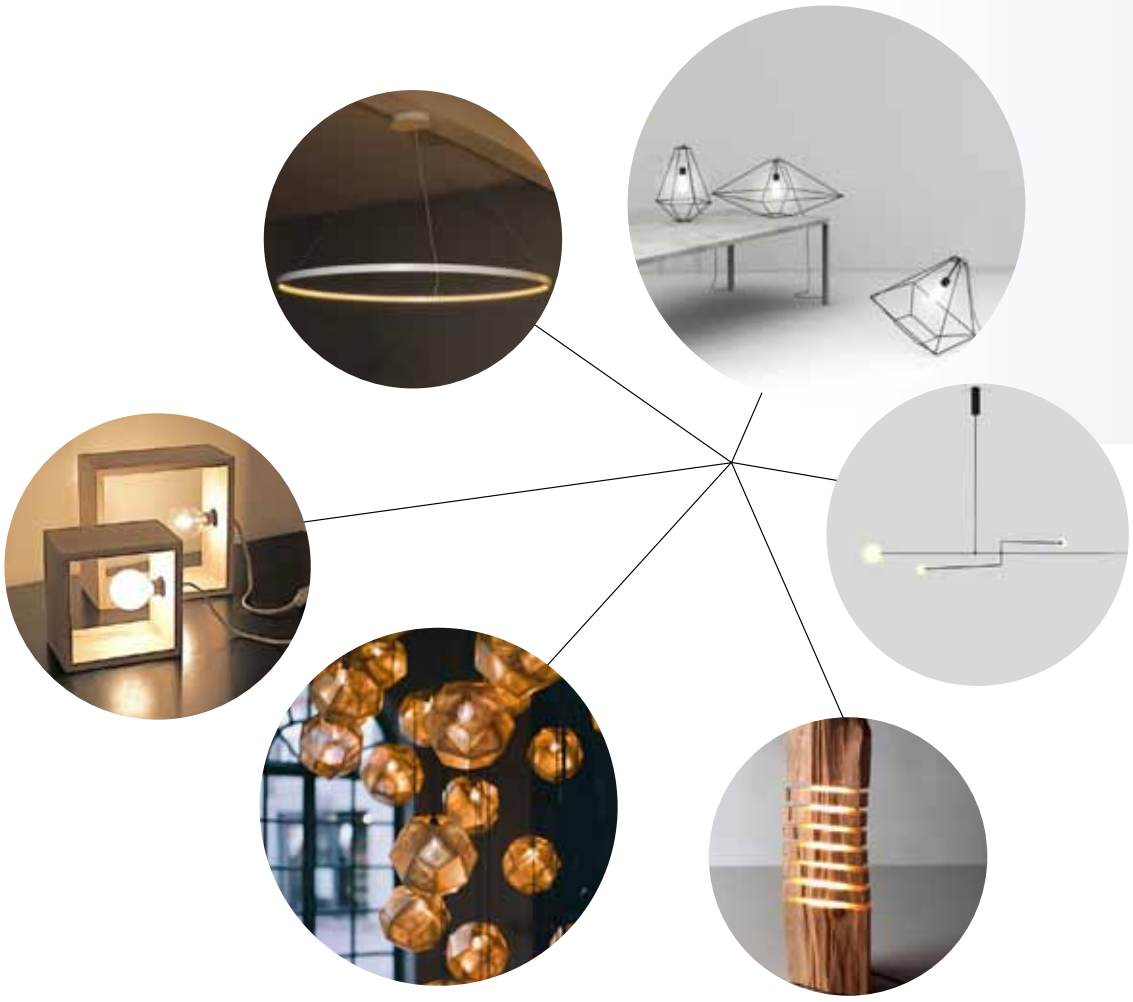
Ill.43

PART NO. 3

A moodboard is created by each team member choosing a selection of lamps based in own interest. Afterwards, the desired features are chosen in the team. Six pictures of lamps representing an interesting quality are brought to the joint moodboard and are viewed as interesting features to incorporate in the lighting concept of the project. The features are listed as:

- Visible light bulb
- The lamp shade being transparent and have a geometric shape
- A material to reflect the light
- The lamp can be used in multiple setups
- The lamp can be multiplied to create a bigger construction by own choice
- Placement of the light source creates a space in itself
- Having a balance principle in the construction like a mobile

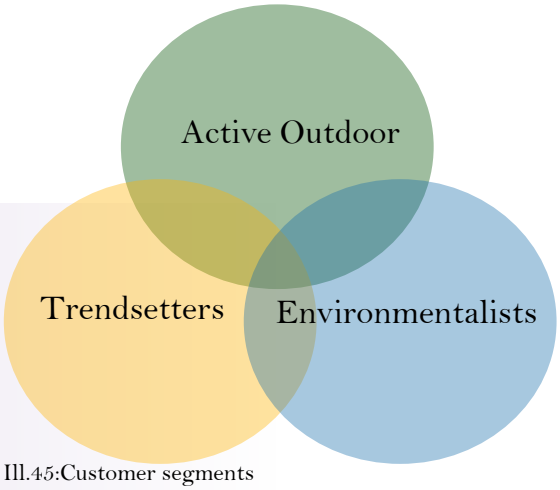
At this stage the moodboard is only used inspirationally and is revisited later on in the light designing process.



Ill 44 : moodboard

CUSTOMER SEGMENTS

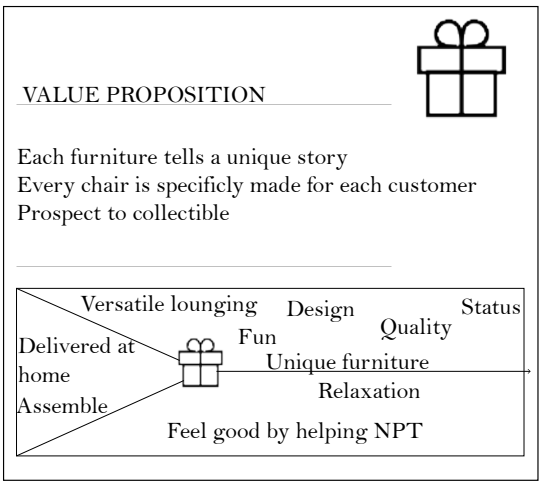
The final customer segment is found and is called trendsetters. This term covers the segment that is interested in design trends, social status and in that context; standing out and be unique. This is also the segment that buys expensive furniture, as the price paramter exclude some segments from buying thus preventing it from being mainstream.



Ill.45:Customer segments

VALUE PROPOSITIONS

As the value propositions are listed, so are the customer segments. This visualize a clear connection between customer wishes and what the furniture is able to offer. [Osterwalder 2014]
The customer needs and motivations are uncovered through the People Value Canvas. [Wildevuur 2013]

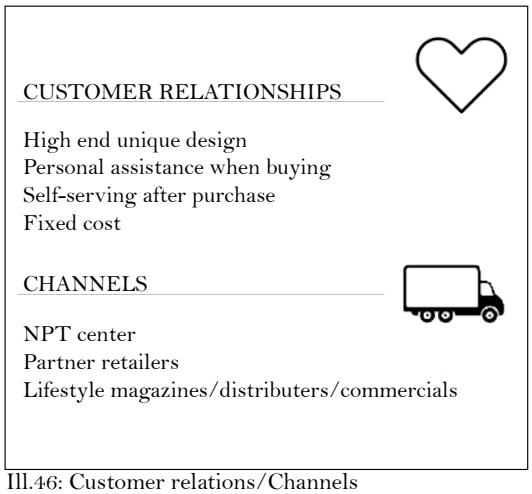


Ill.45: Value proposition

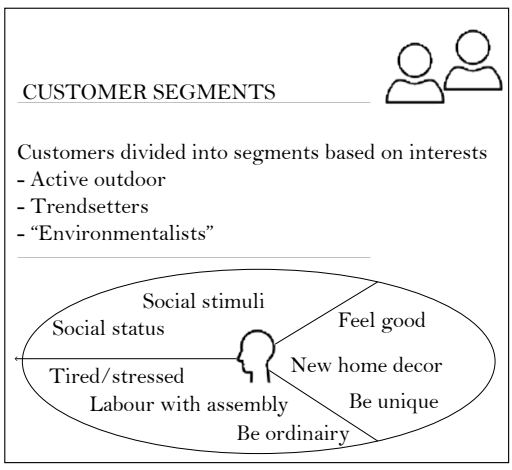
CUSTOMER CONTACT POINTS

The desired relationship with the customers and potential channels are decided through an analysis of where to connect with the potential customers.

Through selected channels it is possible to create a customer relationship with the customer segments. The relationships are chosen to, through specific retailers, guide and service before and during the purchase. After purchase when the furniture is delivered, the customer is not contacted further. Partner retailers are specified to being stores that handles furniture in the high end, thus being able to handle the chairs. This will ensure the customer recieves the right information when buying and the customer is able to ask clarifying questions and getting satisfying answers.



Ill.46: Customer relations/Channels



Ill.47: Customer segments

PEOPLE VALUE CANVAS

Three customer segments are now identified and are investigated using the People Value Canvas. This presents their motivations and both the value proposition and the link to the customer needs. As the project is not user driven, only the parts concerning the customer motivations and characteristics are used.

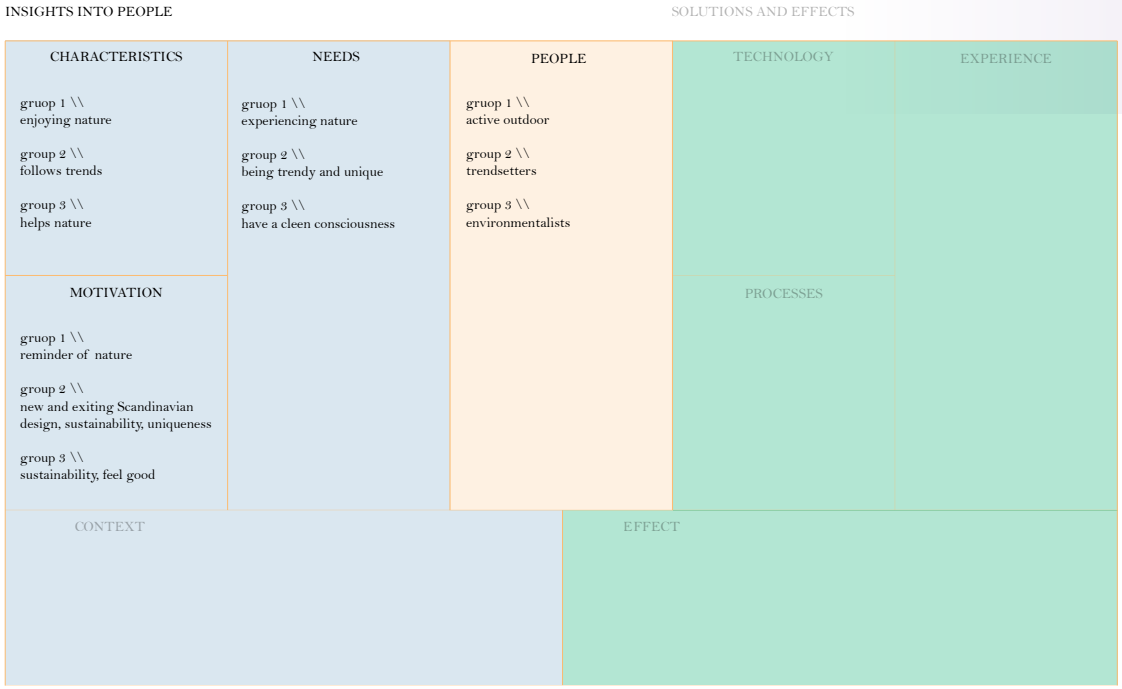
The People Value Canvas is a methodology used to map the user groups, who they are, what they are motivated by and what drives them.
The canvas is divided into two parts: insights into people, and solutions and effects, and in the centre the definition of the user group. In this project the user or target group is divided into three segments. [Wildevuur 2013]

The first segment is the group of people who are visiting the national park centre after having spent time in the park itself and is viewed as active outdoor people. This group could be both tourists from other countries as well as local people who are visiting the park for a day.

The second segment is the ones who are driven by current trends and Scandinavian design. These are the people that becomes aware of the products in lifestyle magazines showing the new trends within the New Nordic or Scandinavian design.

The third group of people is environmentalists who takes interest in the sustainability aspect of the project and wants to support it by purchasing the products and by creating a clean consciousness. These aspects are described on the left side of the canvas while the right side are the aspects of which factors affect the segments of people, such as technologies and how they affects the users.

Because of the approach used in this project, it is only important to look at the users in relation to the left side as the motivation of the groups is what is needed to create the business plan. The right side is left empty as well as the box context because it does not say anything about the motivation.



Ill.48: People value canvas

PART NO.5

To create a storyline conveying the feeling that the customer should get when interacting with the furniture, a set of drawings is created in combination with an interaction vision. The drawings present three steps in the experience of the furniture prior the interaction with the furniture where the national park is visited (ill.49), visiting the national park centre where the costumer interacts with the furniture the first time (ill. 50), and when the customer has the furniture at home(ill.51).

The interaction vision is:

When you meet the furniture you should feel welcome to throw yourself in the furniture, relax and be psychologically and physically swaddled by nature.

The interaction vision is based on a storyboard where the first image is a couple visiting the national park during the day and is swaddled by the nature, with the mountain pine and the sun on their skin, that gives them relaxation and enjoyment. This feeling is the same that the couple should get in the lounge area in the NPT Centre later in the day when the stick2nature furniture is going to be placed for the customer to interact with. When the couple sees the furniture they should feel welcome to throw themselves in the furniture. In the moment they are seated ut should both physically and psychologically, remind them of the visit in the park with the nature surrounding them. Then when the furniture is interacted with and the visitors have experienced the references to the nature, the experience should tempt the visitor to buy the furniture present in the setting and bring it home. By having the nature and the relaxed feeling present in the furniture the use of the furniture at home should bringt back the same feeling that they experienced in the NPT, and they should once again feel relaxed in their own home.

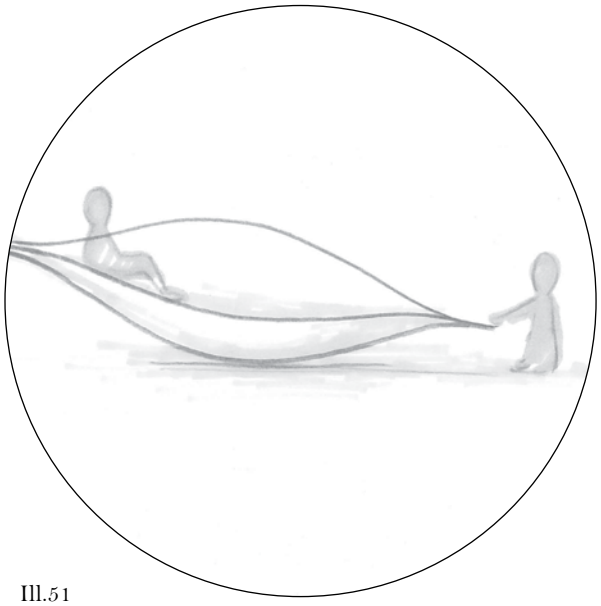
The couple or visitors are regarded as a married young couple, old lovers, a mother and daughter or simply two good friends. In short, the furniture is for those who share a special connection when visiting the NPT together.
In every case the couple should be able to sit together in the furniture setting, relax, enjoy the view and be reminded of the nature that they just visited and talk about their day.

Ill.49 : Visiting the NPT

Ill.50 : Visiting the NPT centre

Ill.51: The furniture at home

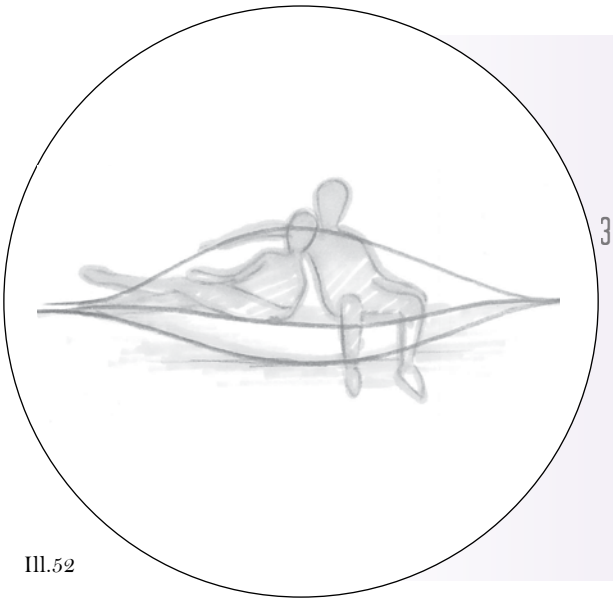
In relation to of concept development and selection, the chair and lamp should be able to create this state of mind when it is interacted without any supporting products. The chair should be able to make the user feel swaddled by the nature and the mountain pine. More over it should have a form that invites the users to throw themselves in it along with their companion and, furthermore, be able to be in a relaxed position. The lighting should be able to enhance the relaxed feeling and, furthermore, provide other aspect of the nature being around you. The form and material will as well as for the chair remind the user of the nature, but it will also provide light as to be able to sit and talk to each other. A relaxing space is created around the chair, in an enlightened bubble, inviting the user to relax, daydream, converse, be together or just have fun.



Ill.51

NEW DERIVED INFORMATIONS

At this point, the visualization of the desired feelings from the bubble created by the furniture, brings new insights which evolves into new demands. First, regarding the moving of the chair it is decided that the chair should be able to rock in two directions, combining the properties of a rocking chair and a craddle. This is to support the relaxation along with a hightened experience.

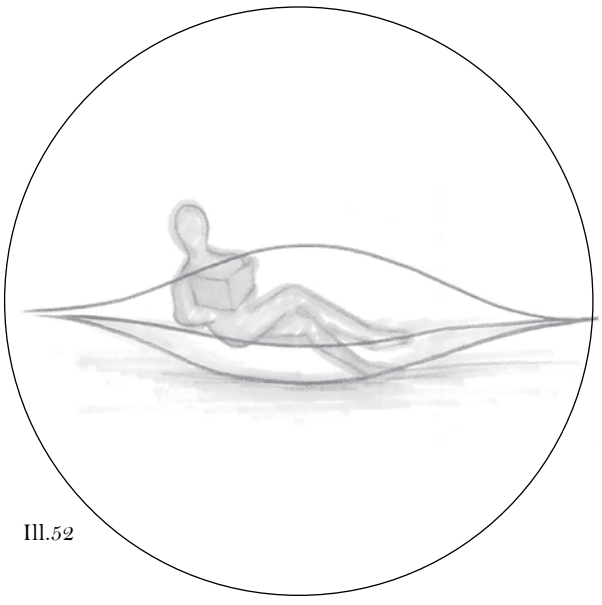


Ill.52

Second, as the light is needed to incapsule the users and at the same time embrace them, the light needs to be investigated for strength, temperature and other technical aspects.

As the team interviews a light engineer at Aalborg Teater, whom is trained in creating different feelings and environments using light, it becomes clear that the light has to be reflected, in other words, it needs to be diffused, as direct light is intense and creates hard/sharp shadows, which can make the users tense or scary looking. [Interview 2015]

The light needs to be diffused to generate the right mood.
The chair needs to be able to move in at least two directions.



Ill.52

3 . 4
REFRAMING

REFRAMING

As the parts have been made, the mission, vision and demands is revisited to align them with the new findings. In terms of the vision and mission it is decided to distinguish the project from the actors and clarify the path of the team. NPT has decided to utilize the huge amount of mountain pine from the park, to help nature preservation, but it is not a direct guiding feature for designing the furniture in this project. Meaning that the team is in need of more project specific guidelines, why it is now decided to reframe and update both mission and vision. Furthermore, it is decided that although the furniture and business parts are developed parallel and closely aligned, each part needs their own mission in spite of they share the same vision. This is to be able to maintain the storytelling of NPT but at the same time ensure that one does not limit the other.

The demands and dogma rules, which are presented in chapter 2, are kept but new demands are condensed through the ideation rounds with additional research in the process. These demands are divided between the two products as they are two different types of products, they fit into different demands.

VISION 1.1
\\ PROJECT

Creating a link to the unique nature in NPT by the use of the various curves found in the mountain pine and thereby creating a relaxing feeling to experience in the NPT Centre as well as in the home.

MISSION 1.1
\\ PRODUCT

Creating unique furniture using the curves of mountain pine, crafted by local people and sold in the NPT Centre linking the end user to the experience of the nature in NPT.

MISSION 1.1
\\ BUSINESS

Creating a supporting foundation in the community by the utilization of local found natural resources for stick2nature products and having the local and social economic businesses produce the products and furthermore, having the products displayed and sold in the NPT Centre and flagship stores.

PROJECT DEMANDS

Chair :

The user should be able to sit in a relaxing and laid back position

Should make the user feel surrounded by the NPT nature

Should fit two people at the same time

The chair should be able to rock from side to side

Should be constructed from natural curved mountain pine lamellae

Should fit in a van with a volume of 9.3 m3

Lamp :

Should provide a relaxing setting with its light

Should make the user feel surrounded by the NPT nature

The light should be diffused

The light source should be visible

Should be changeable

Should be constructed from natural curved mountain pine lamellae

Should fit in a 12*30*30cm sized box

3 . 5 CONCEPT SELECTION

SELECTED CONCEPTS

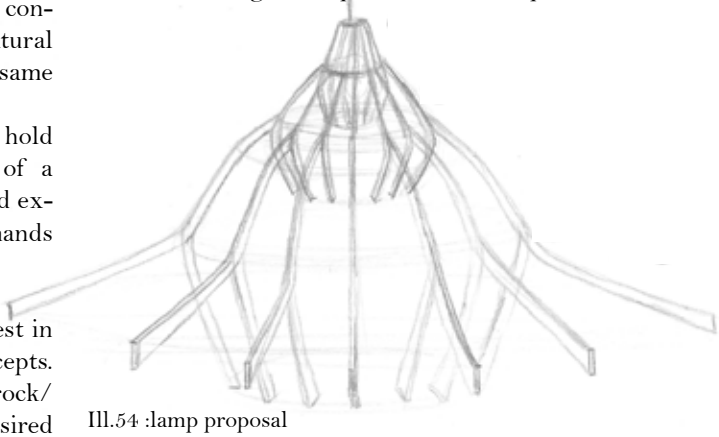
Having reframed the project in relation to the new knowledge and more specific demands towards which kind of products the series should consist of, two concepts are chosen.

3.5

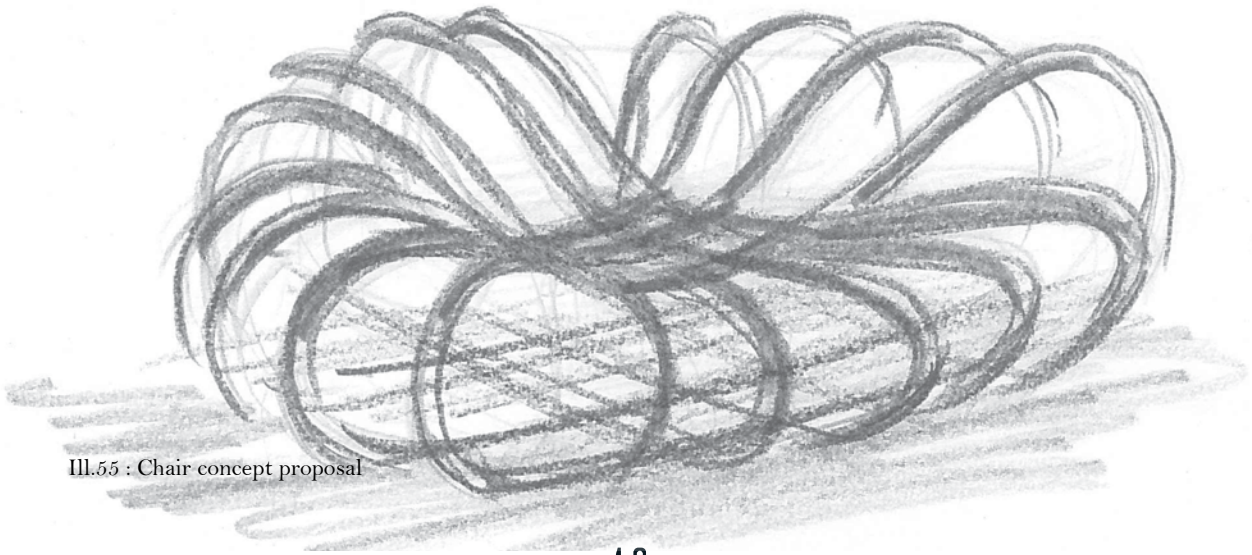
By viewing the sketches, it is obvious that the team has a predilection for lamellae as these are considered the best option for replicating the natural curves from the mountain pine and at the same time express a simple and natural look.
At the same time, the chair should be able to hold at least two persons and have the features of a rocking chair in order to complete the desired experience. Ideas that cannot meet these demands are deselected.

The vision of the chair is specified into "a nest in motion" from the chosen and remaining concepts. This means that the chair have to be able to rock/ move in at least two directions. It is also desired that it contains back support for the users so it is possible to relax and converse.
For the lamp it is chosen that it has to be made from lamellae as well as it has to create a coherence with the furniture. In order to enhance the mood and based on the interview with the light engineer, it is decided that the light bulb should be "hidden" by the lamellae when using the chair but allowed to be visible when not in the chair. This will create the diffused and dimmed light desired in the interaction vision and follow the trend of visible light bulb when inactive. The sketches are sorted and prioritized by the combined demands. Due to this larger lamps as well as lamps in which the main construction parameter is not lamellae, are discarded. It is decided to design a base part in which the bulb is mounted and by experiments and ideations decided whether the lamp should be a floor lamp or a ceiling lamp and how the shade should be formed and created.

Further light experiments and investigation, partly based on the interview with Clemen the light engineer [Interview 2015], about light emission and light color temperature will form a foundation for further desig development of the lampshade.



Ill.54 :lamp proposal



Ill.55 : Chair concept proposal

SHAPING OF CONCEPTS

As the concept development progresses it is needed to define the curves to be used in the furniture. As mountain pine is randomly curved an average curve range is needed to be specified.
The team measured 20 trees during another field trip to Boegsted Rende in the NPT. The location of the selected trees are mapped along with their trunk diameter(ill.56).

Trees with a trunk diameter below 30cm and with a height below 2m is discarded as the team selects on basis of which trees are large enough to be utilize in the furniture design. It is taken into consideration that the sapwood is to be removed in a working process, as it is only the heartwood that can be used.

An area is chosen and the trees are measured: height and diameter. The angles are measured and the trunks are photographed as documentation.
The measured trees are mapped.

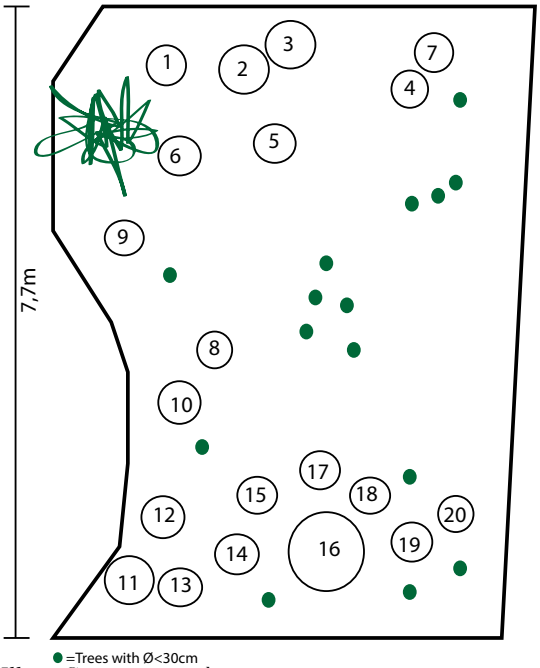
In the illustration it is showing where and how close the trees are placed in the test area.
Next to the map the tree trunk diameter is listed. Furthermore, the relation between height and curvature are plottet in a graph.

The graph is the most interesting part showing how the trees are curving. The point of the trunk being closest to ground surface has coordinates (0,0) in the graph.
Next the degree of the first curve is shown proportionally with the tree height in the current point as shown in the explanation.

As the graph reveal, most curves range between 30-90 Degrees. This means the lamellae need to range between this interval as well, to make sure it is a possible shape.
The documentation from this study is available in appendix 8 - curvature experiments.

It is derived that using lamellae supports the concept of using the natural curves. This study brings a range of degrees be used in the further design of both chair and lamp.

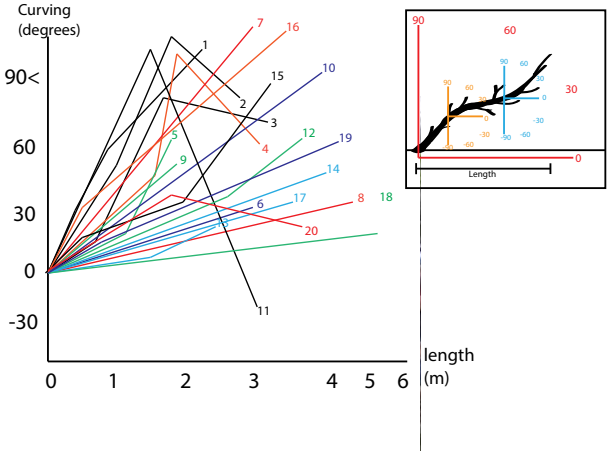
3.5



Trunk Diameter:

1: 36cm	6: 45cm	11: 50cm	16: 90cm
2: 50cm	7: 42cm	12: 40cm	17: 40cm
3: 42cm	8: 36cm	13: 34cm	18: 44cm
4: 37cm	9: 42cm	14: 38cm	19: 55cm
5: 32cm	10: 40cm	15: 40cm	20: 38cm

*It is decided to only use trunks with Ø>30cm



Ill.56 :Curvature study, app. 3,5

4 DEVELOPING THE FURNITURE

Now that the two concepts have been chosen, the concepts needs have be detailed to fit certain demands that has been collected through the prior process, but also some new found demands, which is found during the detailing phase of the process.

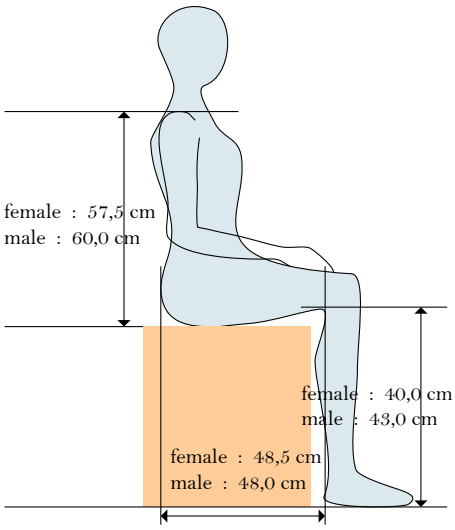
Due to the prior process the rocking chair has already gone through several ideations and iterations and has a more finished form than the lamp, at this point. This is also the reason why the process is divided in terms of developing the chair apart from the lamp, but still having the two processes aligned so that the products connects to each other and the interaction vision, which is stated in the prior chapter.

In creation of a light that convey the desired expression, more research is performed in order to obtain more insight in the matter. Simultaneously, a detailing process is begun in relation to the chair. Curvature investigations are performed by building small models and sketching while technical facts such as general seating sizes are researched. The ideal form of the light and the chair is a sphere containing the relaxed mood found in the NPT Centre. It is considered that visitors often come in pairs why it should be possible to experience the furniture with that special someone.

4 . 1 DESIGNING THE CHAIR

THE FIRST THOUGHTS OF THE CHAIR

The rocking chair has several features that needs to be retouched. It has a spherical rocking base, seating for two persons, a lounge feeling, it should make the user feel swaddled by nature and, furthermore, it should have a clear reference to carpentry, craftsmanship and Scandinavian design. Another important guide setting parameter is anthropometry, the physics of the average body. When creating the shape, the average body measures are considered. The user should feel comfortable when sitting on the seat while being able to reach the ground, as it should be possible to move the chair by yourself. To design the seat, the team used a quick and dirty method:
The seat is measured to be 90cm wide, as this is the space taken by two friends, who would visit the NPT together, when sitting next to each other.

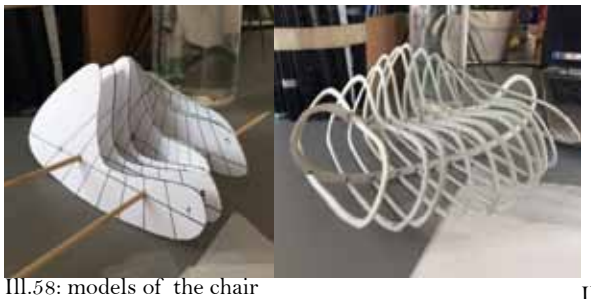


Ill.57: Anthropometry chart

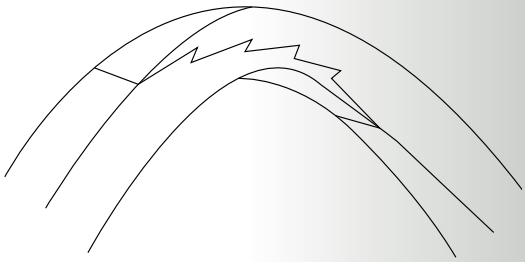
The first mock-up is created only to have a form to relate to and discuss in the group, in terms of creating a shape fitting the interaction vision.
This concept is built on two sets of loops which combined creates a grid structure. The grid in the top creates the seating and in the bottom it creates a spherical surface to make the chair move or rock in multiple directions.
After creating the first mock-up in scale 1:10, the size and construction is evaluated. It is acknowledged that the construction is more complicated than first thought and that the size of the furniture is too big to be placed in the home after having tested its footprint on the floor.

The following developments are made in the 3D modelling programme: SolidWorks, to make each lamellae fit each other and and to design the shapes. In this process the measurements from the average body are applied as well as the joints of the different lamellae. During the modeling, it is discovered that the chair becomes too dense in its expression. Moreover, the wings are not necessary in the supporting of the structure, as it is also not necessary to have as many of the long transverse lamellae in the bottom or in the top. Another added detail is the angle placement of the lamellae. The lamellae is placed with less space between them in the top, than the bottom to ensure a lighter and more dynamic expression. At this stage the joints of the loops are considered to be based on a method used in Viking ships as encountered at a lecture at Roskilde Viking ship museum. [App 3.1]

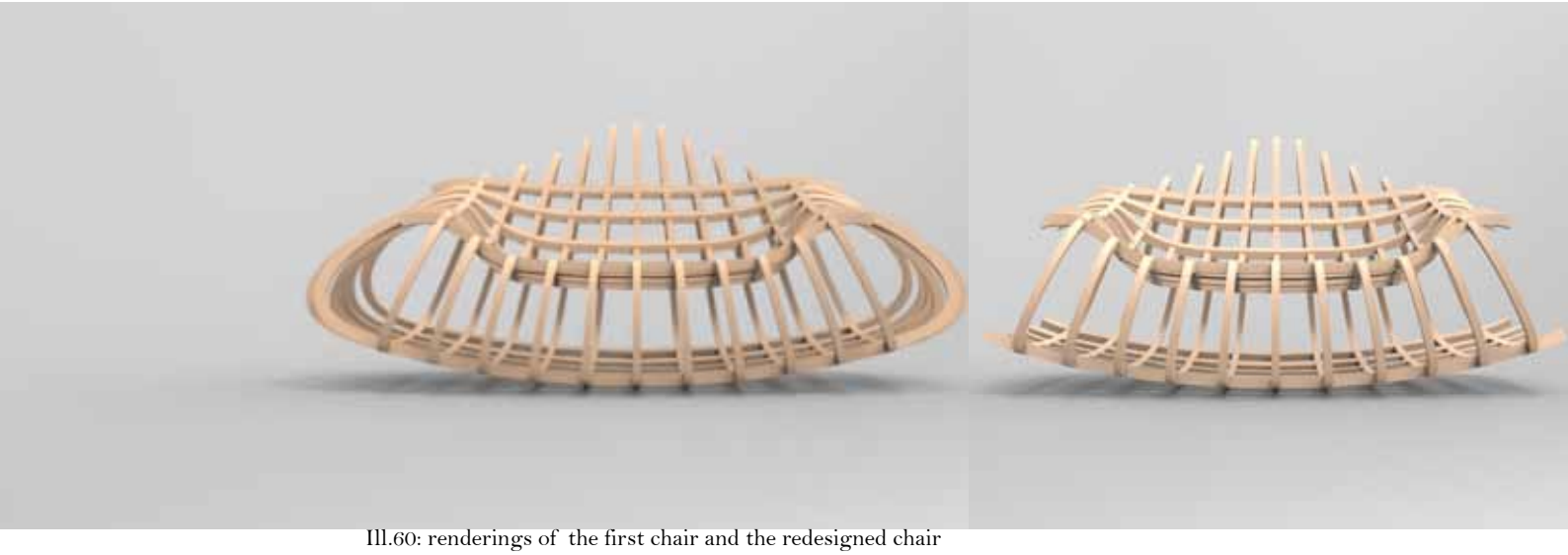
The objective of the visit was to learn about old Viking assembly methods and, furthermore, to learn new building methods. The Viking assembly method is used with natural curved wood in the construction of a ship to maintain the strengths which lies within due to the fibers natural curved wood. The joint should be placed so that the mountain pine pieces can be found as shown in the illustration 59.



Ill.58: models of the chair



Ill.59: proposed assembly



Ill.60: renderings of the first chair and the redesigned chair

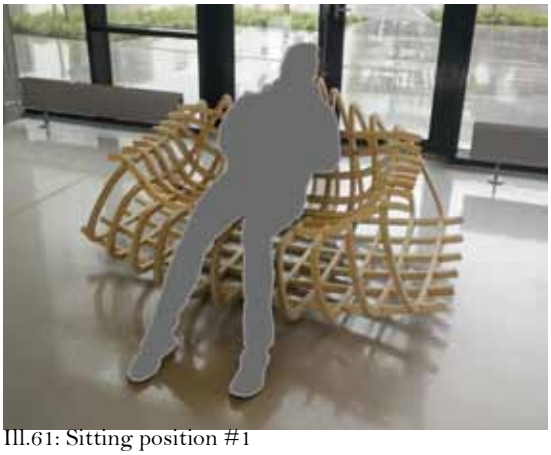
1 : 1 MODELLING

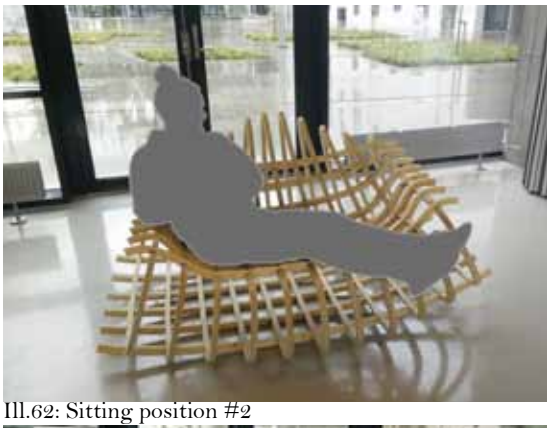
The next step in the process is to test the chair and, therefore, a 1:1 model is created in plywood in order to test both the shape, the comfort and the statics.

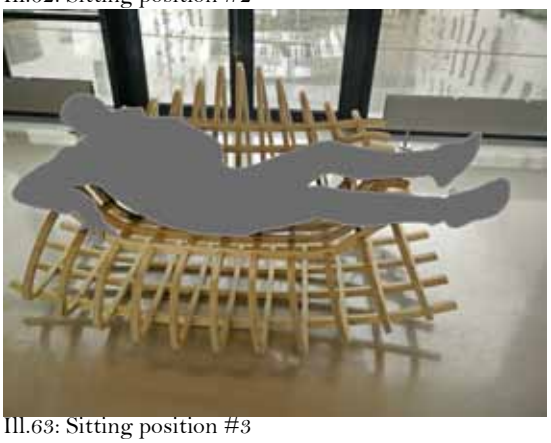
After the model is created it is observed that the shape is experienced as intended. That is, inviting to throw yourself into and the aesthetics, as appealing towards an organic and light weight look. As for the comfort, the test shows that the seating area is too deep, the test person's leg would not be able to reach the ground, without having to put their legs between the lamellae with the risk of getting them stuck. As regarding to the placement and number of lamellae, the seating comfort seemed good and comfortable without having anything getting stuck.
As for this problem area it is imagined to have a soft animal skin placed in the seating area, both for comfort but also to have references to the New Nordic style with raw materials direct from nature. Furthermore, the shape of the organic seating area, with arm and back support, is comfortable to sit on in several positions; both sitting straight up, laying and sitting diagonal on the surface.

4.1

The areas of which the design process needs to be iterated is: the depth of the seating area and the edges, towards making them smooth.


Ill.61: Sitting position #1

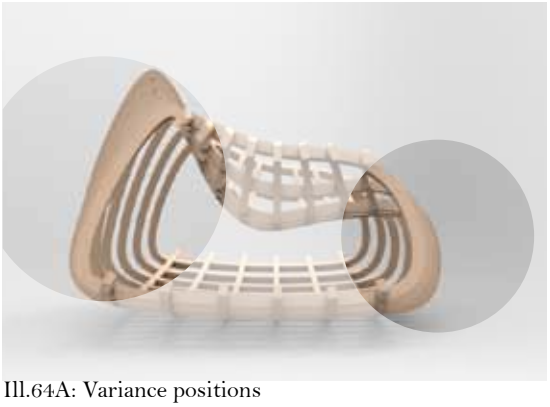

Ill.62: Sitting position #2


Ill.63: Sitting position #3

VARIANCE

During the development the possibility of variance is discussed in relation to the broad variance of curvature in the wood pieces.[App. 3,5]. As the loops are divided into four curvature ranges, two of the areas does not need to have a specific curvature as they serve no functional purpose unlike the loops for the base and the seat (ill. 64A). Because of this it becomes possible to have variance in the curvature in these areas. Thereby, having each chair becomes unique.

This is also enhancing the unique selling propositions, as each customer is now able to receive a unique chair.

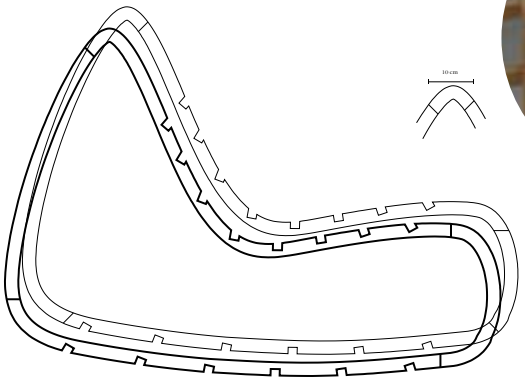

Ill.64A: Variance positions

VALIDATION

A consulting meeting with Mathias Hedal, from &WoodLab, is set up to validate the rocking chair in relation to the construction, statics, production and production costs.

Based on the meeting several changes have to be made to the concept to have it realized. First of all, the lamellae should be higher to ensure durability. The chair should be based on a more simple construction due to the production costs, as Mathias Hedal estimates would be approximately 100.000DKK. The main reason is the loops and the complexity due to having them made of the natural curved mountain pine and having them jointed with high precision. In relation to this, the viking ship method is also discussed and it is found that the size proportions counteracts the strength benefits, normally found in this assembly. A more simple construction method is, according to Mathias sufficient. The same goes for the variants in the two before mentioned areas of the loops, as these will be complicated and expensive to apply in the construction due to production.

It is decided to keep the spherical twin rocking chair, although it becomes expensive. It will be used as an statement piece for the furniture series to come. Additionally, the chair will be used as the design DNA for the series both construction wise and aesthetical. Another aspect that should be applied on other furniture pieces is the supply chain which will be presented later in the process report.



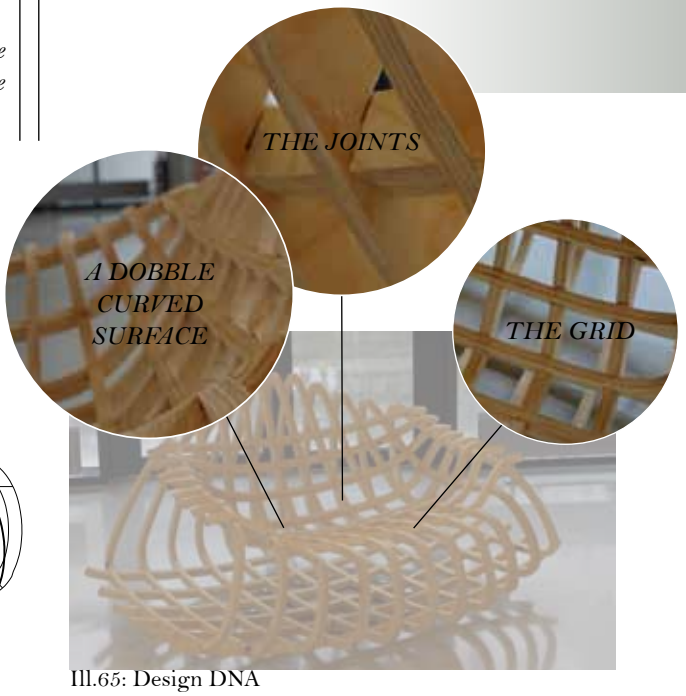
Ill.64B: Design DNA

DESIGN DNA

The prototype is clearly showing the overall design guidelines, also known as both design DNA and dominant design [Abernathy 1978].
When arrived a dominant design it opens possibilities of scaling the furniture and, furthermore, of adding more subjects to a serie.

In accordance with the notion of creating a smaller chair that is of a simpler construction and therefore will be less costly to manufacture and sell, the design DNA is analysed and can then be transferred to other products. This design signature will ensure the association with the stick2nature brand and help prevent the furniture being duplicated by competing companies.

The design DNA is translated into a stick2nature furniture "signature" that conveys the story of the area, the curved mountain pine and the scandinavian design tradition.
When the DNA is established, it can function as a guideline that can ensure coherence between products.
Using design DNA can also allow updates and evolvement in the product series while maintaining the features that brands the product. Hereby, this would be the association to the Thy-story that would be inherited.



Ill.65: Design DNA

STRENGTHS

To support expert advise concerning the durability and rigidity of the chair, a simple calculation is made to prove its durability.
Tensile strenght is calculated and it is thought that at least two people should be able to use the furniture at the same time.

W = modulus (Table Value)
M = torque $M=1/8 \cdot q \cdot L^2$
$q \cdot L^2$ = force/length
k_d = conversion factor(TV)
k_h = Height above 40mm (TV)
f_{mk} = Material troop (Mpa)(TV)
$f_{m,d,M}$ = Calculated force
F = Force
g = Gravity (9,81N)
m = mass (kg)
E = Tensile strength (force perpendicularly on fibers)(TV)
I = Moment of Inertia

As we assume the large chair should be able to hold two people and exaggerate their weight to be 100kg/each, assume that 1/3 of total weight is placed on one lamellae, the total pressure is calculated:

$F=m \cdot g$
$F=200kg \cdot 9,81=1962N$
$1962N/3 = 645N$
$F=0,645kN$

The maximum deflection is calculated in order to evaluate if the deflection is compromising the aesthetics of the chair, when in use. The allowed deflection is calculated :

$$Umax=\frac{1}{500} \cdot L = 0.002 \cdot 450mm = 0,9mm$$

The actual deflection is then calculated. First I is calculated from Umax, then applied in the deflection formula. The stiffness is a table value derived from construction pine class C24.

$$Umax=\frac{p \cdot L^4}{8 \, E \, I}$$

$$I=\frac{5 \cdot p \cdot L}{384 \cdot E \cdot Umax}=\frac{5 \cdot 0,645 \cdot 450mm}{384 \cdot 350 \cdot 0,9mm}=1093336,64$$

$$Umax=\frac{0,645 \cdot 450mm^4}{8 \cdot 350 \cdot 1093336,64}=0,0268mm$$

It shows an actual deflection of 0,027mm, when applying the force perpendicularly on the wood fibers. Then tensile strenght is calculated.

Tensile Strength: $\sigma_M = \frac{M}{W} \leq f_{m,d,M}$

$\frac{M}{W}$ calculated payload resistance

$f_{m,d,M}$ applied payload

Then the troop for the beam is estimated, based on table values for construction beams of pine.

$f_{m,d} = f_{m,k} \cdot k_d \cdot k_h$

$f_{m,d} = 24Mpa \cdot 0,593 \cdot 1246 = 17,33Mpa$

The applied force, measured in Mpa, is calculated:

$$\frac{M=1/8 \cdot q \cdot L^2}{W} = \frac{1/8 \cdot 0,645kN \cdot 450mm^2}{10400mm^3 \cdot 10^3}$$

$= 1,5699Mpa$

The tensile equation is combined:

$\sigma_M = 1.5699Mpa \leq 17,33Mpa$

The calculation supports the statement from Mathias Hedal, carpenter, concerning the durability. one of the seating lamellae is able to hold 17,33Mpa and it is calculated that it will, if two persons are using the chair, be exposed of 1,5699Mpa.

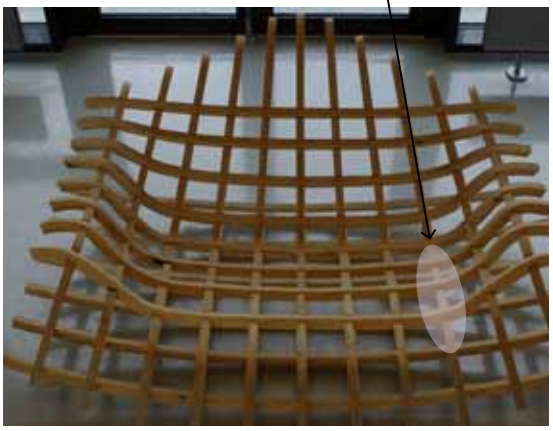
This means significant more force (weight) can be applied, before the chair would break. This is transferred to i.e. mom, dad and several kids could sit in the chair at the same time without damaging the furniture.

Error sources include the modulus (W) being a table value found for pine beams in 25x100mm all though the ones used in the chair are only 25x50mm in dimension which means that the calculated strength is larger than in reality.
The table values origin in construction beams in pine which do not account for the added strength provided by the density and curved fibers found in mountain pine.

Also, actual chair is curved and not straight as assumed in the calculations.

Table values and tensile formula are found ind Teknisk Ståbi and Statik og stykelære.
[Madsen 2010][Teknisk Ståbi 2013]

CALCULATED BEAM



A SMALLER PIECE OF FUNITURE

Based on the knowledge from the meeting with Mathias Hedahl the need for a reduced, and less complicated rocking chair for one person is now under development to fit within a retail price setting at 10-20.000 DKK to be able to sell. The three opportunities are presented to the right.

The third proposal is chosen based on the simplicity compared to the other two and that the loops were removed all together, as they had the most expensive pieces in the construction. Furthermore, this solution is the most lightweight looking construction.

An area, which needs to be visited, is the stability of the foundation, or legs, in relation to tipping point and outward forces that are put on the legs. An ideation is made on the support for the legs both with different structures and alternative materials to the mountain pine as the supporting frame should only be able to withstand a pulling force. Therefore, a light structure based on wires or rope can be used and will create a lighter construction rather than a supporting frame made of wood.

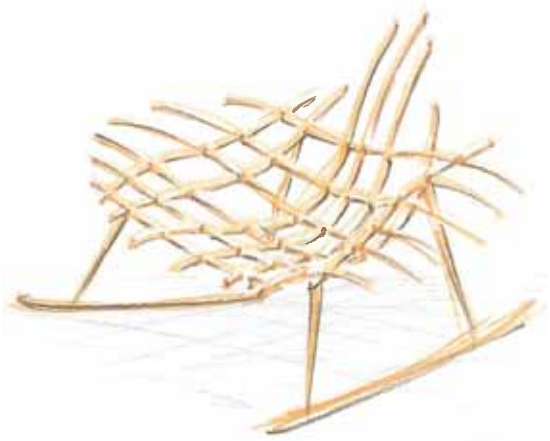
Ill.66: Possibility #1

Ill.67: Possibility #2

A SOFT SITTING SPOT

To enhance the welcoming aspect of the chair, both the small and the big one, it is considered to have an additional layer placed on the sitting surface for the body to feel more comfortable. The materials used is conducted from a mapping of potential materials found in NPT [Appendix 4.1]. From an earlier initiated experiment, of dried lymegrass has been investigated as a textile or rope. It is imagined that the braided cushion of lymegrass could make the experience of the sitting surface softer. In this case the cushion should be braided to fit the individual curves of the two pieces of furniture. Another opportunity is the usage of pelt or hides from the larger animals in the NPT.

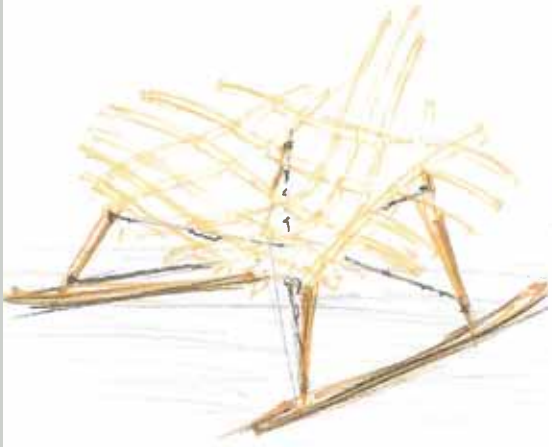
These two possibilities are very different from each another as the pelt and hide is softer looking and less processed than the braided lyme grass. With the lyme grass there is a possibility of pointy ends, which would not be pleasant to sit upon, but it is still a feature, which needs to be tested.



Ill.68: Possibility #3

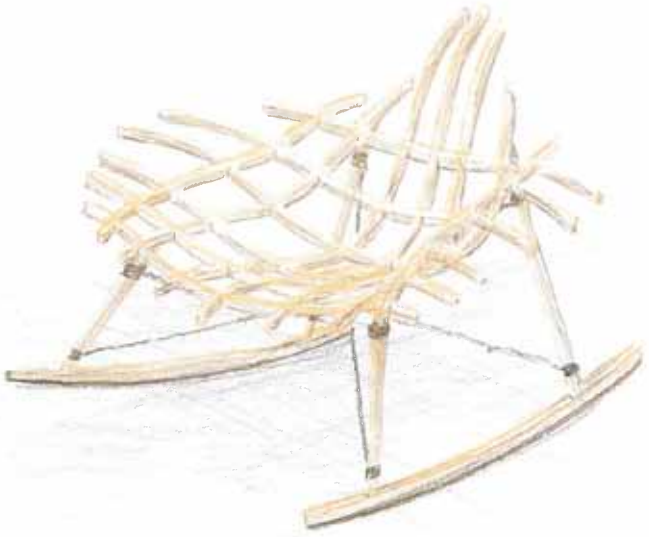
It is decided to consider both of the materials for the seating surface as they both appeal to the look of the "New Nordic" style with its honesty to nature. Another aspect to having both of the solutions to select from is the opportunity of customization, where the customer can choose which kind of material to have added on their individual rocking chair.

Ill.69: Possibility #1



Ill.70: Possibility #2

Ill.71: Possibility #3



Ill.72: chosen concept

Ill.73: pelt

Ill.74: lyme grass

Ill.75: pelt

Ill.76: braided lyme grass

UNIQUENESS

As the furniture pieces should be closed linked to the nature experienced in NPT, the materials should be allowed to be as they are presented in the park. When looking at the mountain pine itself and the wood used in other high end furniture, the difference is not that big in relation to color. To make the mountain pine stand out on the market it is decided to allow the appearance of blue stain. Blue stain is a fungus appearing in wood which has been damaged. It does not influence the properties of the mountain pine but it leaves blue or dark gray stains in the wood. In this project the blue stain is seen as strengths for differentiation and it would allow each piece of furniture to be unique.

THE GESTURE OF THE FURNITURE

As mentioned before in the process, the use of pine as a material for high end furniture, should be carefully considered. It is important to prevent the mountain pine from tarnish due to the usage of lacquer and keep the fair color of the wood. The use of beeswax, from NPT, to protect the wood against UV radiation has been tested in an experiment.[App. 3,3] The outcome shows that some types of beeswax is more suitable that other for keeping the wood fair. In addition, the method that is used to apply the wax has left a thick layer wax on the wood, and that is not acceptable for the furniture treatment. Therefore, a method for the application of the wax should be researched to only apply a thin invisible layer to the wood for protection.

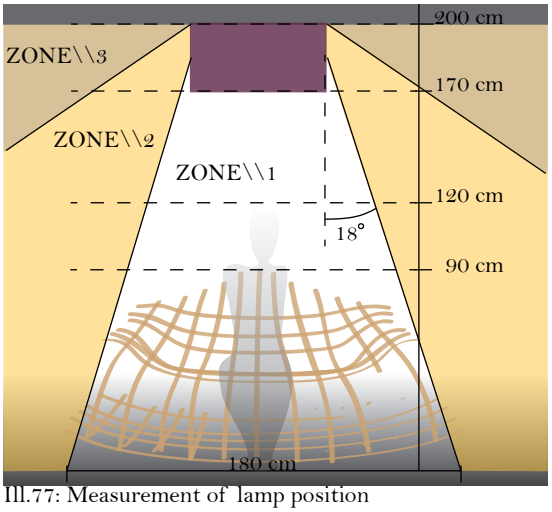
Another method that is considered is sand blasting to leave the mountain pine with a soft surface as the final treatment before applying the bees wax. Furthermore, the method of sand blasting relates to the environment of which the trees originates with the sand being moved by the Westen wind. This method will also differentiate these products from the lacquered pine furniture.

4 . 2 CREATING THE LIGHT

SIZE OF THE LIGHT

Limitations are calculated in order to make this possible. From the studies of size, it is concluded that the lamp is to be hung approximately 50cm from the ceiling; that the lamp cannot be larger than 30cm in height to avoid the user bumping into it when getting up and that the shade has to reflect light in a diameter of minimum 15cm in order to incapsulate the whole chair in its light. Furthermore, the lamp parts have to be able to fit in a box measuring 12*30*30cm. The calculations are made using the large chair.

Further restrictions are applied to the concepts: the products are to be designed mainly to fit into the customer home, be able to move in two directions, fit two people and the lamp has to be able to illuminate the whole chair.



Ill.77: Measurement of lamp position

THE LIGHTING ASPECTS

To create the right light the team has to include different aspects of both technical and holistic nature. To uncover these, different approaches are made. An interview with a light engineer from Aalborg Teater [appendix 3,7] provided the team with an insight in light settings in different enviroments. Furthermore, different light studies are made to create knowledge on which types of light are needed and which features are in need of consideration in order to complete a design proposition.

The interview with Clemen [appendix 3,7] revealed different aspects that are important when a specific mood is to be created with light. Clemen's job is to create the right light in order to emphasize various moods in the different shows. From the interview it is derived that the light should be diffused and warm as these light conditions will make the user relax and as intense light will have the opposite effect. Furthermore, he recommended that the design used the natural feeling of calmness induced by sundowns and dusk lighting. [Interview 2015]

4.2

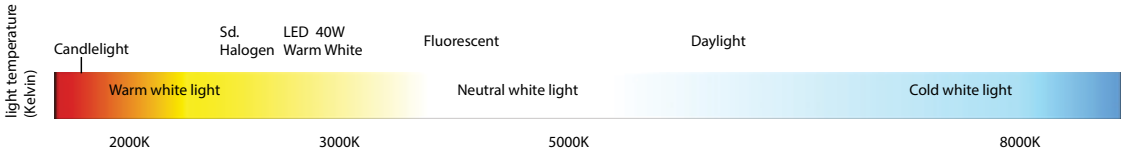
Besides the interview the team is also researching basic technical facts and investigating the PH experiments [Henningsen 1974]to obtain a design foundation. Demands to the blinding of the light is derived from these. The experiments points out that it is very important that the bulb is not visible as this blinds the user and tenses the mood. Nowadays light bulbs have taken a quantum leap and there is no longer a connection between the light power, temperature and intensity. [Energistyrelsen 2014] The PH light experiments does mention the quality of diffused light. [Henningsen 1974]

The light that is needed in the setting of the stick-2nature project should be dimmed, warm and diffused. Because the furniture are to be used in relaxed situations and encourage conversation and togetherness the emitted light has to be diffused with the right temperature and intensity to ensure the inviting feeling. There should not be any direct or blinding light in order to keep the user comfortable. [Weber 1946] The weaker the light (measured in intensity) the color scale is in the low temperature (red/orange) end in order to keep the colour balance in the eye [Henningsen 1987].
From ancient times, humans still have a primitive instinct telling them to go to sleep when it gets dark. In the evening when the dusk arrives, the color temperature is shifting from bright daylight to a red and orange color scheme and then in the end, it disappears as the sun sets behind the horizon. [Slumberwise 2013] This is the color scheme the team is aiming at in the setting of the furniture. Combined with light studies, an examination of bulbs technologies and of color temperature is conducted in order to reveal how the desired effect should be obtained. In order to select the intensity of the light, it is also necessary to investigate the emission of light rays, measured in Lux. Lux is a SI unit measuring the luminous flux per unit area. Lux and Lumen are both SI units of light, but there is a difference in how they are measured.

Lumen (lm) is proportional with Watt (W) and is mainly used to inform about the intensity of a LED compared to incaedescent (watt) bulbs. In example; A 40 watt incadescent bulb is equivalent to 470lumen.

On the other hand Lux is defining how much a cetain area is illuminated. In example; an average office light is 320-500lux, meaning that its lighting can be 470-800lm (40-60W bulb), depending on the distance from the bulb and the enlightened area (whether it is a table lamp or a ceiling lamp). In the experiment and desired outcome it is decided that in order to complete the experience of the chair, a light source with approximately 250-350lm (25-35W) should be efficient. [Wikipedia 2015][Energistyrelsen 2014]

Warm and diffused lighting are derived from this, and will be thought into further designs.



Ill.77: Light temperature scale

LIGHT EXPERIMENTS

The light experiment is conducted in order to create insight in how light function and express itself in reality.

The models are made of brown cardboard in different shapes. There are two variations of the same model: one with lamellae and one in full material. The models where they are attached to a bulb and tested different times of the day in order to research how the natural daylight and surrounding light is reacting with the lamp.
By doing this experiment, the team found that lamellae is giving a sufficient light. It was also realised that the number of lamellae has to be either few or numerous. Otherwise, the shadows and reflections tend to seem disturbing and confusing.

Ill.78: Light experiment

The conclusions drawn through the experiment are that the models with the lamellae providing the most "naked" and true expression whereas the fully covered models seem to be an unnecessary twist of the design. It is also obvious that few lamellae provides a more pure and simple look, in coherence with the preliminary chair design. The models made from the number and placement of lamellae seem to express an almost scary shadow on the wall, comparable to a large mouth with sharp teeth. To avoid this intense expression, it is decided to design a lamp with few lamellae and also to make sure the direct light is reflected as both the interview with the light engineer and the light studies by Poul Henningsen states that diffused (reflected) light is the most comfortable and provides the best experience. [Interview 2015] [Henningsen 1974]

ill. 79, 80, 81 & 82: light experiment

Thin and excessive use of lamellae tends to create a scary and uneased expression. Therefore, the team will attempt to work with wide lamellae and their shapes.

The complete light experiment and its findings are available in appendix 3,6.

IDEATION ON THE LAMP

As the criteria for the lamp is found and listed, an ideation process begins. Earlier sketches that meet the demands are brought into the ideation phase in order to get inspiration for potential new ideas. As sketching is not providing a sense of space which is needed, the process is supplemented with coarse modelling. Both box and lammelae is made. Afterwards, a model of the lamp bases is made in order to test possible lamellae positions. The lamellae is modelled in cardboard made in the range of degrees found in the measurement study from NPT where 20 trees were measured and categorised as shown in the pictures at the bottom of the page.

Below the three first overall concepts are descibed. At the stage of concept three it is decided to move away from the traditional lamellae lamp which exists on the market and place the light source opposite than in other lamps. Furthermore, the inner surface of the lamellea should be coated with a reflecting surface to create the diffuse light surrounding the rocking chair.
At this point in the process of the lamp, the dimensions of the light bulb as well as of the transportation box are taken into concideration when creating the shape and the proposed DIY assembly of the lamp.

Ill.83: More and closed lamellae
1 \\ more and closer lamellae

The first concept is based on the knowledge and construction of the cardboard models created for the light experiment.
Allthough the concept has closly placed lamellae is it still too close to the teeth looking concepts.

Ill.84: one set of lamellae
2 \\ one set of lamellae

In this concept the teeth looking aspect is avoided. Additionally, a dynamic shape is added to the lamellae to make them create a more closed structure at the top where it is thicker.
In this concept nothing shades for the light at the bottom and the direct light is created which is wanted to be avoided

Ill.85: Differentation from ordinairy
3 \\ differentiation from ordinairy

The light source is placed opposite to the light from the bottom of the structure towards the shade which will reflect the light to create a diffuse light in the room. This concept contains the principle of having thicker lamellae at the top centre to forclose the light to reach the room above the lamp.

Ill.86: Lamp box in desired size

Ill.87: lamellae idea #1

Ill.88: lamellae idea #2

Ill.89: Lamp and chair

In order to have a solid furniture line, the design DNA is important to transfer to every item. All through the design process, it has been important that the lamp is reflected in the chair. After creating the mock-up of the third concept, it is realized that the circular revolving shape does not respond to the aesthetics of the chair.
Subsequently the design DNA for the chair, as shown before in the report, is applied to the lamp concept.

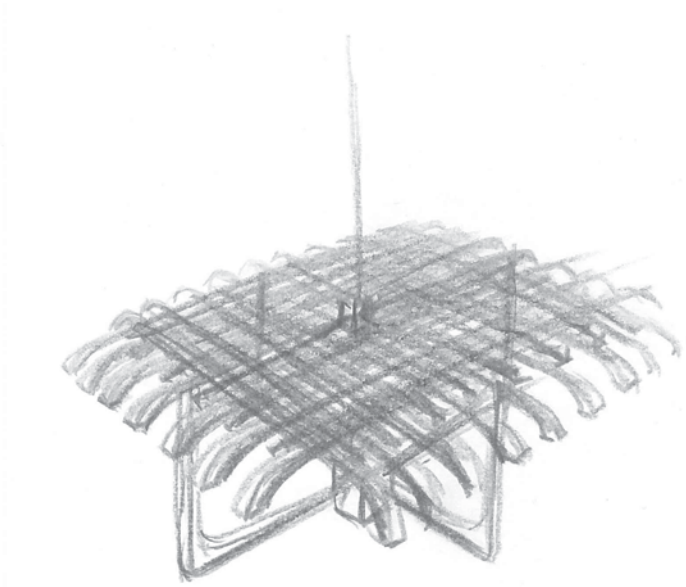
At illustration 89, the final concept is illustrated. The shade is no longer revolvetic and is now based on the same grid as in the rocking chair. Furthermore, it has the same stucture with a frame that fixates the light bulb beneath the shade to have it aimed upwards, so the light will be reflected in the relecting surface of the lamellea.

In order to fulfill the demand concerning that the user not should be able to see the bulb, the design proposition is that it should be placed in the base of the lamp, so that the user is not blinded.

4.2

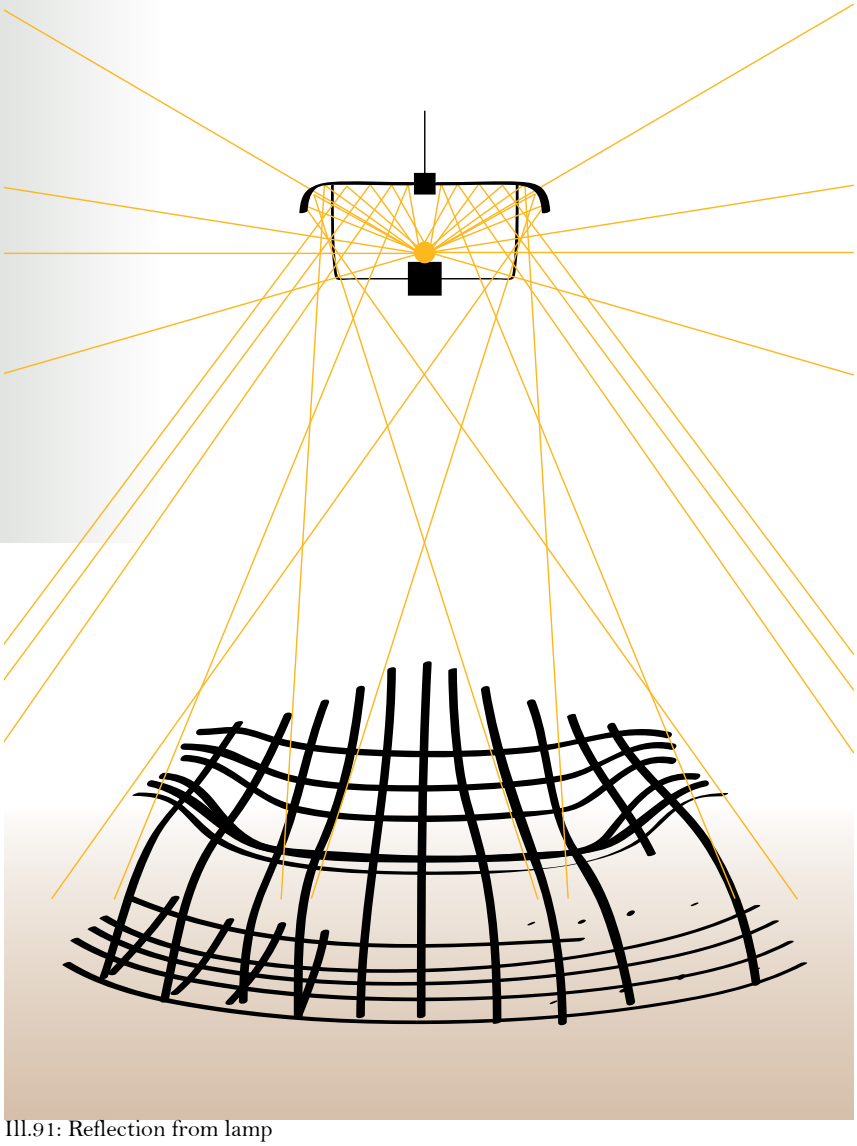
In order to have a concrete visual guideline for the lamp, the measures for the light bulb and fixture is found.

The light bulb is decided to be a small fixture with the standard measure E14, due to the fit of the fixture. Furthermore it is decided the bulb should be a LED.



Ill.90: lamp concept

4.2



Ill.91: Reflection from lamp

4 . 3 FURNITURE PRODUCTION

PRODUCTION METHODS

The prototype is built of lamellae made from plywood, glued and shifted from each other to enforce the rigidity of the model. At the consultation with Mathias Hedal from &Woodlab, it was then advised to build the chair in the same manner, as this provided large surfaces to glue together and would strengthen the structure of the chair.

As mentioned before, the team had decided to use Viking ships building assemblies, in order to prevent the use of bolts and screws and keep 100% rowing materials in the furniture.

Mathias stated that the large ships would also contain large planks and lamellae, which again would result in large assemblies. As the furniture is many times smaller, the assemblies would be proportionally small and result in the glue surfaces being too small to be able to hold. Based on this statement, the team decided to use the suggested way of building the furniture.
Furthermore, the lamellae had to be higher and CNC milled in order to get the accurate angles and cuts in the wood.

When cutting the lamellae it is necessary to use a five-axle CNC cutter due to the angles in the notches combined with the angles of the lamellae.

The precise cut of all the parts will ensure a perfect fit when glued together. It is important to use glue attended for wood, as this type of glue consists of wood fiber that will mix with the wood and secure the position of the parts.

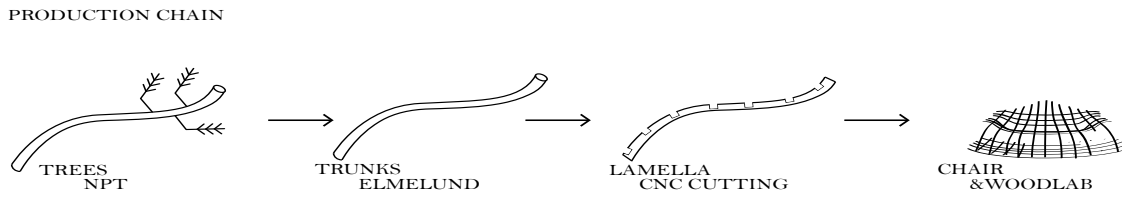
As the furniture are yet to be produced, a specific production method is not yet decided. The cost price of the CNC-cutting varies a lot. From three different sources, three different prices is derived. The manufacturing process depends on which state the material is delivered in as well as which type of CNC cutter is used and whether the cutting parameters are to be programmed manually or through CAM-programming.

As illustrated below, the trunks are processed through several links before they are transformed into chairs.

PRODUCING THE LAMP

During the design process, it was planned that both the chair should be produced by hand and the lamp by hand. After consulting the carpenter, Mathias Hedal, it was realized that the lamellae had to be CNC-milled in order to be accurate enough to get the correct assembly.
Opposite the lamp, that had to be made by hand, as CNC cutting was an excessive production method.

The most optimal production method would be by hand and would not be difficult nor time consuming.



Ill.92: Process chain of mountain pine

5 COST AND SALE

In product design it is important to take the business aspects into account as well as the aesthetical and functional aspects. A product cannot be regarded as succesful if none of the users are interested in buying it.

The furniture designed and made from rowing materials from NPT, manufactured and assembled by local carpenters and sold in NPT Centre offers a unique story that needs to be told. As mentioned in the market analysis made prior to the project, the stories available in the design are crucial parts of marketing and selling the products.

The chair is to be made in limited quantities whereas the lamp is regarded as an industrial product. The marketing focus is mainly on the chair as this is the key product in the furniture line.

This is marketed with a specific image with the purpose of placing the furniture in a high end design niche. Internal processes as product innovation, supply chain and overall business plans are stated as well as external aspects such as marketing, customer segments, channels and key partners. Hereby, an overview of the current guidelines from which the product can be marketed is provided.

5 . 1 BUSINESS MODEL CANVAS

SUMMARIZING BUSINESS MODEL

Throughout, the report, excerpts from the Business Canvas Model is found in their contexts.
Key partners, key activities and key resources are in coherence with the stick2nature ideals of keeping the process in the community.
By involving local businesses, both social economic and manufacturing, the cost price will, probably, be reduced. This is due to the mountain pine being free of charge, as it is to be removed anyway.

KEY PARTNERSHIP

National Park Thy
Elmelund
&Woodlab

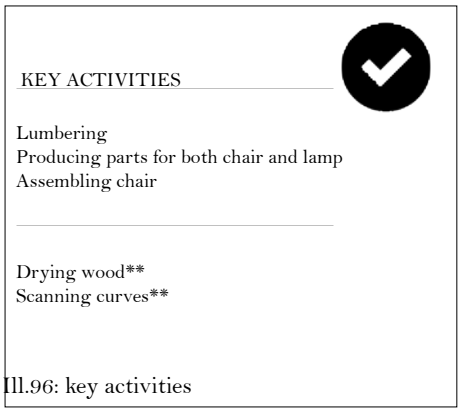
Local manufactures
UCN**
NPT Center
Specified retailers

KEY RESOURCES

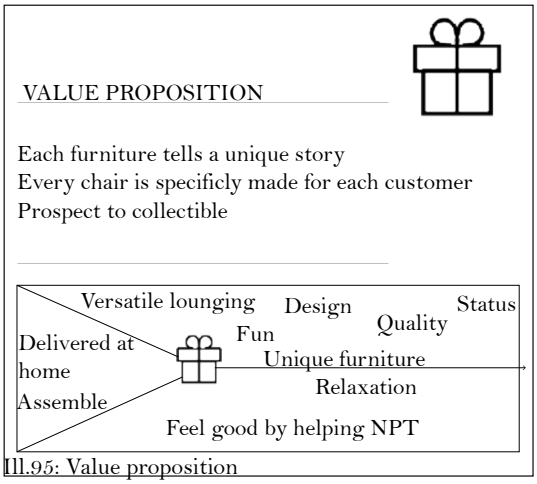
Mountain pine
Roving materials from NPT
Business clusters from community

Ill.93&94: Key partnership, Key resources

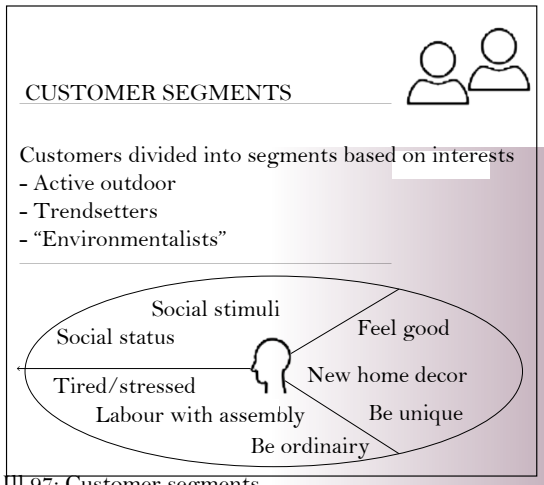
Elmelunden is a social economic institution as they produce for educational purposes, their prices are low. The manufacturing companies responsible for the CNC milling and carpenters assigned to the assembly the furniture, are likely to be extremely fair in their production price due to the purpose of the stick2nature project.



Ill.96: key activities

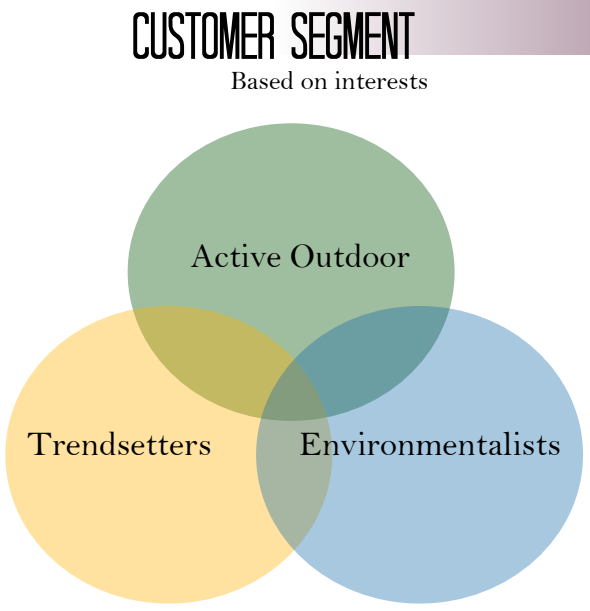


Ill.95: Value proposition



Ill.97: Customer segments

The Value Proposition and the Customer segments are closely linked, and one is supposed to solve the needs from the other in order to offer a sufficient value proposition toward the customers. All customers, no matter what kind of customers, have different "Jobs", "Pains" and "Gains".[Osterwalder 2014] The furniture proposes values as "uniqueness" and aesthetical design, one of a kind and invites to relaxation, fun and togetherness. The found customer segments are based on interests as these seem to be the most adequate way to describe a very versatile group. The segments are described as: Active outdoor which covers the tourists visiting NPT Centre who wishes to bring unique nature home and desire to recall the relaxation found in the nature. The trendsetters are the ones that find value and status in owning a unique piece of furniture and uses expensive furniture to differentiate themselve, from other groups of customers.
Environmentalists belives in nature. They will be interested in this furniture due to its background originating in NPT, that is, being made of "waste" products and provides a "feel good" by helping environment in investing in sustainable products.



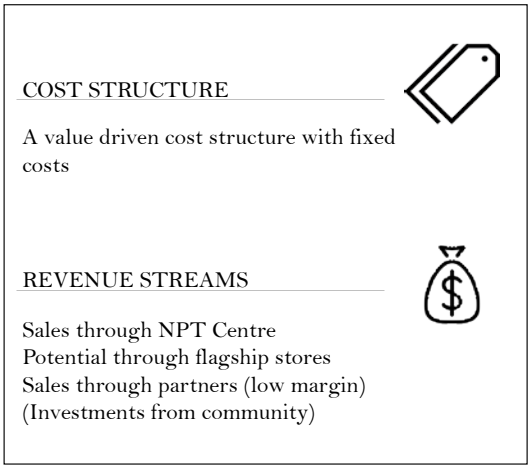
Ill.98: Customer segments

Customer relationships are primarily through the contact points between the furniture and the customer. The relationships between stick2nature furniture and the customer, the customer is able to experience, touch and feel the furniture.

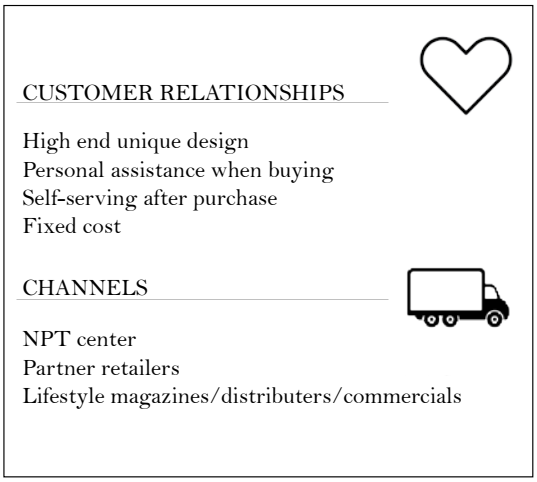
At the NPT Centre, the customer is able to discover the furniture in different settings, along with to trying it and to buy it. As the employees in the centre are not hired with the purpose of selling the furniture, this is not costly, but depends on the engagement in the stick2nature project and whether the staff can communicate the specifications of the products.

In partner retail stores specialized in dealing furniture, the employees are assumed to have a good and valid knowledge and construction of furniture. Therefore, they are able to guide the customer in the sale. This is also where it can be costly to vendor furniture, as the retailer's purpose is to sell furniture and earn money of of it, and therefore typically sell furniture in commision.

5.1 Besides exihibitions and stores, the furniture can be exposed through lifestyle magazines, i.e. Bo Bedre which was also a part of the initial market analysis. This is also a channel through which the furniture can be marketed. This can be costly, as the magazines and similar distributors are charging money for advertisement, unless the furniture is interesting enough to get its own articles. First, the furniture can be displayed through articles, but when its looses it newsworthy, marketing and advertisement is necessary.



Ill.97 &98: Cost structure, Revenue streams



Ill.99&100: Customer relationsships, channels

The cost structure is value driven with fixed costs, as it is assumed that the manufacturers are almost charging only costprice in order to support growth and development in the community. This leaves no saving proportional with larger quantity manufactured. Furthermore, the wood supply is limited and is, therefore, not changeable in cost.
In the beginning, the supply chain cost is slightly higher, as it is inevitable that the supply chain will be inefficient until processes are standardized.

The revenue stream is, primarily furniture, sales. Furniture sold in the NPT Centre returns a higher profit margin than furniture sold in the flagship/ specific retail stores, due to the expences (rent etc.).

Another possible revenue could be investments or funding through local businesses or foundations interested in supporting growth and development in the area.

5 . 2
COSTS

MANUFACTURING COSTS

Both chairs are made of mountain pine made from the NPT, lumbered by Elmelunden and manufactured by local businesses. As the project is yet to begin, specific costs are not yet established. This means that the production costs are a rough estimate based on generic pricing and assumptions made by professionals.

	Volume	Weight	Hours of CNC Milling	Hours of gluing and assembling
Large chair	0,04m^3	16-17kg	30 hours	8-12 hours
Small chair	0,02m^3	8-9kg	15 hours	6-8 hours

	1m^3 Mountain Pine	Drying of 1m^3	CNC milling/ 1hour	Carpenter/ 1 hour
Cost	10000 DKK	3-500DKK	550DKK	350DKK

Large chair: 0,04x(10000+500)DKK +30x550DKK+ 12x350DKK =**21 210DKK**

Small chair: 0,02x10500DKK+15x550DKK+ 8x350DKK = **11 260DKK**

The calculations does not account for transportation between the processes, nor does it account for drying in the stick2nature and UCN experimental containers. Time from drying and lumbering and time between processes is another factor not calculated. It is estimated that the cost price is very low in these calculations and will probably increase as unexpected costs will emerge during the process.

ERROR SOURCES

The error margin in the manufacturing cost calculation is high, as this have not been done before and standardized prices is therefore not available. As mentioned, this is a project yet to begin, so a cost price for 1m^3 and mountain pine is not calculated and, therefore, an estimation based on oak is made. The price for 1m^3 oak wood is provided by Mathias Hedal, owner of &Woodlab.

The drying of wood in an oven is derived from a calculation made on firewood. The per 1.8m^3 wood is approximately 300DKK [Holddigvarm. dk 2014] when dried in an oven. This price is increased as firewood takes less space when dried than planks do. Furthermore, this is a variable price as the ongoing UCN and sstick2nature container experiment is not completed, why a price cannot be calculated yet.

The CNC milling price and hours of labor are estimated by Dansk Maskinindustri A/S and can vary as they only process metal which is a slower process than wood milling. Also, the team is not certain that CNC milling in metal is also more expernsive than CNC milling in wood.

Last the gluing and assembling hours are given by &Woodlab. Carpenter, Mathias Hedal, estimated about eight hours of gluing and assembly for the large chair. This did not include detailing, finishes, or materials.

The calculated price estimate can, therefore, vary quiet a lot, as many uncertainties and pragmatic solutions are yet to be uncovered and cannot be found before the project begins. The carpenter from &Woodlab also consulted the team regarding the large chair, for which he estimated a cost price of 100.000DKK. This insinuates that the cost price is going to increase and supports the decision of scaling the chair into a single-person chair, in order to be able to make and sell the furniture.

The price of the lamp is not calculated as it is to be made by hand and is still in the concept-stage of the development. This means that is almost impossible to estimate how much material is going to be used and the time to consumed.

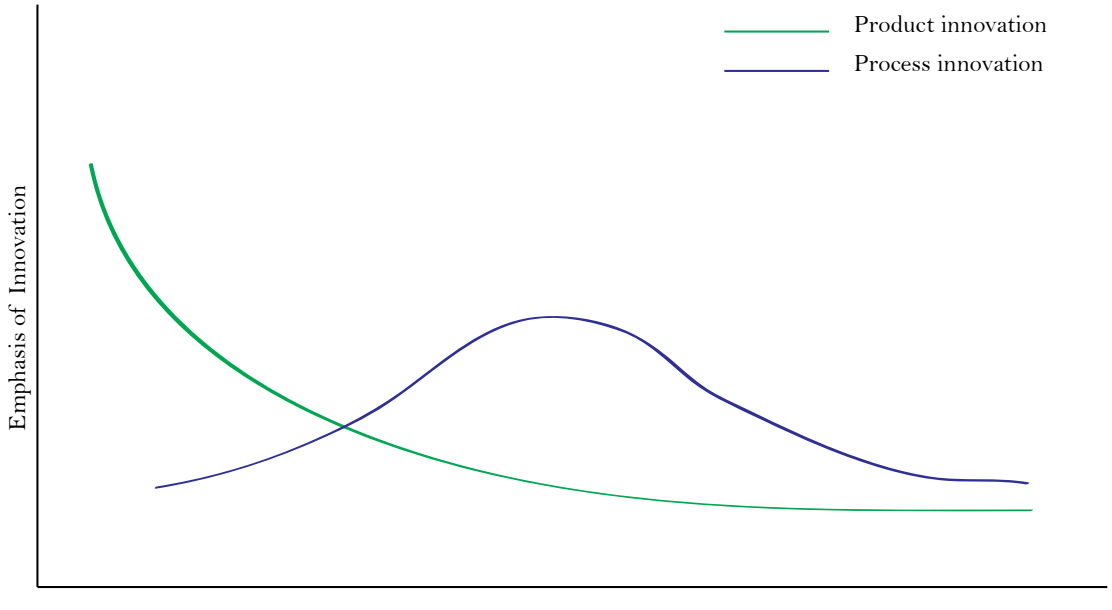
PRODUCT AND PROCESS INNOVATION

The Abernathy-Utterback model is a business model explaining the emphasis of innovation through three phases. The model takes the dynamic environment into account by linking product- and processinnovation, competitive environment and organizational structure together. [Abernathy 1978]

The model is divided into three phases: known as the fluid phase, transitional phase and specific phase. The first phase is where the uncertainty of the market dominates, where the business depends on high skilled labour and manufacturing and where there is almost no process innovation, due to the non-predictable conditions. Through the fluid phase, the product innovation is relative high, as the iteration of the product development causes a constant improvement and refinement of both function and design. At this point, the focus is in integrating the aspects in the design. Moving toward the transisitional phase, the product innovation decreases as the development moves toward completion while process innovation increases due to the building of prototypes and testing of manufacturing methods. This project is kept in the fluid phase as business models and forecasts cannot be tested or proved accurate before the products are produced and launched.

Allthough the project is still in a starting phase, attempts to increase process innovation has been made. As is, the trunks are to be lumbered, cut into planks and dried, before arriving at the CNC Milling. The UCN-experiment, concerning scanning and registering pine curvature, can simplify the process of lumbering and selecting the "right" trunks for the "right" lamellae.
By creating a range (of angles) in which the lamellae are to fit into and a marking-system in combination with the 3d-scanning system, the trunks can be marked even before arrival at the CNC mill. At the factory, a computer programme "read" the scan and fit the specific trunk into a preprogrammed frame. Thereby, man hours used to setup the machine are reduced.

From the fluid phase, the project continues into the transitional phase. This is where the process innovation and production efficiency begins to increase due to the habituation of the production process. Here, the product innovation is decending while the process innovation is increasing as the production is pacing towards massproduction. As the large chair cannot be massproduced due to it's uniqueness, it is still leaning towards an industrialization.
The dominant design is obtained through the design DNA and is securing the unique design against potential copies as well as it is enabling further scaling and polarisation of the products. As mentioned earlier, the dominant design is based on the special assembly and idiom connected to the story of nature.
In the specific phase the base of the dominant design is founded and the innovation is mostly based in product differentiation in competition and cost efficiency.



Ill.101: Product and process innovation

FROM FOREST TO PRODUCT

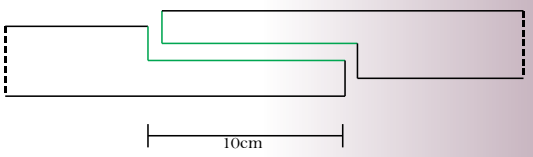
As mentioned earlier: the process from forest to finished product, is very slow through several of the phases. At the same time, the process contains critical points, where it has been necessary to make assumptions and estimates, due to the uncertainty of how the process in reality will proceed.

Elmelunden is assumed to take on the task of lumbering and sawing the trunks into planks. As this institution is a social workshop, both skills and process time are very important factors in the beginning of the process. It is confirmed that Elmelunden lumber the mountain pine, but not if they are able to cut the trunks into planks. If not, it is possible to develop the competencies in another business, but this will be more expensive in production costs. This is assumed by the team, based on knowledge gained from another, small woodmill whom sawed of mountain pine, that the team lumbered.

Another issue is time consumption. As Elmelunden is using this for educational purposes, they are not anticipated to work a full day, due to their capabilities. Furthermore it is not tested whether they are able to operate the scanning app, currently being developed by UCN. If not, someone else needs to perform this task, maybe in cooperation with Elmelunden, and mark which trees to cut.

The next issue will be the drying of the mountain pine. Firstly, the container.drying experiment is yet to be confirmed as a method. Second, it is a time consuming affair. This could be reduced by drying the planks instead of trunks, but at the risk of the planks warp. If the warp is to be prevented it can be costly as the process needs to very controlled and advanced equipment is needed.
Alternatively, the trunks could be dried in an oven, but this would add to the production costs as well.

The next steps in the production process is the gluing, CNC milling, and assembly of the furniture. The gluing can be done by Elmelunden after the planks are cut. First two planks are glued in order to maintain rigidity and then they are to be CNC cut with a 10cm adhesive surface. This is to prevent any intolerances, ensuring the lamellae is not screwed, to avoid manuel correction of shiftet surfaces later in the process. This means that the team are aware of the challenges concerning the CNC cutting of the planks to lamellae. The first assumption is, that there is a sufficient CNC cutter available in the area (at least five axles in order to cut the angles). As the further process depends of the type of machine it is also assumed that the CNC cutter is advanced and able to be programmed through CAM-programming or similar. The lamellae is cut so their ends can meet in an adhesive surface, like this:



The green lines are the adhesive surfaces needed in the final assembly of the furniture. The companies asked in this project, estimates a production of all 120 lamellae will spand 30hours, resulting in a couple of minutes (90sec) for each lamella.

Finally the furniture is to be assembled by a carpenter. To make the assembling efficient for the large chair, a fixture, able to hold the lamellae is needed. First carpenter needs to assemble the loop and then place them within the fixtures, ensuring they are angled correctly. When they are in place, the carpenter is now able to affix the horisontal lamellae in the seat and the base. As they are CNC cut, each assembly will have a specific angle, matching an opposite horisontal lamella, the assembled can be easened only by assigning the parts with numbers.
This registration can also help ensure the carpenter has all the parts, before beginning the assembly.

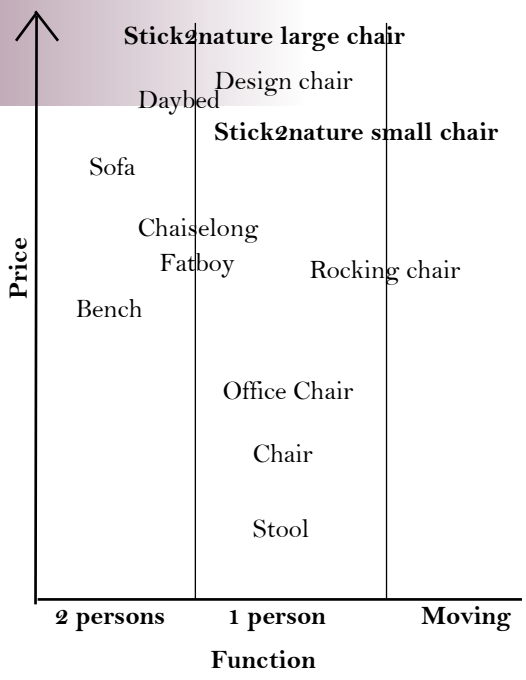
The last step before the store, is refinement and the detailing. This is also done by the carpenter. The detailing contains a smoothing of touchable edges and possible a surface treatment.

5 . 4
MARKET

COMPETITORS

As the customers are identified and the cost price of the manufacturing is calculated, the next step is to pricetag the products.

In order to find the right price for the furniture, it is needed to investigate, which products on the market that can be viewed as competitors. Defined by function, price and value. If our buyers are not going to buy the stick2nature furniture, what could they be persuaded to buy instead?



PRICING

The pricing of the products is based on both cost price and an informal at Paustian Furniture, located in Århus. The sales manager at Paustian explainsed that the large chair will be regarded as a staement furniture and will be hard to pricetag as it requires a special type of customer. If Paustian should estimate, it could be sold in their store for about 50.000-70.000DKK. This supports the notions made from &Woodlab, which stated that the large chair would be expensive to produce. As earlier stated, the chair is analysed for its design DNA and scaled into a smaller piece, one-person chair, that is to be made and sold in a larger quantity than the large chair. This underlines the uniqueness value in the product because not only is every chair unique and different from the others, due to the curvature from the mountain pine; Also, they are made, especially, to a specific customer.

The large chair ranges between 50.000 - 80.000DKK and the small chair is ranging from 11.000 to 20.000DKK.

DKK	
50.000-80.000	**Stick2nature large chair**
10.000-70.000	Danish Design Classics
8.000-25.000	new designer furniture i.e. Bolia, Hay
11.000-20.000	**Stick2nature small chair**
3.000-13.000	"Unknown" designer furniture
900-9.000	IKEA Furniture
1000-5.000	Private label furniture i.e. Trævarefabrikkernes udsalg
500-4.000	No name supermarket furniture i.e. Jysk, Bilka

5 . 5
SPECIFIED RETAILERS

CHOOSING RETAILERS

The main selling platform is assumed to be NPT Centre. Besides the NPT Centre other nature museums, centres and similar, should have an exhibition model of the large chair. This will promote the stick2nature initiave and inspire others areas to assimilate the project and translate into their area. Another intention by exhibiting the furniture in other centers is to create attention toward the project and connect with more customers. Besides the large chair, they should also have a small stock of the small chair and the lamp.

Furthermore, it is planned that the chairs should be marketed through known lifestyle magazines (i.e. Bo Bedre, RUM) (as proposed in the market analysis). [Market analysis 2014] In addition, exclusive furniture retailer should have an exhibition model in their store.

The specified retailers are choosen based on their furniture price range. This emphasizes the quality, knowhow and loyalty towards unique designed furniture and will empower the stick2nature brand. An important aspect to consider when creating new high end design furniture, is the channels from which the image is conveyed. This means that the retailers are to be high end furniture stores, which are already selling furniture in the same price range, as stick2nature is placed in.

In comparrison, could the stick2nature furniture not thrive in stores like Jysk or Bilka, as the staff expertise concerning the furniture, would most likely be lacking. Also, the team hesitates by the thought of having the stick2nature furniture placed among cheap, mass produced, no name furniture, as their images could rub off onto the stick2nature products.

Furthermore, the retailers should be differentiated by their geographical location, meaning that in Aalborg, the retailers could be similar til Brdr. Sørensen or Høgh Møbler while in Copenhagen it could be Fritz Hansen or similar The "right" collaborators are chosen by analysis of the customer segments and the stores they visits.

By strategizing the marketing by choosing specific key partners, it supports the furniture profile and ensures the stick2nature products keeps the desired image.

This will also provide a value toward the retailers, as they will be known as "the store" which sells that stick2nature furniture. Also, if they are successful, an exclusive dealership contract could be suggested along with priority when new products are produced.

By making the furniture something that is difficult to obtain, it will lure some customers, typical, in the "trendsetter"-segment, as they will recognize the uniqueness in owning something that other cannot get their hands on.

DISCUSSING AND REFLECTING

As the project concerning furniture production is still in the pipeline, a lot of estimations and assumptions is made during this report. Furthermore various suggestions and proposals are still unresolved due to the time frame of the project.

As the project team is not able to forecast or foresee potential consequences or obstacles, different subjects are discussed in order to reveal potentail challenges that may occur.

6 . 1 UNKNOWN FACTORS

REMOVAL OF THE MOUNTAIN PINE

A large part of the stick2nature furniture project is based on the removal and utilization of the mountain pine. The mountain pine was planted in order to prevent the sand drift that destroyed farmers crops and made it impossible to live in some areas. After the planting of the mountain pine, the sand became fixated in the dunes by the roots of the trees.

Half a century later, NPT decides to remove the trees in order to enhance living conditions for a rare species of butterfly, living in the park. Thay also state that it is to preserve the nature, as the mountain pine is a self-seeding and invasive tree.

The project team paid attention to that no preliminary reports or experiments were made, to predict how nature would react when all of the mountain pine is removed. Whether the sand drift would return or the missing trees would impair other species of plants or animals.
Thorbjørn Stenholm estimated that some of the bird would relocate, but could naturally not predict if it would happen.

Climate changes during the last century also makes it difficult to predict the consequences of the removal of the mountain pine. The area of Thy is subjected to rough conditions, by being located in the outskirts of Denmark.
If the removal of the trees provoke the sand drift to reoccur, or maybe even initiates other natural

phenomenon, it will result in a hard blow to the community and it's attempt to grow.

DEVELOPMENT OF LED TECHNOLOGY

In the development of the lamp, some of the issues have been concerning the technology as the LED has been undergoing a rapid development. From the incadescent bulb, which has now been phased out in most parts of the market, in favor of the less energy consuming LED bulb, several uncertainties occur when designing a light source.

First is the development of the light fixture. Since the incadescent bulb have been used for almost a century, all bulb fixtures are adapted to stadard sizes. The team discussed whether the bulb should be changeable or build-in.

The LED would out-live the lamp if built-in, but would be problematic if the LED malfunctioned and should be replaced. The other option was to design the lamp with a standardized bulb fixture, so the user could change the bulb if it should break or if the user wanted a different type of bulb.

If the team designed the lamp with a bulb fixture, there is an uncertainty whether or not fixtures, or this fixture would be out dated in the near future.
As the LED development is described by a S-curve and it is almost impossible to say where it currently is placed, the team can only guess how far the evolvement will go, before it reaches a natural boundary.

As history reveals, technology developments will often be slowed or paused due to other technologies lack in development. The incadescent bulb were also slow in the beginning of it's development, whereafter it rapidly evolved and then slowed again untill LED was invented.

If history repeats itself, the LED will become cheaper, better and more efficient, untill it is slowed, and then it will sparked again, maybe by a new invention or further development of another linked technology (maybe wireless electricity).

LONGTERM EXPERIMENTS

Besides the mountain pine, other materials from NPT is used for experiments, in order to reveal if they can be utilized as well. Though it has not been possible to fully obtain an understanding of the possibilities by using the materials, it has provided an insight to which areas of the project, that could be affected.

The very first experiment discussed, was the blue stain. As mentioned in the research, blue stain is a harmless fungus, that can infect the wood, if they are lumbered while the outside temperature is above 5 degrees Celcius.
An attempt to "brand" the furniture with blue stain was considered, in the beginning of the project, as the blue stain did not compromise the structural properties of the wood and the only effects were de aestethical flaws.

Unfortunatly it takes several months for the infecton to spread the fungus and even then it is not certain, that the pattern of blue stains can be controlled. The experiment was planned and detailed, but due to external factors, could not be carried out. It could be something to investigate and test in the furture of the project, as it could give the detailing an extra unique feature.

Another material that was investigated was lyme grass. This was thought to be woven into a sort of seating or otherwise incorporated in the design as a textile. Lyme grass were collected and tried out in different braids. In the experiments conducted by the team it seemed to weak and needed to be treated or processed in some way before it could prove itself usefull.
It is mentioned in the report as it is found that similar materials can be used for braided textiles or even as rope-material, but the team did not posses the skills to make it work, why it is suggested as a proposal.

Bees wax is also tested to get an idea whether it could be used as a treatment to the final products. The idea was to apply it on the untreated wood and test if it could protect the wood from UV light (emitted from sunlight). This could hopefully prevent the yellowish teint pine furniture obtained over time and keep the beauty of the raw wood for a longer period of time.

DOGMA RULES

In relation to the stick2nature project, dogma rules were created. These was to ensure a common guide line for all the actors to follow and was further specified so they related to the stick2nature project.

The idea with the relatively unspecified dogma rules was to make them applyable in other areas and toward other initiatives.

The dogma rules fulfilled their purpose but it is still uncertain whether other areas, parks or communities will be as interested as Thy and NPT. The support for the stick2nature project, experienced at the visit, was almost overwhelming and the team's effort was highly appriciated.
The spirit in the area was very high but there is no guarantee that the involvement will be as high or as welcomming in other areas.

Another unpredictable aspect is the material. It is not certain if any other parks are in possesion of that amount of material in need of utilization and even if the parks or area will be able to remove that number of trees (or other material) without compromising the nature.

It is also important that if the dogma rules are to be transferred into another project, that there will be a very passionated coordinator (like Thorbjoern in the stick2nature project). There are many loose ends to keep track off and many layers to consider.

AMOUNT OF MATERIAL

Assumed the stick2nature project will be a success, and the furniture sells out fast, the material (the mountain pine) is a limited material. As earlier mentioned, there are "only" approximately 500.000 trees and not all of them can be made to furniture.

This will result in a limited amount of furniture, why the team belives there are prospect to be collectible.
But what is to happen if demands exceeds supply?

Will NPT have to find other materials and can they do so, whithout compromising the nature in the park?

Will the area continue to grow and prosper, when the "main attractions" is discharged?

PRODUCTION COSTS

Through the designing and the detailing an estimated production cost is investigated. The team has been in contact with several manufacturers and received cost proposals.
The given costs differs quite a lot from each other. Especially the CNC cutting prices are ranging between 20.000DKK - above 100.000DKK and seems to depend on the company who are asked to estimate.

The team are assuming that the price depends on the type of CNC mill that the companies own. Meaning that Dansk Maskinindustri A/S in example, are low costs due to the new, high tech machine they are in possession of. They estimated the price being proportional with about 30 man hours and would cost around 20.000DKK. As they are only milling metal it should also be taken into account, that there is a large difference btween milling wood and metal, as the metal process is slower than cutting wood.

The carpenter has argued that the cost for cutting the lamellae is ranged above 100.000DKK.
The team is having a hard time figuring out a realistic price both due to mixed messages and because it is difficult to estimate pricing in an area, where the team lacks expertise.

The price may deviate substantially from the calculated price but cannot be predicted before the contractors are hired.

6 . 2
CONCLUSION

The stick2nature is an ongoing project in Thy, initiated to support the local community thereby creating better living conditions for the residents by creating working places and in general spark growth in the area. The scope of the project that the team has worked through, is to create a furniture line by utilizing the mountain pine in a way that substantiated the natural curves that the wood possesses. In addition to use roving material, it also has to be the local companies who should produce the products, thereby strengthening there notion to promote growth.
Additionally one of the project goals was to use Elmelund, a social economic business, to enforce their mission of eductaing and supporting socially challenged people.

Stick2nature is organized as an umbrella that, amongst others, embraces clusteres of companies, to create a base knowledge and experience. This is why it is important that every involved company is an active part of stick2nature and contributes to the stick2nature collaboration. Furthermore the dogma rules is created in order to give every company a common ground in understanding their role in stick2nature.
The main focus of the chair has been to bring people together and let them have an area of relaxation after having walked through the Thy National Park. This is attemted by creating furniture that will make the user memorize their visit in the park and reminisce their relaxation experince.
The main focus of the lamp has been to design an item that can be bought and brought home with the end user even thought that they are on a bicycle or backpacking holyday. Both products should tell the story of stick2natur and the unique nature of Thy.

In order to fulfil the requirements of the project the team has researched the history of Thy thereby creating knowledge of the area thereby understanding the community. Throughout the project there has been conducted material experiments with the objective of researching alternative natural materials that could be relevant to use. These are; lyme grass, bees wax and blue stain.
I collaboration with Thorbjørn there has all the way through the project been a contact to the local companies that are in the stick2nature project in order to get there expertise.

6 . 3
REFLECTION

The stick2nature project is a feel good project with a subject of making furniture, which from the start gave the team the desire to participate into the stick2nature. Furthermore the project has an interesting approach to create a new revenue stream to an area that struggles with the difficulty of being located in remote area of Denmark.

As stick2nature still is in an upstart phase, the mini projects, i.e. drying wood and scanning the trees, are still unresolved and untangible why the team has been forced to assume and estimate through the project. In example it has been challenging to base the project in the NPT Centre, as it has been on assumpting level because the centre yet has to build, or even designed. This provided both freedom to allow the development to take its natural course but also uncertainty, if the centre turns out to be the exact opposite of what is assumed.

The team selected the NPT centre as an exit point for the furniture design. In retrospective the park and nature could have been chosen as well, as both approaches seem to lead in that direction anyway.

Through the whole project, the team has been overwhelmed by the support from the stakeholders. The actors and collaborators has been supporting by providing information and advice all the way.
This is also why the team doubts that the dogma rules can work as efficiently other places, as the spirit and unity of Thy, seems to be extraordinary.

In regarding to the large chair the size and production price can be deterrent for the user. To meet both a realistic production price and expand the customer segment, the chair was made so it was scaleable.
This was done by deducting the design DNA and translate it into a smaller piece of furniture. Neither the lamp nor the small chair, is completely designed and is still in need of testing, several iterative rounds and finishing detailing. This is due to the lack of time in the project and is regarded as further work, as the stick2nature project is to continue after this master thesis.

The business part has also prooved a challenge. This is due to the amount of uncertainties combined with the different aspects. Furthermore, the team is usually presented with a busniess part, where the market positions and similar has to be investigated, but the marketing and branding are taken care off, by a collaborating company. In this case, the team was the best suitet to do so, why it has been challenging to try and predict the output of the business efforts.

The team has from the beginning been aware of the different skills and intrests possessed by each team member and has worked toward making the differences unite as a strength. This has overall worked well, but have in some ocassions been an issue, because the team members had difficulty in agreeing in which parts was to be the most important.

Time has also been an uncertain factor during the project management, as the team was used to being in group of at least five persons, but had to come to terms of only being three. This manifested itself in the planning of tasks and assignments. It felt like tasks consumed a lot more time than they did on previous semesters. This may have pushed the team to work harder and faster in order to reach the desired target.
The team could have wished to achieve designing both the small chair and lamp completely, instead of only having them on sketch and concept level.

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Illustrations and photos not found in the Illustration list, are created or generated by the team.

Ill.11: Områdeaftegning af Thy Nationalpark. Nationalpark, Thy.
viewed: Nationalparkcenter Thy_konceptogide_version_1.pdf. (photo)

Ill.14: Definition of fair:
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Ill. 40: Studioilse w84. Crawford, Ilse . seen: http://www.lumens.com/studioilse-w084-table-lamp-by-wastberg-uu394753.html. 17.05.2015. (photo)

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Ill. 57: Chart of anthropometry values, values derived from: Peebles , Laura og Beverly Norris: The handbook of adult anthropometric and strength measurements. 1. udg. Institute for occupational ergonomics, 1995.

Ill. 73: Kattla lammskinn long. ., Bolia. Seen: http://www.bolia.com/sv-se/sortiment/mattor/21-004-05_1161258. 18.05.2015. (photo)

Ill. 74: Klit. ., netleksikon. seen: http://www.netleksikon.dk/k/kl/klit.shtml. 18.05.2015. (Photo)

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APPENDIX

1 THY VISIT

PURPOSE WITH A VISIT IN THY

The fieldtrip is established to gain knowledge on the project stick2nature, its background, and the stakeholders that are involved. Several aspects are part of the project, such as growth of the community, human resources, local materials, and local companies. The visit will provide insights in the intrests from the major stakeholders and actors in the project and why this project has relevance for the study group to participate in the matter of designing products in this context

1.1 ELMELUND

Elmelund is an educational facility for mentally challenged young people which is given an "early retirement" due to their difficulty with mastering their life. Its main purpose is to help them get a job and train them to achive a structure in their life. Another aspect to the project is the improvement of the areas social economy. The school offered a range of different courses teaching the paticipants in simple skills which would lead to improved quality of life. Some of the tasks were logging and sawing lumber and these were also the intrest points of the visit. The wood types (curved mountain pine) needed for the project is placed in areas impassable for machinary why the logging has to be done manually.

Elmelund can accomplish this all though it has to be in their own speed as they are not able to work full time due to their situations. The tasks also have to be simple and not require a lot of advanced exercises, as the students at Elmelund are not able to comprihend difficult tasks. The idea is that the lumbering is performed to enhance their life quality and bring them toward a routine of a working life.

1.2 THY ERHVERVSFORUM

Thy erhvervsforum is placed in every Region of the country and is supported by EU economical. Vækstforum consults businesses for free in all of the aspects of "væksthjulet", which is used as a methodology at Væksthuset. Additionally they supports and consults entrepreneurship and can provide the companies with contacts and knowledge due to their huge network of companies and individuals. The employees at TE have diverse backgrounds and competences to be able to consult different types of companies in various situations.
In addition TE is a part of NIN to provide a greater network to the companies and communities.

1.3 BOESTED RENDE

A walk in Thy National Park gives an awareness of the nature and gives a possibility to see the mountain pine in its environment furthermore how it looks before it is cut down. The walk can also give inspiration in order to design a product that is in coherence with the local environment and the expression of the product is thereby enhancing the story telling of the project.
The main reason for cutting down the mountain pine is because the plantation is manmade in order to prevent the sand drift that was problem at that time. But now the mountain pine is seen as an weed, it cannot been controlled and with it's self-seeding ability, it should be wiped out.
At the same time the mountain pine complicates the living conditions of rare animal species. For instant there is a special butterfly spices - in order to live it has to have help from a special ant species, but neither of the two animals are moving in a big radius, and the mountain pine is a barrier for both to connect to each other. This has resulted in that there now are two different genetics of butterflies within the same species.
When the mountain pine is removed it has a consequence for the nature but the exact consequence nobody knows, but the concern is that sand drift will appear again and some birds population will be reduced.
The terrain in Thy National Park is filled with sand dunes, in example, parabolic dunes, which goes out as a parabola. These can be serval years old. This creates difficulties to access to the moun-

tain pine with machinry and large equipment which means that the cut down of the trees should be done manually. The institution Elemelund can be used in this context, in order to obtain a satisfying logging process, logging manuals are handed out. Blue stain is a fungus that is infecting wood that has been cut down in to high temperatures or if the wood is lying in a humid environment. In Thy National Park the humidity is high and therefore to ensure that the mountain pine does not get the blue stain there has been experimented to dry the wood in containers. The fungus does not reduce quality of the wood but has especially from carbinet makers, been seen as aesthetic flaw that made the wood unuseable. Because of the blue stain there has from stick2natures side been made experiment on where the wood should lie in order to control if the mountain pine was getting infected with the fungus. In order to find out trees was cut down and placed around in the park, in different environments. There was found out that if the wood was drying in humid areas the blue stain infected the wood.

1.4 THY SECRETARIAT - THY NATIONAL PARK CENTER

A Nation Park is defined by areas with geological eccentricities that is wished to be protected. National Park Thy was announced in 2007 to be the first National Park in Denmark due to its unique nature and animal life. The center is to be build around the idea of being close to nature which is enhanced by placing the building in a sand dune that is reaching into the small city Nørre Vorupør. The National Park Center is a canter that will be placed in the park and serve as a learning and experience center with the National Park as the theme. The center should be a platform for social activity by engaging with the facilities surrounding the center, which is the local fish house and

smoking house to provide a possibility of having eating guests at the center.
As well as the learning and experience aspect of the center the products certified as National Park Thy products will be sold from the center.
The potentials that is seen in relations to the center is;

1. Naturen i Nationalpark Thy
2. Thy med naturen som forkant
3. Historien om sandfl ugten
4. Historien om kystfi skeriet
5. Høj markedsføringsværdi
6. Viljen til Thy
7. Nye muligheder for cykelturismen
8. Kystbyernes genopblomstring
9. Folkeligt ejerskab
10. Placeringen i Nr. Vorupør

Some of the potentials can be used as the dogma rules in the stick2nature project.

Historically mountain pine has been planted to keep the sand from drifting with the wind. Additionally a value of safety has been added to the mountain pine throughout the years in relation to the community who has been using mountain pine to fight the sand from being lifted up by the wind and brought into the country.

Sand migration is believed to have created poverty in the area around National Park Thy because the sand was able to cover fields from day to day. In so doing, crops have been destroyed. This has led to that the larger farms had to move further in to the country and every time money has been lost. An example on the forced replacement is a farm that had to move three times due to the sand migrations and ended up as a smallholding with a smaller fortune than they had in the first place.
First when the church was noticing the problem, by less church taxes, action was taken. The initiative to having the sand fastened by plants was begun to make the farmers produce more money and thereby the church had the possibility of collecting more to the church. Mountain pine was one of the initiatives that could withstand the tough conditions of both weather and geological aspects.
Throughout generations the moor has been seen as a negative thing but the gathering of the community to support the moor at a National Park has turned the view on the area as something to be proud of.

1.5 &WOODLAB

&Woodlab is an upstart cabinetmaker company owned by Mathias Hedal. The objective of the visit is to ensure a initial knowledge about wood and to experiences the &Woodlab products. One product that was enhanced is a brochure rack, that should be used around in Denmark to display folder from National Park Thy. It is the first non-food product in the Thy certification line. Furthermore there was shown chopping board where experimentation of colouring the wood by smoking it by using household ammonia. With this method there is created a darker color. In order to get the darkness all the way through the wood the smoking should be over a longer period of time depending of the thickness of the wood.

The visit resulted in a proposition of usages of the workshop, there are facilities in order to create wood products but there is not a turning lathe, furthermore Mathias Hedal offered consultation in order to obtain a coherence and validity of the product that should be designed.

&woodlab had mountain pine with blue stain in it, and from that it was discovered that it gave the wood a special textual appearance. Therefore it was suggested to make field research with graf of the trees in order to create this texture on all the trees. The negative about the blue stain is that it is placed in the sapwood. Furthermore another experiment that would be interesting to conduct is the usages of natural wax to treating the wood. There could be used local bee-keepers wax and from different bees, this would enhance the local story line.

There was not a wood sample of the bended mountain pine, therefor the agreement of gathering this was arranged.

1.6 MORSOE

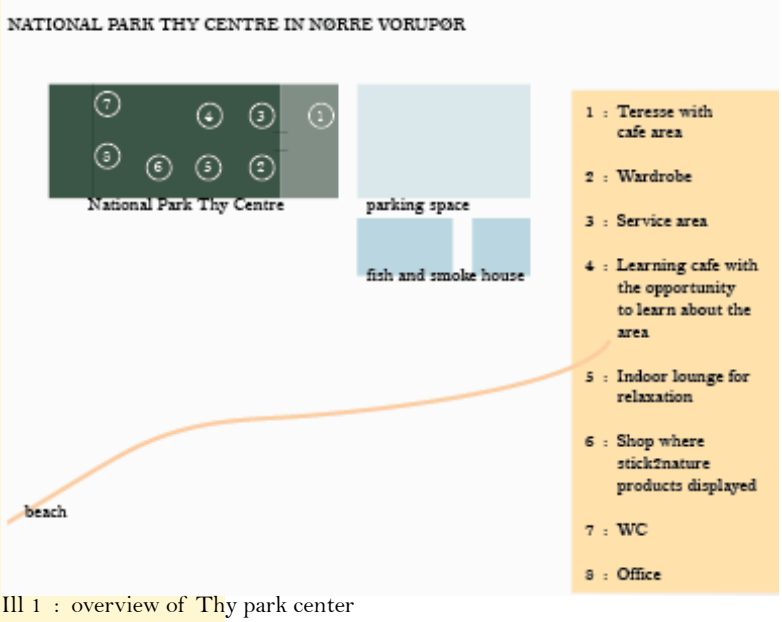
Morsø is mainly known around the world for their wood stoves made from cast iron. It is an old company with a lot of history which has now been modernised and is nowadays producing the original products which has been updated to fit our times standards. Besides these they also make outdoor barbecue equipment, like pizza ovens and grills, as well as a range of acessories to support their products.
The company percive their story as very important in their company structure and was very interested in using the wood from Nationalpark Thy as well as local builders, in order to create a "better" story. Besides from the company, the current owners are both occupied and involved in sustainable and self-sufficient processes and were excited of the new ideas reagrding the cooperation with both the park and the project group. Further more had the company decided to launch a serie of cookware, made also from cast iron, as this was one of their main products in the time when the company first started producing.
To compliment the cooking ware they then needed accessories for both indoors and outdoors cookware products and thought well of letting the project group design these.
Through the whole visit, which involved a tour of the factory as well as a look back in history and seeing some of their new products, the company did underline the business aspects. They needed to make money of this coalition otherwise they could not see the benefits towards the company in participating.

2 IDEATION ROUND

2.1 FIRST ROUND OF IDEATION

The first round of ideation is setup to give an initial idea of the possibilities within the project frame. Secondly it should be possible to identify a line of concept from the first ideation for the following ideation, as it is wished to have a series of non food stick2nature products.
The procedure of the ideation starts with National Park Thy Center as the inspiration to systematically generate ideas. The Center is being used as it will be one of the facilities where the products will be displayed and therefore it is seen as a way of making the products fit naturally to the flow and interaction in the building.
First the expected interaction areas of the Center are identified with the presentation from the field trip as knowledge, as the center has not yet been drawn (se section with the description of the park center). The areas, which have been identified, are;

1. Terrace
2. Wardrobe
3. Reception
4. Learning area
5. Exhibition
6. Store
7. Toilet
8. Office



Ill 1 : overview of Thy park center

The areas that is being sketched from is the eras 1 to 4 as it is the areas were the visitors are able interact with the designed products freely to be tempted to purchase the products.
The sketching section is planned to follow the areas one by one and with a time limit on 10 minutes pr round of sketching. After each round the concepts are evaluated in relation to exiting principles and elements that is identified from the early concepts.

- Use of the whole trunks and its curvature
- Use of curvature formed lamellae to create shapes serial
- One to more – module based furniture to create a bigger and different piece of fur niture
- Use of the curvature to line the mountain pine planks together and creat ing a bigger surface
- Use of natural branches
- Sand as weight
- Silkcutted wood pieces to create transparency
- Wood pieces as mosaic
- Adjustable light
- Joinable after the situation

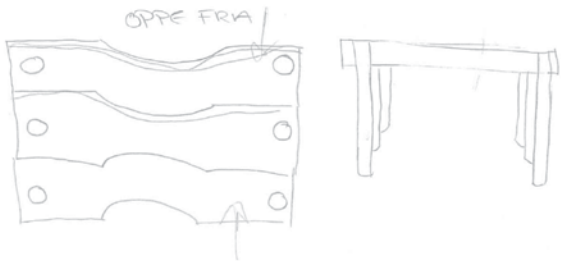
- Lamp
- Table
- Rocking chair
- Shelf
- Playthings
- Hanger

The ideation round has given a large range of features and elements, which can be used to stage a new ideation round with the aim of identifying the kind of series that the furniture will be designed from later in the process.

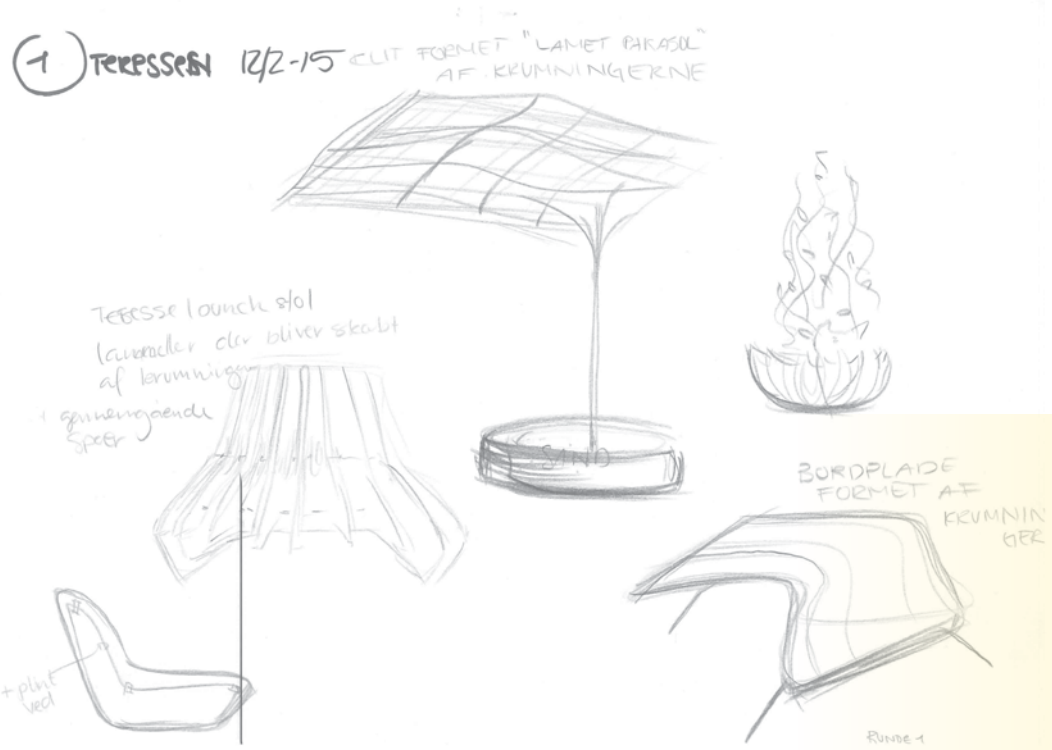
2.2 DRAWINGS FROM FIRST ROUND OF IDEATION
TERRACE

Ill 2 : Sketch of furniture for terrace (1)

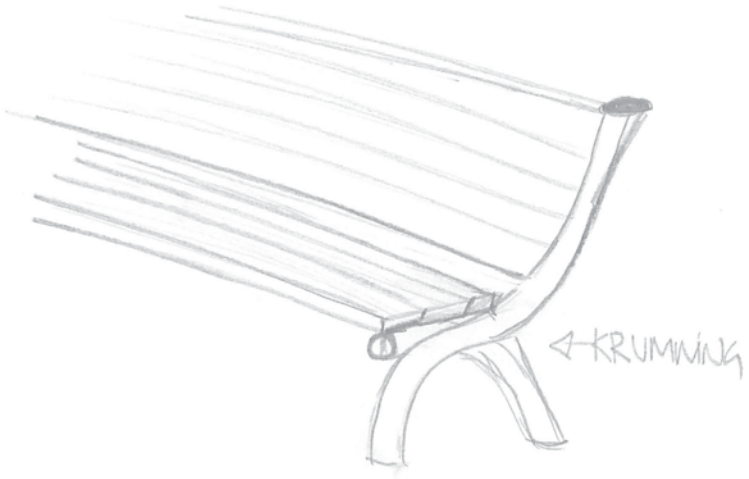
Ill 3 : Sketch of furniture for terrace (2)



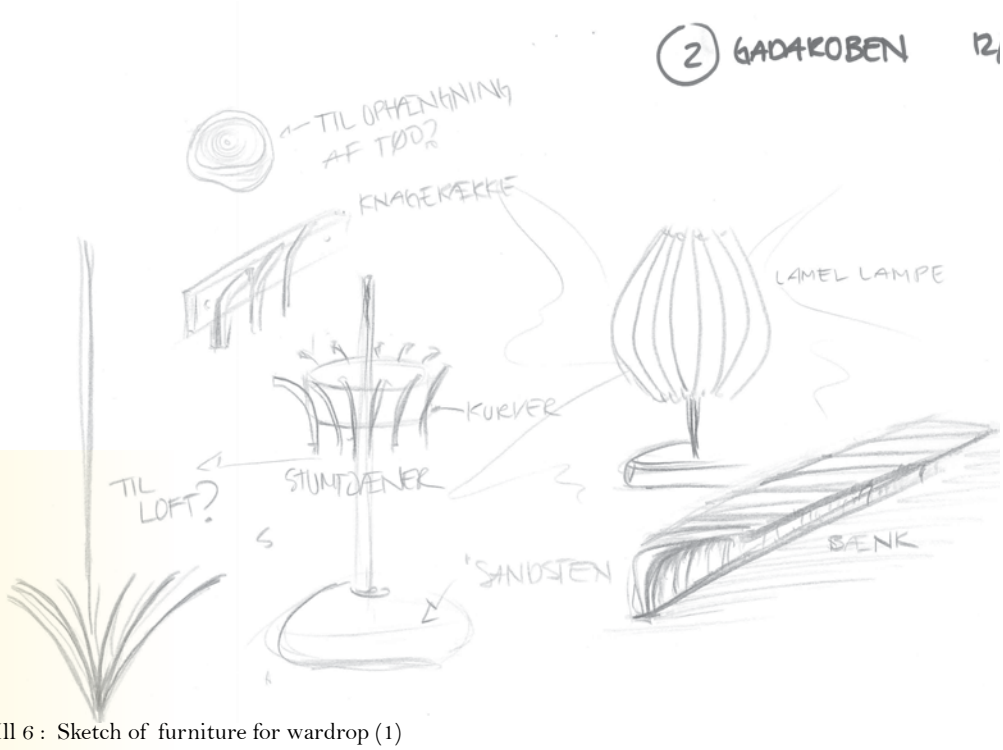
Ill 4 : Sketch of furniture for terrace (3)



Ill 5 : Sketch of furniture for terrace (4)



Ill 6 : Sketch of furniture for terrace (5)



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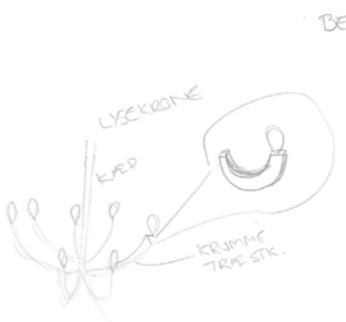
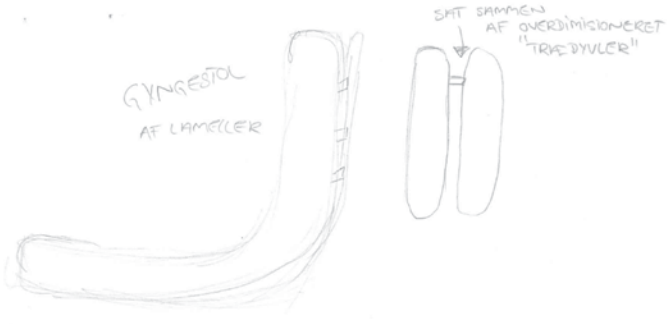
Ill 6 : Sketch of furniture for wardrop (1)

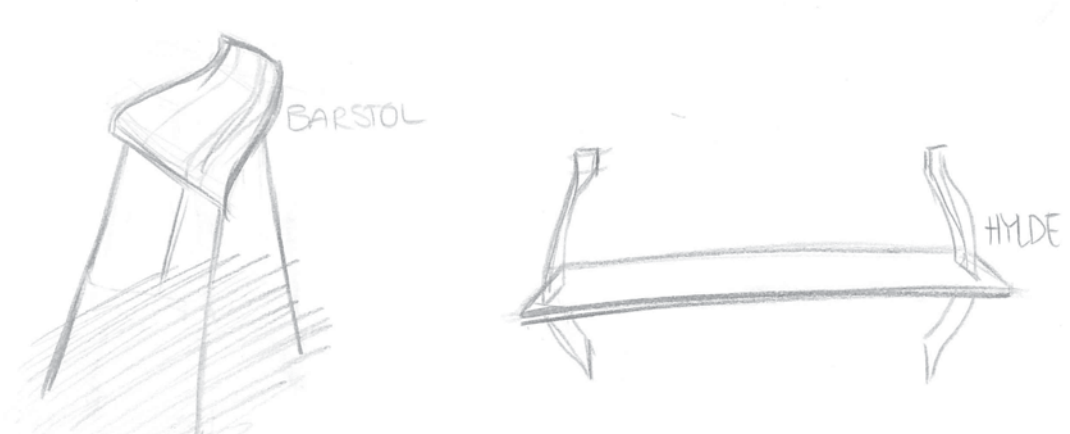


Ill 7 : Sketch of furniture for wardrop (2)

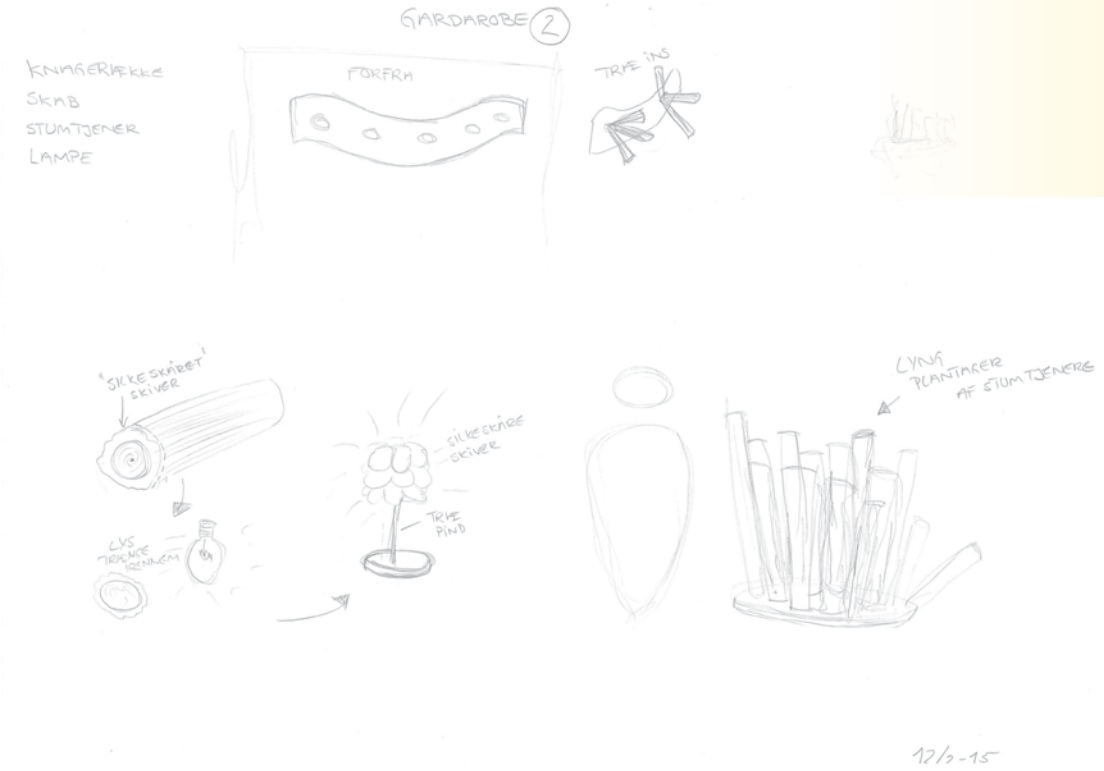


Ill 8 : Sketch of furniture for wardrop (3)

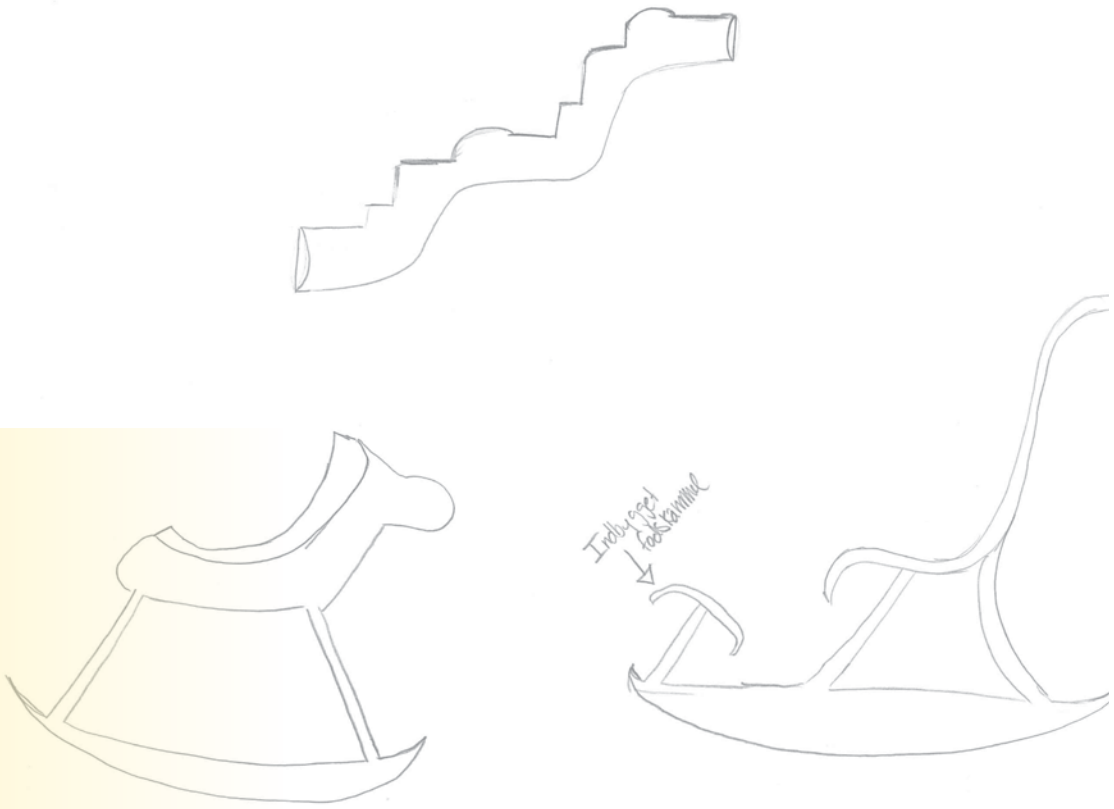
SERVICES AREA



Ill 9 : Sketch of furniture for services area (1)



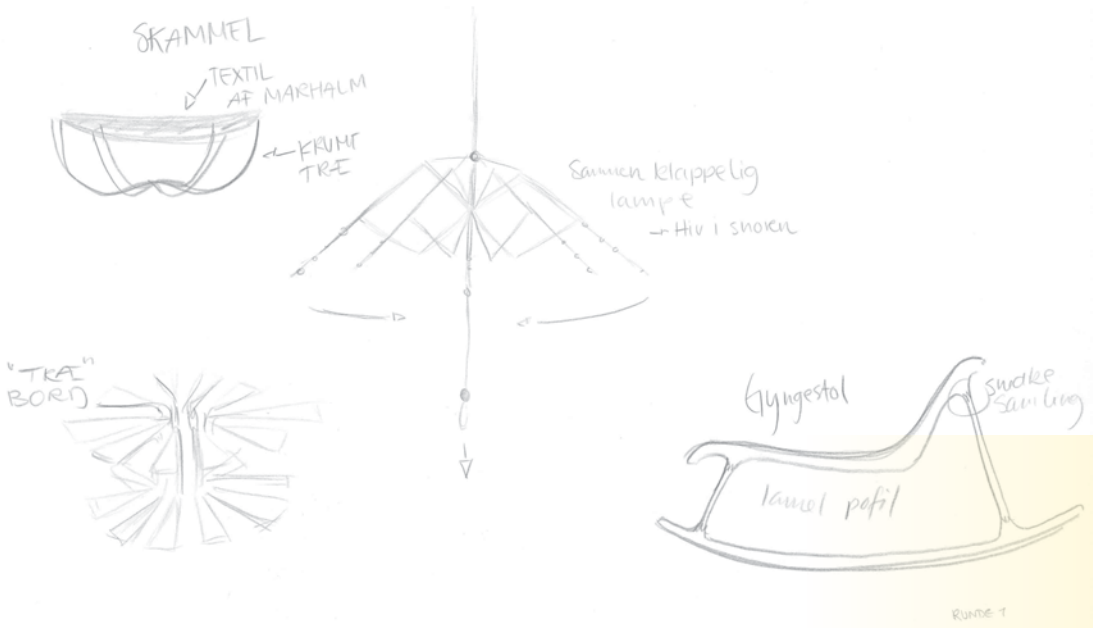
Ill 10 : Sketch of furniture for services area (2)



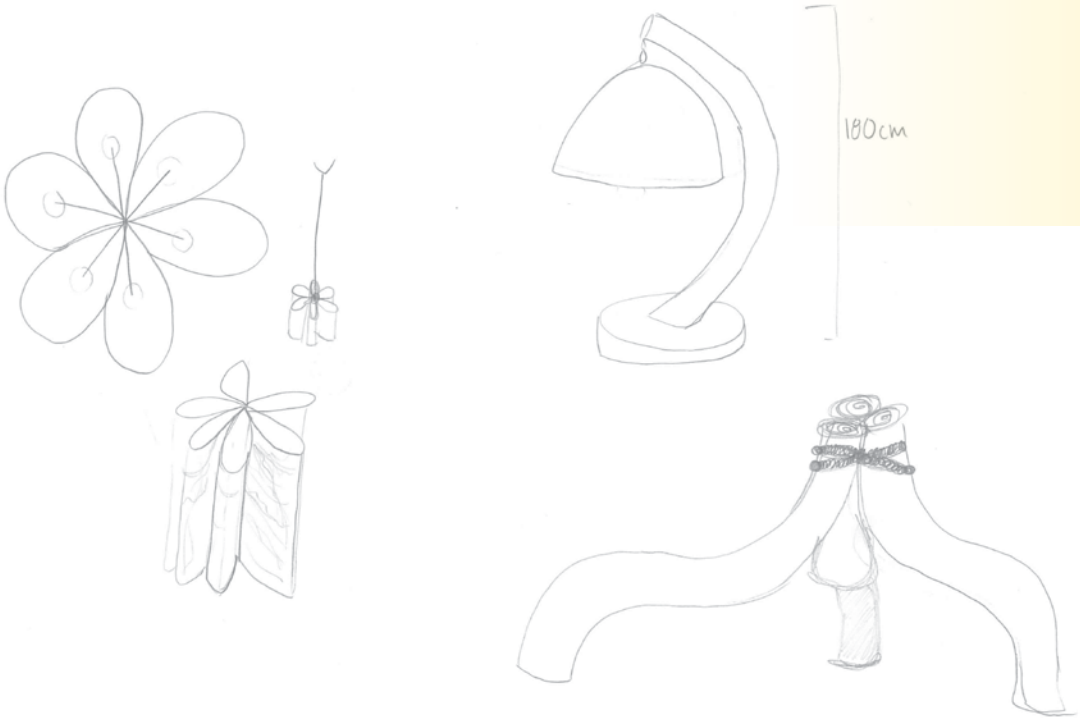
2

Ill 11 : Sketch of furniture for learning cafe (1)

Ill 12 : Sketch of furniture for learning cafe (2)



Ill 13 : Sketch of furniture for learning cafe (3)



Ill 14 : Sketch of furniture for learning cafe (4)

2.3 CONDENSING OF IDEATION ROUND 1

In condensing the first ideations round the suggested design should be held up against the created demands, this creates a valid decision ground. The output information is divided in two parts: Principals that is interesting to incorporate in future ideations rounds and furniture that could be a part of the product series.

The principles output:

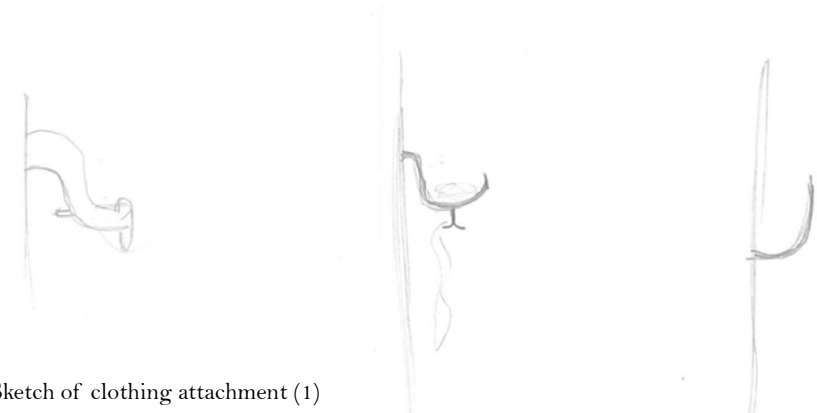
- Mosaics of mountain pine, in order to create a sheet
- Use sand as gravity
- Lamella as the creating element of the furniture
- Ability of composition of the furniture

Furniture:

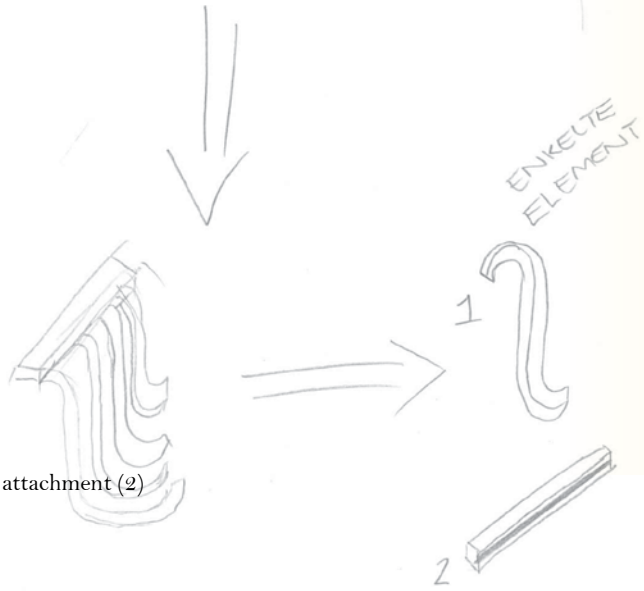
- Rocking chair
- Clothing attachment
- Furniture that creates experience
- Shelf "storage"
- Table

One of the furniture types that has been deselected is lamps, the reason for not working further with the subject is the necessarily of adding of electronica components would conflict with the demand of using a 100% local materials furthermore the usages of curved mountain pine would not be represented to its fullest.
#1: Two types of furniture is giving another name, those are hanger and plaything. The reasoning is to create a freely ideations round these types has been changed to clothing attachment and furniture that creates experience.

2.4 DRAWINGS FROM SECOND ROUND OF IDEATION
CLOTHING ATTACHMENT

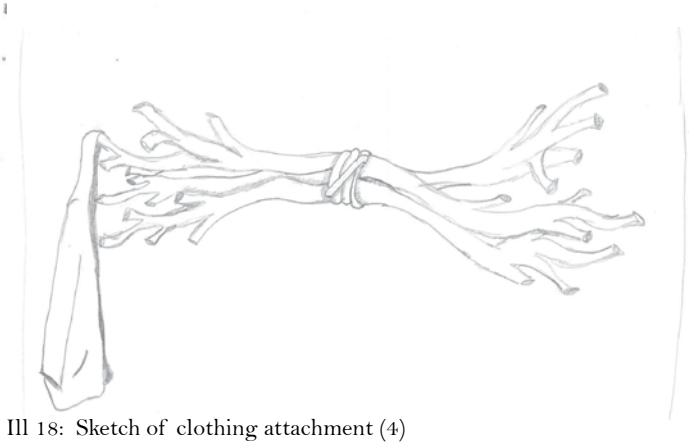


Ill 15: Sketch of clothing attachment (1)

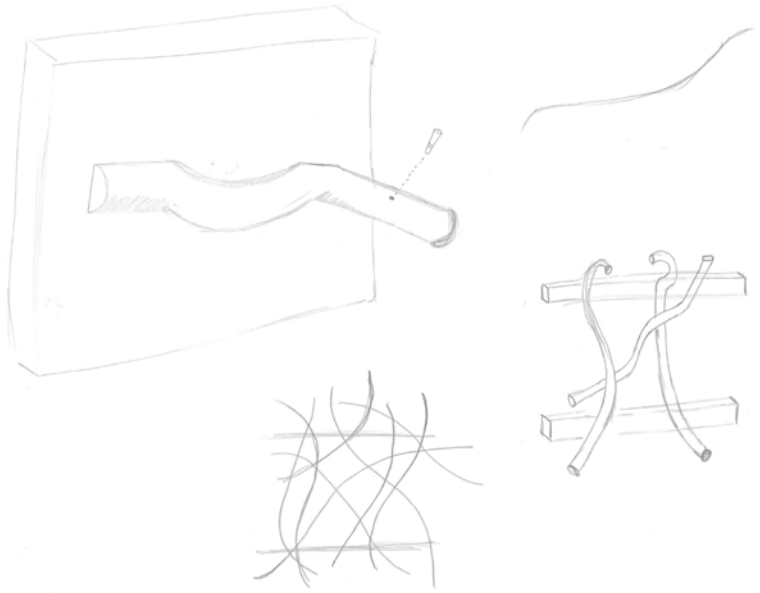


Ill 16: Sketch of clothing attachment (2)

Ill 17: Sketch of clothing attachment (3)

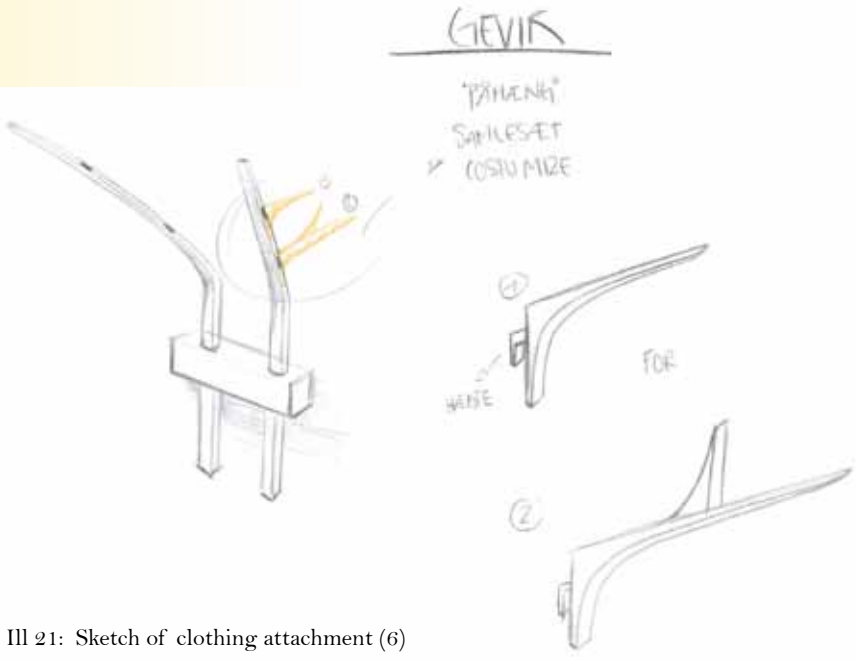


Ill 18: Sketch of clothing attachment (4)

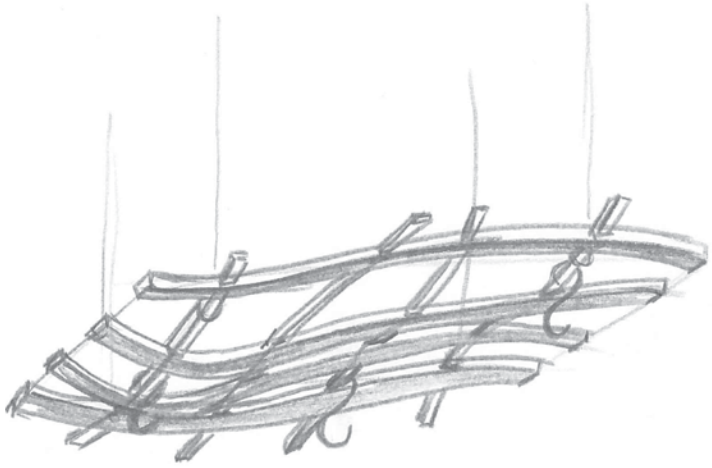


Ill 19: Sketch of clothing attachment (5)

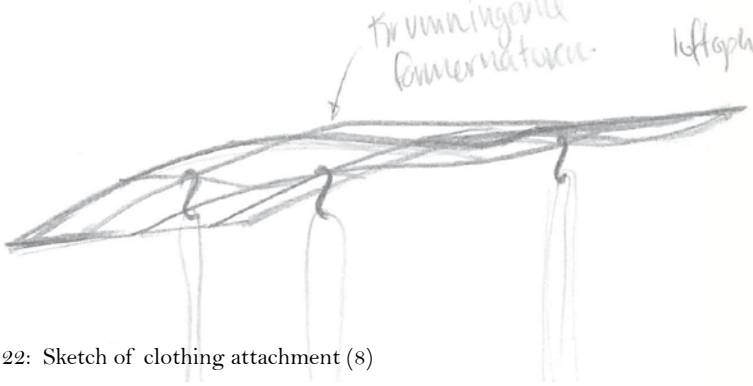
Ill 20: Sketch of clothing attachment (6)



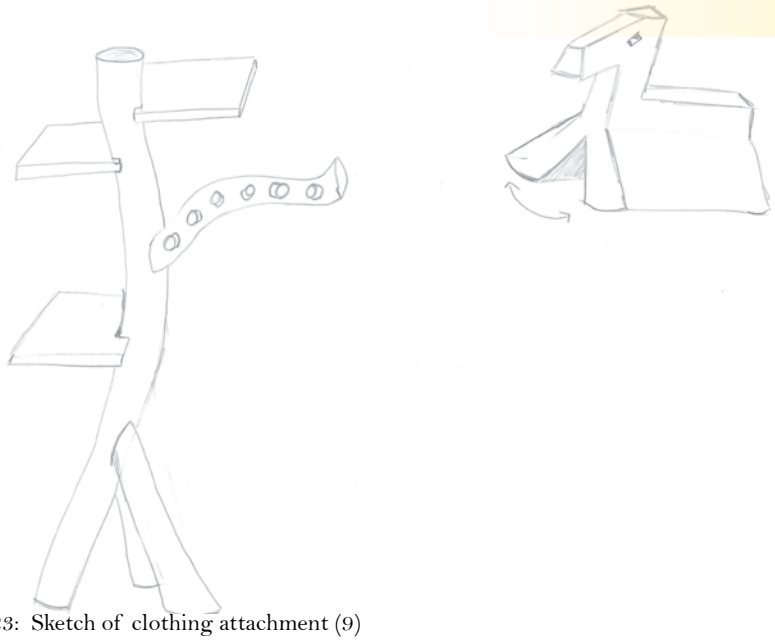
Ill 21: Sketch of clothing attachment (6)



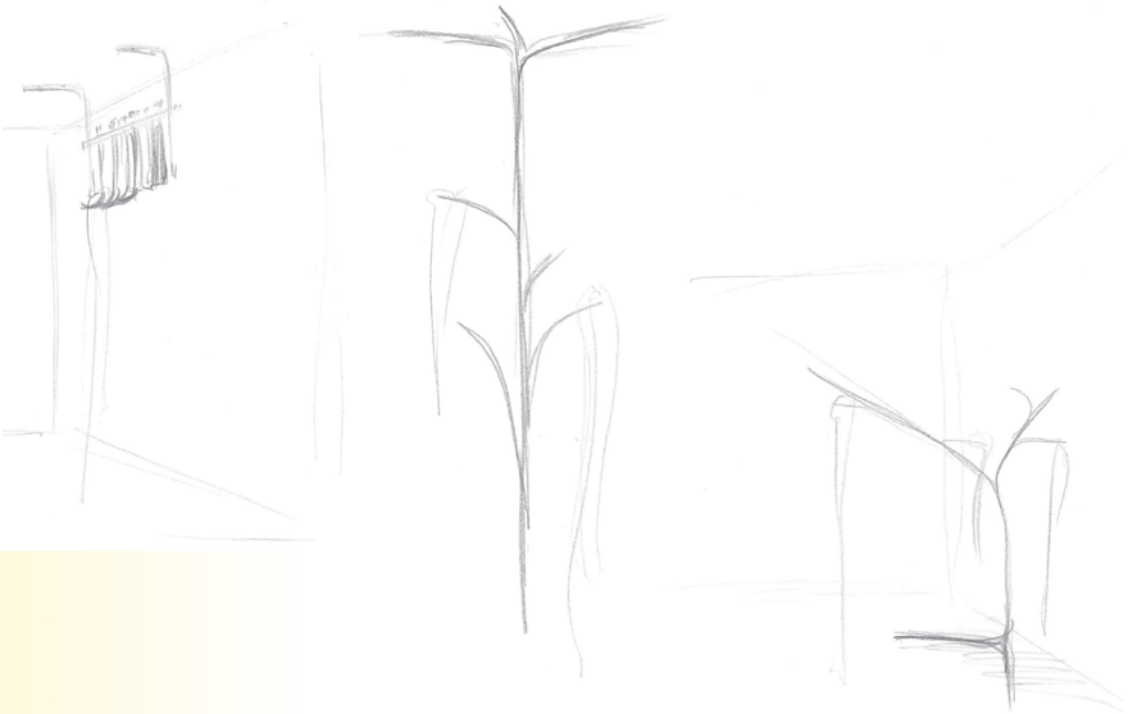
Ill 21: Sketch of clothing attachment (7)



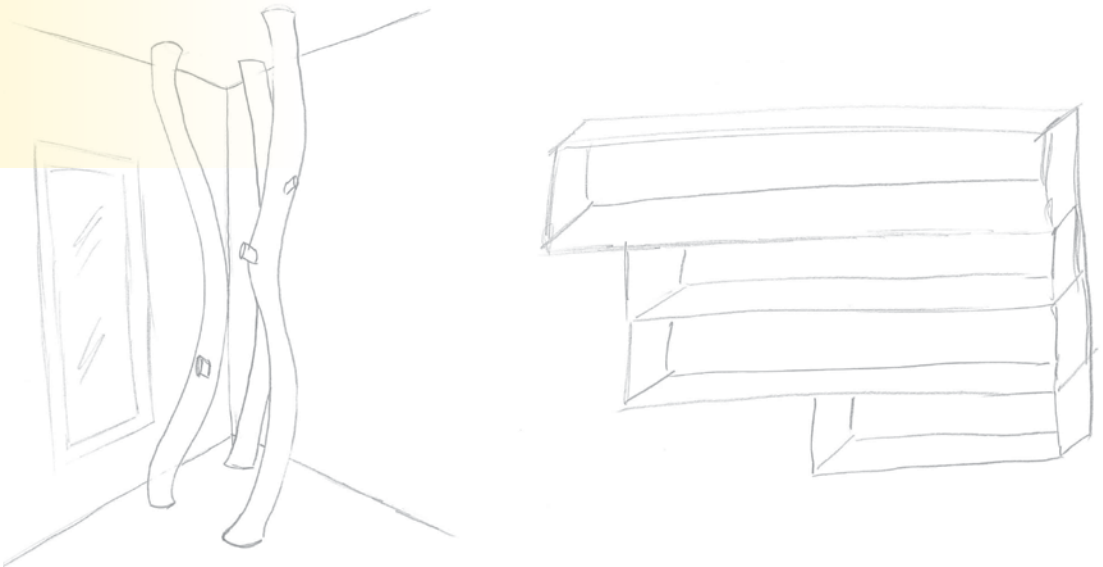
Ill 22: Sketch of clothing attachment (8)



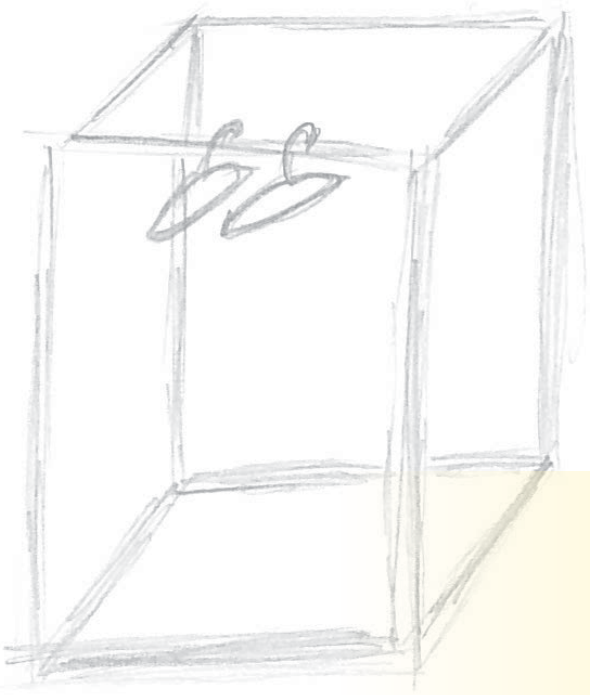
Ill 23: Sketch of clothing attachment (9)



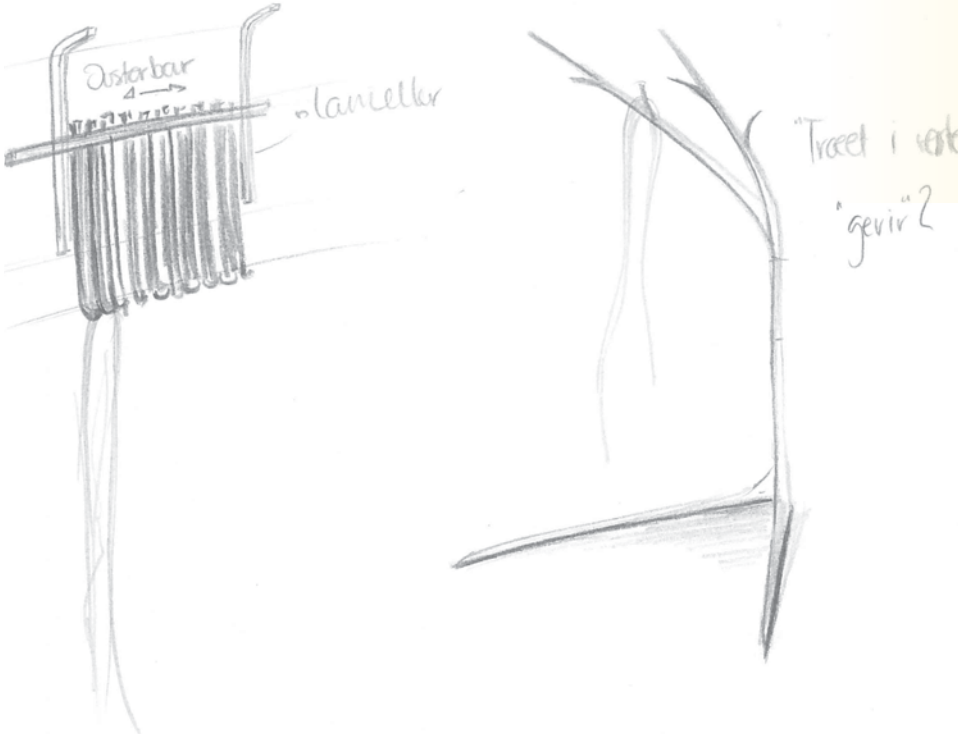
Ill 24: Sketch of clothing attachment (10)



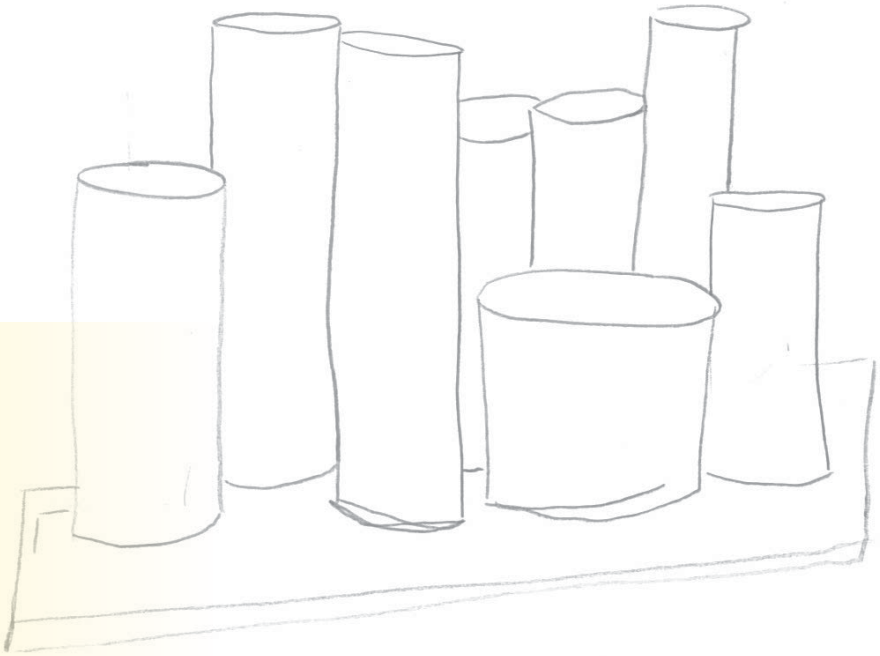
Ill 25: Sketch of clothing attachment (11)



Ill 26: Sketch of clothing attachment (12)

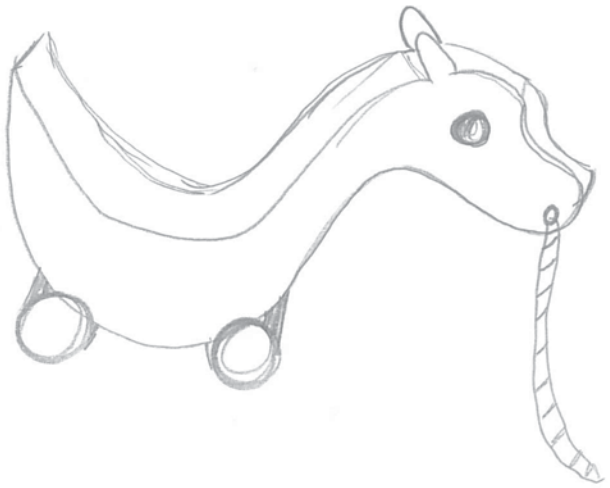


Ill 27: Sketch of clothing attachment (13)

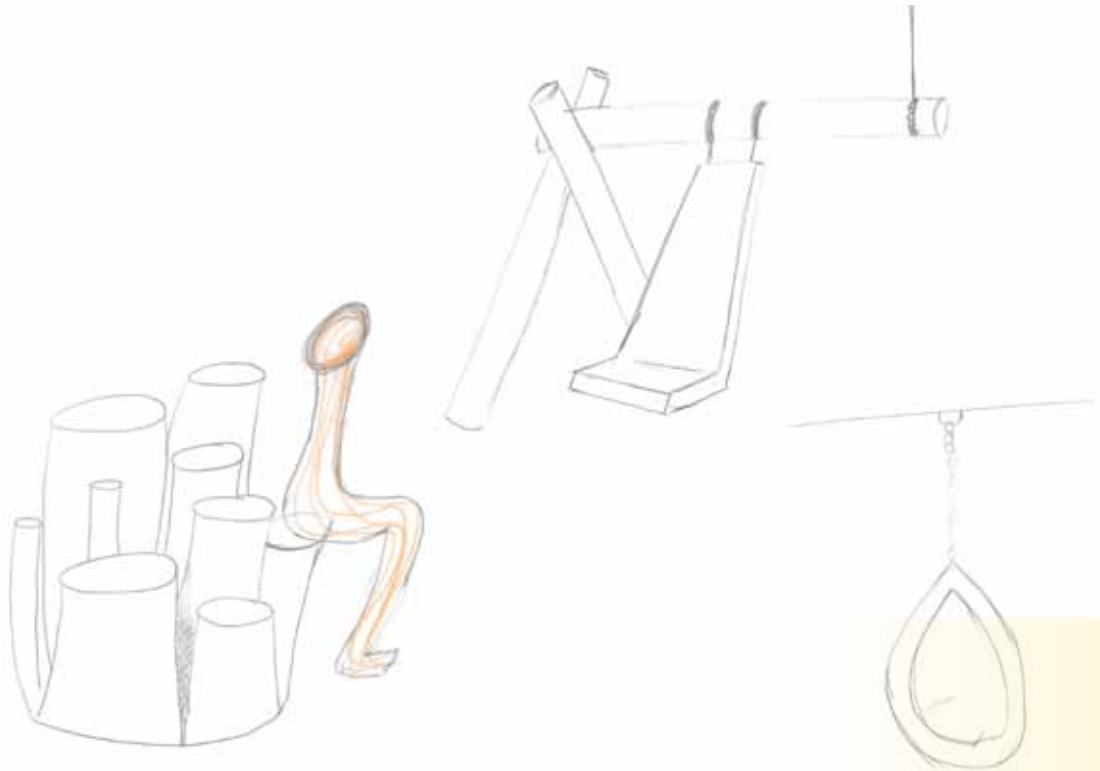


2

Ill 28: Sketch of experience furniture (1)

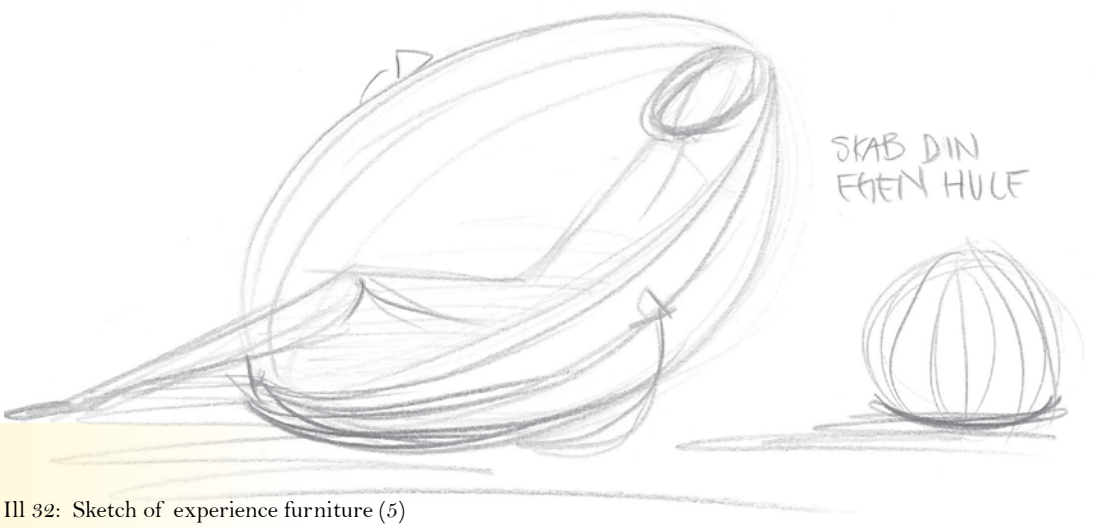


Ill 29: Sketch of experience furniture (2)

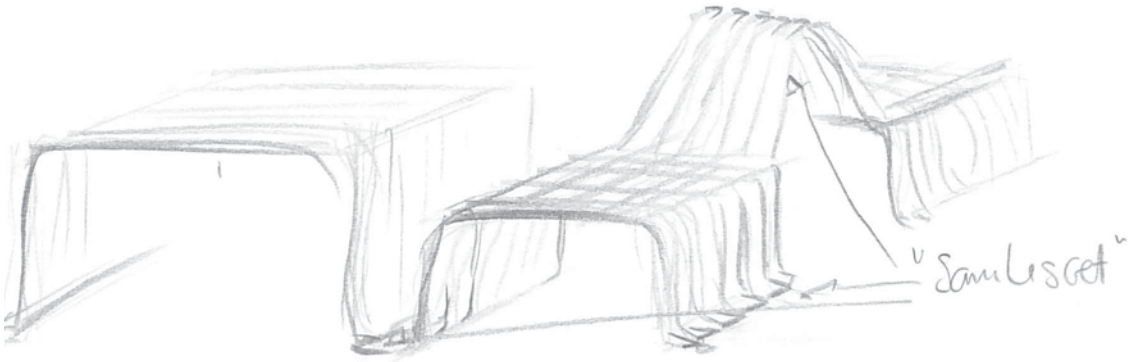


Ill 30: Sketch of experience furniture (3)

Ill 31: Sketch of experience furniture (4)



Ill 32: Sketch of experience furniture (5)

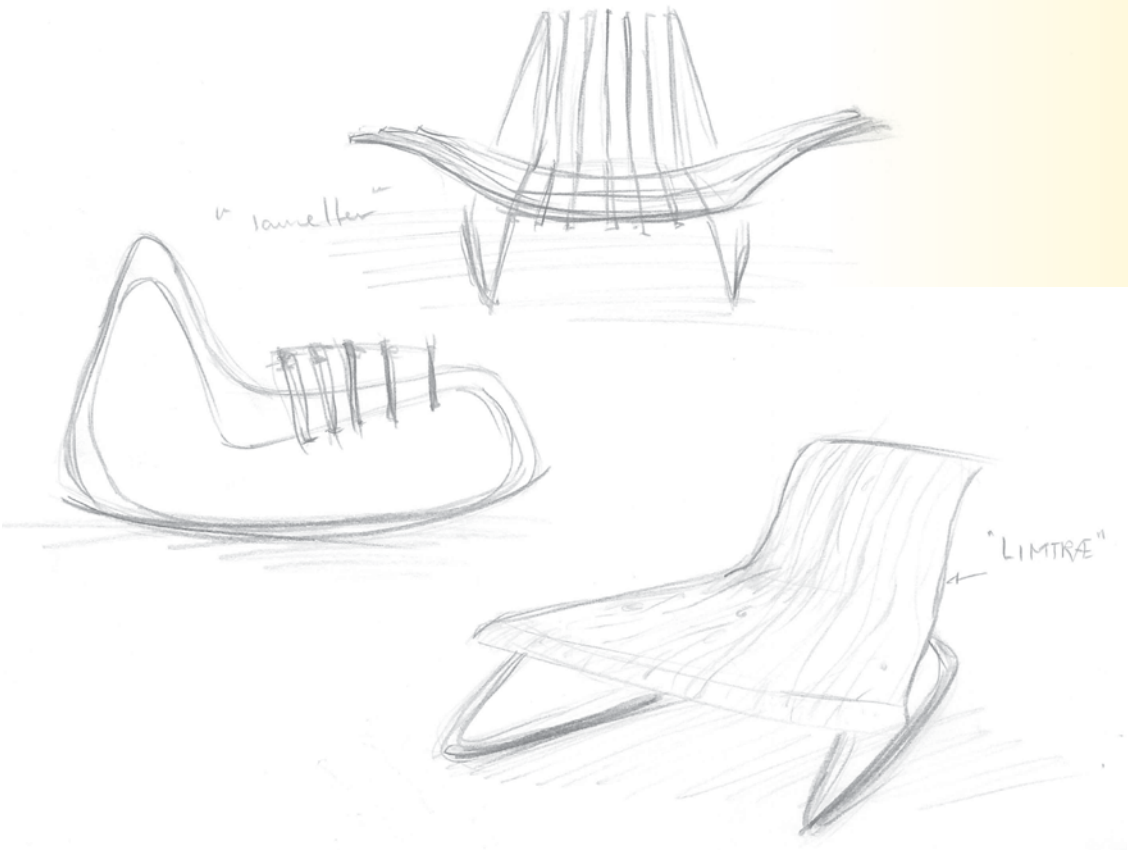


Ill 33: Sketch of experience furniture (6)

ROCKING CHAIR

Ill 34: Sketch of experience furniture (7)

Ill 35: Sketch of experience furniture (8)

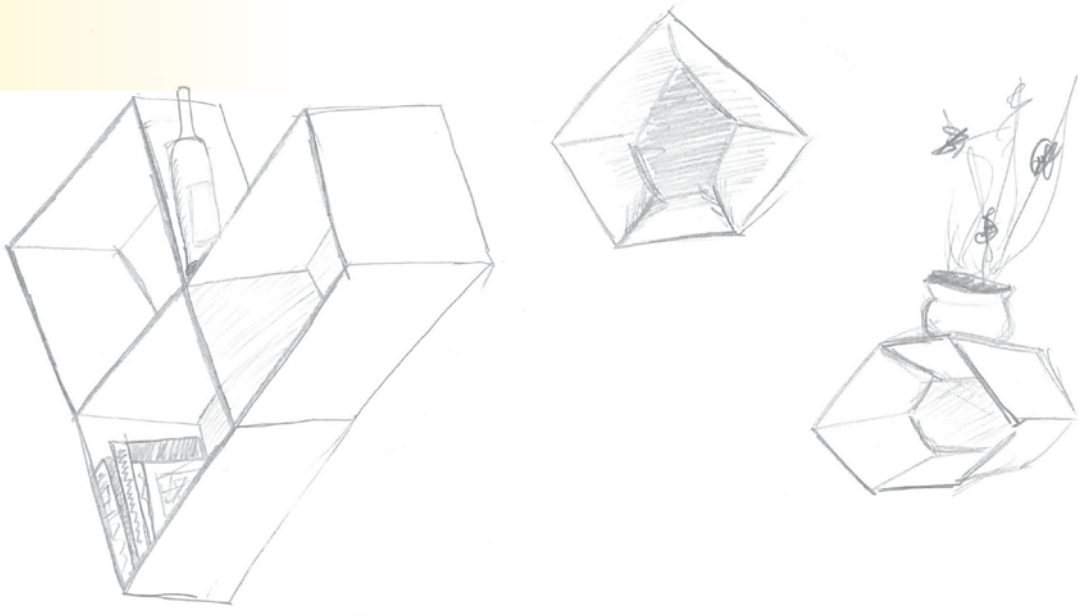


Ill 36: Sketch of experience furniture (9)

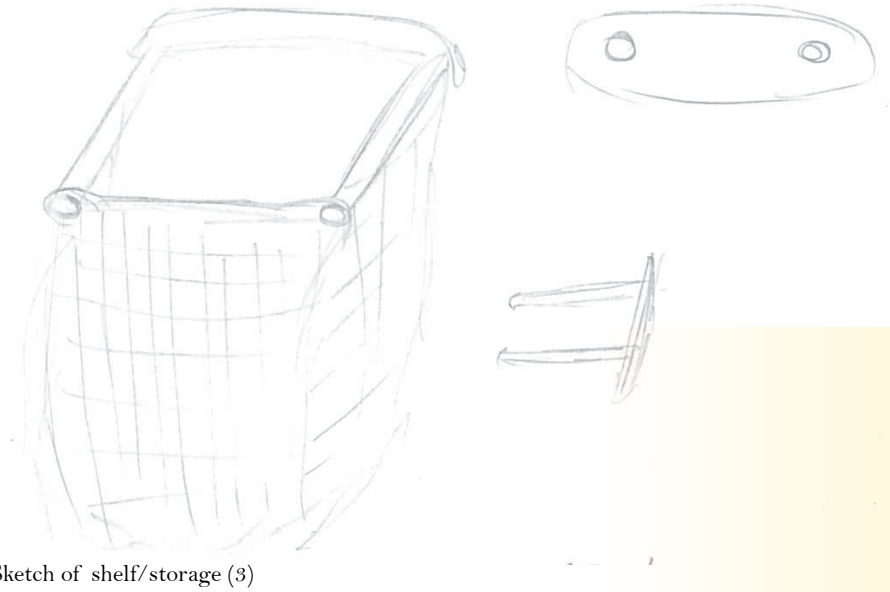
SHELF / STORAGE

Ill 37: Sketch of shelf/storage (1)

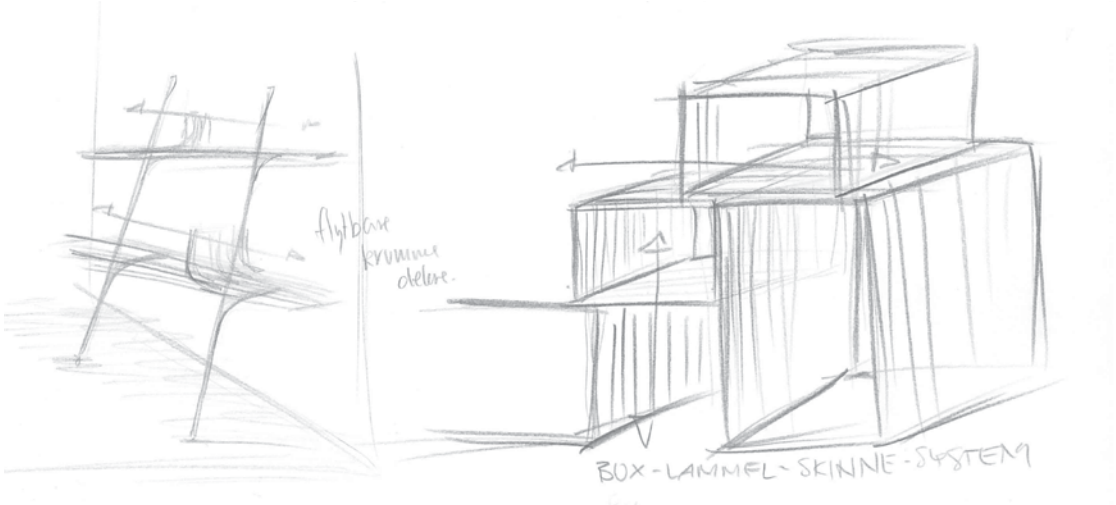
2



Ill 38: Sketch of shelf/storage (2)

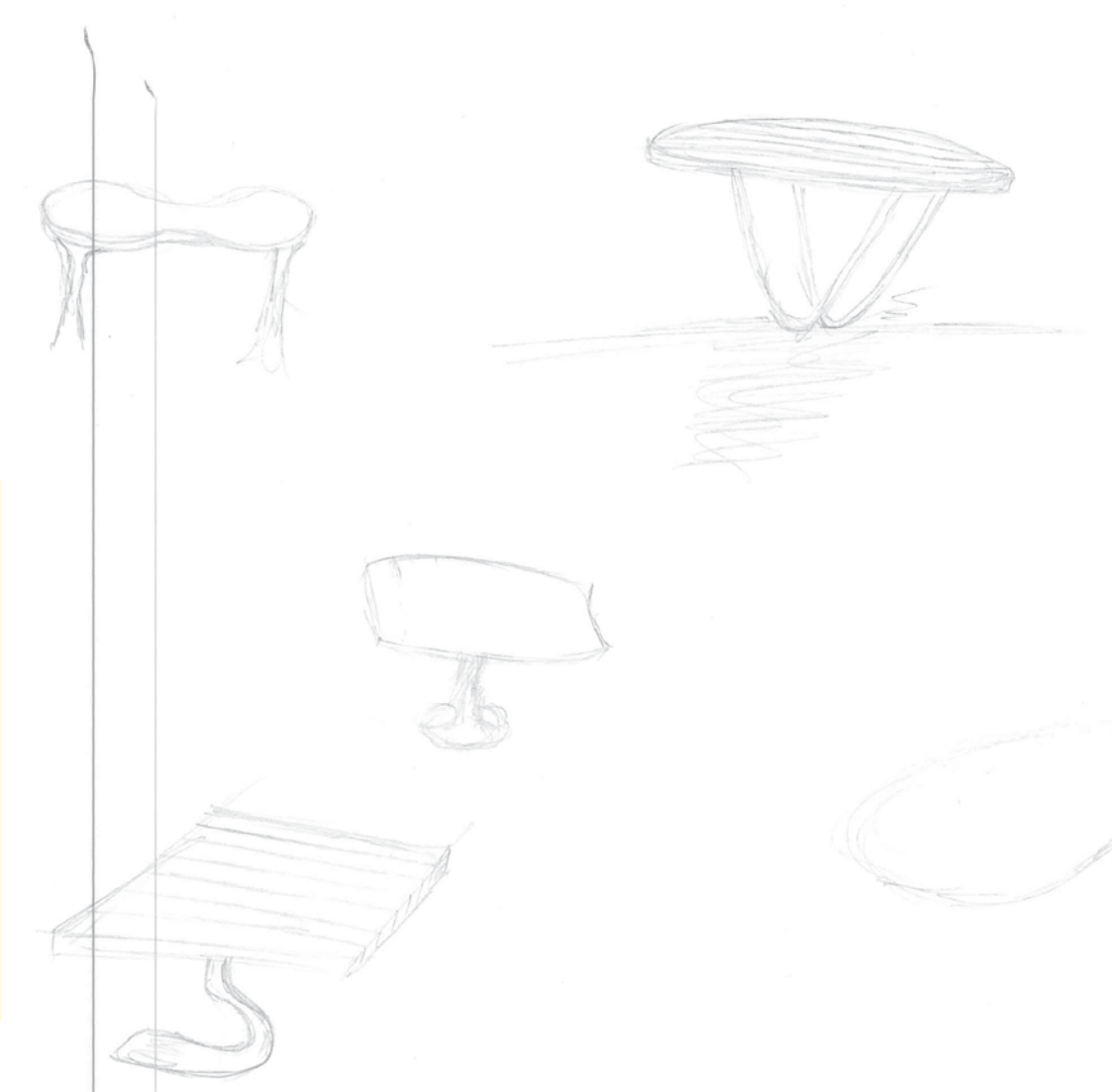


Ill 39: Sketch of shelf/storage (3)

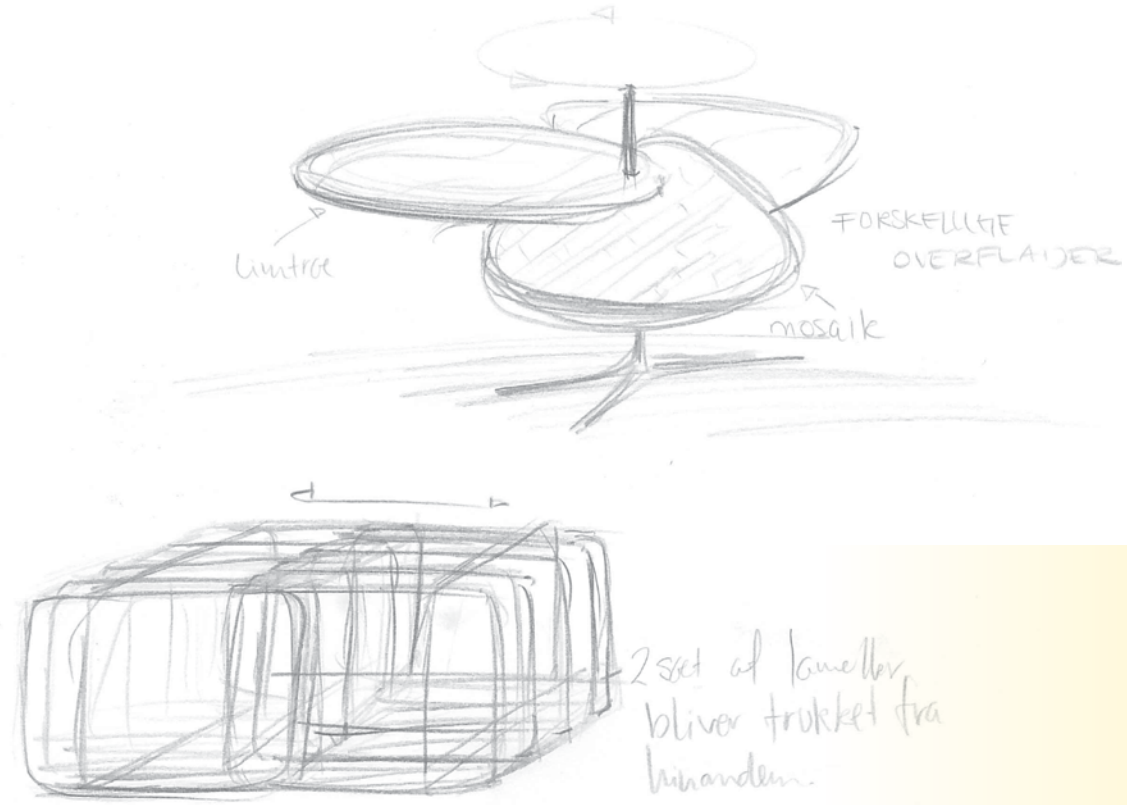


Ill 40: Sketch of shelf/storage (4)

TABLE



Ill 41: Sketch of table (1)



Ill 42: Sketch of table (2)

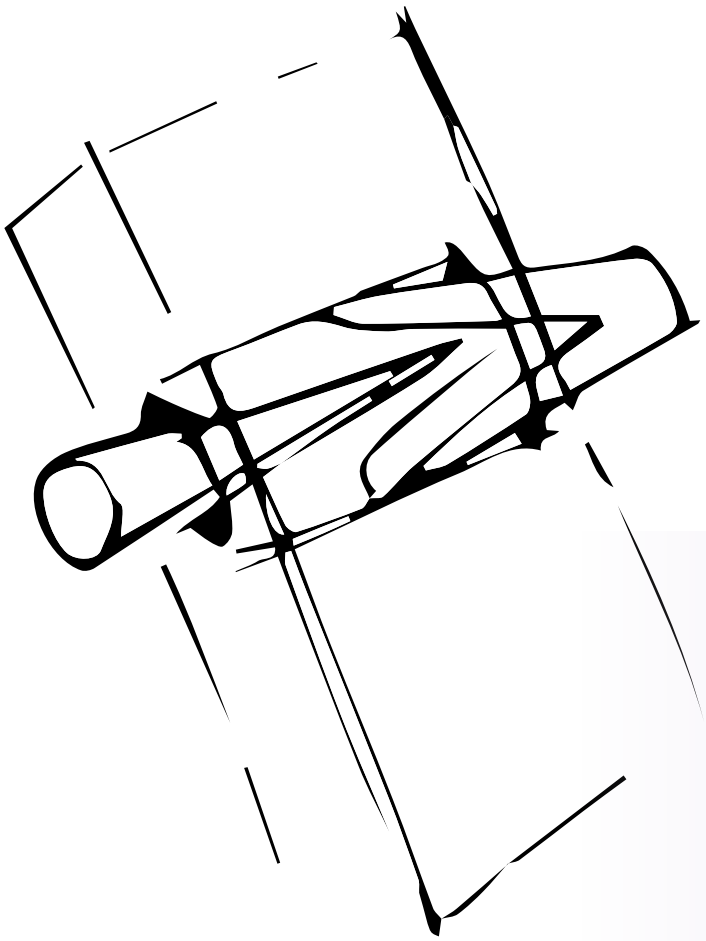
Ill 43: Sketch of table (3)

3 EXPERIMENTS & FIELD TRIP

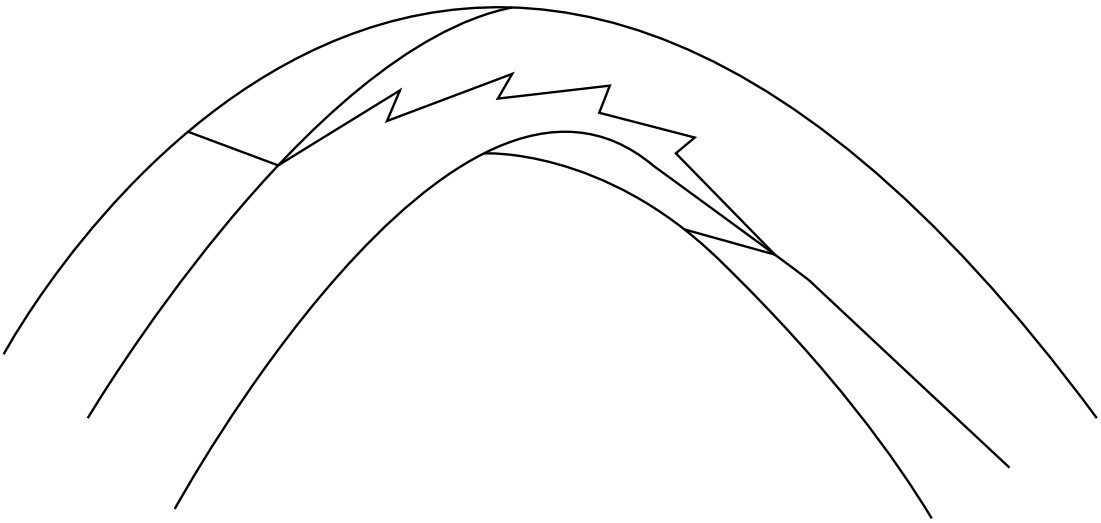
3.1 ROSKILDE VIKING MUSEUM
3.2 LYME GRASS
3.3 BEES WAX
3.4 BLUE STAIN
3.5 CURVATURE
3.6 LIGHT
3.7 CLEMEN - LIGHT ENGINEER AT AALBORG TEATER

Ill 44: Viking Ship

The lecture about wood at Roskilde Viking museum was divided up in different part, this means that the were parts of the lecture that could not been used in there project. This is why only excerpts are in this report.
Søren Nielsen who is a boat builder and working at the museum was introduced as the lecturer in the part of the lecture of the process of building a Viking ship. At the museum there has in the past been builded many ships but the one that was highlighted was Havhingsten which was a replication of one ship that was found at a Viking excavation. In order to find the right parts to the ship they were hiking in the Norwegian woods with templates thereby finding the best curved wood as possible.
In order to fix the Viking ship there are different methods used, see the illustrations. These different methods have been used in different parts of the ship.
The field trip to Roskilde Viking museum has given the team insights in old traditions and maybe one of the fixtures could be used in regarding to the production of the chair.



Ill 45: Viking Ship fixation (1)



Ill 46: Viking Ship fixation (2)


Ill 47: Lyme grass

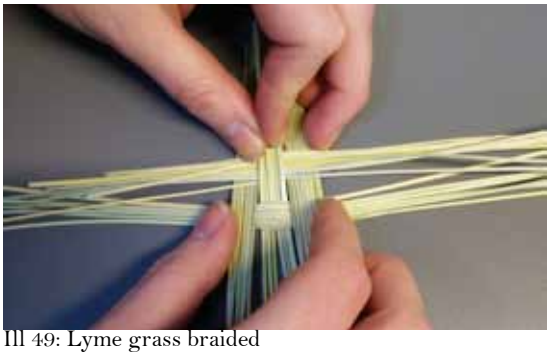
3.2 LYME GRASS

In the context of exploring alternative materials from NPT there has been collected lyme grass in order to conduct an experiment with the objective to test the durability in the lyme grass.
The lyme grass should be dried in order to prevent a possible situation of decomposing and after the drying period the grass will be experimented with for example weave it.

The experiment provided the knowledge that a lime grass straw in itself not is able to be used because of the porosity, but if the lyme grass is collected in a bunch it creates greater strength.
If the material should be used it would be preferable to contact a professional within for example a thatcher or robemaker to get at broader knowledge.

The objective with the Lyme grass experiment is to research if it can be used as an additionally material beside the wood. It could strengthen the story line of stick2nature by utilizing more than one material from NPT. The way it was conducted is to dry Lyme grass and thereafter have a workshop where the material is subjected to brads and twist.


Ill 48: Lyme grass twisted


Ill 49: Lyme grass braided

The Lyme grass seems to be fragile and not usable, especially if the grass blades are alone, but if there is more than one it is stronger. There could potentially be a method of softening the blades because it is a SPRØDT material and thereby creating a soft product that could be used. The process of select the blades that could be used is time consuming.
If Lyme grass should be used there should be made further research for example in old traditions in Denmark, there could be methods that has been forgotten.

3.3 BEES WAX

The objective of the experiment is to obtain knowledge about the properties of bee's wax, in relations to protecting wood in different environments and furthermore investigate if the wax can prevent the pine from yellowing as it does when exposed to light.

The experiment is set up with different types of bees wax; Melted bees wax, wild build bees wax, Hatchery boards from September of 2014, peeled wax from July of 2014 and pressed wax. Almost all the bee's wax is melted in a pot and applied on four planed pine tree planks with a brush. Except hatchery boards and pressed wax, they are applied by rubbing the wax against the wood by hand.
The four planed pine tree planks are placed in various environments; Outside and sheltered, outside exposed to the climate, inside in direct sun light and inside in a dark place.
The expected outcome for the experiment is that one of the types of bee's wax could be able to protect the pine, both from weather but also from the sun light.

Some of the possible errors could be placed in lack of knowledge on how to apply bee's wax and if it should be mixed with another product or not. Another issue could be the planks placed outside as they could attract animals or insects.
The experiment is also performed in the winter/ early spring months which could result in less and weaker sunlight which could be misinterpreted as the user would probably use the furniture all year.

The result of the experiment is as seen on the illustration that the planks that has been outside is the bees wax chanced colour into white. The bees wax could be used on the wood, but the method that it is applied has to be researched in order to obtain the right amount on the wood and an even layer. In order to get a more reliably result the experiment had to be conducted over a longer period than 2 month.


Ill 50: Bees wax - first day


Ill 51: Bees wax - last day

3.4 BLUE STAIN

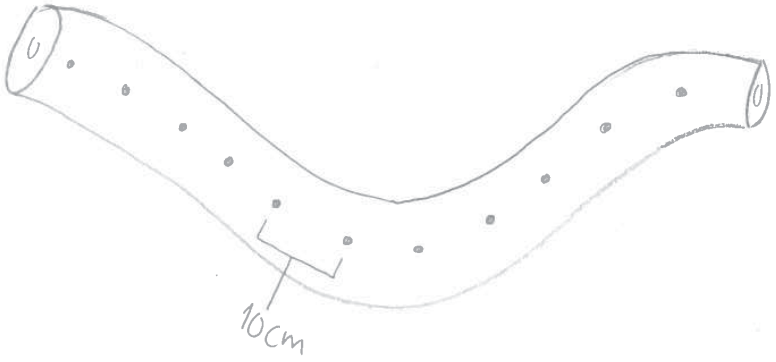
Blue stain is a tree fungie that is characterized by leaving blue “stains” in the sapwood. The Blue Stain does not penetrate the heartwood as this is dead wood and does not consist of any xylem. The fungie can only live where there is moisture to feed it. As the mountain pine is slim it is hard to prevent some of the sapwood being a part of the sawn planks as the blue stain will characterise the furniture build from the wood. The fungie can be prevented but it takes a lot of inconvinience to do this as it requires the wood being chopped at a temperatur below 5 degrees celcius – which leaves a few months during the year to perform this tasks. Further more the logs have to be removed from the enviroment almost right away. The blue stain fungie color residue is left behind even after the fungie itself is dead. The fungal infection does not affect the tree

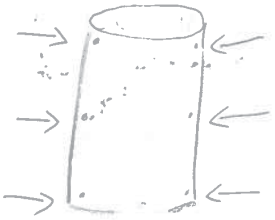
properties as it is discussed that it can be used to “brand” furniture by deliberately graft the trunks with blue stain. It is decided to experiment with grafting the trees in different patterns in order to manipulate

The blue stain to form in a specific way. All though this could be a unique way to brand furniture it is also a timeconsuming process as the trees also have to be dried before that can be used as building material. [Jacobs, 2001] Because of the blue stain there has from stick2natures side been made experiment on where the wood should lie in order to control if the mountain pine was getting infected with the fungus. In order to find out trees was cut down and placed around in the park, in different environments. There was found out that if the wood was drying in humid areas the blue stain infected the wood.

PODNING AF BLÅSPLINT

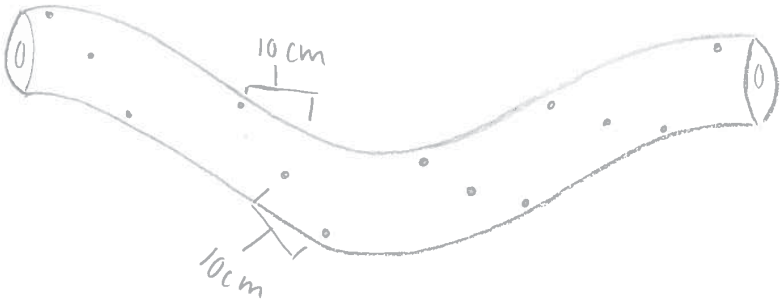
1. "Linje" på begge sider af stammen med 10 cm mellemrum





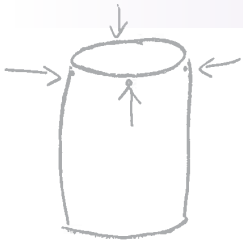
BOREDYBDE:
Ydkanten af kernen

2. Bores som en "spiral" ned af stammen.



BOREDYBDE:
Midten af kernen

3. 4 huller bores overfor hinanden (som et tværkryds)
10cm mellemrum



BOREDYBDE:
Kun splintved

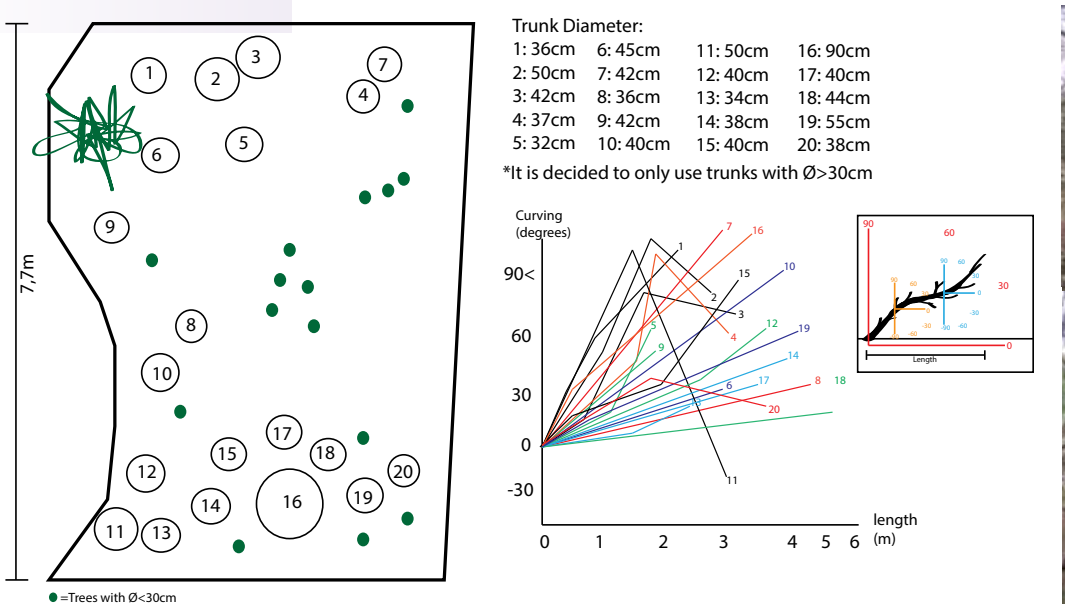
Ill 52: Graft experiment

3.5 CURVATURE

Ill 53: Bøested rende

In order to get a better insight on which types of curves the mountain pine consists of, an eksperiment was conducted. An area was chosen and 20 trees were measured. This gave e general base to how the pine was formed in the area.
It was decided that trees with a diameter below 30cm in trunk width could not be used.
The measured trees do therefore consist of a trunk diameter above 30cm, which is visualised, in the first illustration, along with the location of these.
On the second graph the curves are shown.
The lines each represent a pine and every elbow in the lines is a new curve in the tree. The x-axis show how long the measured tree is and where the elbow is located. The y-axis shows the angle of each curve.

The eksperiment resulted in a lot of different angles and lengths of the pine trees. Due to the enviroment they are rarely thick as they normally would be according to their age. They are all also very curved and the majority of the measured trees consist of two or more curves, within the first 1,5m. The average trunk has two curves with approximately 30-60 degree angles and is 3m in length.



Ill 54: Curvatur registration

3.6 LIGHT

The light experiment is conducted in order to create awareness about how light works in reality andfurther more to create a broader knowledge of how light is working. The models that are going to be made is of brown cardboard, in different shapes. There are two variations of the same model; one with lamellae and one in full material. There are antal models, where they are attached to a bulb, and tested in for different times of the day in order to research how the natural daylight is reacting with the lamp. The end result of the experiment should give the design team a broader knowledge in how to design the lamp and where there are areas of challenge and how to solve these.

DIFFERENT TYPES OF MODELS


Ill 55: Type og model (1)


Ill 56: Type og model (2)


Ill 57: Type og model (3)


Ill 58: Type og model (4)


Ill 59: Type og model (5)


Ill 60: Type og model (6)


Ill 61: Type og model (7)


Ill 62: Type og model (8)

DARK ROOM

Ill 63: Model in dark room (1)

Ill 65: Model in dark room (3)

3

Ill 64: Model in dark room (2)

Ill 66: Model in dark room (3)

Ill 67: Model in dark room (4)

Ill 69: Model in dark room (6)

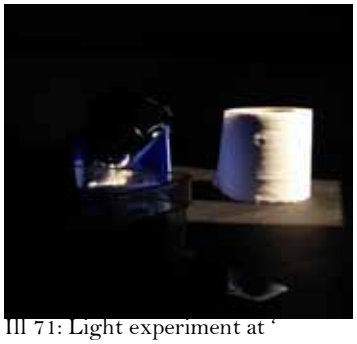
Ill 68: Model in dark room (5)

Ill 70: Model in dark room (7)

3.7 CLEMEN - LIGHT ENGINEER AT AALBORG TEATER

After it was decided to create furniture that brought home an experince for the user, a meeting with a light engineer was arranged. This was to discover the mood aspects a lamp could contribute to the scenario that the furniture should convey. Clemen works as a light engineer at Aalborg Teater and is therefore used to create different moods and emotions through light underlining the expression of the show. To begin with he mentioned the color of the light. This is measured in Kelvin and is an expression of a plate of metal that is heated. The metal will change color depending on the affecting temperature and ranges from incadescent to red hot. The strongest natural source of light is daylight which is about 5000Kelvin , in comparisson; an ordinary incadescent bulp is around 3500K. He told the team that the lamp would have to compeet with daylight as this is the most "natural" light and that daylight is cold and blue in its expression. He also suggested that the team thought about a reference scale so it could be possible to place the desired light temperature the right place. The scale could range from daylight and move through "work"-light, home lighting, sunset and end in darkness. Another aspect was the prmitive effect light would have on the user. Normally sunsets would illuminate with warm red and orange colors signaling to earth inhabitants that is was time to relax and go to sleep. This is programmed in most living creatures on earth. This is also the same feeling coming from the incadescent light bulbs for decorations. Natural light is also the most pleasant for the eyes as this was the first light, before man invented fire. To create a sphere of mood associating the furniture with NPT and the wild could also be done by creating a physical sphere of light. He suggested to investigate lampshades called GOBO and a specific type called Conee. This lampshade is able to create a distinct cone in which the furniture could be placed. He reffered to a company named Bico, that produced lighting for different occassions and scenaries. Further more he suggested that the team investigated a Danish painter named Wilhelm Hammershøi that specialized in painting external light in different situations and creating an expression using the light and shadow. The team could also look into creating small spots focusing on the floor and thereby creating a space with light. He also taught the team about the dif-

fused lighting. The level of diffusion is a direct result of the size of the area it bounces of. The more area the more diffused the light is going to be. Direct light can be hard and not very pleasant for the eyes. To create a relaxed mood for the furniture and inspire to relaxation and conversation, the light would need to be diffused and soft, not direct and hard. Further more is was also important how the signal value conveyed the story of the area. A floor lamp could end up sending a completely different signal than a table lamp or a seling lamp. In this aspect, design would also have a significant impact. There was also a possibility of mixing a color from a lamp with daylight and soften the daylight. If the reflecting area is colored, the color would also reflect into the diffused light wich will result in a faint teint of the lighting.



Ill 71: Light experiment at ' Aalborg teater (1)

Ill 72: Light experiment at Aalborg teater (2)

When presenting the furniture at the NPT centre, the team should also keep the placing of the furniture in mind. Should it be placed close to windows and have to compeet with daylight or should be placed in a more dark and cozy setting? Is the nature and the special northern light to be part of the setting, it has to be thought through as a conscious choice. Concerning this, Clemen also talked about how it was possible to create darkness to highlight a specific target, such as the furniture. Humans are programmed to see the most enlightened areas and also follow the light when it is moved; they prefer to look at the items and areas that are most enlightened.

4 MATERIAL

MATERIAL MAP

In order to have an overview of the different natural material in Thy the material map has been createde.

4

In regards the stick2nature projeckt Thorbjørn Stenholm gave the project team a market research.

thy erhvervsforum

EPINION

Notat

MARKEDSANALYSE MED FOKUS PÅ AFSÆTNINGSMULGIHEDER FOR NATIONALPARK THY MØBLER
Thy Erhvervsforum

Baggrund

Erhversforum Thy ønsker at undersøge markedspotentialet for at fremstille møbler i bjerg- og klitfyr fra Nationalpark Thy. Træet er FSC mærket, tømmeret bliver CSR mærket, møblerne bliver Nationalpark-certificeret. Produktionen af møblerne skal være med til at udrydde bjerg- og klitfyr hurtigere da de er invasive og truer klitheden i nationalparken. Bjerg- og klitfyr er her kendetegnede ved at være meget små krogede træer, der vokser meget langsomt. Til gengæld er tømmeret meget hårdt og tungt med et tæt og smukt ved. Møblerne vil derfor ikke kunne sammenlignes med traditionelle fyrretræsmøbler. Der vil være tale om et nyt nordisk design med meget utraditionelle råvarer. Møblerne er ikke fremstillet endnu, men projektets udgangspunkt er i nordisk design og det er planen, at unge innovative designere skal tegne møblerne.

Formålet med undersøgelsen er at blive klogere på, om der er et markedspotentiale i arbejde videre med ideen samt at få generelle input fra personer i branchen til, hvor dette potentiale ligger.

Beskrivelse af informanter

I alt 10 møbel- og designforhandlere er blevet interviewet, samt 2 boligmagasiner. De 12 informanter er blevet identificeret via desk research og snowballing, med det mål for øje, at de har kompetencerne til at vurdere markedspotentialet for Nationalpark Thy Møbler. De 10 forhandlere er udvalgt ud fra, at de forhandler sammenlignelige produkter og på baggrund af et ønske om en geografisk spredning. De 2 boligmagasiner er udvalgt som øvrige branchefolk for, fra en anden vinkel, at give deres syn på markedspotentialet.

Nedenstående tabel giver et overblik over analysens informanter.

Informant	Beskrivelse
3Falke Møbler	▪ Møbelforhandler med 1 butik på Frederiksberg. Sælger high-end designermøbler. ▪ Kontaktperson: Souschef
Paustian	▪ Møbel- og indretningsforhandler med 3 butikker i Danmark. Markedsførende designforhandler med high-end møbler. Er også aktiv i designfasen. ▪ Kontaktperson: Christian Thestrup Poulsen, Product Developer
Schiang Living	▪ Møbel- og indretningsforhandler med 2 butikker med udgangspunkt i Odense. Sælger high-end designermøbler. ▪ Kontaktperson: Søren Larsen, Indehaver
Bolighuset Jobo	▪ Møbelforhandler med 1 butik i Kolding. Sælger middle- til high-end møbler. ▪ Kontaktperson: Bo Arvad Pedersen, Direktør
Ingvard Christensen	▪ Møbelforhandler med 4 butikker i Syd- og Midtjylland. Sælger middle- til high-end møbler ▪ Kontaktperson: Anders Bonde, Administrerende Direktør

BoConcept	▪ Forhandler med base i Herning og i alt 260 franchisebutikker verden over. Udvikler og sælger designermøbler ▪ Kontaktperson: Henrik Hedegaard, Sourcing Manager
Thorsen Møbler	▪ Møbelforhandler med 1 butik i Aarhus. Sælger high-end møbler. ▪ Kontaktpersoner: Erling Nielsen, Direktør og Bettina Dyhr, Erhvervskonsulent/indretningsarkitekt mDD
Bolighuset Ry	▪ Møbelforhandler med 1 butik i Ry. Sælger high-end designermøbler ▪ Kontaktperson: Tanja Ahlmann, butikschef
Vodskov Bolighus	▪ Møbelforhandler med 2 butikker i Vodskov (v. Aalborg) og Skagen. Sælger middle- til high-end designermøbler. ▪ Kontaktperson: Per Færch Thomsen, Indehaver
Illums bolighus	▪ Møbel- og indretningsforhandler med 8 butikker. Sælger high-end mainstreammøbler ▪ Kontaktperson: Bo Overgaard, Indkøbschef
Bo Bedre	▪ Danmarks største og førende boligmagasin med oplag på ca. 70.000. ▪ Kontaktperson: Charlotte Ravnholt, Medredaktør
RUM Interiør Design	▪ Nyere dansk boligmagasin med særlig fokus på design. Oplag på knap 20.000. ▪ Kontaktperson: Mette Barfod, Chefredaktør

Overordnet vurdering af markedspotentialet

Informanterne deler sig i tre overordnede grupper: dem der har svært ved at se et markedspotentiale i idéen (3Falke Møbler, Schiang Living, Ingvard Christensen og Bolighuset Ry), dem der er forbeholdne men positive over for idéen (Bolighuset Jobo, Thorsen Møbler, Vodskov Bolighus, Illums Bolighus og RUM), samt dem der er meget positive over for idéen (Paustian, BoConcept og Bo Bedre).

De forhandlere der umiddelbart stiller sig negative over for idéen lagde i særlig grad vægt på, at der ikke er et marked for den slags nicheproduktion samt at der skal noget lange mere håndfast til før de kan tage stilling til noget som helst.

Paustian og BoConcept stillede sig som forhandlere (og produktudviklere) særdeles positive over for produktidéen. De kunne sagtens se markedspotentialet i et nicheprodukt fra Thy og den historie som idéen tager udspring i. De lægger især vægt på, at designet og kvaliteten skal være i top og at designet skal lægge sig op af de klassiske håndværksdyder kombineret med letheden i den (ny-)nordiske designbølge. Bo Bedre så ligeledes stort potentiale i idéen og fandt, at konceptet var lige i tidsånden og passede godt ind i deres magasin.

Den sidste gruppe var forbeholdne om end positive over for idéen. De ville gerne have noget mere konkret at forholde sig til, herunder træprøver,

Jeg tror på, at der er en niche her, hvor historier og naturpark går op med godt og usædvanligt design.
- Vodskov Bolighus

Jeg vil gerne have en eller flere typiske prøver så jeg kan an fornemme styrke, hårdhed, struktur, udseende og blive inspireret.
- Paustian

Design er alt - bare at slå på noget særligt træ, certifikater osv. interesserer ikke nok.
- Ingvard Christensen

designskitser med mere, men kunne umiddelbart godt følge selve produktidéen. De vurderede overordnet set, at der kunne være et markedspotentiale, men at potentialet i høj grad afhænger af design og slutprodukt.

Holdninger til produkt og design

Der er delte meninger blandt informanterne om, hvordan designet af produktet skal være, dvs. om det fx er vigtigt med lyst eller mørkt træ, klassisk eller moderne design, etc. De fleste mener, at der er underordnet *hvilken* designretning der er tale om, så længe designet er godt og spændende. Andre, blandt andet BoConcept og Bo Bedre, er af den overbevisning, at designet skal være let og lyst i udtrykket, så det rammer den nye nordiske designbølge, der ses inden for branchen. Alle råder derudover til, at produktet ikke kommer til at minde om konventionelle fyrretræsmøbler. Halvdelen af informanterne er desuden af den holdning, at det vil være en fin idé at mærke produktet med producentens logo.

(Mer)værdien af certificeringer

Det forventes, at det at træet er FSC-mærket, tømmeret er CSR-mærket og møblerne er nationalparkcertificerede, giver møblerne en vis merværdi. Det er svært at sige hvor meget denne merværdi vil udgøre, men den forventes at være til stede. De fleste informanter lægger dog vægt på, at certificeringerne ikke er så vigtige igen, eller at det i hvert fald ikke er det vigtigste. *Møblets design og kvaliteten af de benyttede materialer, er de altoverskyggende parametre, når værdien af et designermøbel skal fastsættes.* Først i anden række bliver diverse certificeringer relevante. Kun Paustian lagde vægt på, at certificeringerne i sig selv var et vigtigt og selvstændigt værdiskabende parameter.

Målgruppe

Produktet henvender sig i særlig grad til danskere med en høj indkomst. Alle informanterne vurderer prisniveauet til at være fra halvhøjt til meget højt. De fleste informanter vurderer dog, at det med produktidéen *er* muligt at ramme dette segment ved at producere unikke møbler med fokus på design, kvalitet og den gode historie. Informanterne er splittede i forhold til, om produktet har en chance uden for Danmark. Især BoConcept, der har franchisebutikker i mange europæiske og asiatiske lande, samt Vodskov Bolighus, potentiale i at markedsføre produktet på bl.a. det (nord)tyske marked. BoConcept åbner desuden også op for mulighederne på det asiatiske marked, men det handler i høj grad om, at skabe et high-end produkt med et godt design. Andre informanter ser derimod intet markedspotentiale uden for landets grænser, mens eksempelvis Paustian anbefaler, at man starter med at fokusere på det danske marked, hvorefter man kan brede det ud.

Markedsføring

De fleste informanter nævner specifikt, at produktet er ideelt til at blive markedsført gennem boligmagasiner. Mediet er ideelt til at fortælle den gode historie bag produktet, omkring egnsproduktionen, det særlige træ,

Alt afhænger af veldesignede og spændende produkter. Det med det særlige træ, certifikater og logoer kommer i anden række.
- BoConcept

Det må helt klart gælde om at få nogle af disse ambitiøse unge designere til at se mulighederne i Thy-træet og skabe ting der kan fange opmærksomheden. Glem alt om at interessere store kommercielle møbelfabrikker
- Bo Bedre

Vi må se prototyper. Det altafgørende er om MØBLET er interessant. Certificeringer og stamtavler sælger ikke i sig selv.
- Schiang Living

Vores meget succesrige butik i Tokyo sælger KUN klassisk nordisk design. Det helt rene og lyse.
- BoConcept

Markedet har aldrig før været mere hot på snedker-håndværk, unika og nytolkninger af den klassiske Wegner-Mogensen-stil.
- Bo Bedre

certificeringerne, med mere. Produktidéen rammer desuden godt ind i boligmagasinernes læsersegmenter og vil således være med til at kunne skabe en 'hype' omkring det særlige produkt. Bo Bedre foreslår at markedsføringsindsatsen centreres omkring ét boligmagasin (fx Bo Bedre). Omtales produktet, designet samt hele historien bag produktet her, så vil de øvrige magasiner, søndagsaviser og lignende følge efter. Der lægges således op til at fokusere snævert, men intensivt, i stedet for at forsøge at markedsføre bredt.

Konklusion

Konklusionen på analysen og interviewene med forhandlere og branchefolk er, at:

- Der *er* et marked for møbler produceret af træ fra Nationalpark Thy. Markedspotentialet ligger i niche-/unikaproduktion af møbler med et let, lyst og spændende design, der udstråler kvalitet.
- Certificeringerne er ikke det vigtigste. Det vigtigste er selve møblet, herunder design og kvalitet. I anden række kan certificeringerne være med til at skabe merværdi for visse kundesegmenter.

Fem anbefalinger

På baggrund af interviewene anbefales det, at nedenstående parametre tænkes ind i den videre proces:

1. Fokuser på designet og kvaliteten af møblerne i første ombæring. Det er designet, der sælger – ikke certificeringerne.
2. Fokuser på niche-/unikaproduktion frem for masseproduktion.
3. Involver unge iderige designere og snedkere, fx gennem designkonkurrencer, og tænk 'New Nordic' i designet: Kvalitet, lethed, lys.
4. Involver branchefolk og forhandlere i design og udviklingsfasen, eksempelvis gennem et samarbejde med Paustian.
5. Storytelling i markedsføringen: Kombinationen af lækre designermøbel og møblernes historie, herunder det særlige træ fra Thy, navnet på snedkeren, der har lavet møblet, etc.

Det bliver dyrt og håndværksbaseret - så skal der noget HELT særligt designmæssigt til. Blot at tro på, at et konventionelt produkt kan sælges på Thy pga. noget specielt træ... Nej.
- Ingvard Christensen

Alt er tilladt! Bare det er godt.
- BoConcept

'New Nordic' er ikke bare mad, det er også en stor interesse for træ-træ-træ uanset sort og farve. Men der skal være dét der nordiske touch af noget let, lysfyldt og svævende. Interessen, også internationalt, har aldrig været større!
- Bo Bedre

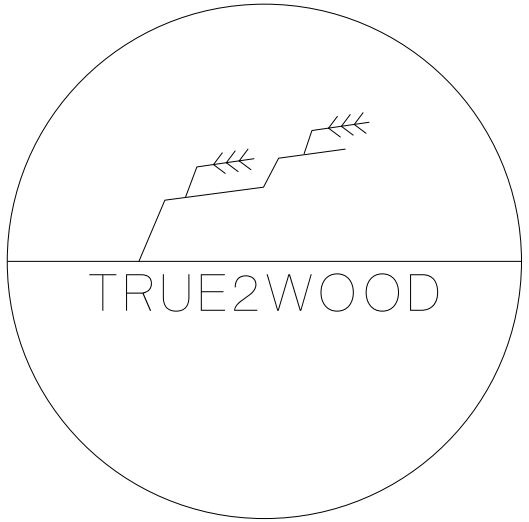
Designmæssigt er alt muligt, men pas på ordet 'fyr'.
- 3Falke Møbler

product report
master thesis
spring 2015

MSc04ID group 8

Betina Ø. L. Jørgensen
Lina P. Perner
Louise Siig Nielsen

INDUSTRIAL DESIGN
AALBORG UNIVERSITY



a stick2nature project

title page

TITLE	TRUE2WOOD - a stick2nature project
PROJECT THEME	Furniture from natural curved mountain pine
STUDY PROGRAMME	Master thesis
PROJECT PERIOD	01 . 02 . 2015 - 27 . 05 . 2015
PROJECT GROUP	MScID04 Group 8
PROJECT CLIENT	stick2nature
MAIN SUPERVISOR	Kaare Eriksen, Department of Architecture, Design and Media Technology, Aalborg University
SECONDARY SUPERVISOR	Poul Henrik Kyvsgaard Hansen, Department of Mechanical and Manufacturing Engineering, Aalborg University
NUMBER OF PAGES	24

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abstract

TRUE2WOOD is a project developed in collaboration with a sustainability project, stick2nature, which originates in Thy.
The objective of this project is to design furniture based on a need of utilizing mountain pine from National Park Thy and thereby create a revenue stream to the area by using local businesses for the production.

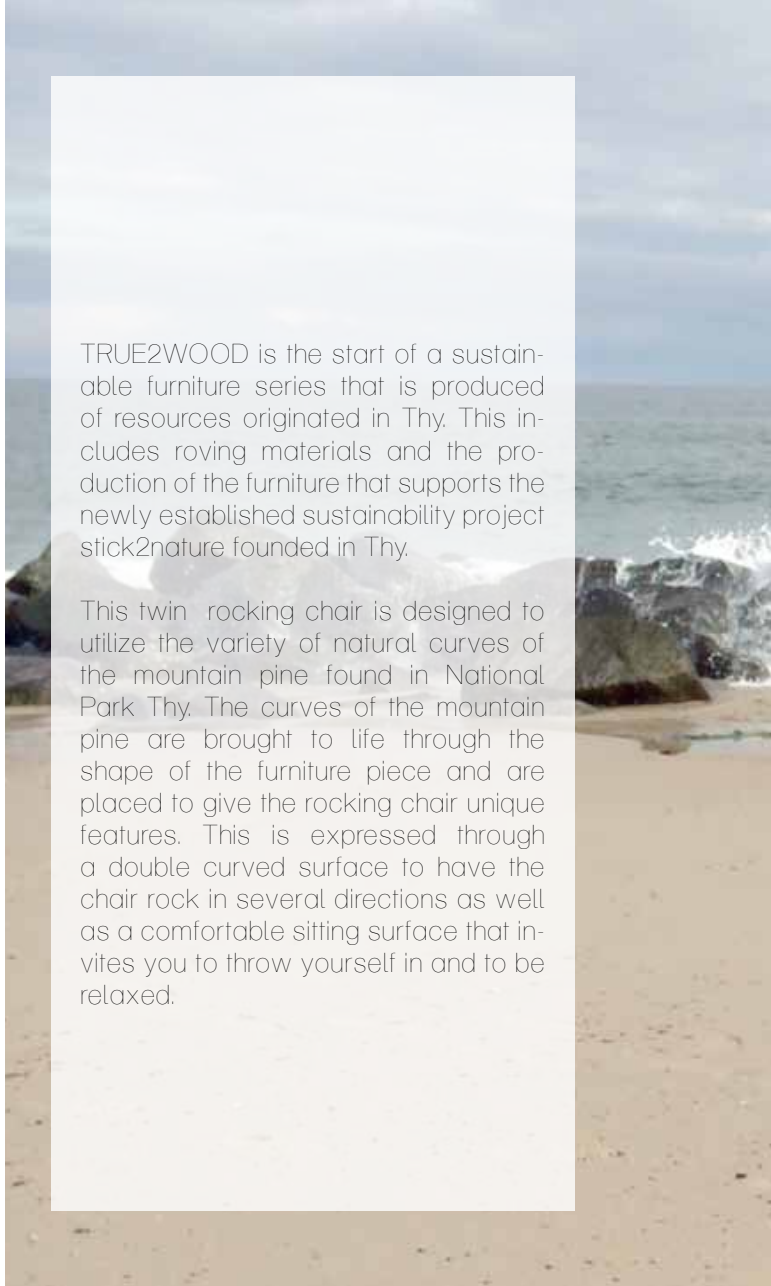
The products reach from a statement rocking chair to a reduced and smaller version of the chair. Additionally, a product range that could be based on the design DNA derived from the statement piece is presented. The main focus in the furniture is the natural curvature derived from the mountain pine, which has formed the products.

Throughout the product report, the products will be presented in context, scenarios, business considerations and the assembling of the chair.

THE STORY TO COME...

TRUE2WOOD

a stick2nature project



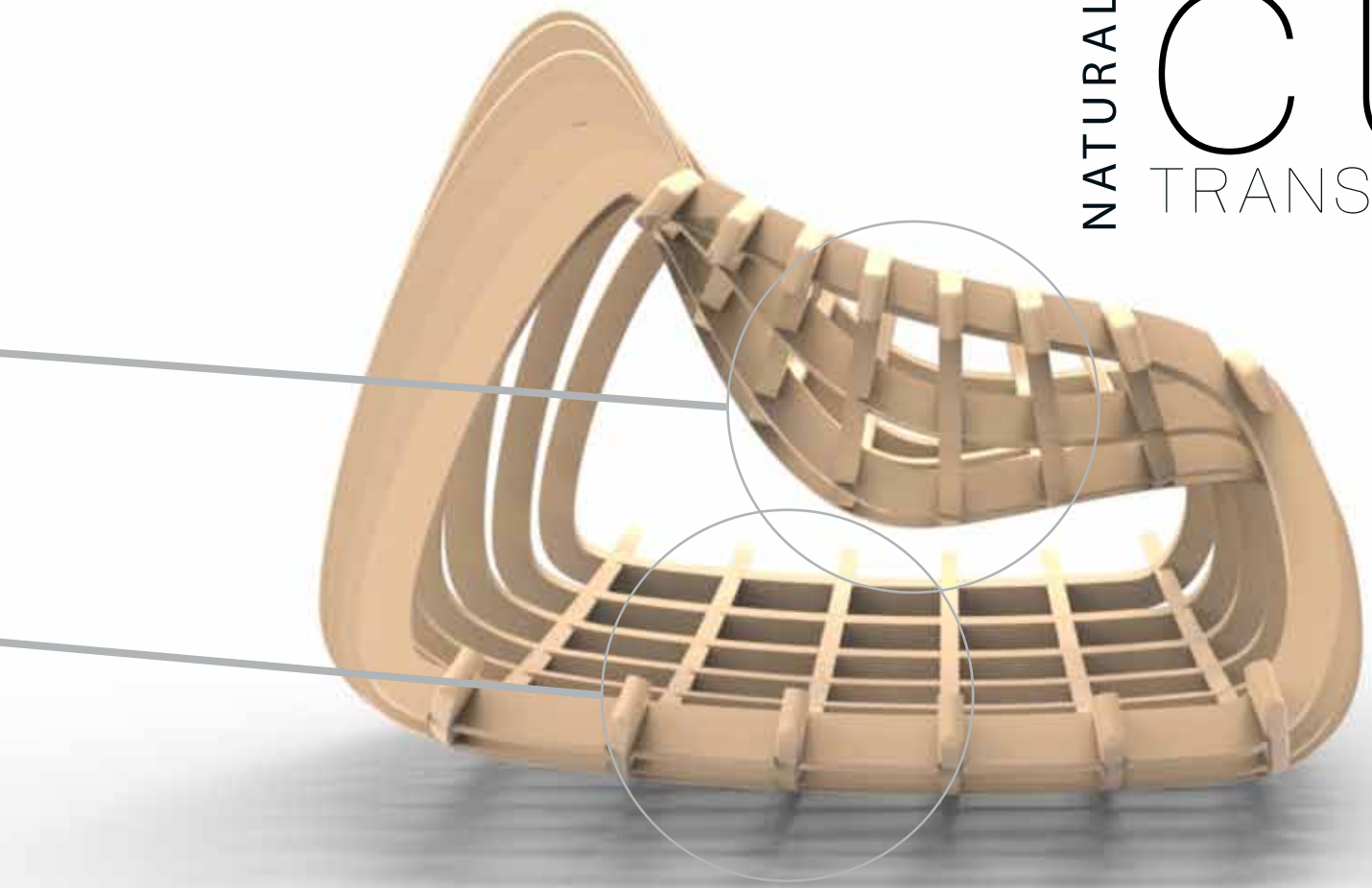
TRUE2WOOD is the start of a sustainable furniture series that is produced of resources originated in Thy. This includes roving materials and the production of the furniture that supports the newly established sustainability project stick2nature founded in Thy.

This twin rocking chair is designed to utilize the variety of natural curves of the mountain pine found in National Park Thy. The curves of the mountain pine are brought to life through the shape of the furniture piece and are placed to give the rocking chair unique features. This is expressed through a double curved surface to have the chair rock in several directions as well as a comfortable sitting surface that invites you to throw yourself in and to be relaxed.

stick2nature

The stick2nature project is initiated in the Thy area with the purpose of promoting wellfare, economy and growth in the community. The challenge is to utilize mountain pine and roving materials from National Park Thy in correlation with nature preservation in the park. Furthermore, the vision is to create a supply chain based in the community, which should result in materials being harvested, processed, and build by local social economical businesses and craftsmen located in the area of Thy.

NATURAL curves
TRANSLATED INTO A CHAIR



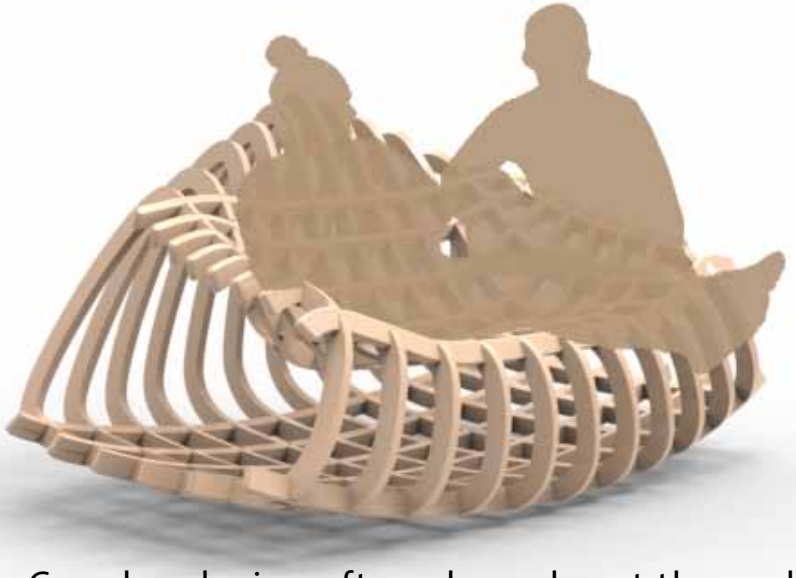
The natural curvature derived from the mountain pine is translated into the chair. One of the most important aspects of the design DNA is the natural curvature found in the mountain pine.
The average curves have been analysed and the results are being transformed into the design of the chair, meaning; all the curves found in the furniture, can be found in the wild as well.

& use motion

When you meet the furniture you should be welcomed to throw yourself in the chair, feeling relaxed and swaddled by nature.

Big sister is rocking her siblings

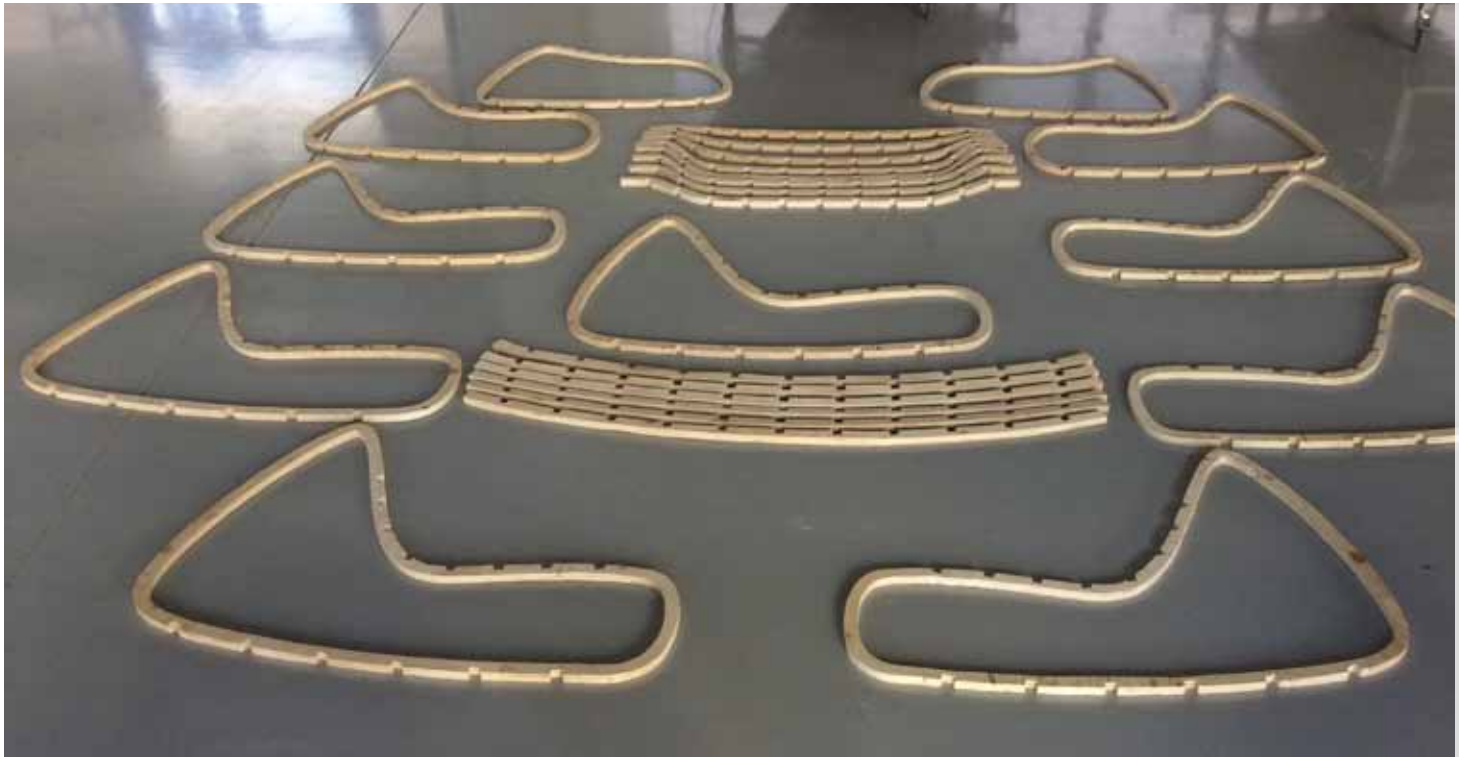
Curious dad is testing with the chair



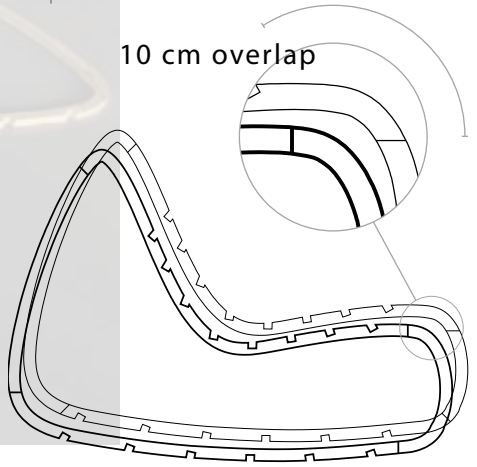
Couple relaxing after a long day at the park

Grandpa is sitting and enjoying the view

assembly
OF THE FURNITURE

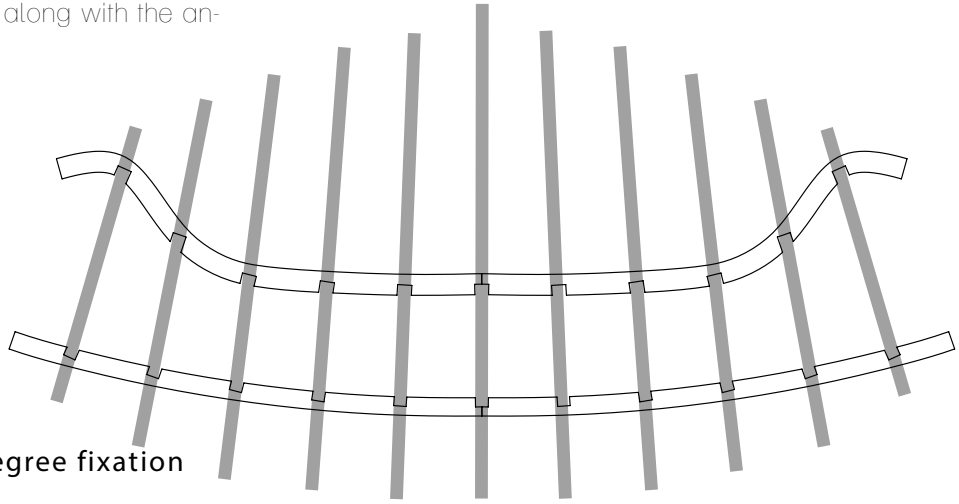


The planks is glued toghether before CNC cutting in order to ensure the right tolerances. The cuts are angled to fit the horizontal lamellae perfectly, why no further grinding is necessary. After the cutting, the lamellae are assembled. First the loops are placed in a fixture with the prezice angels and then the horizontal lamellea is fix onto the loops.

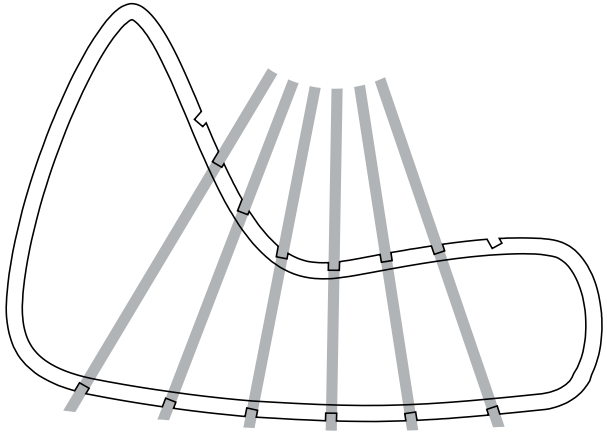


fixation

As both the cuts in the horizontal lamellae and loops are angled, the loops needs to be fixture during final assembly. This will ensure the lamellae and loops being fixed in the right position while being cured not to have the chair tilt.
Shown in the illustrations is the angled cuts in the lamellae along with the angling of the loops.



5 degree fixation

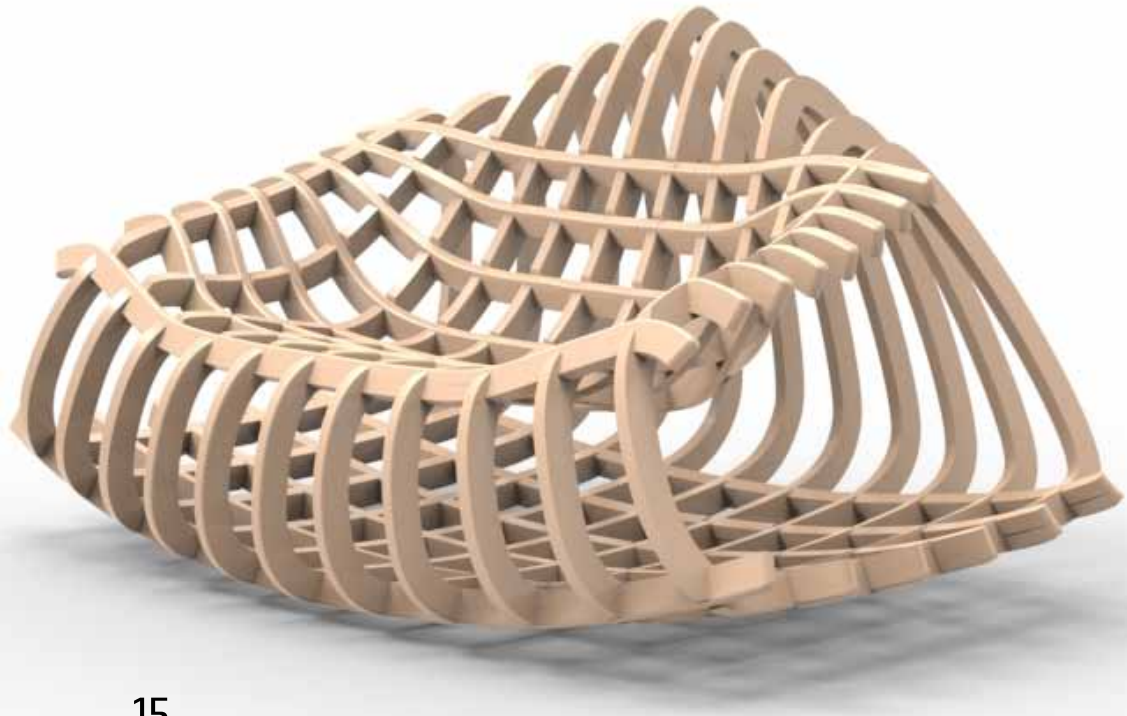


10 degree fixation

the statement piece

the design DNA

The aim when designing a statement furniture in the TRUE2WOOD product series, is to obtain a dominant design. This means arrive at clear design guidelines that then can be translated to additional products so the origin is clear.
In the statement piece, the design DNA is the unique curving, derived from the mountain pine, the grid in the furniture and the angled cuttings in the assemblie joints.



The business case

The design DNA is the foundamental aspect of the project and it is important to market the products accordingly.
The dominant design is derived from the statement twin chair and is applicable in following designs ensuring the values and qualities toward the customer.

The design DNA is conveying the story of the unique roving materials found in National Park Thy, the cooperations between local businesses and the goal of strengthening the community and aspire growth.

It is estimated that the single chair will cost approximately half of the production costs of the large chair as the small chair is half the size. It might even be cheaper as it is simpler and without the loops.

To keep the products in the right market segments, the furniture are sold in retail stores which carry high end designer furniture. This channels the furniture toward the chosen customer segments and maintains a certain reputation of uniqueness and quality in the furniture. The price for the small chair are keept in an affordable price range but still creates a boundary between the customer segments whom are motivated by intrests.

KEY PARTNERSHIPS

\\ National Park Thy
\\ Elmelund
\\ &woodlab

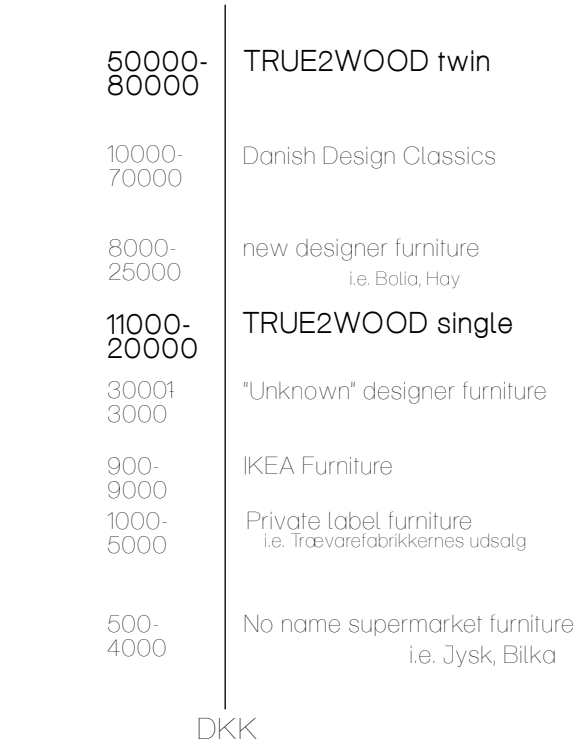
\\ Local manufactures
\\ UCN, with a cataloging program
\\ National Park Thy Centre
\\ Specified retailers

KEY RESOURCES

\\ Mountain pine
\\ Rowing matierials from National Park Thy
\\ Business clusters in the community of Thy

CUSTOMER SEGMENT

\\ Trendsetters
\\ Environmentalists
\\ Active outdoor



scalability

FROM TWO SEATS TO ONE

The single TRUE2WOOD rocking chair is designed as a follow up in the furniture series.

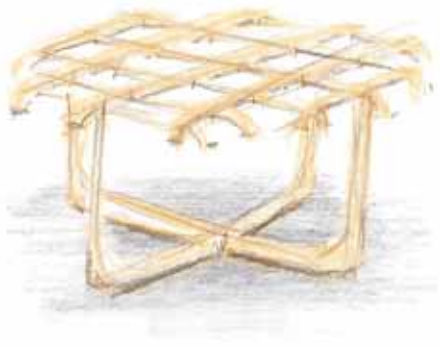
The design is based on the design DNA from the original TRUE2WOOD twin rocking chair as it is the features to rec ognize these products from.

The twin rocking chair is a lighter version to sell in the National Park Thy Centre as well as high-end Scandinavian design furniture retailers to connect the customer segments.

Following furniture pieces are to come and will be based on the same story and design DNA as the two rocking chairs.

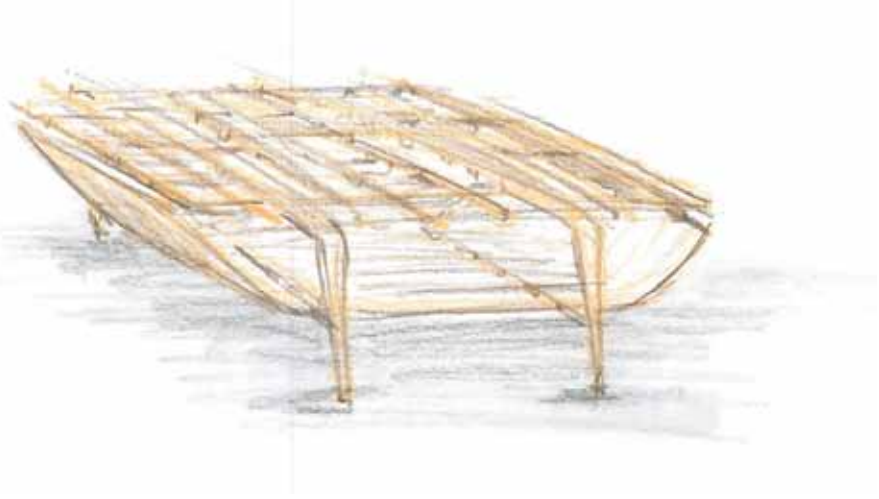
In the small chair; the curvature, grid, and special assembling infuses the design. This will be the TRUE2WOOD trademarks.

the
posibilities
are
many...

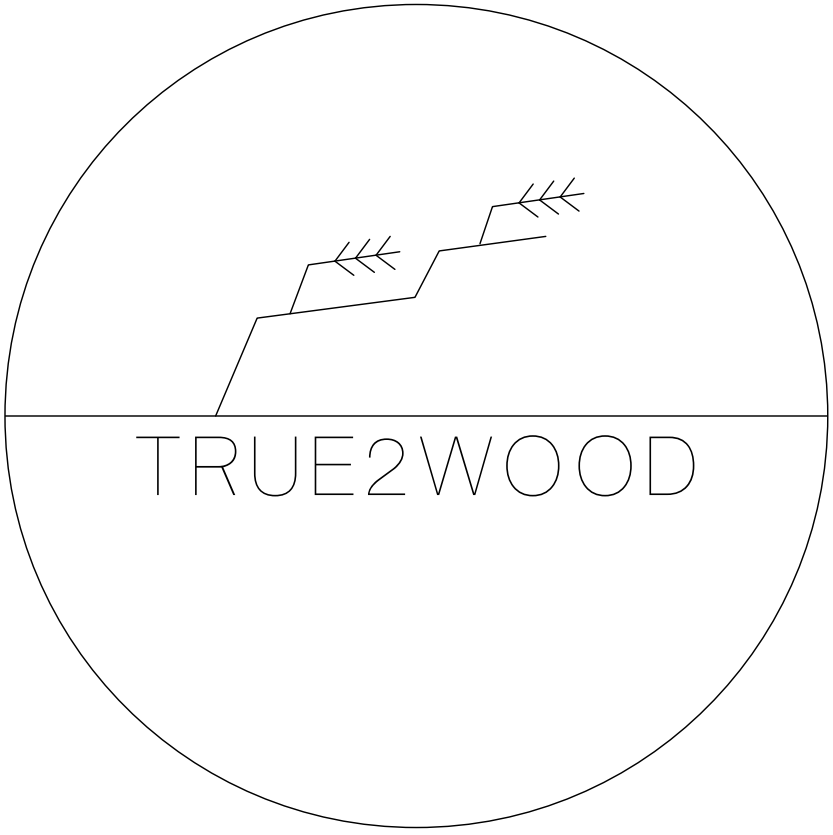


FURTHER POSSIBILITIES

\\ dining furniture \\
\\ cutlery \\
\\ table lamp \\
\\ outdoor furniture \\
\\ shelf \\
\\ bench \\



the
natural
curves
creates
the
furniture



all of the illustrations
and renderings are made
by the project team