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Developing sustainable value proposition for renewable packaging material

Master's Thesis

Supervisors: Professor Marko Torkkeli, Associate Professor Kalle Elfvengren

Instructor: Maria Holopainen

ABSTRACT

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This master's thesis aims to develop sustainable value proposition for renewable packaging material and to demonstrate sustainable value for the customer. Value proposition and sustainability are widely discussed themes, but together they have not been target for research very often. In the packaging markets the demand for sustainable solutions is growing and there is need to demonstrate the sustainable features of the packaging effectively to the customers. This study is conducted by exploring former literature related to the topic and by doing a case study. The data for the case study was collected by using semi-structured interviews and content analysis about customers' sustainable reports.

In conclusions the sustainable benefits of the researched packaging material are demonstrated with three different aspects of value proposition: all benefits, favorable points of difference and resonating focus. Life cycle assessment was used to determine sustainable benefits. In addition the benefits and their impacts are examined from the perspective of every actor in the value chain of packaging. The most important sustainable value driver identified is efficient material use. The researched packaging material responds to this need by demonstrating lighter weight, smaller carbon footprint and reduced use of raw material.

TIIVISTELMÄ

Tekijä: Saara Kaikkonen

Työn nimi: Kestävän arvolupauksen kehittäminen uusiutuvalle pakkausmateriaalille

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Ohjaaja: Maria Holopainen

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Tämä diplomityö pyrkii kehittämään kestävän arvolupauksen uusiutuvalle pakkasmateriaalille sekä havainnollistamaan kestäviä hyötyjä asiakkaalle. Arvolupaus ja kestävyys ovat useasti keskustelussa ja tutkimuksen kohteina, mutta niitä ei ole yhdistetty vielä kovinkaan laajasti tutkimuksessa toisiinsa. Kestävien ratkaisujen tarve pakkausmarkkinoilla kasvaa, joten tarve kestävien arvojen määrittämiselle ja osoittamiselle asiakkaalle on myös kasvussa. Tutkimus on toteutettu tutustumalla aiheeseen liittyvään kirjallisuuteen sekä case-tutkimuksen avulla. Tutkimuksen aineisto on kerätty hyödyntäen puolistrukturoituja haastatteluja sekä tutkimalla asiakkaiden kestävyysraportteja.

Tuloksissa esitellään tarkasteltavan materiaalin hyötyjä kestävyyden näkökulmasta kolmen erilaisen arvolupausmallin avulla. Ne tuovat esille tarkasteltavan materiaalin kestäviä hyötyjä eri näkökulmista: kaikkia hyötyjä tarkastellen, vertaamalla sekä keskittymällä vain tärkeimpiin hyötyihin. Kestäviä hyötyjä on arvioitu elinkaarilaskentaa hyödyntäen. Lisäksi hyötyjä ja niiden vaikutuksia on tarkastelu erotellen pakkauksen arvoketjun eri toimijoiden näkökulmat. Asiakkaiden tärkein kestävä arvoajuri on tehokas materiaalin käyttö. Tarkasteltava pakkausmateriaali vastaa tähän tarpeeseen keveydellä, pienemmällä hiilijalanjäljellä sekä vähemmällä materiaalin käytöllä.

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The end of this thesis project means also the end of my studying time at LUT. When I entered the university building for the first time I could not have guessed how much I would learn and grow, and how many great memories and friends I would get. I want to thank my friends for making the time at the university unforgettable, and especially Jenny for helping me with this thesis. I would like to thank my family for supporting me both emotionally and financially during my studies, and my relatives living in Lappeenranta for offering me help whenever was needed. Special thanks go to my late grandfather who was always proud of me and my accomplishments, even before I learned to be.

Helsinki, 20th of February 2017

Saara Kaikkonen

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List of symbols and abbreviations

€	Euro
%	Percent
CO_2	Carbon dioxide
CTMP	Chemical thermomechanical pulp
FSC	the Forest Stewardship Council
g/m^2	grams per square meter
ISO	International Standards Organization
LCA	Life cycle assessment approach
LCC	Life cycle costing
LCI	Life cycle inventory
LPB	Liquid packaging board
MFC	Micro fibrillated cellulose
mN	mill newton
nm	nanometer
PEFC	the Programme for the Endorsement of Forest Certifications
R&D	Research and Development
TQM	Total Quality Management

1 INTRODUCTION

1.1 Background

During the past few years the ending resources and high environmental costs have changed marketers' attitude toward resource use and environmental issues. Companies need to re-examine their strategies and practices to balance between growth and sustainability. The attitude change has not happened without reasons. Analysts have estimated that the current global production and consumption are using 50 % more natural resources than ecosystems regenerate (O´Shea et al., 2013), and the mismanagement of natural assets is leading to economic costs for societies (OECD, 2011). Not only the economic and legal factors affecting the attitude change but also the customers creating pressure to companies to change their business into a more sustainable way. Consumers are often willing to buy environmentally friendly products over other options if sustainable options are financially acceptable. Sustainability is not anymore a 'nice to have' –trend, it has become a critical business driver. (Stewart & Vesterinen, 2011; Kotler, 2011)

Business has often been seen as a major cause for social, environmental and economic problems, which has caused that the trust in companies is declining. The more business embraces corporate responsibility, the more it is blamed for society's failures. (Porter & Kramer, 2011) Focusing on sustainability can lead to additional value creation factors but it needs to be applied to every area of business. Value can be created for example with green sales and sustainable marketing creating new markets and increasing sales (Martin & Tojic, 2013). Additionally sustainability can build more competitiveness for example creating savings by using resources productively (Porter & Kramer, 2011).

In the paper and board industry the origin of raw material, production, energy consumption, transport, end-use and recycling and reuse are some of the many obstacles on the ecological sustainability (CEPI, 2013). Not only the regulations but also the competition within the packaging industry is getting harder. The paper industry must be able to compete against other packaging materials such as plastics. Globalization has change the competition in Europe when European

markets need to be able to compete with pulp from Brazil and paper and board from China such as with low energy costs produced paper products from US. (CEPI, 2013) Simultaneously the demand for sustainable packaging is growing strongly. By 2018 sustainable packaging is expected to represent 35 % of the total global packaging market. Consumer demands and government legislations are the key drivers for growing markets for sustainable packaging. Aside of recyclability, reusability and biodegradability downsizing and lightweighting are also common trends in sustainable packaging. (Rao, 2013)

Differentiation and marketing are tools to gain more competitiveness in the markets. Like in the other industries, also in the packaging markets, customers are more interested in greener packaging than they were before. According to Innventia report of future packaging sustainability is already today a key focus for the packaging industry (Innventia, 2016, p.65). Through sustainable packaging companies are able to position their products and create brand stories. Environmental statement on how the package was manufactured can have a very positive impact on consumers. (Falk, 2009) Consumers are having a strong opinion about packages and their environmental impacts even though the package causes approximately 10 % of environmental impacts of food products (Grönman, 2012). Especially plastic has a negative reputation as packaging material because of the waste created from used packages, and all the plastic in the ocean, and because of usage of non-fossil raw materials (Cooper, 2016). Consumers' focus on impacts of packaging is making it more import for companies to be able to communicate the sustainable factors of packaging and use sustainable packaging to create added value for the product inside of it.

1.2 Objectives, research questions and limitations

The main objective in this study is to develop a sustainable value proposition for micro fibrillated cellulose (MFC) in liquid packaging. MFC is one material used in the board making to enhance the properties of the board. The case company Stora Enso is a global supplier to paper and fiber products. The thesis focuses on Stora Enso Consumer Board –division and MFC.

The main objective:

Develop a sustainable value proposition for MFC in liquid packaging board.

The main objective can be divided into three research questions and their objectives that are presented in Table 1.

Table 1 Research questions and objectives

Research question	Objective
1. What are the key benefits that MFC provides in liquid packaging board?	Identify the benefits of MFC in liquid packaging board.
2. What are the key factors that influence customer's decision?	Identify the key factors that affect customer's decision process at the moment and in the future.
3. How to define and demonstrate sustainable value created for the customer?	Create a system to define benefits created for the customer and a quick and effective way to demonstrate the value of MFC in liquid packaging board for the targeted customers.

The first research question aims to identify the sustainable benefits that can be provided to the customers with MFC when it is used in liquid packaging board as one material component. The second research question aims to identify the factors that influencing the customer's decision process. The key sustainable factors are specific researched. Both current and future factors are taken into consideration. The third research question aims to define the most important sustainable value created for the customer with MFC in liquid packaging board. The second part of the third research question aims to demonstrate value proposition to the targeted customers in a quick and effective way. In this study the targeted customer is the packaging converters who buy the board and convert the board into a package.

In this study the term value proposition is understood as t Anderson et al. (2006) introduced it and this study is aiming to create resonating focus –value proposition as a result. Resonating focus –value proposition communicate only the most valuable benefits in the product for the targeted customer. It demonstrates and documents the value of this superior performance in a quick and effective way for the

customer (Anderson et al., 2006). Also nonfinancial benefits are taken into consideration in this study because in some cases they are valuable points that make difference compared to competitors' products (e. g. Ulaga & Eggert, 2006). The term sustainability is variable and often used. The definition used in this thesis states that sustainable development is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs` (WCED, 1987). Sustainability consists of three aspects economic, social and environmental. Economic aspect consists of financial impacts, social aspect includes impact on social communities such as human right and workforce questions and environmental aspect includes the products impacts on its surroundings. All three aspects are taken into consideration in this thesis.

Value and value proposition are two of the most widely used terms in business and especially in customer value management approach. (Anderson et al., 2007; Camlek, 2010) In the same way sustainability has become the topic of discussion in many approaches, but still the sustainable value proposition has not been the target of research very often. This study aims to fulfill the research gap identified by creating collective review from former literature and developing new industry application. These aspects provide guidelines to the study delimiting the research scope illustrated in Figure 1.

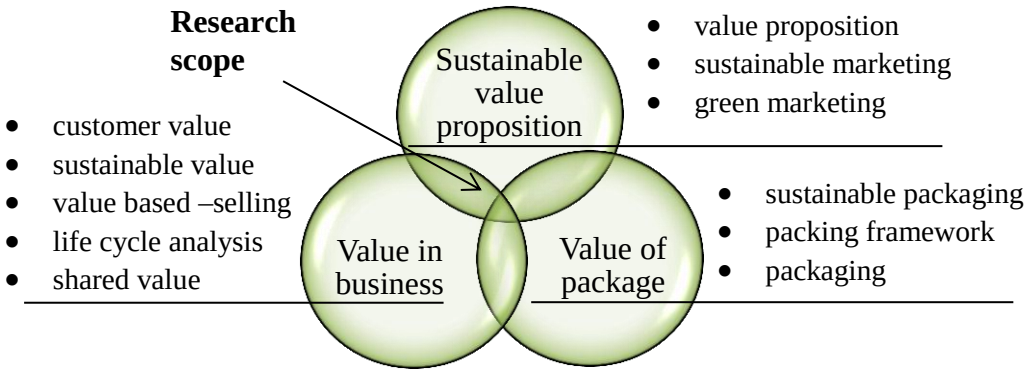


Figure 1 Research scope of this study and keywords for literature review

This study is limited to focus only on using MFC in liquid packaging board as it is used to substitute part of the normal pulp. The number of use possibilities for MFC is wide and within this study it was impossible to consider all of them. The geographical market area is not limited but the target is to examine the liquid packaging convertors which are the biggest customers of Stora Enso. This study is conducted for Stora Enso Consumer Board division between August 2016 and February 2017.

1.3 Execution of the study

This study follows a deductive approach. The existing theory is used to formulate the research questions and objectives, it has used to device a framework to be able to organize and direct data analysis. (Saunders et al., 2009, p. 489) As a primary research method it employs qualitative case study. The purpose of a case study is to investigate a phenomenon within its real-world context (Gog 2015). This study comprises MFC used in the liquid packaging board of Stora Enso. Mixed methods are used but main role is in the qualitative research with a descriptive approach. A case study can include both quantitative and qualitative methods in data collection, which are both used in this study (Saunders et al. 2009, p. 152). They are used separately to support each other's results. As a time horizon this study has cross-sectional which means that it is observing a particular phenomenon at a particular time (Saunders et al. 2009, p. 155). The philosophy chosen for this study is introduced in the research onion in Figure 2.

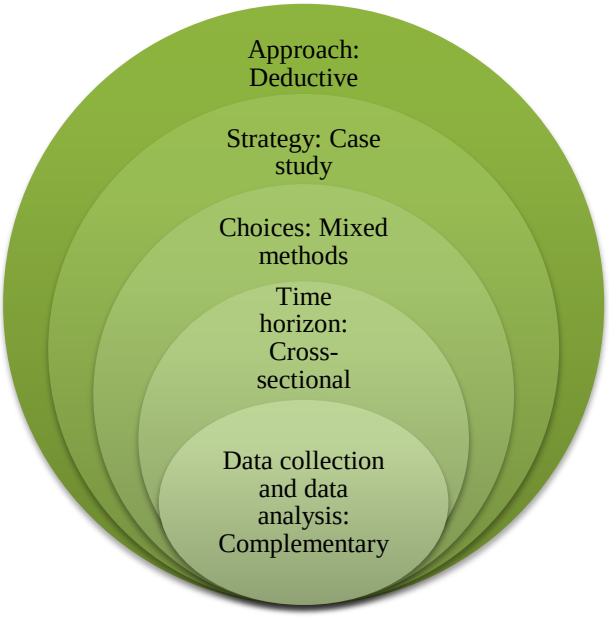


Figure 2 Research onion for this study

The execution of the study consists of three phases showed in Figure 3. The first phase is the introduction to introduce the scope of the study. Research questions and objects that this research is aiming to reach. It introduces the limitations this study has. The second phase is literature review which aims to create a collective understanding of earlier studies on sustainable value proposition and value of packaging. The literature review is a baseline for developing sustainable value proposition. The main methods for data gathering were literature review and expert interviews. Literature review has mainly been done with used research papers from different science and business journals. Different external reports about sustainable packaging and Stora Enso's internal reports have been used as reference material. The study is built on the theories of value in business, sustainable value proposition and value of packaging. The key words used in the search can be found in Figure 1. The theoretical part of the thesis is based on a concept analysis research approach and literature search is designed to obtain a comprehensive understanding over the topic such as a baseline to develop a sustainable value proposition for renewable packaging solution.

The third phase is the empirical part of the study. Case study consist both qualitative expert interview and analysis of the data collected and quantitative analysis of the sustainable reports of the main customers. Both approaches are used to create

understanding of the needs of the customer. All the phases lead to the conclusions made in empirical part of the study. It is possible to use both quantitative and qualitative research methods in one study but they should be addressed to specific research questions, otherwise they cannot be placed in a hierarchy of excellence (McCusker & Gynaydin, 2014). In Figure 3 behind the different elements of the case study has been marked if they are addressed to research question 1 (R1), research question 2 (R2) or research question 3 (R3).

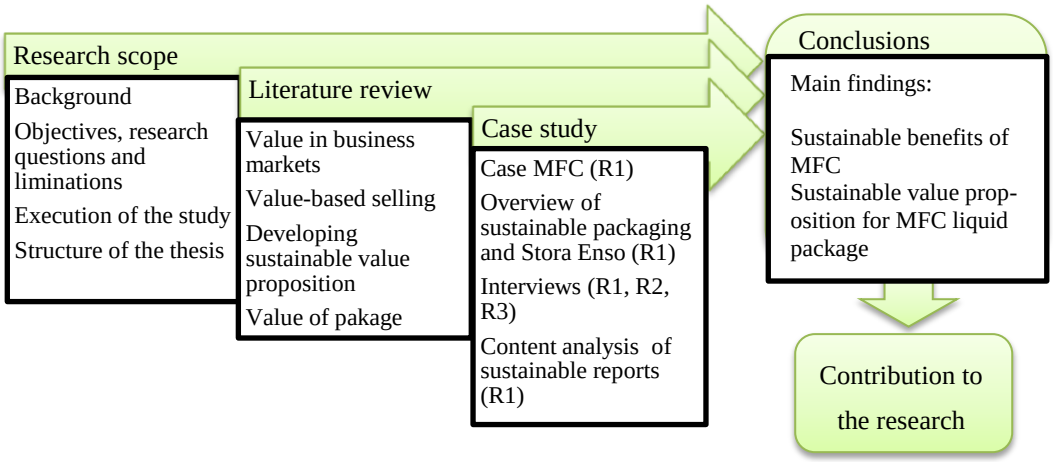


Figure 3 Execution of this study

1.4 Structure of the thesis

This thesis can be divided into two parts: theoretical and empirical. The theoretical part is divided into four chapters 2-5, where previous literature about value in business markets, value-based selling, developing sustainable value proposition and packaging are discussed. The purpose of these chapters is to provide a required understanding for further analysis of sustainable value proposition development for renewable packaging material. The empirical part of the thesis consists of three chapters 6-10. Methodology part of the thesis explains how the study is conducted in more details. First in the empirical part the case company and the case situation are introduced and described. In the chapter 6 the results of the study are introduced. In the two last chapters the results are analyzed in discussion part and conclusions made out of analysis are introduced. The inputs and outputs of the chapter can be seen more detailed in Figure 4.

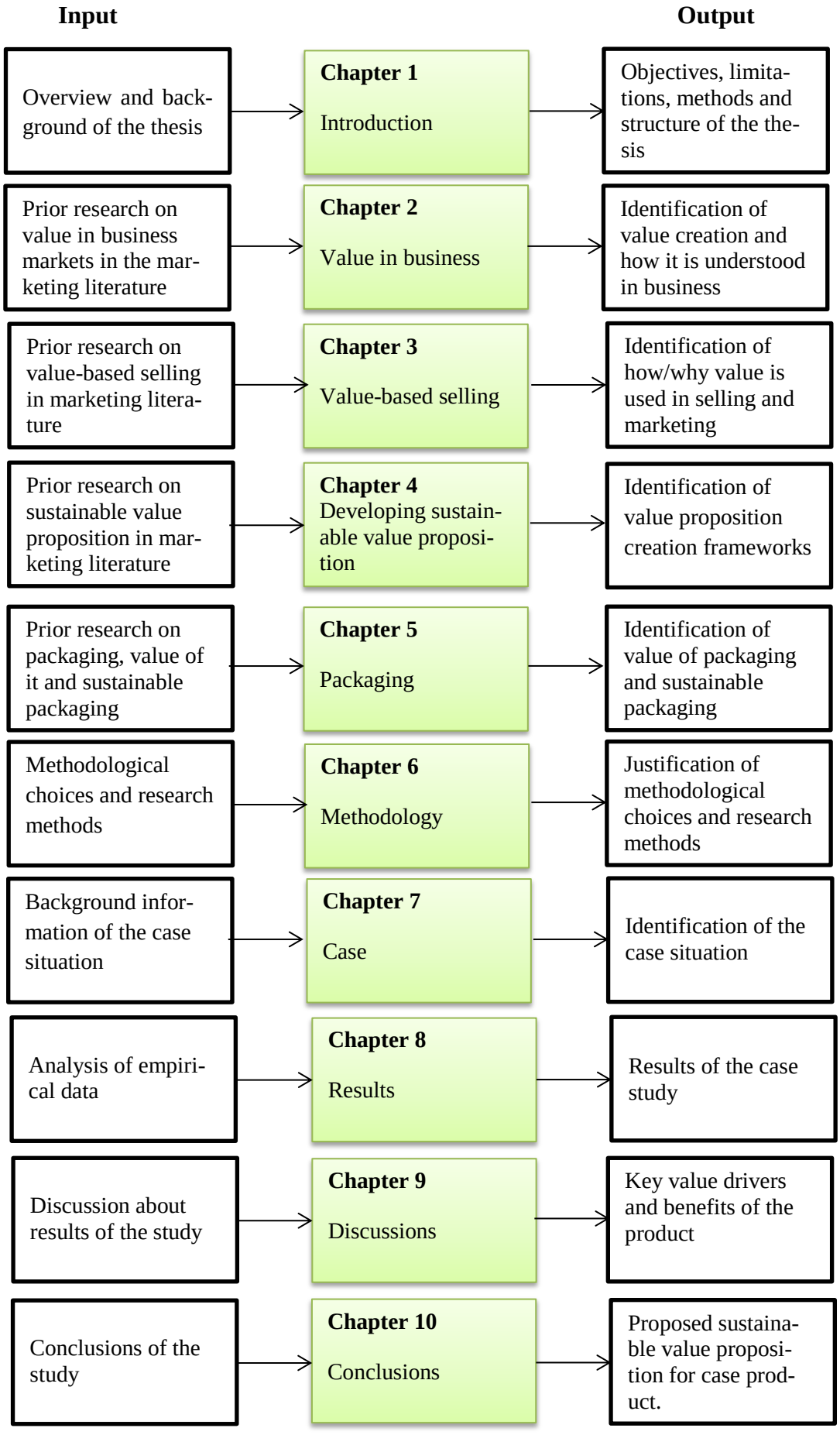


Figure 4 Structure of this thesis

2 VALUE IN BUSINESS

2.1 Customer value

The definition of value consists of many aspects and in marketing research it has been divided into three perspectives: seller, mutual and customer perspective. The seller's perspective to value includes the whole value chain, the value customer is creating to seller, and the value created to other shareholders. Mutual perspective focuses on superior customer value, value distribution and how the value is created and shared between seller, customer and other shareholders. Customer perspective focuses on the value customers acquire. (Terho et al., 2011) The customer's acquired value is complicated to determine because customers are not homogeneous and they may perceive different value within the same product (Ulaga & Chacour, 2001).

Customer value has many definitions and it has been defined in the previous literature many times. Different definitions are summarized in Table 2. Zeithaml (1988) defines that the value represents a trade-off between the give and get components. According to Porter (1985) value is what customer is willing to pay, and superior value is created if the company is able to offer the same benefits than the competitor, but with lower price. Holbrook (1996) divides customer value into eight types: efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality. According to Holbrook's theory the customer value reflects in three dimensions. First dimension is extrinsic value versus intrinsic value: if the offering is creating value with its functionality or ability versus if the offering is creating value as an end-in-itself. Second dimension is self-oriented value versus other-oriented value, and it is about prizing; if the offering is priced according to its effect or the effect it has on others. The last dimension is active versus reactive value; the customer acts on the object versus the object acts on the customer. Anderson and Narus (1998) define value in business markets as "the monetary terms of the technical, economic, service and social benefits a customer company receives in exchange for the price it pays. Unlike Holbrook (1996) Anderson and Narus are regarding performance relatively to the competition (Anderson et al, 1998). Sometimes terms value-in-use and value-in-exchange have been used in-

stead of customer value. Value-in-use means that value is created in the consumption and through use, and the value is determined and created by customers. (Vargo & Lusch, 2004) Customer value is determined often with the value-in-use, more than a personal value the customers are having. The real value-in-use is rather perceived by the customers than determined by the seller. (Dumond, 2000)

Kim and Mauborgne introduced within their blue ocean strategy the value innovation concept. When companies are seeking to create new and uncontested market space, they focus on creating value for both buyers and the company by creating new and uncontested market space and not benchmarking the competitors. Value without innovation tends to be incremental and innovation without value leads to development of products or service without customer demand. Value innovation has seen as a way to seek differentiation and low cost simultaneously. (Kim & Mauborgne, 1997; Leavy, 2005) Berghman et al. (2006) see the customer value at the same way by being market driving. Customer value creation depends on company's ability to absorb external market and customer information.

Table 2 Definitions for customer value

Research	Definition of customer value
Zeithaml (1998)	Trade-off between the give and get components.
Porter (1985)	What customers are willing to pay.
Holbrook (1996)	Value types: efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality Dimensions: extrinsic, self-oriented and active versus reactive value.
Anderson and Narus (1998)	The technical, economic, service and social benefits received in monetary terms in exchange for the price paid.
Vargo and Lusch (2004)	Value-in-use and value-in-exchange.
Dumond (2000)	Linked to the use of the product, and is perceived by the customer.
Woodruff (1997)	Perceived benefits of those attributes, attributes performance and consequences arising from the use situation.
Kim and Mauborgne (1997)	Value is created to customer by creating totally new business markets by seeking both differentiator and low costs.
Berghman et al. (2006)	Customer value creation depends on company's ability to absorb external market and customer information.

Woodruff (1997) defines customer value as perceived benefits of those product attributes, attribute performance, and consequences that are noticed in the use situation. These benefits are achieving the customer's goals and purposes. Woodruff has developed a value hierarchy model that is based on this definition. The model describes three levels of desired or received value: valued attributes and attribute performance, valued consequences in use situation and customers' goals and purposes. Woodruff's (1997) value hierarchy model fits well into the business-to-business context, where profitable business is customer's main goal and it is guiding customer's decision making. The goal should assign importance to the consequences of the use and that should further assign importance to attributes and attribute performance. Woodruff's hierarchy model is introduced in more detailed in Figure 5. (Niemelä-Nyrhinen & Uusitalo, 2013; Woodruff, 1997) Shifting the focus on consequences instead of only concentrating in attributes will lead to a more strategic sustainable competitive advantage (Woodruff & Gardial, 1996).

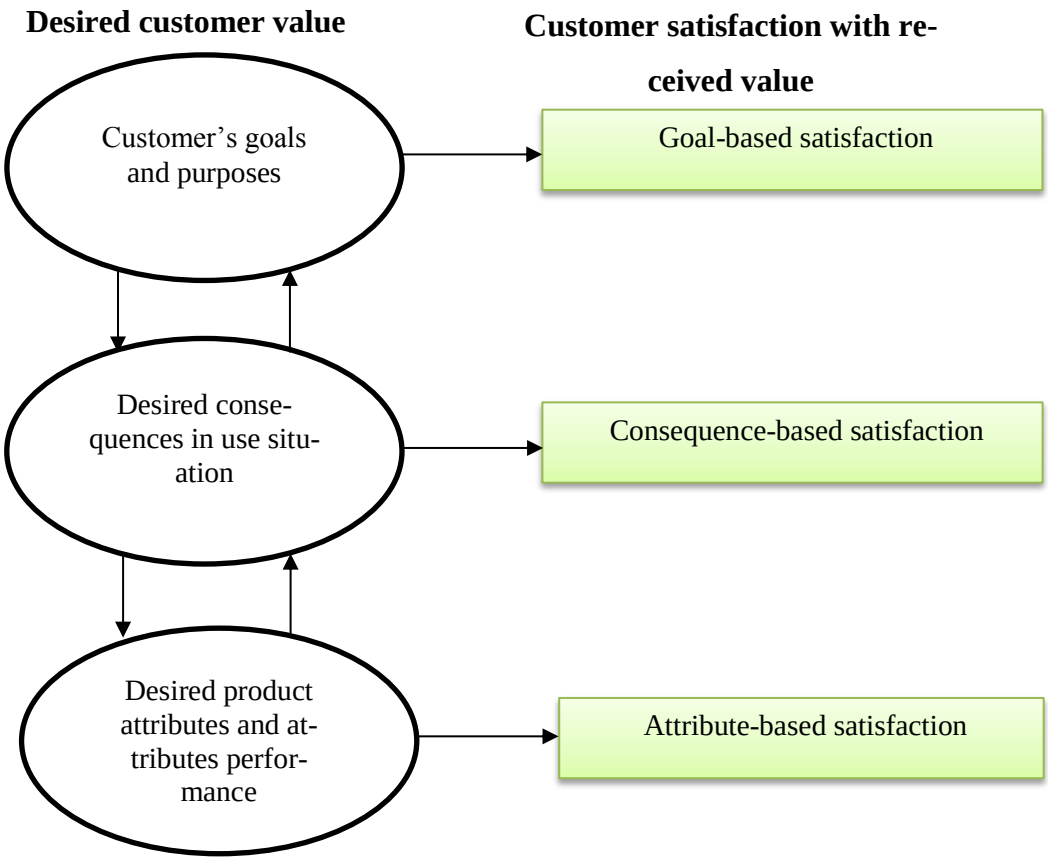


Figure 5 Woodruff's hierarchy model

Customer value often involves a trade-off between what customer receives and what he or she needs to give up for that. (Dumond, 2000) When making decisions about trade-offs customers often focus on only acquisition price, which is not the whole economic value of the product (Gogerty, 2014). To be able to change the focus area into the total life time costs of the product, companies need to know completely what their customers value what for they need the product. Many customers know their requirements for the product but do not know what those requirements are worth to them. That proves an opportunity to companies to demonstrate the value they provide. (Anderson & Narus, 1998)

Customer value management has two goals: to deliver superior value to targeted market segment or customer and to get an equitable return on the value delivered (Anderson et al., 2007). Three types of value delivered to customers are: points of parity, difference and contention. Points of parity are factors that have the same performance or functionality than the next best alternative. Points of difference are those factors that make the product either superior or inferior to the next best alternative. Points of contention are elements on which meaning the company and its customers disagree. Points of contention can be ether point of parity or difference depending on from which perspective it is looked. (Anderson et al., 2006; Anderson et al., 2008) Customers are often looking for a justifier, which is an element of the offering that will make a great difference to the customer's business. Helping the customer make the purchasing choice by giving them a visible promise of the value, will make it possible for the company to price the offerings at near the upper end of each customer's acceptable price range. (Anderson et al., 2014) Customer value analysis is not only related to pricing or market research, it is a strategic marketing tool for auditing customer's needs, positioning the company and competitors, and measuring gaps in the buyer's and vendor's value perceptions. Ulaga and Chacour argue that the customer is satisfied when he or she feels that the products performance is the same than what he was expecting. (Ulaga & Chacour, 2001)

2.2 Sustainable value

Sustainable value is often understood as eco-friendly attributes, such as biodegradable materials (Chou et al., 2015), but it requires firms to not only have environmental responsibilities but social and economic responsibilities as well. (Fraj et al., 2013; Chou et al., 2015) Social aspects are about whether a product helps to address challenges faced by society, whether it causes problems to society or at least to specific social groups. Economic assessment has focus on cost assessment and its applications. Environmental aspect is the most commonly used and it is measuring products impacts on environment. (Wood & Hertwich, 2012) The environmental agenda has forced companies to address the issue of sustainability. Companies need to consider more sustainable aspects by developing new products for example their raw material sources and carbon footprint. Consumers are more and more willing to buy from the companies that care about environment and society. The companies need to concentrate on brand building and sustainable marketing because of the increased importance of word of mouth. (Kotler, 2011) Figure 6 shows all of the three elements of sustainability and examples of how they can create value for business.

Environmental strategies can be sources of cost and differentiation advantage. Cost reduction often comes from the production modifications which make reducing material consumption and use of cheaper material possible. Differentiation advantages are reached by sales growth, successful new products and higher prices of environmental products through environmental branding. Environmental performance can have a positive impact on financial indicators by reducing exploitation and liability costs and having pioneer advantages. Also material impact on consumption and waste management are increasing firm's performance and value. (Fraj et al., 2013) The same attributes creating both environmental and economic value or in some cases creating value in all three elements can be seen in Figure 6.

Shared value means the principle which involves economic value creation in a way that at the same time creates value for society. (Porter & Kramer, 2011; Pfitzer et al., 2013) Shared value is not sharing the value already created by firms

but noticing the challenges and needs in the society and changing them into profit by expanding the total pool of economic and social value. The ways for companies to create shared value can be divided into three categories; companies can improve products and markets again in a new way, redefine productivity in the value chain or work with a local cluster development. (Porter & Kramer, 2011) When sustainable responsibility is fair trade purchasing the example of shared value would be to transform procurement to increase quality and yield in the suppliers farm (Porter & Kramer, 2011).

Shared value does not work as a one way path that only business or society is following, it needs to be both-sited. Both business decisions and social policies must follow the principles of shared value. When only one side is considering mutual profits the idea of shared value is not increasing competitiveness of no either party. But not all profit is equal, and benefits can be seen and measured in the different time phase, some directly when using the product or solution and some after years. Society is having two kinds of impacts on companies: inside-out and outside-in linkages. Inside-out linkages are those impacts that companies are having on society with their normal course of business. Outside-in linkages are impacts that external social conditions, negative or positive, are influencing companies. No business is able to solve all the challenges of surrounded society is having, so instead of trying that each company needs to select issues that fit to its particular business and gain long-term competitiveness. (Porter & Kramer, 2006)

When companies are creating scalable social and business value they want to measure it. There is no commonly used system yet, but the Sustainability Accounting Standards Board is creating a system that would enable comparison between companies' environmental and social impacts. It is important to establish intermediate measures and track the progress because the benefits of shared value can sometimes not been noticed instantly. Because of the wide range of ranking criteria almost any company can meet some measures of social responsibility (Porter & Kramer, 2006). To create social value five ingredients are needed: social purpose, a defined need, measurement, the right innovation structure, and co-creation with different stakeholder such as government or other companies.

(Pfitzer et al., 2013; Porter & Kramer, 2006) Haque (2009) has created a concept of thick and thin value that brings the social and cultural values as import part of the value created. The value that has been created in traditional business, thin value, is inauthentic, brittle and unsustainable. He claims that capitalism understates costs and overstates benefits, which leads to losses of customers. Companies should concentrate on innovations that reconceive costs and benefits that customers respond to so called thick value. (Haque, 2009)

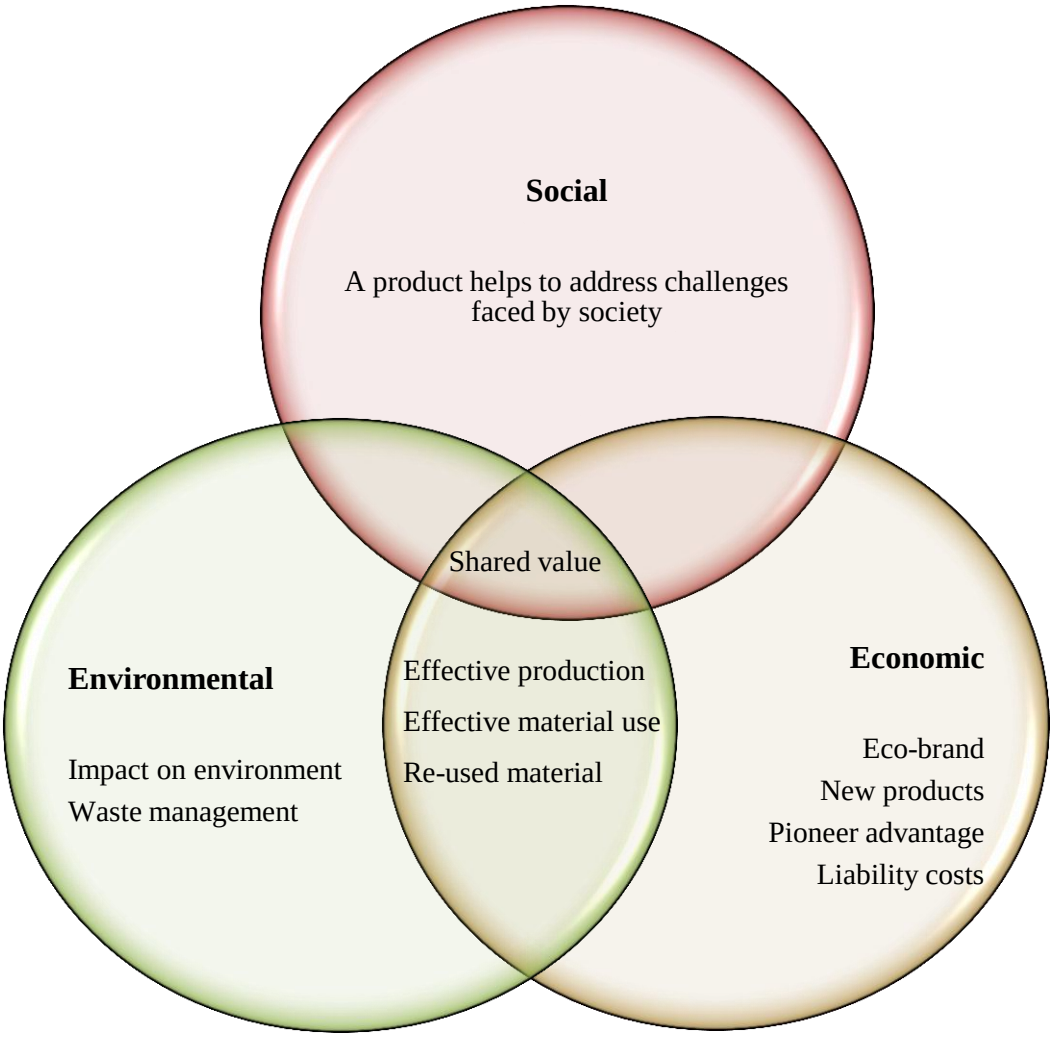


Figure 6 Sustainable value

3 VALUE-BASED SELLING

3.1 Value proposition

According to Terho et al. (2011) value-based selling can be divided into three dimensions. First dimension is to understand the customer's business model, second is to craft the value proposition and third is to communicate the customer value. In value-based selling the benefits are translated into monetary terms, to be able to demonstrate all the value created. Still it is difficult to demonstrate how benefits are affecting customers' profitability, and that is why companies need to have a deep understanding of the customers' business model and needs. Value-based selling focuses on being proactive and promoting market offerings that through cost savings and increased performance adds value to the customer's bottom line. (Terho et al., 2015)

Even though the term value proposition is lately widely used, it is used in many different purposes and there is no clear definition of the term. (Anderson, Kumar & Narus 2007; Camlek, 2010) Value proposition communicates the value offered to the target customer or market segment (Anderson et al., 2006). Often what companies name as value propositions are actually more like statements of features and functions rather than carefully created value propositions.

Camlek (2010) defines value proposition only with the tangible benefits or measurable customer value that a product or service will provide, when the definition of Anderson et al. (2006) counts intangible and unmeasurable benefits into value proposition. According to strategy theory companies need to create a distinctive value proposition that meets the needs of a chosen set of customers to be successful. Competitive advantage is created by configuring the value chain and the set of activities involved in creating, producing, selling, delivering and supporting its products and services. (Porter & Kramer, 2011)

Understanding customers' choices and the reasons behind them is the first step and the baseline for every kind of value proposition (Falk, 2009; Camlek, 2010). It is important to know what customer's goal is and how the customer makes profit, the customer's earning logic and to understand the customer's customers.

When the company has fully understanding of customer's business, it is able to create proactively value for it. It allows the company to identify the most important value drivers for adding substantial value to a customer's business. (Terho et al. 2015)

Value proposition defines the direction and motivation for company to operate in their environment in the value creative way. If the company is creating value with its business, it needs to evaluate what the value means in practice, to be able to communicate the value, and use it in their marketing. One way to build value proposition is human centered proposition. It defines what kind of human activities the company is providing and what kind of impacts the company is aiming to have in society. This kind of value proposition is often used by forerunner companies that want to create new kind of value to their customers. Traditionally companies have been trying to create short-term value and economic capital. New value creation is concentrating on creating sustainable value and maximizing shared social and cultural value. (Tikka & Gävert, 2014) The same idea can be seen also in the concept of shared value that Porter et al. (2010) have introduced.

Three possibilities what managers mean when they are talking about customer value proposition are all benefits, favorable points of difference and resonating focus value proposition. **All benefits -**value proposition demonstrates to the customer why the targeted offering is beneficial. All the benefits of the product or service that might be delivered to the customer are included. It often contains features that do not provide any benefit to the target customer. That might give a confusing sign to the customer because it is not separated either the benefits are point of parity or points of difference. That kind of value proposition requires only a thin understanding of the specific characteristics of the targeted customer segment and their businesses. A **favorable point of difference -**value proposition tells why this offer is better than competitor's one. That kind of value proposition requires comprehensive knowledge of customer needs and competitive products or solutions. Only those benefits are chosen to the value proposition that are points of difference and convey value to targeted customers. The third type of value proposition is **resonating focus** –value proposition that tells which are the most valua-

ble things in the product for the targeted customer. It demonstrates and documents the value of this superior performance in a quick and effective way. It differs from favorable points of difference in two ways. Resonating focus concentrates only on one or two most important point of difference. It does not necessarily contain only points of difference because sometimes points of parity are the factors what targeted customers value. Company needs to have a sophisticated understanding of the customer's business priorities to be able to develop resonating focus value proposition. (Anderson et al. 2007; Anderson et al., 2006)

3.2 Sustainable value proposition

Marketing that has goals in preservation, protection and conservation of the natural environment, is called as sustainable, green, environmental, ecological, eco-, environmental or sustainable lifestyle marketing. Not only the name but also the definition of the term is different. This study uses the term sustainable marketing that includes both commercial marketing of sustainable product and social marketing of sustainable behaviors. (Rettie et al., 2012) The main motivations for green marketing are to create a competitive advantage, and through that become a global market leader on specific market area or reach cost savings (Vaccaro, 2009). Sustainable marketing can encourage other actors such as customer or competitors to behave in a sustainable way. (Rettie et al. 2012) Sustainable issues have become more important for companies because of moral and ethical mandates, legal pressures, legitimacy searching and competitive opportunities. In the literature sustainable marketing has been concentrating on the customer markets more than in the B2B context. Sustainability can help firms to build long-term relationships when they can answer to buyers' demand of greener products and services and because it can contribute to the firm's operational and environmental efficiency. (Fraj et al. 2013) Two greatest challenges of sustainable are the compromises that need to be made for example in price or in quality of sustainable products, and the trust in the company (Verghese, 2010).

According to findings of Chou et al. (2015) value proposition is the key determining how companies deliver environmental and social value to customers. Sustainability plays important role in firms' operation activities (Porter & van der Linde,

1995). Because sustainability involves a wide range of issues to consider included environmental, economic and social, they need to have a clear proposition to concentrate and understanding how their customers value sustainability. Recognizing the institutional and cultural context behind customer problems will help companies to develop offerings that not only bring environmental and social good but also business potential. (Chou et al., 2015)

To be able to create a successful sustainable value proposition the firm need to collaborate with partners throughout the whole supply chain. Sustainability can be seen in every phase of products life cycle from design to the end of use. Sustainability is creating value but it is not a key driver for most customers. Trying to please all the needs of customers is not easy, and firms should rather focus on offering the best overall sustainable choice. (Falk, 2009)

3.3 Communicating the customer value

Modeling and estimating value is difficult but important (Gogerty, 2014). When estimating value customers value drivers need to be defined and found. Value drivers are factors that have a great influence on the operating and financial results. They can be financial or in financial (Mard& Rigdy, 2007). They often have an impact on the entire decision-making dynamic. Most value propositions lack on the supporting evidence and only claims of savings and benefits to the customer (Anderson et al. 2006). One of the vital elements of that customer value assessment process is distinction between customer segments and different use situations (Ulaga & Chacour, 2001).

Customer value assessment can be divided into backward-looking and forward-looking practice. Backward-looking practice is determining customer value with the past, what the customers have experienced. Basically what the customers have got in exchange of the price they paid. Forward-looking practice determines customer value with the future, how the product or service is creating value for the customer. Forward-looking practice is often made by using value calculations and customer value models like Total cost of ownership (TCO). (Keränen & Jalkala, 2014)

Ulaga and Chacour (2001) are measuring customer value with a backward-looking process that is based on the assumption that value can be described either as “benefits” or as ”sacrifices”. In their model the value perceived is measured and demonstrated in comparison between benefits and sacrifices, quality and price, and with alternative suppliers’ offerings. (Ulaga & Chacour, 2001) Customer references are widely used way to demonstrate a past history value successes and evidence of the suppliers capability to deliver superior value and reduce perceived risk (Jalkala & Salminen, 2010; Anderson et al., 2006; Van Weele, 2008). Those can be detected with for example customer surveys (Ulaga & Chavour, 2001).

There is usually high uncertainty perceived by the customer, which should be somehow included into the value quantifications. Reducing customer perceived risk has been identified as one of the main areas of value selling strategies (Roune et al., 2011). Van Weele (2008) divides customer perceived risks into four classes; technical, commercial, contractual and performance risks. Performance guarantees are other widely implemented manner to prove suppliers commitment to delivering superior value (Roune et al., 2011). Open dialogue, transparency and trust have an essential role in demonstrating credibility of the arguments presented (Kaario et al., 2003; Terho et al. 2015).

4 DEVELOPING SUSTAINABLE VALUE PROPOSITION

4.1 Crafting the value proposition

Patala et al. (2012) have in their recent studies created a framework to develop sustainable value proposition. The framework names four phases in the process. Developing the value proposition should start with identifying current and future benefits of the specific offering. Aside of the identification of potential beneficial impacts companies need to identify the type of impacts a customer values and customize the value proposition to the customer's needs. That requires determining the unique value drivers of the target customers to uncover the elements of the key value creation mechanisms of the customer's processes, where the supplier's offering can create value or prevent losses where problems exist. An assessment should be conducted to determine the favorable points of difference. The framework is showed in Figure 7.

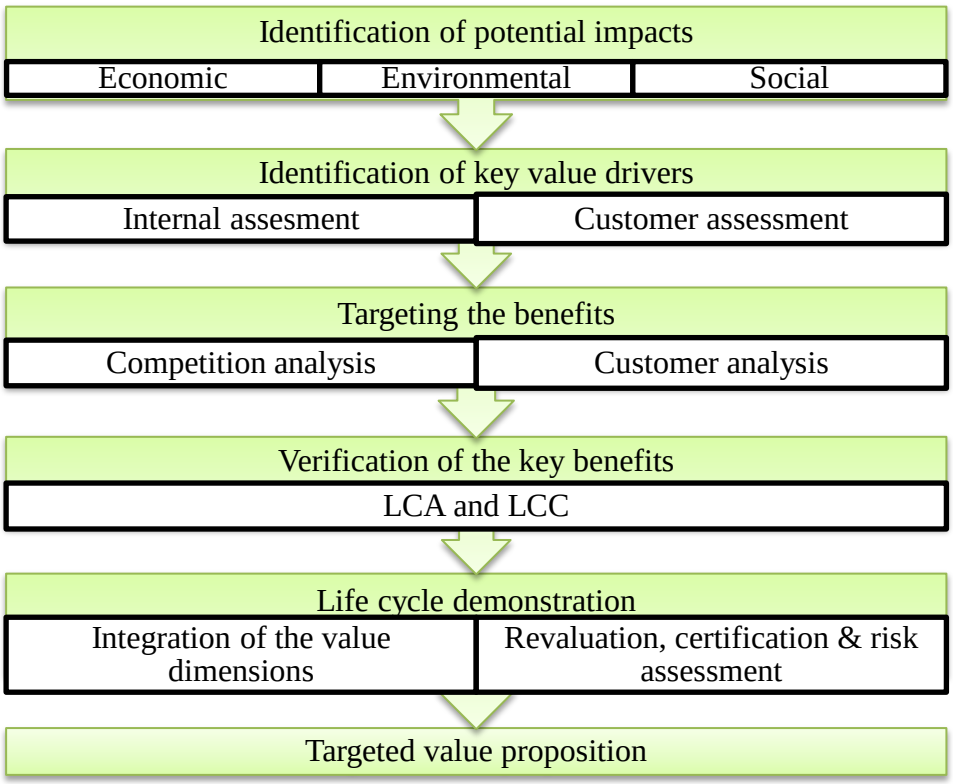


Figure 7 Framework for developing sustainable value proposition adapted from Patala et al. 2012 and Patala et al. 2016.

Anderson and Narus (1998) have developed guidelines to successfully build customer value model by using field value assessments that is concentrating more on the backward-looking customer value assessment. In field value assessment data means that it is gathered directly from customers whenever possible. Of course such a direct research is not always possible when information about customer needs must be gathered other ways. Indirect approaches could be for example surveys or focus groups research. The first step in building the customer value model is to create a right kind of value research team. The team should be cross-functional including people with product, field engineering, marketing and sales experience. Including salespeople in the team is important because they know the customers. (Anderson & Narus, 1998)

Understanding customer's business model and especially its earning logic are one of the main requirements in crafting value proposition and communicating it effectively (Terho et al., 2011). Relevant indicators that quantify the value provided by the offering and measuring their baseline need to be determined. The scope of the assessment needs to be made clear, so that the right impacts are taken into consideration. Not all of the key indicators are directly received by customers; some are providing value to the society and the environment. (Patala et al. 2013)

Some suppliers have created so called customer value models to demonstrate what their products are worth with data analysis. Those models are based on assessment of the costs and benefits, and they are for individually to one customer and one situation. The right market segment and customers need to be selected to be able to develop effective value proposition. The second step is to make a comprehensive list of all value elements of the offering. Value elements are those characteristics that affect the costs and benefits of the offering in the customer's business. Some of the elements are tangible and some intangible. The whole life cycle of the product should be taken into consideration when gathering value elements. (Anderson & Narus, 1998)

When the targeted benefits have been determined, they need to be verificated to be able to demonstrate and transform them to the customer. For some elements it is impossible to estimate monetary worth. Those elements can be put aside and

presented in qualitative way. When the worth of the elements has been estimated and the essential elements have been chosen to include in the model, the model should be validated. Different customers might need to have different elements in their model, even if they are from the same market segment. When building a value proposition both the existed customers and the potential future customer should be taken into account. The last step is to create value-based tools for sales. One common sales tool is a value case history or a spreadsheet software application that can be used to count the specific worth for every customer. (Anderson & Narus, 1998)

4.2 Communicating the value proposition

The tone and color of the language in value proposition is important to choose correctly to be able to get the customers. It should be framed from customers' perspective, not from the company's perspective. It should be measurable and possible to deliver to the customer somehow. Value should be superior compared with competitions offerings and profitable for both customer and seller. (Camlek, 2010) Buyers are being increasingly driven by costs, which is making it even more important to be able to demonstrate the true value of offerings. Value proposition can be demonstrated with value case histories which present the actual cost savings or added value that reference customers have received earlier. Another way to demonstrate the value proposition is to use some kind of value calculator. These tools usually are spreadsheet software applications that are used on laptops to demonstrate the value. (Anderson, et al., 2006) Determination of total value realized for the customer. Customer value can be communicated with all three aspects of sustainability. In the context of customer value propositions, this can be accomplished by integrating the direct economic benefits, and those economic benefits that reduced environmental and social impacts have caused, as well as the benefits provided to the wider society. (Patala et al., 2016)

Value proposition should reflect supplier's understanding of customer's specific needs both on financial and nonfinancial attributes. (Ulaga & Eggert, 2006; Woodruff, 1997) Quantification in monetary terms is recommended, especially with offerings based on new-technology, which makes it easier for customers to

understand which offering creates the greatest value for them. In value proposition offering's technical features need to be changed first into benefits for the customer and then into what they are worth monetary to the customer. Customer value is best understood when it is compared with the next-best alternative. Customers accept higher price more likely if it showed to create more value at the same time. (Wouters & Kirchberger, 2013)

Benefits and costs are always either tangible or intangible, and either immediately or over the long term incurrent. With tangible it is not meant that the cost or benefit is inherently measurable, it is meant that it can be predicted with some accuracy in advantage. (Cadle et al., 2010). Narayandas (2005) has grouped benefits and value drivers into four categories that makes it easier to manage and determine created customer value. According to him benefits are always tangible or intangible, and either financial or nonfinancial. Financial benefits are easier to communicate to the customer than nonfinancial because those can be measured monetary. Tangible financial benefits are those that both customer and seller are able to verify. Nontangible financial benefits are those with value hat seller can validate but is hard for customer to notice. Non-financial tangible benefits are hard to quantify by both seller and customer. Nontangible nonfinancial elements have value that cannot be quantified, and need to be communicated otherwise. (Narayandas, 2005)

4.3 Analysis frameworks

Cost-benefit analysis is used to options evaluation and business case development. It investigates the costs of taking a particular course of action and the benefits of doing so. Cost and benefits are allocated to be either tangible or intangible, and either immediate or long term. There are discussion that intangible benefits or costs are not valuable and do not belong to business discussions, but very often it is almost impossible or at least difficult to calculate before the offer is really used by the customers. Benefits are sometimes confused with features of the offering. (Cadle et al. 2010) The framework for this analysis is introduced in Table 3.

Table 3 Cost-benefit analysis (Cadle et al. 2010)

	Immediate	Long term
Tangible	Tangible and immediate	Tangible and long term
Intangible	Intangible and immediate	Intangible and longer tem

Tangible benefits are for example staff savings, reduced effort or improved speed of work, faster response times, reduced accommodation and avoided costs. In tangible benefits might be for example: increased job satisfaction, improved customer satisfaction, better management information, greater organizational flexibility, more creative thinking time, improved presentation, and better market image. (Cadle et al. 2010)

4.4 Value evaluation frameworks

4.4.1 Life cycle assessment

Life cycle modeling is employed to quantify the indicators in the economic, environmental and social dimension, which involves establishing a baseline for the key indicators and analyzing the resulting impacts over the life cycle. Sustainable life cycle tools have been more often used in consumer markets (Harris, 2007), even though the importance of sustainability in industrial markets. Life cycle assessment approach (LCA) is powerful tool to evaluate the environmental aspects and impacts of a product or service during its whole life cycle, only design and development phase is sometimes excluded because it often has small environmental impact. (Rebitzer et al., 2004) Sustainability assessment in LCA consists on ecological, economic and social aspects. Social aspects address whether a product helps to address challenges faced by society or whether it causes problems to so-

ciety or at least selected social groups. Economic assessment has focus on cost assessment and its application. Ecological aspects are then most known and measuring products impacts on environment. (Wood & Hertwich, 2012) LCA includes the counting those environmental factors that are outside the traditional management such as raw material extraction or products disposal (Buxel et al., 2014).

LCA method was originally used in the area of environmental and chemical engineering to identify key environmental issues of products and processes. Nowadays LCA approaches are regulated by ISO 14040 and 14044. LCA calculates specific measures along several environmental impact categories to get a holistic view of environmental impact. The LCA method is counting the environmental impact of the product and process in every part of its life cycle. It identifies the critical life cycle steps with high environmental impacts that makes it possible for companies to analyze the impacts of changes in one particular step. (Buxel, Esenduran & Griffin, 2014; ISO 14044 2006) It provides credible information for marketing claims and identifies opportunities at various points. One benefit of LCA is that it instill life cycle thinking into the business (Cooper, 2016). It can assist in identifying opportunities to improve the environmental performance of products, or to inform different stakeholders and decision-makers. LCA can assist in selecting relevant indicators of environmental performance, and it can be used in marketing as well. (ISO 14044, 2006) LCA can be used as a management decision tool. It creates learning value within companies and it can support decision making in strategy development, research and development (R&D) and product development, procurement and production as well as marketing and sales. (Buxel et al., 2014)

4.4.2 Life cycle costing

Even though economic aspect is important for many companies in the decision making, it is not included in any aspects of traditional LCA. Life Cycle Costing (LCC) is a framework for calculating the Total Cost of Ownership (TCO), which includes acquisition, operation, maintenance, conversion and build one key economic figure out of them. The differences between LCA and LCC are summarized in Table 4. When LCA evaluates as holistic as possible the relative envi-

ronmental performance of alternative product systems, LCC compares the cost-effectiveness of alternative investment or business decision. LCC makes it possible to evaluate LCA results and use them better internally in decision-making and externally communicating them to customers. The ecological and economic goals may be competing or complementary and that is it is important to know their trade-offs in decision-making so that decisions can be made to reach right strategic goals. (Bierer et al., 2013; Norris, 2001)

Table 4 Differences of LCA and LCC (adapted from Norris, 2001)

Tool/Method	**LCA**	**LCC**
Purpose	Compare relative environment performance of alternative product system for meeting the same end-use function.	Determine cost-effectiveness of alternative investments and business decisions, from the perspective of an economic decision maker.
Activities which are considered part of the "Life Cycle"	All processes causally connected to the physical life cycle of the product.	Activities causing direct cost or benefits to the decision maker during the economic life of the investment, as a result of the investment.
Flows considered	Pollutants, resources, and inter-process flows of materials and energy	Cost and benefit monetary flows directly impacting decision maker
Units for tracking flows	Primarily mass and energy; occasionally volume, other physical units	Monetary units (e.g., dollars, euros etc.)
Time treatment and scope	The timing of processes and their release or consumption flows is traditionally ignored; impact assessment may address a fixed time window of impacts but future impacts are generally not discounted	Timing is critical. Present valuing (discounting) of costs and benefits. Special time horizon scope is adopted, and any costs or benefits occurring outside that scope are ignored.

The most challenges in LCA calculations are that there are not much data to get from the other actions of the life cycle. When the product has much different kind

of uses it is hard to calculate the average impact. (Rebitzer et. al., 2004) For companies' environmental strategy and politics it is enough to understand and know the environmental impacts of the product in the overall level. With life cycle analysis environmental impacts can be evaluated and put into the order. Still companies need to analyze competition situation and customers' needs, issues related to image and cots aspects of the impacts, before they can create an environmental strategy. When detailed LCA is already made for some similar cases, it is in some situations relevant to only do simplified analysis. It is still important to remember that even though carbon- and water footprint can be used to evaluate single material flow, when evaluating the whole life cycle of the product, wide scope and various indicators need to be used. (Antikainen & Seppälä, 2012)

5 PACKAGING

5.1 Value of packaging

Packaging can create value for the product in many ways, and to determinate the value is complex and depends on the situation (Falk, 2009). Different actors desire and receive value different ways and prefer different attributes (Olsmats & Dominic, 2003). Niemelä-Nyrhönen and Uusitalo (2013) have developed model of customer value of packaging which have three levels that correspond with the levels of Woodruff's (1997) customer value hierarchy model and is based on the earlier research of packaging. Packaging attributes and attribute performance are the bottom level of the model. The middle level consists of three most often mentioned core functions of packaging: protection, convenience and communication. Olsmats and Dominic (2003) have developed packaging scorecard, that can be used to get an overview of packaging performance throughout the product supply chain, and it is based on the `balance scorecard´. The scorecard has been developed based on earlier research of value of packaging in which functional criteria of packaging. Criteria have been categorized for every actor along the supply chain. Criteria of the scorecard for different actors can be seen in Table 5. According to the scorecard the factors suppliers need to take into consideration are: machinability, product protection, flow information, volume and weight efficiency, value-adding properties, reduces use of resources, minimal use of hazardous substances and packaging costs. (Olsmats & Dominic, 2003)

Transportation has an important role in many parts of the life cycle of packaging. Sweeney (2009) has introduced four fundamentals in his study. Customer service requirements need be exceeded, total supply chain cost and investment is optimized, the whole supply chain is as strong as its weakest link; efficient and effective management if material, money and information, and re-appraise both internal and external customer relationships. (Sweeney, 2009) Many packaging providers are facing new challenges due becoming part of large and complex international supply chain and emerging electronic commerce technologies.

Table 5 Scorecard for packaging. (Olsmats & Dominic, 2003)

Criteria	Supplier	Transportation distribution and wholesale	Retail	Consumer
Machinability	X			
Product protection	X	X	X	X
Flow information	X	X	X	
Volume and weight efficiency	X	X	X	
Right amount and size		X	X	X
Handleability		X	X	X
Other value-adding properties	X			X
Product information				X
Selling capability			X	X
Safety			X	
Reduced use of resources	X			
Minimal use of hazardous substance	X			X
Minimal amount of waste			X	X
Packaging costs	X			

Niemelä-Nyrhinen & Uusitalo (2013) separate the attributes of package into three categories which are providing value; protection, convenience and communication showed in Figure 8. Jönson (2000) is looking the same theme form a bit other aspect and divining the functions of packaging into logistical, marketing and environmental functions. Package protects the product and the surrounding environment of the package during the whole transportation. Convenience means that packaging makes the handling and storing of products convenient for all shareholders (Niemelä-Nyrhinen & Uusitalo, 2013). For example food package can be used in preparation of the product; and it might work as product storage. The third function is communication. Package attracts consumers to purchase by delivering important information, and facilitate use and consumption of the product (Cooper, 2016; The Consumer Goods Forum, 2011), and it has important role in brand and product promotion (Verghese et al. 2010). Other additional functions mentioned in the literature are containing, preserving, unitization and apportionment. These

additional factors are building the fourth function. The model does not have a special function just for environmental impacts even though both consumers and European Union (EU) directives are creating pressure on manufactures to use environmental-friendly packaging. Environmental attributes are integrated into the other factors. (Niemelä-Nyrhönen & Uusitalo, 2013; The Consumer Goods Forum, 2011)

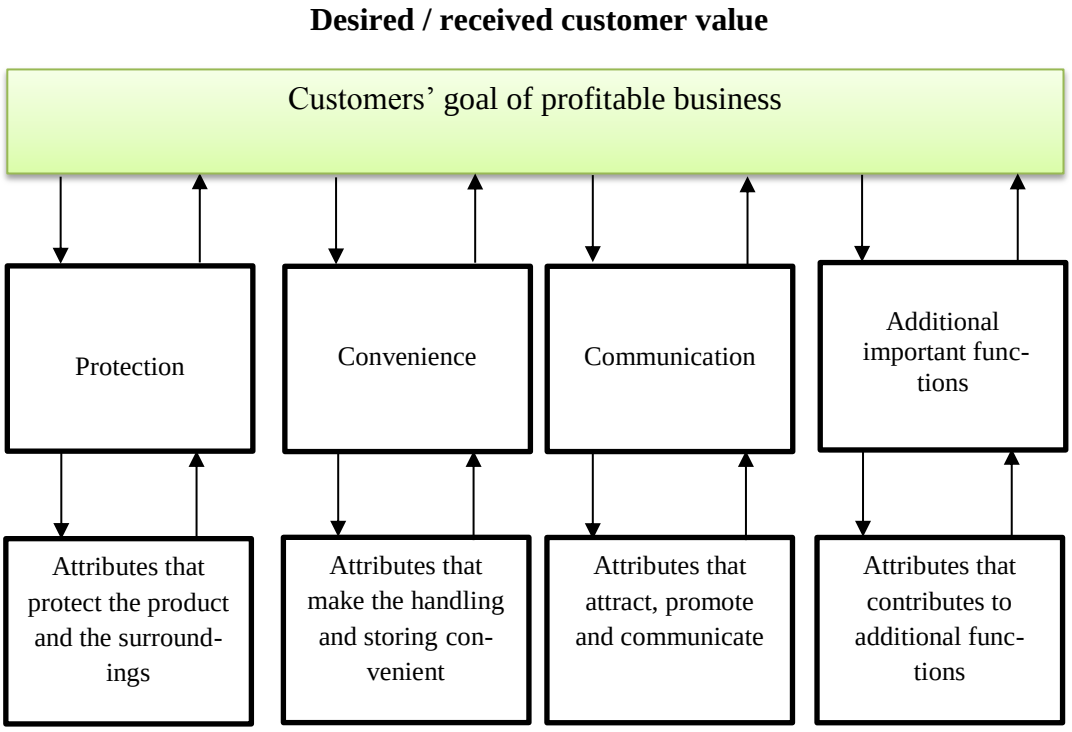


Figure 8 Value of package (Niemelä-Nyrhönen & Uusitalo, 2013)

The value of packaging is understood differently in different parts of the value chain. It is important to understand the needs of the whole value chain and not only the needs of the immediate customer. Understanding of the customer value along the entire value chain could turn out to be valuable source of competitive advantage. (Niemelä-Nyrhinen & Uusitalo, 2013). Different actors in packaging value chain are allocated in Figure 9.

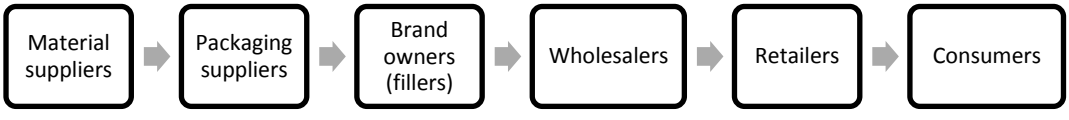


Figure 9 Actors in packaging value chain adapted from Niemelä-Nyrhinen & Uusitalo, 2013.

5.2 Sustainable packaging

Sustainability has become often discussed theme in the packaging industry. Packaging pollution has become extremely important aspects because of plastic bottles and bags that have ended up in the oceans, rivers and streets. (Boyce &Palmer, 2015) European Parliament and Council directive sets requirements for packaging. Packaging weight and volume should be limited to the minimum amount to maintain the necessary level of safety, hygiene and acceptance. It should be reusable, recyclable or otherwise recoverable, and it should not include hazardous substances. Packaging should be recoverable in form of material recycling; energy recovery, composting, and it should be biodegradable. (European Parliament and Council, 2014) (The consumer goods forum, 2011) Each stage of the packaging life cycle has environmental impacts which make it necessary to use life cycle thinking when talking about sustainable packaging (Verghese et al., 2010).

In sustainable reporting packaging is very often seen only in the waste perspective. Still package has other important aspects as well, such as reducing footprint through material usage and effective packaging which are the most effective ways creating value that both increase competitiveness and reduce environment impact. In food packaging material use and recycling possibilities have been the main environmental objectives in the past years. Still the recent studies indicate that the environmental impacts of packaging are much smaller than the environmental impacts of the packed food products and food losses. When the package protects the product and distributes the right product to the right end-user in a safe, cost-efficient and user-friendly way is recyclable and made from as less material as possible it has fulfilled most of the characteristics of sustainable packaging. (Grönman et al., 2012)

Sustainable packaging means a whole packaging system, which includes both primary and secondary packaging and transport infrastructure and logistics. It also includes other factors of the packaging such as shelf-life extension and food-waste reduction and recyclability. Current trends in sustainable packaging have focused on light weighting (Boyce & Palmer, 2015), barrier plastics, the use of recycled content and bioplastics and end-of-life recycling and recovery. (Cooper, 2016)

Grönman (2013) has determined sustainable food packaging. Packaging should minimize the environmental impacts of the package and of the food as well. Packaging should be cost-effective in all life-cycle stages, what means for example cost-efficient raw material, transportation and prevention of food waste. Packaging should be healthy and safe to use and beneficial to the user. (Grönman, 2013)

Verghese et al. (2013) have developed a framework for sustainable packaging that is seen in Table 6. The framework divides the economic, social and environmental characteristic into effective, efficient, cyclic and safe. Packaging should fit for the purpose it is made for, which can reduce product damages and product waste, and increase product sales. Sustainable package is using materials, energy and water as less and efficient as possible throughout its life-cycle, what leads to reduced costs in purchasing and transport, which will reduce the amount of produced waste. It is made of renewable materials and it is recoverable at the end-of-life. Packaging needs to be safe for people and the natural environment. (Verghese et al., 2013)

Table 6 Model of sustainable packaging. (Verghese et al. 2010)

	Economic	Social	Environmental
Effective – Fit for purpose	• Reduced product damage • Increased product sales • Labelling	• Consumer convenience • Accessible packaging	• Reduced production waste • Reduced product damage in supply chain
Efficient – Materials, energy, waste	• Reduced resource costs • Reduce transportation costs	• Reduced weight or volume	• Reduces consumption of materials, energy and water • Reduced waste and emissions • Reduced energy consumption and emissions from transport • Reduced product waste
Cyclic – Renewable and/or recyclable	• Reduced material costs (recycled materials)	• Reduced aesthetic impacts of litter • Extension of life for existing landfills	• Reduced consumption of materials, energy, water • Reduced waste and emissions from production of virgin materials • Reduced packaging waste requiring disposal
Safe – Non-polluting and non-toxic	• Reduced cost of disposal (hazardous or toxic waste) • Reduced risk of product recalls • Carbon credits or reduced cost of carbon emissions	• Reduced health and safety risks for consumers and neighbors	• Reduced eco-toxicity impacts • Reduced contribution to global warming

There are many strategies on how to decrease environmental impact of packaging. Life cycle assessment studies have showed that three most useful ways to reduce environmental impact of packaging are minimizing packaging material and volume, maximizing supply chain efficiency and use of renewable energy (Verghese et al., 2013). Hanssen et al. (2012) have suggested five strategies for food packing optimization with regard to environmental impacts and resource use. In food packaging the reduction of food waste in the whole value chain is the most important strategy. Impacts from transportation can be reduced by improving degree of filling of product in packaging. Material selection of packaging is one of the

main issues both the type of the material and the amount of it. The material should be recyclable after use or recycled from the beginning and it should be used as less as possible. Suppliers of material are having an important role, and supplier with low-impact material and production should be chosen. (Hanssen et al. 2012)

Sustainable packaging has new value because of consumers are more and more aware of environmental issues and because there are more options for packaging materials. Packaging is affecting brand and it is used to clarify the positioning and brand story. Sustainable packaging can communicate the image and brand of the company or the product and new customer segment can be reach. More natural products can be found at mass retails what creates demand for sustainable packaging, and can help to create competitive proposition for the companies producing sustainable packaging. (Falk, 2009) Value of packaging is not always easy to determine because trade-offs often occur while trying to decrease the environmental impact of packaging. Multilayer barrier materials protect the product better but make the packaging hard to recycle. Reduction of material would make the impact on transportation but make the package weaker. Low-impact materials might reduce the strength or protectiveness of the packaging. (Hanssen et al., 2012) The most significant environmental impacts of paper and board are according to Verghese et al. (2010) are related to growing and harvesting of the trees, chemicals used in board production and emissions generated and water used during board production.

6 METHODOLOGY

This study aims to develop sustainable value proposition for renewable packaging. A single case study was chosen as a main research method in this study, because of it is suitable for new research areas and for examining them in a specific situation (Rowley, 2002). The purpose of a case study investigates a phenomenon within its real-world context. Different types of case study are used for different purposes. In this study descriptive case study is used, which describes the natural phenomena within the data in question (Zainal, 2007). The case study research process includes planning, design, preparing, collecting, analyzing and sharing data. (Gog, 2015) The empirical data were collected in 2016 and 2017, and it involved various stages and methods. The main method for data collection is semi-structured internal expert interviews.

The case product is liquid packaging board that has MFC added in the middle layer. The product is designed to retain the properties of the board and simultaneously being able to make a lighter product. The firm has promoted the product with lighter weight, but other values created with MFC were not estimated. Case company and product are introduced in more details in the chapter seven.

6.1 Data collection

Literature review describes four areas of former research, which are value in business markets, value-based selling, developing sustainable value proposition and packaging. The theory part of this study offers wide overview of value-based selling and how value is created through packaging, which gives the baseline to develop sustainable value proposition for the case product. In this study the literature review is used to understand the concept of sustainable value proposition and value in business markets. To be able to find the right value drivers for the customers, value of packaging and the concept of sustainable packaging have been researched.

The empirical data included nine in-depth interviews, with representatives from Stora Enso's two business functions: liquid packaging board and sustainability and two customers: other converter and other brand owner. Interviews were con-

ducted during October 2016 and January 2017. Duration of the interviews varies between 30 and 80 minutes. Seven of the interviews were made via company's internal communication system, and two of them were made in person. Interviews were semi-structured/theme interviews (Gog, 2015), which allowed more space for novel ideas form experts. According to Anderson and Narus (1998) the salespeople know the customer well and they need to be included to the value determination process. That is why many salespeople were interviewed. The expert area of interviewees and durations of the interviews have listed in Table 7. The questions and themes that were used in the interviews of employees of Stora Enso are introduced in the appendix 1 and for customer in the appendix 2. Semi-structured interview means that a list is created that consist of themes and questions to be covered. Themes and questions can vary from interviews, and the additional questions may be asked. (Saunders &, 2009) Questions asked were based on the literature review. The first question-body consisted four parts: Liquid packaging board markets, Liquid packaging board, sales process, and construction of value-model. In addition to interviews two discussions with employees working for research and development and for LCA calculations team were held to discuss the properties and environmental impacts of the product. In these meetings the features of the board and the LCA calculations of the products were discussed. In addition several discussions about the case situation and this study and its findings were held with Stora Enso's employees. The customer interviews were planned to handle the same themes than other expert interviews. Customers were asked about the properties of packaging material (mainly board) and beneficial packaging properties. Both focus groups were asked about sustainable issues in packaging and the future development directions. The answering alternatives to the questions were chosen according to Olsmats & Dominic (2003) framework and results of expert interviews, and they were only to help interviewer to keep the discussion in the right direction.

Table 7 Summary of interviews and meetings

Position	Duration		Organization
LPB sales	80 min.	Face-to-face	Stora Enso
LPB sales	45 min.	Telephone	Stora Enso
LPB sales	30 min.	Telephone	Stora Enso
LPB sales	40 min.	Telephone	Stora Enso
LPB sales	40 min.	Telephone	Stora Enso
Sustainability	45 min.	Face-to-face	Stora Enso
Sustainability	45 min.	Telephone	Stora Enso
Customer	50 min.	Telephone	Customer
Packaging expert	45 min.	Telephone	Customer
R&D, LCA research	60 min.	Face-to-face	Stora Enso
R&D, LCA research	30 min.	Telephone	Stora Enso

Errors may occur in data collection in many forms, and it is important that they are tried to avoid as effective as possible. Potential data errors may arise if the interviewee does not understand the question, when recording the interview it must have done accurately. (Sreejesh et al., 2014) Many of the interviews were made in telephone, because the interviewees were working in the different country. Telephone interviews have many disadvantages compared to face-to-face interviews, which were trying to avoid. In telephone interview it is easier to just hang up to phone, so the time of the interview is often shorter and the topics are not discussed as detailed as in face-to-face interviews (Sreejesh et al. 2014). In addition to the expert interviews several discussions with research and development personnel were held. One meeting was arranged to discuss the LCA calculations and environmental properties of the product.

Content analysis was chosen as a research method because it has been used to analyze sustainable reports from the different points of view by many researchers (Beck et al., 2010; Meckenstock et al., 2014; Tate et al, 2010; Leszczynska, 2012). Content analysis is technique for making inferences from texts to the contexts of their use. It provides new insights, increases understanding of particular phenomena, or informs practical actions. Content analysis of sustainable agenda

of three biggest customers, who were identified in expert interviews, was made to get customers' perspective on the topic. (Krippendorff, 2004a) Content analysis does not always need to be quantitative, and addition to numeric results content analysis may result in verbal answers to a research questions. (Krippendorff, 2004a) Steps of content analysis are first to create a hypothesis or hypotheses and then to identify appropriate data which can be text or other communicative material. Sampling method and sampling unit need to be determined before drawing a sample. To make the data analysis easier data should be collected into units. Coding scheme should establish so that it allows for testing hypothesis. After the data has coded the reliability of coding should be checked. The coded data are analyzed and applied to appropriate statistical test. (White & Marsh, 2006)

The analysis was made to get support to the interviews and surveys and to get overview of the customers' sustainable agenda. Tetra Pak, Elopak and SIG Combibloc have separately sustainable report in their web-pages. The customers, who were research, were chosen according to the results of expert interviews.

6.2 Data analysis

The three most often used analyzing methods of qualitative data are summarizing, categorizing, and restructuring as a narrative to support meaningful analysis. In this study data analysis follows the path of preparing, categorizing, unitizing, recognizing relationships and developing testable proposition, that was introduced by Sausander et al. (2009).The data needs to be prepared before the analysis. Interviews should be transcripted and other documents such as emails documented, anonymized and stored for analysis. (Saunders et al. 2009) All the semi-structured supplier interviews made for this study were recorder and transcribed to be able to analyze them correctly. The two customer interviews were not recorded but notes were made during the interview. They were not recorded to make the interview situation comfortable. Data was derived into categories that were found in the literature review both in benefits of packaging and developing sustainable value proposition. The survey results and the interviews were analyzed and restructured as a narrative to build a holistic view of the situation. Sustainable reports was ana-

lyzed with Online Word Counter (Online Word Counter, 2016), a free tool that counts the word from the data. An analysis made by external consulting group was used as a basis of the content analysis. They had identified six approaches of sustainability by combining the common themes the brand owners and retailers are talking about. Themes are less and better material, preventing waste, eco ethics, safety secured, sustainable innovations and trusted and transparent company. The themes can be seen in

Table 8. Each theme mentioned earlier was having a group of topics characterizing it. The range of points applier in evaluating sustainability reports was between 0 and 4. For each topic was given a particular number of points as follows:

- When a specific topic was not mentioned in the report, no points were assigned
- Brief or generic statements – 1 point
- A more detailed coverage – 2 points
- An extensive coverage- 3 points
- When the coverage was full, 4 points were assigned

Table 8 Themes for content analysis

Approach	Number of topics	Maximum points
Less and better material • Conversation of resources • Renewable resources • Carbon footprint	3	12
Preventing waste • Waste • Reduce/Reuse/Recycle	2	8
Eco Ethics • Responsible sourcing • Fairness • Supporting local • Human rights	4	16
Safety Secured • Health & Hygiene • Safe products	2	8
Sustainable innovations • Productivity • Value creation • Innovation	3	12
Trusted/ Transparent Company • Customer loyalty • Partnerships	3	12

In addition to the quantitative analysis sustainable reports were analyzed qualitatively for the future development plans and sustainable goals they are reaching to accomplish in the future.

6.3 Reliability and validity of the study

Validity and the reliability of the data required an important role in the choice of data collection method. Validity means if the chosen research method is producing results that are relevant to the researcher. Reliability means that the results are comparable and the results can be trusted. (Sreejesh et al. 2014) The confidentiality of the study is limiting the sharing of all the material used and named in the thesis. Internal reports of the company or ordered reports from external companies cannot be attached to this thesis. The processes and the important information needed to understand the situation of the case is described. Not all the calculations could be published in this study because the confidentiality to the case company.

According to Yin (2009) the reliability of the study can be enhanced with multiply sources of evidence and databases. To establish reliability of the study interviewees were chosen to represent wide range of expertise across the company to avoid one sited perception. Still the main focus is on those experts and customers who have been working with the new material to keep the data collected valid. At the beginning of the every interview the confidentiality of the study was explained to interviewee to feel comfortable to discuss confidential issues. All the expert interviews were recorded and transcript to be able to analyze them correctly afterwards. All the interviewees were asked for permission to record. Semi-structured approach in the interviews made it possible to discuss the same themes in every interview even though the background and expert areas of the interviewees varied a lot. All the interviews were conducted as personal interview to avoid negative behavior of group such as dominating personalities leading the discussion. First conducted interviews vary from the last interviews because of the interviewer's gained knowledge about the theme and conducting interviews. Especially in qualitative research the researcher should try to stay as objective as possible because he/she can easily affect the execution of the study (McCuster et al. 2014; Verschuren, 2003). The language challenges and possible grammar mistakes

were corrected and noticed in the transcripting phase. When choosing the citations of interviews into the text it has paid attention to the context of the discussion.

There are many actors in the value chain of packaging from material producer to the end-consumer. Every actor in the value chain and its specialties are tried to take into consideration to make analysis more reliable. The same themes were used in the customer and expert interviews to be able to reliably compare them with each other. Because only view answers were received from the customers, the results could not been used to generalize. To have more data sources, to increase the reliability of the study, the sustainable reports of the main customers were analyzed. To keep the data collected valid only three main customers for the case situation were researched. The content analysis has the same problem with only view data sources. The reliability of data is a main issue with content analysis. If the data is interpreted or categorized incorrect the results might be incorrect or misleading. (Krippendorff, 2004b) This has taken into consideration and the results of customer interviews and sustainable reports analysis have been only used to support the experts' opinions.

7 CASE

7.1 Stora Enso

Stora Enso is a world leading provider of renewable solutions in packaging, biomaterials, wooden constructions and paper on global markets. Stora Enso's customers are in a wide range from publishers to construction companies. The group has 26 000 employees in more than 35 different countries, and it is publicity listed on the Helsinki and Stockholm stock exchanges. The aim of the company is "to replace fossil based material by innovating and developing new products and services based on wood and other renewable materials". Stora Enso is divided into five divisions; consumer board that develops and provides consumer packaging board for printing and packaging applications, Packaging Solutions divisions provides fiber-based packaging, Biomaterials division offers a variety of pulp grades, Wood Products division provides wood-based solutions for building and Paper division provides paper solutions. Stora Enso's has a focus on fiber-based packaging, plantation-based pulp, innovation in biomaterials, and sustainable building solutions. (Stora Enso Oyj, 2016a, Stora Enso, 2015)

Stora Enso Consumer Board division is focusing on fiber-based packaging solutions using renewable and recyclable natural materials. One of big end-use of Stora Enso's board is food and beverage packaging. One in three beverage cartons in the world are made of liquid packaging board from Stora Enso. Stora Enso is constantly looking for new ways to produce more sustainable ways of packaging. The aim of the Innovation Center for Packaging is "to create customer value through strategic packaging that can drive sales, while also reducing environmental impact and total cost" (Stora Enso Oyj, 2016b).

7.2 Liquid packaging board

The properties and requirements for overall paperboard packaging correlated with the needs of printing, its conversion into packages and their use in packing, distribution, storage, product protection and special consumer needs. Requirements can be roughly divided into two categories: appearance and performance properties. (Kirwan, 2013) Liquid packaging board (LPB) is a paperboard which is mainly

used in beverage packaging. The board has a multi-layer structure, and it is often coated to enhance the barrier properties. Because LPB is mainly filled with food, it is important to have a safety product, and that is why only virgin fibers are used. There are two kinds of products categories in the liquid packaging board (LPB) markets; Ambient with Aluminum-foil barrier for long shelf life products, and Fresh LPB with polyethylene barrier for short shelf life products. These two types differ in end-use and physical properties. (Kiviranta, 2000) Stora Enso's liquid packaging board is called Natura Board, and it follows the typical construction on LPB and has three layers. The top and back layers are bleached sulphate pulp and the middle layer is bleached sulphate pulp and CTMP (NaturaBoard, 2016).

The LPB has in the top and bottom typically bleached kraft pulp, which have good printability and high elastic modulus. The middle part consists of mechanical pulp often bleached chemical thermomechanical pulp (CTMP), kraft pulp and broke, and it forms the thickest part of the board. Its purpose is to provide high stiffness with low basis weight through increased bulk. Some chemicals are needed to add with the pulp to enhance the properties of the end product for example to bleach the board. (Kiviranta, 2000) For food packaging four functions are defined; containment, protection, convenience and communication. Protection has considered as the main purpose of packaging. The importance of communication has increased during recent years. Packages are seen as "silent salesman" to communicate the brand image. The good visual properties are achieved with formation, appropriate smoothness, and good printing quality, brightness and yellowing resistance. (Chamberlain & Kirwan, 2013) The life cycle of generic board is showed in Figure 10. The life cycle begins from the growing and harvesting of trees and purchasing other materials used. The material goes through pulp, board and packaging production. The end-of-life of the board varies between landfill and litter and re-use as energy, recycled material or composting. (Verghese et. al., 2010)

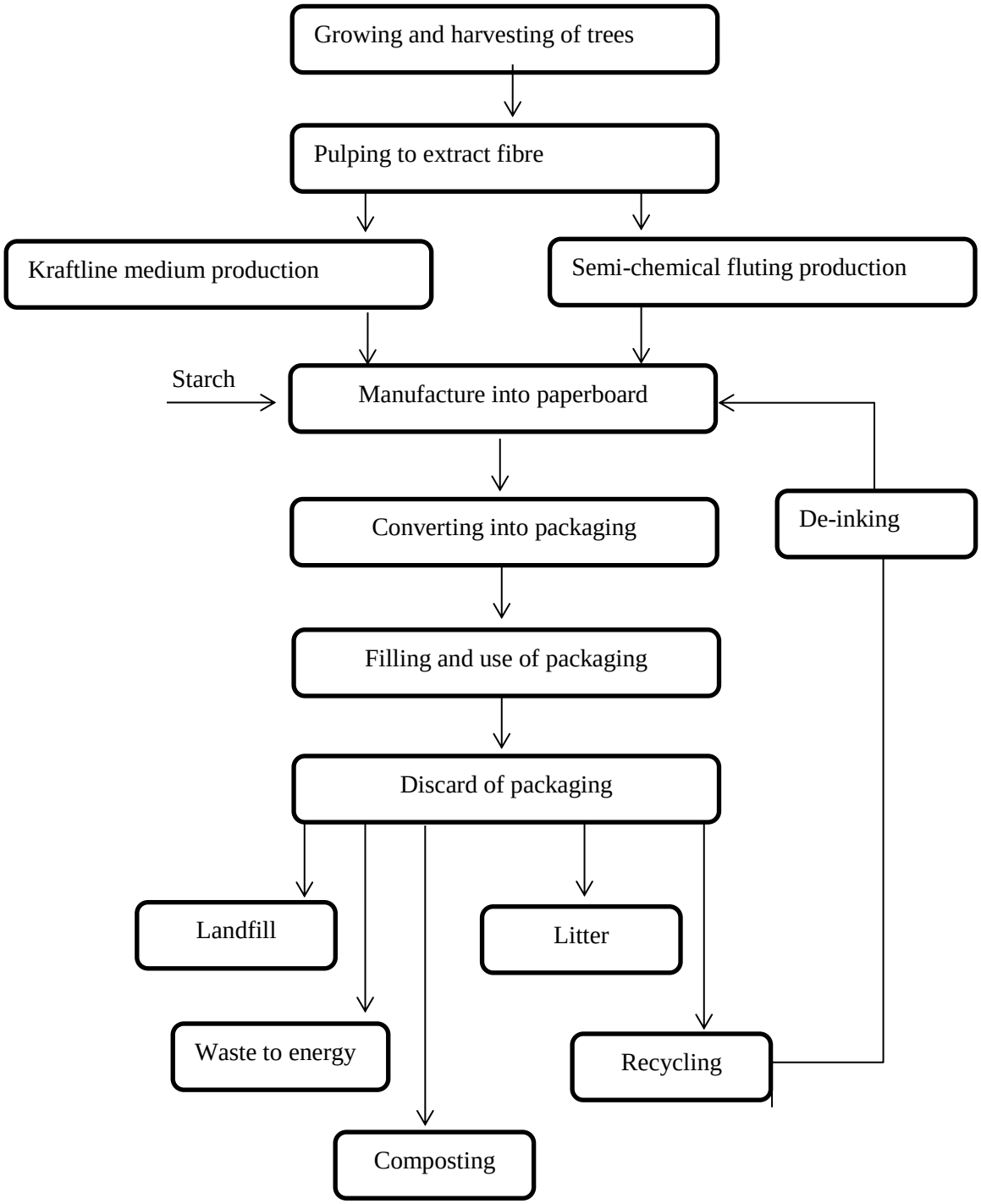


Figure 10 Life cycle of board generic (Verghese et al. 2010)

7.3 Micro fibrillated cellulose in liquid packaging board

The term micro fibrillated cellulose (MFC) has not been standardized yet so it has various names in literature and patents such as cellulose nanofibrils, nanofibrillated cellulose, nanoscale cellulose fibrils, cellulose fibrils only to mention couple of them. In this study the term micro fibrillated cellulose is used. In MFC the individual micro fibrils have been partly or totally detached from each other. The fibres can be detached chemically, mechanically or with the combination of them, or even with bacteria. (Tozluoğlu and Poyraz, 2016)

In paper and board making MFC can be added to the surface or the furnish of a paper or board. In the papermaking industry cellulose-based nanomaterials have got attention as a dry and wet strength agent and as coating applied to paper to enhance its barrier properties (Lindström & Aulin 2014). MFC can provide added value and possible cost reduction as well as potential environmental benefits, higher amount of minerals, less material, improved strength and retention for paper and board making. Increased strength can reduce costs through lightweighting or through increased filler, such as clays or calcium carbonate, levels. MFC increases the strength of paper and it can replace the binders such as starch. When used as a furnish MFC is strengthening and improving the surface properties of the fiber based products. MFC can improve wet web strength, allowing improved runnability and better productivity. It improves dry sheet strength, allowing the use of less fibre with resulting cost reduction. (Kim et al., 2015). Due its renewability and biodegradability in combination with its high-strength properties and its barrier properties (Kim et al. 2015), MFC is a sustainable replacement for petroleum-based plastics (Lindström & Aulin, 2014). Examples of possible usage applications for MFC are as a component in food, plastics, laminates, composites, pharmaceuticals. (Stora Enso Oyj, 2013)

Paper markets are declining, which is forcing the forest products industry to change their business. In recent year the industry has been doing large research into the preparation, production and modification of these materials, and applications for the product. Stora Enso was the first company to successfully launch a commercial paperboard including MFC. The liquid packaging board of Stora En-

so that has MFC in the furnish is called in this thesis New Natura and it is Stora Enso`s first commercialized product using MFC. The traditional liquid packaging board is called Natura. LPB has to contain fluids for up to one year, ensure that fluids remain clean and safe. It needs to be suitable for use in converting and filling machines. The packaging should support the brand`s image with its attributes. It needs to tolerate transport in difficult conditions and remain intact even if accidentally dropped. The material should be as light as possible and recyclable. MFC has added to the board to be able to maintain the properties of the board and at the same time being able to produce lighter board and using fewer raw materials. (Stora Enso internal material)

8 RESULTS

8.1 Current market scope

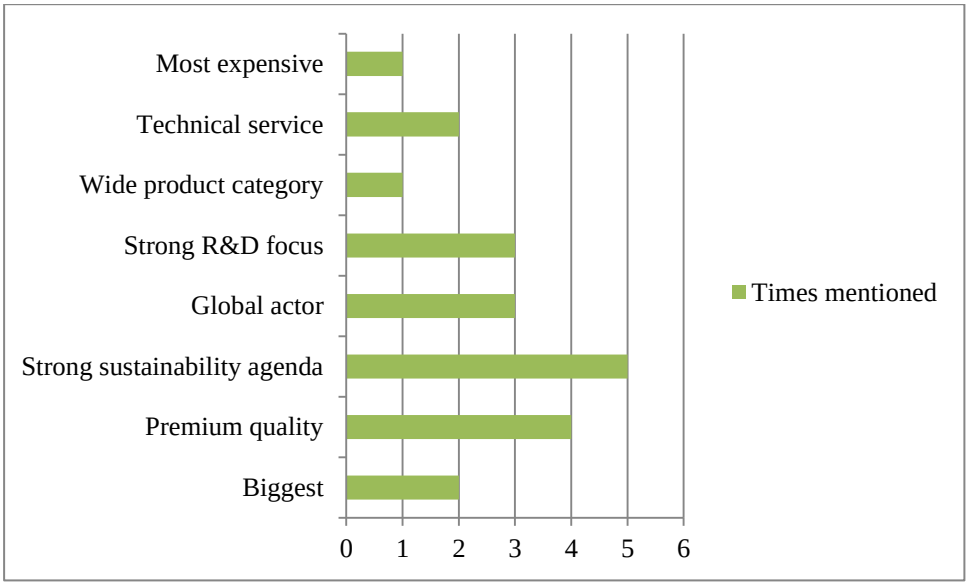
The overall liquid packaging board market is growing in annual basis. The markets are predicted to grow at an annual rate of 3.5% over the period 2015-2021 (Boyce &Palmer, 2015). The liquid packaging board markets have only view big packaging producers, but the situation is changing when new smaller packaging converters have entered to the market. The markets in the Europe and North-America are quite mature but the markets are growing more in the developing countries. One interviewee mentioned that even though the overall packaging markets in Europa are growing slowly there are plenty of possibilities to gain markets from other packaging materials such as plastics.

"In the developing countries the packaging markets are decreasing, but in the then in the Europe and in the North-America everything that needs to be packed is already packed, so the markets are full. But then you can find new markets for fibre-based products, so can we find solutions that can replace plastic-based solutions."

The biggest competitors are Rank group, Korsnäs and Klabin. Additional to these competitors plastic and aluminum were mentioned as competitors in two interviews. BillerudKorsnäs was mentioned five times, and Klabin four times, Evergreen (part of Rank group), Westrock and Nippon industries three times. Compared to competitors Stora Enso has positioned clearly as high quality producer. Stora Enso is the biggest producer of liquid packaging board. Almost all the interviewees mentioned that Stora Enso has strong sustainable agenda. It is creating competitive advantage by for example lowering the risk of surprises for customers when acting with Stora Enso. Even though Stora Enso is the biggest actor in the markets the competitors are equal. One interviewee mentioned that positions change all the time and every company has their own competitive advantages compared to others. The most often mentioned answers about Stora Enso's position in the liquid packaging board markets are shown in Table 9. One of the interviewees summarized Stora Enso's position in the markets as following:

”But extensively looking we are clearly the best actor, specifically in quality, and we are also mainly one of the most expensive. We have clearly profiled ourselves in environmental issues and all in all our sustainable issues are in good shape.”

Table 9 Positioning of Stora Enso



In customer interview longtime relationships and strong reliable partner was mentioned. It is important to work with a strong company because of the developing force and delivery reliability of it. Delivery needs to be safe and sure, and there should be a way to secure the delivery for example another mill that can produce and deliver the same product. The delivery reliability is really important in food and beverage packaging markets because of the customers of the packaging producers are having big troubles if they are not able to pack their products in time, because it is hard to store anywhere or a long time.

The main trends in the market according to one study are lightweighting, cost optimization, technology developments, waste and recyclability and various demographic trends (Boyce &Palmer, 2015). Stora Enso has determined they own six key success factors for packaging in 2016 and beyond: Enabling the basic functionality, supporting brand value, decreasing time to market, communicating the value of being sustainable, reducing costs and optimizing operations.

Because MFC is still in the research phase in many companies it is expensive and there can be very big difference between companies. However, it is still research and developed by many companies in forest industry. One of the biggest competitors of Stora Enso, Billerud Korsnäs, announced in December 2016 that it is having trials of adding MFC in its paperboard products (BillerudKorsnäs, 2016). Also other companies such as UPM (Salin, 2016), Futamura (Futamura, 2017) and Borregaard (Exilva, 2016) American process (Bioplus, 2016) are researching MFC and its applications. MFC is named as one of the most important future developing area from fiber in future forecasts. (Innventia, 2016; Boyce & Palmer, 2015)

8.2 Customer situation

The biggest LPB converters are Tetra Pak, Rank Group/ SIG Combibloc and Elopak. Geographic the biggest market in LPB markets was in 2014 Asia (37.01%), North America (23.5 %) and Western Europe (21. 7%), until 2020 Asia is predicted to growth to 39% and North America (22.5%) and Western Europe (20.6%) to decline. (Boyce &Palmer, 2015) Stora Enso liquid packaging board is produced in Skoghall Sweden, Imatra Finland, Kasur Pakistan and Tiger China. Tetra Pak, SIG Combibloc were announced as three biggest liquid packaging board customer globally and for Stora Enso by all of the interviewees. The change in the markets was mentioned in the interviews few times. There is more packaging converter in the markets as before. Before there were only few big packaging converter in the liquid packaging markets but not the competition is getting tougher. That has given more power to the brand owners and consumers because they have more options to choose from. Brand owners have become direct customers to packaging material producers and they are more and more interested in material of their packages.

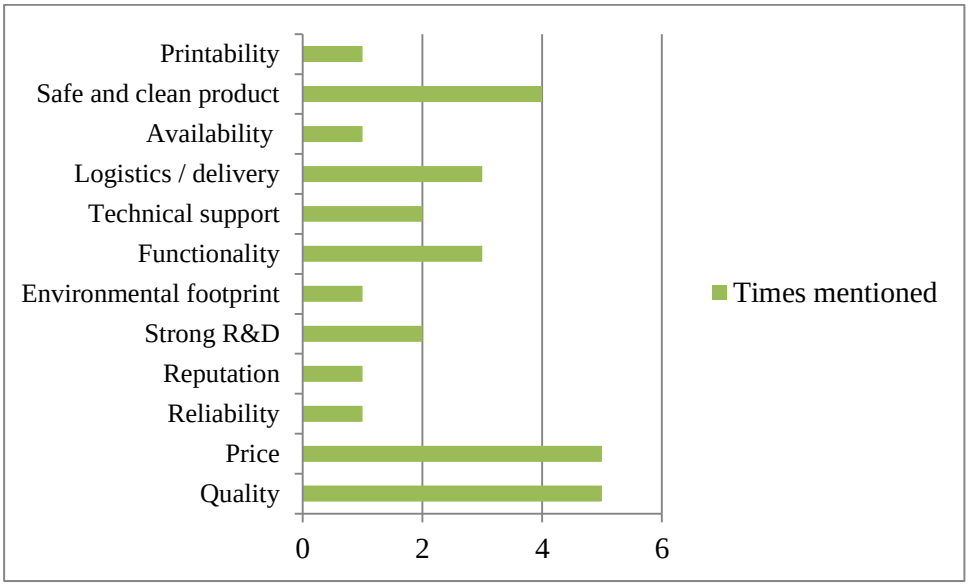
8.3 Identifying value drivers in liquid packaging markets

The main points that are affecting customers purchasing decision are quality and price, which both came up in five interviews in total. With quality it is the most important thing that the quality of the board is equal in every delivery. Safety and

protection of the product inside was mentioned four times. Safety and health issues were specially mentioned because the board is used to package food products. Because of the same reason there are regulations and international laws that the packaging cannot affect the product at any way. The others factors that are affecting the material purchasing decision of customers can be seen in Table 10. Board characteristics that were mentioned are printability, low environmental footprint, functionality through the whole value chain, safety and clean material. Many characteristics of the supplier were mentioned such as overall reputation, strong focus on R&D, possibility to get technical support, easily and quickly available products and well-functioning supply chain system. In the end there are two most important properties that are affecting the purchasing decision:

" Brutally said price and quality."

Table 10 Factors affecting the purchasing decision



Selling points for Stora Enso's LPB can be seen in Table 11. The interviewees were asked for selling points for the traditional LPB. The most often mentioned point was quality of the product, which was mentioned six times. Functionality and protection of the product were mentioned both three times. Renewable material was mentioned as a differentiator when compared to other possible packaging material such as plastic. The price is not always the best way to demonstrate the costs. Often the cheapest board is not functioning that well in different kind of

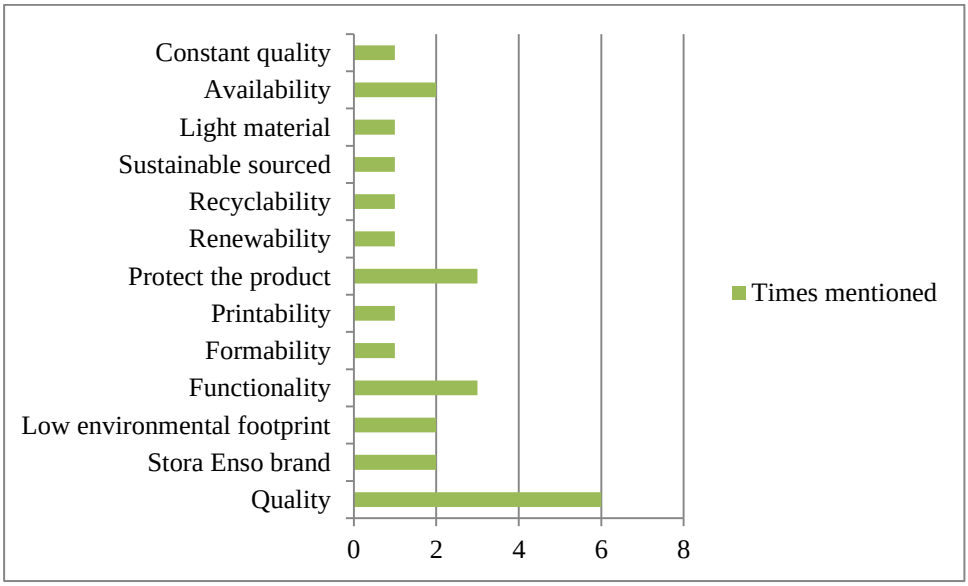
packaging or it is not protecting the products as well as more expensive but better quality product. The importance of being able to demonstrate the whole life-cycle cost related to the board functionality was mentioned by one interviewee:

"It needs to be cost-efficient, and with that I do not only mean price but the total cost of ownership."

Two interviewees mentioned that risk and image -issues are really important to take into consideration. Stora Enso brand and the size of the company is one of the selling points, because that brings reliability. Reliability can mean reliability of delivery, reliability of the source of the raw material or reliability that the quality is always as promised. One interviewee explains the importance of sustainable issues and Stora Enso brand:

"So it brings security to them when they are working with their customers they can be sure that their supplier is professional in this. That they are able to convince their customer that the product is safe and the deliver is safe and the forests are taking good care of et. cetera…."

Table 11 Selling points for LPB



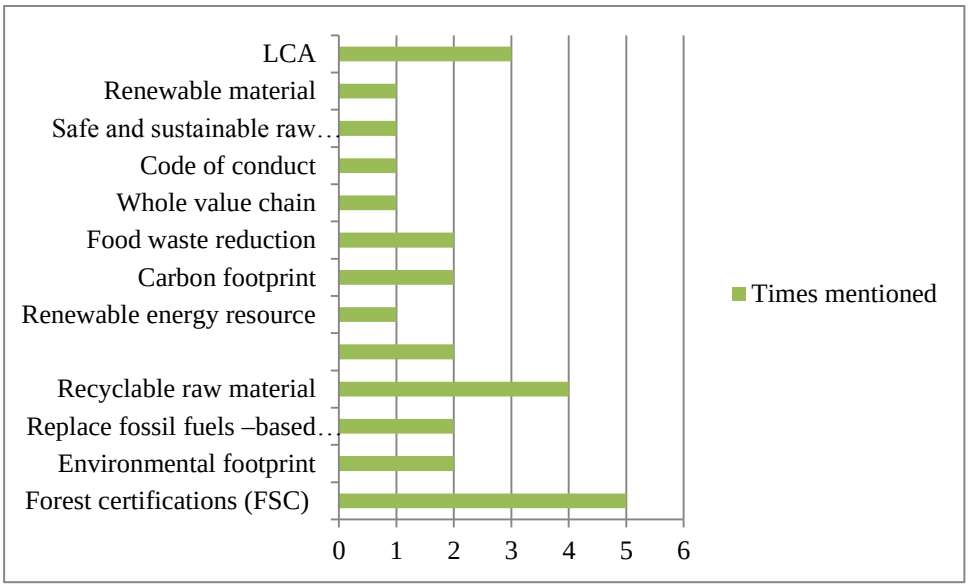
From the customer interview couple of themes arise that the most important properties of package are strongly related to the product inside of the packaging. The duration of shelf-life and need for transportation are affecting the material deci-

sion. The packaging supports the brand of the product. For example for green or eco products sustainable packaging is a must to support the products brand. Also for low price products the packaging quality is not that important than the price of the packaging. The discussion of sustainability was more to choose the sustainable material not the recycling. Reducing the fossil fuel- based materials was one theme for future, and sustainable packaging to be the next norm in packaging markets. Safety was mentioned as the number one feature of material in customer interview. The material needs to be safe to use and cannot have any impact on the product. For the physical properties the first is stiffness because it helps the packaging to protect the product. The next important factor is printability.

The last part of the interviews was dealing with sustainability and its different factors considering packaging and liquid packaging board. The most common sustainable factors mentioned were forest certifications, which have become almost like license to work in this industry. The Forest Stewardship Council (FSC) certification was mentioned five times to be that certification customers are focusing on. The Programme for the Endorsement of Forest Certification (PEFC) was mentioned couple of times. PEFC was mentioned to be not that interesting from the customer's perspective than FSC certification. FSC was mentioned in every sustainable report of researched customer but PEFC only in one. Recyclable and renewable material was the second often mentioned aspects. The recyclable material was mentioned because that reduces waste. Fibers are reused as material many times and in the end the material is used as energy source. The LCA calculations and carbon footprint were mentioned couple of times with the whole environmental footprint. View interviewees mentioned the main meaning of packaging mainly protecting the product and the environmental impact if the product inside is damaged. Preventing the food waste was mentioned as one of the most important factors in customer's perspective too. It was highlighted that the purchase chain must be responsible, transparent, legal and safe. The sustainable factors and their frequency are showed in Table 12.The protection as main purpose of packaging was described by on interviewee:

"The most important thing is, that the product inside of the package remains in safe and that the package is not affecting on the product."

Table 12 Sustainable factors for board



In the customer interview environmental factors were mentioned as one of the main factor in purchasing situation. The yield and the protection properties of the board are the most important ones but as little material should be used as possible. The weight of material was mentioned to have many impacts throughout the whole value chain. The lighter the board is then cheaper it will be for the customer because it will get more packages from the same weight of material. Less material is also more environmentally friendly and it is reducing governmental fees for recycling for example in Germany.

Different market areas were mentioned to have different sustainable value drivers. In some areas they cannot afford to have a social responsible agenda when the price is having much bigger impact on purchasing decision. Sustainable characteristics are having variable importance in different markets. For example in China CO_2 emissions are playing more important role than in some other countries. That is because the huge problems with air pollution.

One interviewee introduced a summary of sustainable agendas of three biggest LPB customers of Stora Enso: Tetra Pak, Elopak and SIG. He had summarized

briefly the sustainable agendas into three main points: renewable, sustainably sourced and recycled. The products should be made from fully renewable materials which mean bio-based barriers but maybe in the future fillers, coatings and other additives in the board. The material needs to be certified with FSC and that should be done also for non-fiber materials such as chemicals. Packages need to be able to recycle after they are used. The companies are reducing their environmental and carbon footprint in their production and products. The social sustainability issues are not in the summary because they are not mentioned often in the agendas of customers:

"What I do not have in the slide, because it is reflecting our customers, is the whole human rights aspect and social agenda what we are driving really strongly in Stora Enso. That is because our customers are not driving it very strongly."

Future changes in sustainable issues that are considered as most important got various answers. Some interviewees had on opinion that the importance is not growing anymore and it will stay as it is. Some of the interviewees on the other hand mentioned that the importance has been growing during last couple of years and it will continue to grow in the future.

In content analysis of sustainable reports six approaches of sustainability were research. Less and better material was the category that was mentioned most often in all reports. Sustainable innovation and development was too having an important role. When talking about food packaging the preventing the food waste was having an important role too.

Approach	**Tetra Pak**	**Elopak**	**SIG**
Less and better material	12	12	12
Preventing waste	8	8	8
Eco Ethics	14	7	7
Safety Secured	6	1	7
Sustainable innovations	8	8	6
Trusted/ Transparent Company	3	7	3

Tetra Pak is having a 2020 climate goal is to cap greenhouse gases (GHG) emissions at 2010 levels while continuing to grow their business. 47 % of climate impacts are caused by suppliers and 40 % by customer, only 5 % are caused by converter. Also reducing the impact of transportation and travel both of the products and people is one of the goals. Tetra Pak has set clear criteria to ensure that all the raw materials they are using come from sustainable sources, and have minimal impact on the environment. Greenhouse gas emissions are a key parameter in the yearly evaluation of suppliers' operations and environmental performance. (Tetra Pak, 2016)

Elopak has 2020 Vision, which consists of no oil no foil, green supply chain, 25% reduced CO_2, zero waste produced and being a sustainable company. They ensure the sustainability of the raw material by using FSC certified material. Reduction of CO_2 –emissions is tried to reach by using sustainable energy and concentrated in making the logistics as sustainable as possible. Reduction of CO_2 –emissions is used as selling point for the customers. They are often compared with plastic bottles to demonstrate the reduction. Customers and their operations are one of the main pillars they are relaying on and having a strong focus on customer –driven development. The zero waste –goal is the key point in sustainable agenda. The circular economy is enhanced by promoting beverage carton recycling and reducing internal waste. Elopak is announcing that an average of 35 % of its cartons sold in Europa and North America were recycled in 2014. Social responsibility is mentioned and business ethics and labor standards highlighted. (Environmental Status Report 2015)

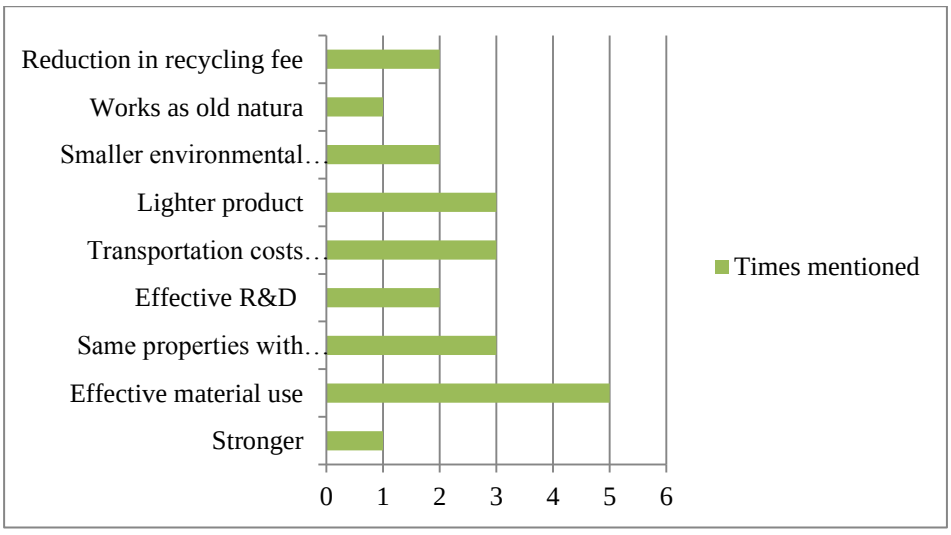
The main message in SIG Combibloc's sustainable report is to protect foods and care for the environment. They want to enhance the entire carton package product life cycle including resource, production, filling, secondary packaging, distribution and disposal and recycling. They want to provide the most ecologically advantageous packaging system for food and beverages. About the raw material they say that they want to offer the most effective opportunity for them to make a contribution to protect the environment. SIG is continuously reducing the weight of raw material used, and FSC certified carton is used. CO_2 emissions are tried to

reduce within all the raw material of example beverage packaging. 21 % of CO_2 emissions of package are caused by carton, 29% by polyethylene and 50 % by aluminum. At the same time when paperboard is usually making up around 71 % of the weight if a carton package. SIG aims to increase the fraction of renewable, regenerating raw material in the composition of their packaging material.

8.4 Characteristics of MFC in liquid packaging board

This study has limitations only analyzing the benefits MFC used in the middle layer of liquid packaging board to substitute part of the pulp normally used. The MFC increases the stiffness of the board. More strength in the board brings opportunity for light weighting and cost reduction, when at the same time having the same performance than before. Added MFC and reduced basis weight, providing a product that has lower cost and performs as well or better. The board with MFC can reach the same properties than the board without MFC but be approximately 3 % lighter. The trend of making the board lighter has been a goal for years. The main purpose to add MFC to board was to maintain the standardized properties of the liquid packaging board, but to make it lighter and use fewer raw materials. For selling point for New Natura the most recently mentioned was effective material usage. The source reduction has been going on for decades for liquid packaging board, and MFC is the most recent step on that development. The mentioned selling points for the case product are showed in Table 13.

Table 13 Selling points for the case-product



MFC was mentioned to be a proof of the innovativeness and strong developing agenda of the company:

"If they have an idea of developing some material or they have some kind of technical problem, they really appreciate if we have technical service organization and also R&D organization. That is what we have proved with Elopak and this New Natura -concept. When adding MFC into the LPB we are able to produce the same stiffness but significantly lower basic weight."

When asked from the customer, why they participated the development the first reason was to help a long time partner and be part of the product development. Customer has been satisfied with the product and it has worked well in the testing markets. They have not noticed any problems in the converting or transporting the products. They would be eager to order more board with MFC in the future. New Natura was mentioned to work without problems just like Natura, it is just lighter. It has noticed to have a bit better printability and a bit different physical properties, which are not affecting the converting process. For converters it is important that the new products are going to work in the same way than the previous one, because the machines and processes are planned that way. The same functionality is important to customers because then there does not need to be done any changes in the producing and filling lines. Then the converter does not need to do any big and expensive changes in their processes and the same apply for brand owners. If they have already working solution they are not interested to change it for a bit better packaging solution.

Sustainability and environmental issues related to MFC were mentioned in view interviews. The path of efficient raw material usage is a way to show that Stora Enso is using the forests sustainable and responsible way. One interviewee mentioned that when the customer is getting more products to sell from the same amount of board in tons it is a sustainable solution. The other sustainable aspect mentioned in the interviews was that with MFC Stora Enso is able to use wood resources effectively:

"They have been very satisfied and that is also one way to say that we are taking care of the raw material we have on earth. That we are using not more than is needed for make board."

The MFC is not used as packaging material before. Couple of questions is still open for example how it is affecting the reusability of the board. Because MFC is processed fiber it cannot be reused as many times as virgin fibers, but the real impact has not been examined. The process of making New Natura needs more energy, which is bought and produced outside of the mill, than what then traditional Natura –board. That is affecting the carbon footprint of the product. One interviewee mentioned that when the size of fiber is getting closer to the nano size its impacts on health has been discussed. When talking to natural materials there are always some nanoparticles within it naturally. The impact of nano and micro size particles for example in plastics or board packaging has not been research a lot, but companies should be ready for the discussion in the future.

When talking about MFC many interviewees mentioned that if fossil fuel -based material could be replaced with MFC, it would create a huge competitive advantage. MFC used as barrier in the packages instead of plastic-based barriers and MFC films replacing thin plastics was mentioned couples of times in the interviews. Replacing the aluminum in the liquid packaging was mentioned couple of times in the interviews but it was also mentioned that LPB is probably not the first product where it can be done with MFC because of its high barrier properties and because it is used for long-self-life products.

9 DISCUSSION

9.1 Choosing value drivers for customer value quantification

The life cycle of carton board packaging consists of various phases and includes many different actors that have different needs for the packaging. Determination of value drivers is baseline for the further value proposition development (e.g. Falk, 2009; Terho et al., 2015). Some of the value drivers are same to many actors but some attributes are important only for one actor's group. The framework for actors is presented in Figure 9. Some value drivers are important to all actors in the value chain but creating different kind of value to different actors. The market area is affecting a lot both in demand of the board and value drivers. Demand is growing the fastest in developing countries where there are more and more packed products in the market. Sustainability aspects in different market areas are also having different kind of focus areas. Understanding different cultural context behind the value drivers is important if the value proposition is aiming to include environmental and social benefits but also business potentials (Chou, Chen & Conley, 2015).

The main purpose of packaging is to protect the product from its environment. That is seen within all the value chain actors. For material supplier being able to produce same properties with fewer raw materials is more important. When talking about beverage packaging it is really important that the packaging is also safe for the product. The packaging cannot have any impacts on the product, and it is important that no hazardous material is being used, and that there are no particles that could loosen from the packaging. Packaging that has direct food contact, also has strict regulations and the development of new materials in this sector takes longer time and requires a lot of testing and cooperation with customers.

According to Innventia (2016) sustainable packaging does not mean minimizing the packaging material but using the material in optimized way to ensure the required protection. According to a content analysis converters are strongly aiming to use less and better material in the future. That means renewable and recyclable materials and packages. Fossil-based components in carton board packaging are

tried to replace with more sustainable materials and solutions. For example Elopak is aiming to resist of using oil-based materials in their products and are at the moment using bio-based plastics to replace fossil-based plastics.

In the interviews were noticed that one of the most important value driver is to avoid perceived risks. Four categories of risk are technical, commercial, contractual and performance (Van Weele, 2008). Performance risk was strongly mentioned when talking about deliver reliability. Customers are avoiding risk when they are choosing to work with a company that can guarantee to deliver what promised at the right time. Commercial risk is affecting on the brand and image of the company. Transparent social sustainable agenda was mentioned as one prove that there is not high risk of ruining the brand image of the customer. If there are delays the customer's customer, brand owner, is going to have challenges to store their products. In beverage packaging the shelf-life can be long or short. For beverage packaging the product needs to be packed right away after production, and storing it somewhere might be impossible. Performance risk is often understood as quality. In the interviews quality was mentioned to be the most important factor, and often it is even more important to have equal quality every time than aim to deliver really high quality board but being able to deliver the same quality every time. The board needs to act in the same way every time in converting line or in printing. This could also be technical risk when the board is not working correctly. The importance of technical support from the supplier was mentioned to affect customers purchasing decision.

Sustainable issues and strong sustainable agenda were named as one of the main distinctive advantages of Stora Enso by almost every interviewee. But when talking about selling points for board, sustainability was not mentioned as often. That might be because the interviewees concentrated in comparing Stora Enso's products with other similar board products and not with other possible packaging materials such as plastic. Sustainability issues such as raw material from certified forest came up often and were mentioned to be "a license to work" in the industry. Customers mentioned in their sustainability reports the FSC, and named that as a goal instead of just any certification. Getting certifications to other raw materials

and not only for wood would give more reliability on the supply chain of supplier. Sustainability was mentioned to be important for the customers but price is often a more important value driver. In cases where the product itself is marketed as sustainable, it is important that the packaging can be labelled to be sustainable. Sustainable benefits can be seen as more important for brand owners because they can use it for marketing and communications. Trade-offs are often needed when sustainable issues are discussed. As mentioned, in the theory part of this thesis, in food products the food waste has the biggest environmental impact instead of the packaging. The most effective way to prevent this waste is to have as strong packaging as possible. That was often mentioned and it is also noticed by customers. On one hand the thickest board can be considered to be the strongest board and it is going to protect the product well throughout the supply chain, but on the other hand functionality in the converting line or in certain packaging designs thick board might not work at all. The weight has many financial impacts such as increasing transportation costs and the amount of waste produced. In Europe the amount of waste has been discussed a lot and the European Parliament and Council directive sets requirements for packaging's weight and volume.

Replacing fossil –based materials with renewable solutions is one of the sustainable goals of customers. Replacing petroleum-based plastics or aluminum used in the package as coating is already now tried to be done with different kind of bioplastics. Replacing plastics or other non-renewable materials with MFC would be the main goal, which could have more competitive advantage. It is yet important to solve how the changes are going be able to do without changing the converting or filling line of the customer. In liquid packaging board most of the CO_2 -emissions are caused by aluminum coating or plastic used in the packaging. Replacing them with renewable solutions would have a huge environmental impact. European Parliament and Council's directive is pointing out that packaging should be reusable, recyclable or otherwise recoverable, which support the goal of customers to be able to use only renewable materials. The importance of some issues can also change quickly depending on the environmental situation as well as new laws and regulations. However, the importance of sustainability does not seem to diminish in the future. Customers have strong sustainable agenda and goals for the

future development. The most important goal is to reduce the carbon footprint and the used material, while still be able to have packaging that protect the product and are safe to use. The renewability of the raw material is important. Customers have also a strong agenda to innovate some more sustainable solutions.

The most important value drivers for packaging converters are shown in Figure 11. They are divided into protection, convenience and communication. These categories are introduced by Niemelä-Nyrhinen and Uusitalo (2013) in their value of package – framework (Figure 8). The most often mentioned were quality and cost-efficiency, and protection of the product. In board's functionality it is important that the board is strong enough to be able to convert as packaging. When it comes to board features, printability was mentioned to be important. The key sustainable value drivers are effective material use, need for more sustainable materials and responsible raw material sources. The protection of the product inside of the packaging was mentioned as important sustainable factor as well.

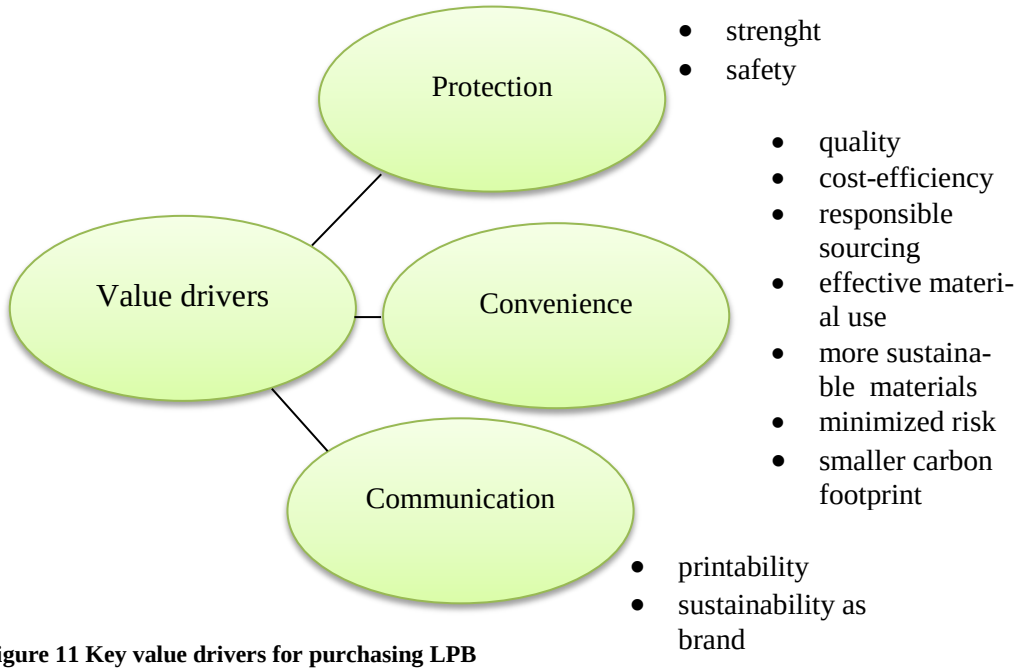


Figure 11 Key value drivers for purchasing LPB

9.2 Identifying the key benefits

The developing project of New Natura was more technology pushed than customer driven. The new material, MFC, was used to make the board lighter. The weight reduction has been going on for decades and it has made it possible to stay in the profitable business when the competition in producing costs is getting harder. MFC is the most recent step in this development. MFC is creating other benefits for the customer either through light weight or with other properties.

The key benefits, which MFC is creating in the LPB, are noticed mostly in use situation, which make tangible benefits easier to determine. New Natura is lighter version of the Natura board, what is having an impact on many aspects of value chain of packaging. Most importantly the customer can make more packages from the same amount of board calculated weight based. Lighter material is reducing the transportation costs in every phase of the life cycle. Although in the liquid packaging the heaviest part is not the package but the liquid inside of the packaging. Carton board packaging is already having an advantage comparing to glass bottles when considering weight and transportation. During the end-life of the material the lightness of the material is affecting on the amount of waste produced. At the same way also fewer raw materials are needed for the production. As seen in Camlek's customer value –model there are two sides of the value: the customer and business. Even though this study concentrates on customer value the seller's perspective is noticed. Using fewer raw materials is beneficial for the producer as well. The lighter material is affecting most at the beginning and the end-life of the material.

The customer has not noticed any significant changes in properties during their converting process or from their customers. There is no need for changes in the processes or machines of the customers in any part of the value chain. Even though some changes have been noticed in the performance such as printability the effects are not notable or they are only positive. Printability was mentioned to be value driver for purchasing. In this case it was not mentioned by customer to be significant for the use so it is not mentioned in the framework.

Intangible value MFC is providing is harder to detect and evaluate than tangible values mentioned earlier. Developing products from MFC are one showing the innovativeness and continuous development of Stora Enso. The strong R&D agenda of Stora Enso is one of the main differentiators from competitors. Being first company in the markets providing board with MFC as a part of it, and creating the markets for that kind of products, is one prove of that. The development process of MFC and its usage as a board material is going forward all the time. Working with Stora Enso creates an advantage to first access the new applications of MFC.

According to the theory MFC is providing environmental benefits when less material is used and with smaller carbon footprint. In this case fewer chemicals were not used because the goal has been kept in the efficient material usage. As in theory MFC is providing economic value through increased strength, which is making the lightweighting possible. Improved runnability or better productivity were not noticed by the customer, at least not in significant way. Decreased transportation costs and no further investment can be categorized as economic benefits as well. Social benefits are the innovativeness and strong R&D focus, which are showed in in the development process of MFC, when less raw materials area used and at the same time less waste is produced. If the more sustainable packaging material is used to support the “eco”-brand, it might, according to the theory, lead to increased sales and has made it possible to keep on higher price .In Table 14 presents all benefits value proposition of MFC in LPB with cost-benefits analysis. According to Anderson et al. (2007) Anderson, Narus & van Rossum (2006) the all benefits are for the situations in which the targeted customer is not that well known and that is why the value proposition can include also benefits that might not bring any extra value for that specific customer group. In this case in the model are all the benefits MFC is providing to the LPB to all actors in the packaging value chain (Figure 9).

Table 14 All benefits of MFC in LPB (environmental**, economic &** *social***)**

	Immediate	**Long term**
Tangible	• **No further investment costs for customers** • **Smaller recycling fees** • **Lower transportation costs**	• Smaller carbon footprint • Reduction in wood consumption • Less waste produced
Intangible	• *Safe product* • No hazardous materials	• *Innovativeness* • **Brand** • **First in the market** • **Trusted partner**

9.3 Verifying value

All benefits value proposition is usually confusing for the customer because it consists of all benefits that MFC is providing and they are not targeted to customers or prioritized in any way. The verification of the benefits can be done through comparison. Favorable points of difference value proposition (Anderson et al. 2007; Anderson, Narus & van Rossum, 2006) compared the product with competitive one. In this case there was not enough information to compare New Natura with competitor's solution. New Natura has been compared with Stora Enso's Natura board to evaluate the sustainable benefits MFC is creating in the board.

Verifying the value MFC is providing is difficult to measure with backward looking practice because the product is new and there is not much customer infor-

mation how the material has worked. The forward looking practice calculations are based on the TCO and LCC is translating the benefits into monetary terms, which would make the demonstrating of value proposition easier. The main challenge of LCA calculations is the lack of data available because of the many actors during the life cycle and if there are many end-use possibilities for the product(Rebitzer et al., 2004). To be able to translate the benefits of carton board into monetary term would require specific data from customer and their customers. That would mean concentration on specific customer and market segment or even one specific product of brand owner on one market area. The lack of data available is the main challenge in LCA calculations in general but the long value chain of packaging is making calculations even more complicated because the benefits are spread to different actors throughout the value chain. When making the calculations from the material supplier's point of view, the many different end-use possibilities and market areas are making the generalized calculations impossible. The life cycle calculations used in this study are all calculated from the raw material sourcing until the product leaves the supplier's mill.

Effective material use was named most recently as a selling point in the most interviews and discussions. About 10.1 % (kg/m^2) less wood is used to product same amount of New Natura than Natura when the calculations are made area-based. Depending on the calculation logic the reduction of wood consumption vary between 8-11 %. The difference is based on the more CTMP and less chemical pulp used in New Natura. The higher yield in CTMP process is making the wood consumption reduction possible. The other environmental impacts are containing to stay in the same level as they are in the former board. No more material is used than needed to fulfill the need of the customer. Effective material use is ensuring that there is enough raw material for growing demand of packages.

The weight reduction of only 3 % in packaging is not affecting that much in the phases where the product is already packed into the package. With MFC the board has been able to make 8 g/m^2 lighter when the bending resistance (stiffness) is 360mN. When the original weight is 265 g/m^2 and the lighter board with MFC is 257 g/m^2, the weight reduction is approximately 3 %. MFC`s strong binds are

making it possible to reduce the weight of the board. Weight reduction is affecting the transportation costs but only slightly in every part of the value chain. Recycling fees are often paid per tons of material. Many countries in Europe are part of the "Packaging Recovery Organisation Europe" that is producing responsibility systems engaged in the collection and recycling of packaging waste. In the countries where they have recycling fees for packaging lighter board would cause savings. The weight reduction is affecting to the amount of the waste created in the end of life of the package.

LCA calculations are certified and widely used by companies within many industries and it can be used to compare the environmental impacts of products with each other. Stora Enso is calculating only LCI for their products because there are many end-use possibilities and market segments so it would not make any use to calculate to only one of them and it would be impossible to calculate to all of them. The carbon footprint of New Natura is slightly smaller than the one of Natura. If calculated area-based, the carbon footprint decreased from 110, 1 g CO_2 /m^2 to 108, 1 g CO_2 /m^2, so the reduction is about 2%. The biggest part of the carbon emissions of New Natura are coming from the energy consumption in the production of MFC and CTMP. When the process could be made more energy efficient and more environment friendly energy source used the carbon footprint would decline even more. The value of the carbon footprint can also be monetized through carbon emission prices. In other factors of LCA calculations, such as eutrophication, acidification, ozone depletion and photochemical ozone creation, remarkable difference between Natura and New Natura was noticed.

The reductions on carbon footprint (-2 %), weight (-3%) and wood consumption (-10%) are the key points of difference of New Natura compared to Natura board. Innovativeness is included to the framework because this is the first commercial MFC product of Stora Enso and the development of better products is still going on. The sustainable benefits which MFC is providing to Natura board can be seen in Table 15, which is created with the model of sustainable packaging of Verghese et al. (2010). The sustainable impacts are divided into four categories and economic, social and environmental aspects are covered.

Table 15 Sustainable benefits that MFC is providing compared with Natura board

	Economic	Social	Environmental
Effective –Fit for purpose		• Innovativeness	
Efficient – Materials, energy, waste	• Reduced resource costs (~10 % less wood) • Reduce transportation costs (~3 % lighter board)	• Reduced weight (-3%)	• Reduces consumption of wood (~10 %) • Reduced waste and emissions (~2 % smaller carbon footprint) • Reduced energy consumption and emissions from transport (~3% lighter board)
Cyclic – Renewable and/or recyclable			• Reduces consumption of wood (~10 % wood) • Reduced packaging waste requiring disposal (~3 % lighter)
Safe – Non-polluting and non-toxic	• Carbon credits or reduced cost of carbon emissions (~2 % smaller carbon footprint)		• Reduced contribution to global warming (~2 % smaller carbon footprint)

9.4 Proposed resonating focus -value proposition

Three customers' sustainable value drivers are efficient material use, better materials and responsible material sourcing. All of the researched customers have pointed out in their sustainable reports that their sustainable goal is to decrease their carbon emissions and emissions caused by transportation. MFC is answering to both of them by weight reduction and reduced carbon footprint. As mentioned by one interviewee New Natura is one example that Stora Enso is taking good care of the raw material we have on earth. The sustainable value of MFC in liquid

packaging board can be summarized as material efficiency. MFC is making it possible to use 10 % less wood, making the board 3 % lighter with retaining the properties when calculated in area based. The reduction of weight and wood consumption are diminishing the carbon footprint of the product with around 2 %. The material is renewable, recyclable and safe to use. Other purchased materials and their suppliers are monitored to be sure that they are sharing the same values and operation behavior. The value proposition is presented as the resonating focus value proposition in Figure 12, which demonstrates the value of this superior performance in a quick and effective way. Resonating focus can concentrate only on one most important points of the product for the customers, what in this case are smaller carbon footprint and reduction in material use.

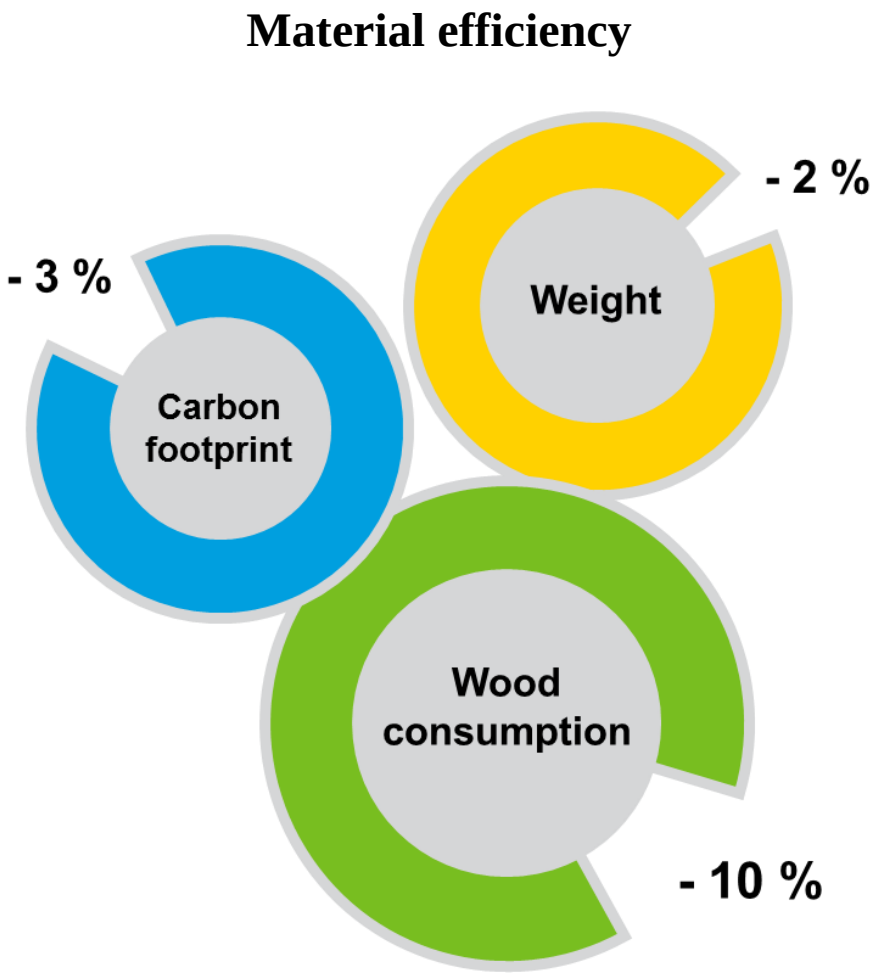


Figure 12 Sustainable value proposition for the case-product

The customer perspective is the key element of value proposition and communicating it. The use of MFC is impacting different areas of Stora Enso`s customers business but also other actors` business in the value chain of packaging. In Table 16 is shown all the actors and how the key sustainable benefits of MFC might are affecting each actor. The framework is combination of two frameworks of Niemelä- Nyrhinen and Uusitalo (2013) introduced in Figure 9 and in Figure 8. The value of package framework of Niemelä-Nyrhinen and Uusitalo (Figure 8) is having in addition to protection, convenience and communication also a category for additional important functions. It has not included to the framework used in this study because of the unclear definition of it. It could be added to the framework for further use, but in this case situation it was not needed because all the key benefits and their impacts could be demonstrated with the three key categories. The impacts and benefits illustrated in Table 16 are not evaluated and not probably presenting all of the impacts. The packaging suppliers are the main targeted customers in this study but other actors wanted to take into consideration too because of the importance of understanding the whole value chain and the impact on different phases. Retailers are often also brand owners because they have their own private labels. In that case brand owner's impacts are also affecting retailers.

The key benefits of MFC are not affecting the protection on the product in a specific way. There are no hazardous materials in the board and it is safe to use but that is not a benefit MFC is adding to the board. With MFC the board's strength could be increased and in that case, it would have many benefits on protection category for the actors. The reduced impact on global warming is named as social impact. It is affecting the most the brand owner and material supplier, but most of all it is affecting the whole society and that is why it is hard to name specific actor for social impacts.

Lighter board is affecting the convenience in various ways for many actors in the value chain of package. The reduced transportation costs and reduced emissions caused by transportation are affecting throughout the whole value chain. Reduced material use is impacting mostly the material supplier in convenience. Emission fees are usually paid by the packaging supplier and the recycling fees most often

by the actor who is bringing the product into the markets. As environmental impact the smaller carbon footprint is affecting every actor in the value chain.

The packaging material has an important role in building the image and brand of the package and the product. The whole packaging is promoting the product and the brand effectively. The brand image is mentioned in the communication category because the properties of MFC are supporting the sustainability and responsibility values in many ways. For consumers the more sustainable packaging means more sustainable consumption and for example smaller personal carbon footprint.

Table 16 Demonstration of sustainable value proposition of MFC (environmental**, economic &** *social***)**

Actor / Function	Material supplier	Packaging supplier	Brand owner	Retailer, Wholesaler	Consumer
Protection	• *reduced impact on global warming*		• *reduced impact on global warming*		
Convenience	• **reduced transportation cost** • less material used • smaller carbon footprint	• **reduced transportation cost** • **smaller emission fees** • smaller carbon footprint	• **reduced transportation cost** • **reduced recycling fees** • smaller carbon footprint	• **reduced transportation cost** • smaller carbon footprint	• smaller carbon footprint
Communication	• **sustainable brand image**	• **sustainable brand image**	• **sustainable brand image**		• *more sustainable consumption*

10 CONCLUSIONS

10.1 Research questions answered

The main objective of this thesis is to develop sustainable value proposition for MFC in liquid packaging board. The factors of liquid packaging board markets and MFC were examined in order to find the key value drivers and key benefits of the case product. The theoretical part of thesis was designed to give a comprehensive understanding over the topic and to support the empirical research.

Based on the literature there are three ways how value proposition is usually understood: All benefits, favorable points of difference and resonating focus. In the process of developing sustainable value proposition the phases are: identification of potential impacts and key value drivers, targeting the benefits and their verification. The value of package constitutes of three factors: protection, convenience and communication. The sustainable packaging can be determined with four attributes: effective, efficient, cyclic and safe.

In the empirical part of the study the research questions were answered and the data was analyzed and discussed. The findings for each research questions are summarized in Table 17.

What are the key benefits that MFC provides in liquid packaging markets?

The first research question was aiming to determine the most important benefits of MFC in liquid packaging board. MFC has been added to liquid packaging board to make the material lighter. That is causing the reduction in transportation fees and emissions in all stages of the life cycle. The customer is able to make more packages from the same weight of material. The efficient material use, but at the same time being able to keep the same properties and functionality and having a safe product were mentioned to be benefits. The innovativeness and continuous development are also the benefits of MFC. From all the benefits efficient material use is the key benefit.

What are the key factors that influence customer's decision?

The second research question was aiming on understanding the value drivers customers are basing their purchasing decision on. Especially key sustainable factors were aimed to find and also the key factors in the future. The key value driver in liquid packaging markets is the protection of the product inside, quality and cost-efficiency. That means the packaging material needs to fit for its purpose and it needs to be safe to use. One key value driver is to avoid risks. Customers are trying to minimize the risk by for example guaranteeing deliver and quality. As board features strength and printability were mentioned. From the sustainable agenda of customers three key value drivers could be identified: efficient material use, better and more sustainable materials, and as third responsible sourcing. In the future two sustainable factors were identified to be in the focus on customers: reduction in carbon emissions and replacing plastics or other non-renewable materials with more environmental friendly solutions. For this case situation the most important sustainable value drivers are the goal of efficient material use, carbon emission reduction and need for better materials.

How to define and demonstrate sustainable value created for the customer?

The third research question was aiming on developing sustainable value proposition. According to Anderson et al. (2006) there are three possible value propositions. All benefits, favorable points of difference and resonating focus value propositions. MFC's sustainable benefits were demonstrated with all of the three value proposition. Life cycle calculations is used to evaluate the sustainable value. They all demonstrate the benefits MFC is providing to the LPB from different aspect. All benefits –value proposition (Table 14) is demonstrating all benefits for all actors of packaging value chain when the customer is not clearly targeted or customers' value drivers are not taking into consideration. The favorable points of difference –value proposition (Table 15) is demonstrating the economic, social and environmental benefits of New Natura board compared to Natura board to demonstrate what kind of sustainable benefits MFC is creating in this case. The resonating focus –value proposition (Figure 12) demonstrates the key sustainable benefits of New Natura in quick and effective way to the customer. The main ben-

efits of MFC in LPB can be summarized into effective material use. Three main aspects are smaller carbon footprint, reduced weight and reduction in wood consumption. Because the value chain of packaging consists of many actors the impacts of sustainable value has determined divided for every actor in the value chain in Table 16.

Table 17 Summary of the main findings of the study

Question	Answer
1. What are the key benefits that MFC provides in liquid packaging board?	Lighter product, efficient material use, innovativeness, same functionality and safe product. (Table 14)
2. What are the key factors that influence customer's decision?	Quality, cost-efficiency, protection, minimized risk, effective material use, better material and responsible sourcing. In the future: reduction in carbon emissions and replacing fossil-based materials. (Figure 11)
3. How to define and demonstrate sustainable value created for the customer?	Three different value proposition aspects are used to define and demonstrate the value created. LCI is used to define the value. The impacts of sustainable value has determined for every actor in the value chain.

10.2 Limitations and future research opportunities

During the research process limitations needed to be made concerning the findings and their interpretation. The case product was not yet widely available in the market so there is not much information about customers' use experience of the product. Only one customer has tested the product in the market. That limited the customer insights and other data collection of this study. The customer`s interview was used to support the supplier`s guesses. Even though customers` sustainable reports were researched for support there might be some important customer insights that have not been achieved. The findings clarify understanding of existing theories and their use in the business situations.

The market area is not strictly limited and the liquid packaging producers are examined as one. On the other hand this study concentrates on European markets

and does not take into consideration for example the Asian and other developing countries' markets and their special needs and sustainable value drivers. Because the food and beverage packaging markets are growing in Asian markets it would be interesting to research specific these markets and their sustainable value drivers in comparison to European and North American countries. The concept of this study and the frameworks could be used to develop sustainable value proposition for any kind of packaging material or solution in targeted market and customers.

In this study the packaging converters were the targeted customer group. The market situation is changing in two ways; firstly there are more packaging converters in the markets aside of the three big ones that have traditionally been in the markets, and secondly the brand owners are more directly in contact with packaging material producers. This creates a new aspect on the theme and demand for developing a sustainable value proposition for both brand owners, those who are already customers, and the potential new customers. Potential new customers could be for example companies using plastic packaging at the moment. Comparison between plastic and board as packaging material would be useful and reasonable.

There are many possible ways to use MFC in packaging and it can be used to enhance different features of board. The frameworks introduced in this thesis could be used to determine the value created with different usage possibilities. With the frameworks the different ways of using MFC in packaging material could be also compared with each other to find the most valuable way to use it as part of the packaging for the targeted customer.

The monetary evaluation of the benefits was not possible within the scope of this study. Verification of key benefits would be interesting to research more detailed. With LCC analysis the TCO could be determined in some cases but the problem is the lack of specific data and not generalized use situations and customers. Still this could be made by choosing one case customer and use situation. Case example could be used as a support for the sustainable value proposition developed in this thesis.

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ATTACHMENTS

ATTACHMENT 1. Questions and themes for in-depth interviews (Supplier)

1. **Background information**
   a) The interviewer presents background and purpose of the thesis
   b) Tell us briefly about yourself, your background and your current position in Stora Enso.

2. **Markets**
   a) How Stora Enso is positioned compared with competitors?
   b) What factors in your opinion influence customers' decision to purchase a product and to choose the vendor?
   c) How sustainability is seen in the packaging markets? Liquid packaging?
   d) How do environmental factors influence the decision to buy at the moment? How about in the future?

3. **Sustainable packaging**
   a) What are the key sustainable points in liquid packaging board?
   b) How the selling points do has been demonstrated to the customer?
   c) Have there been any changes in the sustainable factors?
   d) How do you see the importance of sustainable value to the customers in the future?

4. **Construction of value model**
   a) How do benefits of LPB could be demonstrated better to the customer?
   b) What are the benefits you will see that model of the economic -, social - and environmental benefits has in the sales situation?
   c) What would be the main factors that should be taken into account in the model?
   d) How do you see as relevance in the demonstration of the benefits (for example, environmental benefits), which cannot be directly measured in monetary terms?
      a. What would be the most important factors?
      b. Could they be somehow quantified?
   e) What challenges do you see in developing this kind of value model?

5. **Additional important themes and follow-up interviews**
   a) Can you think of things that could be important for the study of which has not yet been discussed?
   b) What about the other people from Stora Enso, which could have important information from the perspective of the objectives of the study.

ATTACHMENT 2. Questions and themes for in-depth interviews (Customer)

1. What are the most important properties of material when purchasing it? Can you give an estimation of the importance of the factors?

2. What are the most important characteristics of suppliers when purchasing the material? Can you give an estimation of the importance of the factors?

3. How do sustainable factors of the material affect the decision making?

4. How do you see the sustainable factors of the material affecting the decision making in the future?

5. What made you to try MFC in the board with Stora Enso?

6. Overall, how satisfied are you with the New Natura -concept?

7. How would you see opportunities related to MFC in the future?

8. What could be the barriers / obstacles for not using MFC in the future?

ATTACHMENT 3. Dictionaries used in the quantitative analysis

Less and better material

Conversation of resources

- Renewable energy
- Energy efficiency
- Energy use
- Water usage
- Material use
- Energy consumption
- Water consumption
- Material resources
- Minimize

Renewable resources

- Renewable
- Renewable sources
- Renewable energy

Carbon footprint

- Carbon
- Carbon footprint
- Environmental
- Environmental footprint
- Greenhouse
- GHG emissions
- Climate change
- Emissions

Preventing waste

Waste

- Waste
- Food waste
- Material waste

Reduce/Re-use/Recycle

- Reduce
- Reduce weight
- Re-use
- Used cartons
- Use and disposal
- Recycling
- Carton recycling

Eco Ethics

Responsible sourcing

- FSC
- PFC
- Responsible
- Responsible sourcing

Fairness

- fair trade
- in developing countries

Supporting local

- Local
- Local level
- Environmental incident

Human rights

- Human rights
- People
- Employee engagement

Safety Secured

Health & Hygiene

- Health
- Hygiene
- Health and safety

Safe products

- Safety
- Food safety
- Protection

Sustainable innovations

Productivity

- Productivity
- Sustainable update

Value creation

- Value
- Value chain

Innovation

- Sustainable innovation
- Environmental innovation
- Sustainable way

Trusted / Transparent Company

Customer loyalty

- Customer loyalty
- Loyalty
- Customer engagement

Partnerships

- Partnerships
- Co-operation