



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY

---

# **Insight into Consulting Services regarding Sustainable Supply Chain Management**

A study performed in collaboration with ÅF

Master's thesis in Supply Chain Management/Quality and Operations Management

CARL EDMAN  
PATRIC ANDERSSON



REPORT NO. E2016:029

# Insight into Consulting Services regarding Sustainable Supply Chain Management

A study performed in collaboration with ÅF

CARL EDMAN  
PATRIC ANDERSSON

Department of Technology Management and Economics  
*Division of Supply and Operations Management*  
CHALMERS UNIVERSITY OF TECHNOLOGY  
Gothenburg, Sweden 2016

Insight into Consulting Services regarding Sustainable Supply Chain Management  
A study performed in collaboration with ÅF

CARL EDMAN  
PATRIC ANDERSSON

© Carl Edman and Patric Andersson, 2016

Technical report no. E2016:029

Department of Technology Management and Economics  
Division of Supply and Operations Management  
Chalmers University of Technology  
SE-412 96 Gothenburg, Sweden  
Telephone + 46 (0)31-772 1000

Chalmers Reproservice  
Gothenburg, Sweden 2016

# Abstract

There are increasing expectations from consumers and stakeholders on companies to take full responsibility of their operations and activities. In response to these increasing expectations, global businesses are required to extend their line of responsibility along the complete extent of their supply chains, both regarding products, services, processes, and relationships. This has led to increased supply chain scrutiny with increased monitoring and auditing, since environmental and societal problems easily can spoil the sales or image of the responsible businesses. This forms the background to this thesis.

The purpose of this thesis is to investigate how firms can adapt to this new focus and awareness. More specifically, the thesis focuses on how consultancy firms can develop their service offering to align with the increased focus on sustainability among businesses and where consultancy firms can provide the most value towards businesses regarding Sustainable Supply Chain Management. The thesis has been performed in collaboration with ÅF, which previously have been performing a master thesis identifying the increased focus of sustainability.

The thesis develops a definition of Sustainable Supply Chain Management based on gathered theory regarding Supply Chain Management, sustainability, as well as areas and drivers of Sustainable Supply Chain Management. The thesis also builds on an investigation and maps the current situation regarding Sustainable Supply Chain Management among companies in four different industries: Manufacturing, Automotive, Textile, and Transportation industry. Results from this study shows that many companies and industries has working with issues in this area, and, when further analysing collected industry findings, it is possible to distinguish trends in the different industries based on the industry contexts as well as the type of companies that operate in each industry. The thesis also performs and presents a competitive benchmarking of current service offering regarding Sustainable Supply Chain Management in the consulting context.

Finally, recommendations are developed and presented regarding future development for ÅF and their service offering of Sustainable Supply Chain Management. One of the main conclusions regard the importance of developing relationships with customers in order to reveal the opportunities for realising business in the area of Sustainable Supply Chain Management.

*Keywords: sustainability, sustainable supply chain management, service offering, consulting, customer relationships*

# Acknowledgements

This master thesis was conducted in the spring of 2016 at Chalmers University of Technology, as a part of the M.Sc. program Supply Chain Management and Quality and Operations Management, at the division of Industrial Marketing. The master thesis was done in collaboration with ÅF, located in Gothenburg, where a large part of the study was conducted.

This master thesis was supervised by Lisa Melander and Frida Lind at Chalmers University of Technology, and Pär Ström at ÅF, and to them we are especially thankful. Their experience, support and inspiration were highly valuable in the thesis process.

Furthermore, we would like to thank the many employees at ÅF in Gothenburg, Stockholm and Malmo for their advice and support during the thesis project and especially the company representatives for the interviews and information sharing. In addition, we would like to thank all the representatives from ÅF for valuable input and help as well as for broadening our vision and providing an interesting aspect of the topic.

---

Carl Edman

---

Patric Andersson

Gothenburg, May 2016.

# Table of Contents

<b>1. Introduction .....</b>	<b>1</b>
1.1 Background .....	1
1.2 Purpose and Research Questions.....	2
1.3 Structure of the Report .....	3
<b>2. Theoretical Framework .....</b>	<b>4</b>
2.1 Sustainability.....	4
2.2 Supply Chain Management .....	5
2.3 Sustainable Supply Chain Management.....	6
2.4 Areas and Practices of Sustainable Supply Chain Management.....	8
2.4.1 Sourcing .....	8
2.4.2 Operations .....	10
2.4.3 Logistics .....	12
2.5 Drivers for Sustainable Supply Chain Management.....	14
2.5.1 Customer Demand .....	14
2.5.2 Regulations.....	15
2.5.3 Financial Benefits.....	15
2.5.4 Competitive Advantage.....	16
2.6 Towards a Definition of Sustainable Supply Chain Management.....	17
2.6.1 How Should Sustainable Supply Chain Management Be Defined? .....	17
<b>3. Methodology .....</b>	<b>19</b>
3.1 Research Approach .....	19
3.2 Selection of Industries and Companies .....	19
3.3 Research Process.....	20
3.4 Data Collection.....	21
3.4.1 Literature Review .....	21
3.4.2 Interviews .....	22
3.4.3 Benchmarking of Current Service Offerings .....	24
3.4.4 Additional Sources of Information.....	25
3.5 Reliability and Validity.....	25
<b>4. Focal Company Description; ÅF .....</b>	<b>27</b>
4.1 ÅF .....	27
4.2 Sustainability.....	27
4.2.1 Sustainable Solutions .....	29
4.2.2 Responsible Business.....	29
4.2.3 Attractive Employer .....	30
4.3 Supply Chain Management Department.....	30
4.4 Packaging Department.....	31
4.5 Reference Cases.....	32
4.6 Sustainable Supply Chain Management at ÅF's Offices in Gothenburg, Stockholm, and Malmö .....	32
4.7 Interfaces with Customers and Society.....	35
<b>5. Findings from the Industry Study .....</b>	<b>37</b>
5.1 The Manufacturing Industry .....	37
5.1.1 ABB .....	37
5.1.2 Ericsson .....	38
5.1.3 IKEA .....	39
5.1.4 Analytical Comments on the Manufacturing Industry.....	40
5.2 The Automotive Industry.....	41
5.2.1 Volvo Cars .....	41

5.2.2 Volvo Group .....	43
5.2.3 Analytical Comments on the Automotive Industry .....	44
5.3 <i>The Textile Industry</i> .....	45
5.3.1 H&M .....	45
5.3.2 Inditex .....	46
5.3.3 KappAhl.....	47
5.3.4 Lindex.....	48
5.3.5 Analytical Comments on the Textile Industry.....	49
5.4 <i>The Transportation Industry</i> .....	51
5.4.1 DB Schenker .....	51
5.4.2 DHL.....	52
5.4.3 Analytical Comments on the Transportation Industry .....	53
5.5 <i>Cross-analysis of Industry Findings</i> .....	54
5.5.1 Understanding the Situation of Sustainable Supply Chain Management in Industries .....	56
<b>6. Benchmarking of Current Service Offerings Within Sustainable Supply Chain Management .....</b>	<b>58</b>
6.1 Accenture.....	58
6.2 Deloitte .....	59
6.3 PwC.....	60
<b>7. Analysis and Discussion of Sustainable Supply Chain Management Services .....</b>	<b>62</b>
7.1 <i>Monitoring of context</i> .....	64
7.2 <i>Customer Relationships and Sales</i> .....	65
7.3 <i>Service Offering</i> .....	67
<b>8. Conclusions and Recommendations .....</b>	<b>70</b>
8.1 <i>Definition of Sustainable Supply Chain Management</i> .....	70
8.2 <i>The Situation of Sustainable Supply Chain Management Among Companies in Industries</i> ....	70
8.3 <i>Recommendations to ÅF Regarding Sustainable Supply Chain Management Service Offerings</i> .....	71
<b>References .....</b>	<b>72</b>
<b>Appendix A .....</b>	<b>I</b>
<b>Appendix B .....</b>	<b>II</b>



# 1. Introduction

The following section presents the reader to the subject of the study. The background, purpose, and research questions is presented as well the scope of the study and the structure of the report.

## 1.1 Background

In today's global business environment, there is an increased expectation from consumers and stakeholders alike for companies to take full responsibility of their operations and activities (Ashby et al., 2012). Companies also have increased requirements to have clear continuous demonstration of ethical environmental and societal behaviour, in addition of demonstrating profitability. Since businesses of today often are part of one or more supply chains the business competition has translated into the definition that it is supply chains, in contrast of single businesses, that are competing for markets (Ashby et al., 2012). In response to this increased pressure, global businesses are required to extend their line of responsibility along the complete extent of their supply chains, both regarding products, services, processes, and relationships according to the authors. In recent time, these supply chains have developed into complex networks that has increased the requirements on responsibility even more whilst enhanced the difficulty and complexity (Ashby et al., 2012).

Morana (2013) further press on the importance of sustainability, since most business do not only face economic challenges in their daily activities, but also societal and environmental challenges. If companies are not able to meet the requirements of these challenges, they are ensured to lose the attention of end customers, where the increased focus of sustainability often originates (Morana, 2013). The pressure of these requirements tend to travel throughout the full range of the businesses supply chain, but the companies closest to the end consumer and the public are often the ones under the highest pressure and scrutiny (Seuring et al., 2008). This has lead to increased additional supply chain scrutiny with increased monitoring and auditing since environmental and societal problems easily can spoil the sales or image of the responsible businesses according to the authors.

In order to illustrate the challenge of sustainability to its fullest content, both the issue of child labour and poor working conditions serves as examples in the following paragraph. As companies have further outsourced operations and processes, the difficulty of ensuring ethical integrity along the supply chain has increased. Since the 1970s, companies have increasingly outsourced manufacturing processes to lower cost locations in developing countries, leading to opportunities for especially young, often unskilled, workers and children (Rossi et al., 2014). This globalisation of export production has since then been one of the major triggers of poor working conditions and child labour, and a significant cause of regional wage depression in developing countries (Rossi et al., 2014). Additionally, due to increased fragmentation of sourcing and heightened competition among buyers, prices have dropped during the years and paved the way for under-regulated subcontracting of labour according to the authors. As a

consequence, this has during recent time lead to increased media and consumer attention towards concepts such as sweatshops and the third world living standards.

In addition to end customers, companies are also under the scrutiny of authorities and governing bodies which have the power of restricting business activities if requirements are not met (Morana, 2013). Supply Chain Management (SCM) can, therefore, be stated to have a high importance when both aiming to successfully compete in today's global market as well as in addressing the degree of responsibility throughout the supply chain. SCM thus represent an important aspect when aiming for an increased focus of sustainability and integrating environmental and societal aspects together with overall profitability, three aspects equally important for achieving sustainability (Ashby et al., 2012).

Additionally, SCM is defined as the systematic and strategic coordination of all traditional business functions and tactics across these business functions, both within a focal company and across businesses within the supply chain, for the purpose of improving the performance of both the individual company and the supply chain as a whole (Morana, 2013). SCM can, therefore, be said to encompass the planning and management of all activities regarding sourcing and procurement, transformation and logistics. It includes all logistics management activities, as well as manufacturing operations and the coordination of activities within marketing, sales, finance, and IT. It also includes coordination and collaboration with network partners, such as suppliers, third-party logistics, and customers all the way from the point-of-origin at the most upstream point of the supply chain to the point-of-consumption by end customers. SCM integrates both supply and demand management within and across companies (Gold et al., 2010). However, for the purpose of this study only the areas of SCM regarding procurement, operations as well as logistics are included and further investigated.

Furthermore, it is by academia well known that SCM has a close connection to the perspective of sustainability, and that sustainability in SCM extends to both operational drivers of profitability as well as the relationship to society and the environment around us (Winter & Knemeyer, 2012). All together, this has lead to the increased focus among companies today to implement Sustainable Supply Chain Management (SSCM) in their complete range of business activities and supply chain networks (Ashby et al., 2012).

## 1.2 Purpose and Research Questions

As previously mentioned, there is an increased focus on sustainability in SCM and an increased awareness resulting in SSCM. The purpose of this thesis, therefore, is to investigate how firms can adapt to this new focus and awareness. More specifically, the thesis focuses on how consultancy firms can develop their service offering to align with the increased focus on sustainability among businesses and where consultancy firms can provide the most value towards businesses regarding SSCM.

The thesis is performed on behalf of ÅF, which previously have been performing a master thesis identifying the increased focus on sustainability. Furthermore, ÅF have also expressed an aim to expand their service offering regarding sustainability in the SCM-market.

The following research questions can thus be presented below:

- *How should SSCM be defined?*

Sustainability is a broad and contextual definition with just as many definitions as applications. The first aim of this thesis is to deliver a general definition of SSCM, based on gathered theory, which can be applicable for both investigated industries in this thesis, as well as for ÅF.

- *What is the situation of SSCM among companies in various industries?*

In order to successfully satisfy customers regarding SSCM, it is of importance to have a service offering aligned with industry's contextual situation and to understand needs and requirements of the targeted industries. This requires an extensive mapping of situations regarding SSCM in different industries and also an understanding on what is required to satisfy needs and requirements.

- *What recommendations can be given to ÅF on how to develop their services regarding SSCM?*

In order to fully understand the identified contexts and situations regarding needs and requirements in investigated industries, it is of importance to investigate the root cause and the perceived benefits of having these services delivered from a customer perspective, and having the customer's needs fulfilled. Based on this, the aim is to deliver recommendations to ÅF on steps to achieve an aligned service offering regarding SSCM towards investigated industries.

The scope of the thesis is limited to investigate the industries of manufacturing, automotive, textile, and transportation. This selection has been based on suggestions from ÅF and the companies in each industry has been selected based on turnover, sustainability focus, and geographical presence. This has resulted in the limitation that companies with a substantial focus on sustainability and with operations in Sweden are only investigated in this thesis.

### 1.3 Structure of the Report

The thesis is divided into five main parts. Initially, a theoretical framework is presented followed by the study's methodology, empirical findings in combination with analysis, discussion, and finally conclusions and recommendations to ÅF. Investigated theory combined with gathered empirical findings functions as the foundation for the analysis and discussion, which results in recommendations and answers of the research questions and the purpose of the thesis.

## 2. Theoretical Framework

The following chapter aims to deliver an understanding around the areas of sustainability, Supply Chain Management (SCM), and the combination of these in what is known as Sustainable Supply Chain Management (SSCM). The theoretical framework is additionally used to gain a deeper understanding of different areas and practices of SCM concerned with sustainability issues, as well as drivers for the development of this area. Finally, an analysis and discussion regarding a definition of SSCM and an answer to Research Question 1 of this thesis is presented.

### 2.1 Sustainability

There exist various definitions of sustainability in contemporary literature, depending on the context. Since the first appearance of the term sustainability in literature some 20 years ago, numerous authors and experts have proposed multiple definitions of the term (Winter & Knemeyer, 2013). Originally, the World Commission on Environment and Development entitled 1987 in the Brundtland report "our common future", proposed the following definition of sustainability: "using resources to meet the needs of the present without compromising the ability of future generations to meet their own needs." (Winter & Knemeyer, 2013).

This definition suggests from a business perspective that not only a focus on economic aspects is sufficient but that also aspects concerning nature and society as a whole is required. This has during the years developed towards what today is called the Triple Bottom Line (TBL), which incorporates the economy, environment, and society. The concept aims, according to Winter & Knemeyer (2013), to help corporations to not just focus on economic values, but also on environmental and social values that the corporation's activities result in. A common theme is, however, that the economic aspects of the TBL are well developed and widely used in businesses and measurements while the more "abstract" environmental and social aspects are less prevalent and more diffuse to measure (Winter & Knemeyer, 2013).

However, due to increased pressure from internal (investors, employees, etc.) and external (legislations, customers, etc.) sources on an increase of the environmental and social aspects of sustainability, the development of these aforementioned aspects and relevant measurements are increasingly progressing. This does, however, not mean that the economics aspects and performance has to be adversely affected by the increased pressures of the other sustainability aspects (Winter & Knemeyer, 2013). Additionally, many companies nowadays aim to engage in environmental and social activities and performance goals that affects the environment and society positively, in addition to providing long-term economic benefits and competitive advantages (Winter & Knemeyer, 2013).

Conclusively, sustainability can be illustrated according to Figure 1, with the three aspects, economic, environmental, and social, in symbiosis with each other.

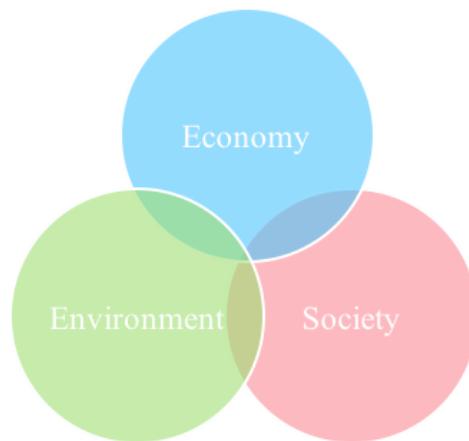


Figure 1. Illustration of the three aspects of sustainability.

## 2.2 Supply Chain Management

SCM has risen to prominence over the past decade and is according to Mentzer et al. (2001) frequently used to describe executive responsibilities in businesses. There are many explanations to the increase of popularity of the concept. Trends in global sourcing, emphasis on competition regarding time and quality, and their respective contributions to sustainable uncertainty can be traced to be specific drivers towards the increase of the SCM concept (Mentzer et al., 2001). Many corporations have increasingly moved toward global sourcing of supplies, which is forcing the demand for increased effectiveness of coordination of flows in and out of companies. Furthermore, companies and their concerned supply chains increasingly compete more on the basis of time and quality according to the authors. A competition in which customers demand consistent improvements of deliveries regarding speed, on-time, and security. These requirements have forced companies to increase coordination and cooperation with suppliers and distributors, and an increased uncertainty requires greater flexibility of both individual companies and complete supply chains (Mentzer et al., 2001). This in turn demands increased flexibility in supply chain relations according to the authors.

Additionally, SCM can be defined as the systematic, strategic coordination of traditional business functions both within an individual company and across companies within supply chains, both for the purpose of improving long-term performance of individual companies and the supply as a whole (Mentzer et al., 2001). A supply chain can be illustrated as a pipeline, with directional flows of products, services, financial resources, and information (Chopra & Meindl, 2007), and the traditional business functions of a supply chain includes marketing and sales, forecasting, production, sourcing, logistics, information technology, finance, and customer services (Mentzer et al., 2001; Chopra & Meindl, 2007). However, this thesis focus on the three major areas of sourcing, operations, and logistics of the supply chain.

Furthermore, Christopher (2005) state that the focus on SCM is upon the management of relationships, to achieve increased profitability for all members of the supply chain. This brings additional challenges due to many occasions where self-interest of one party may be subsumed for the overall benefits of the supply chain. Christopher (2005) further state that in many cases, the word "chain" in SCM should be replaced by "network" due to the

fact that there normally are multiple suppliers involved, as well as sub-suppliers and customers and customers' customers, which should also be included in the complete system.

## 2.3 Sustainable Supply Chain Management

In today's global business environment, environmental and social demands on a firm's performance has changed drastically. From previously focusing on creation of wealth through superior economic performance compared to competitors in terms of assets, liabilities, and market strength, companies now have an increased focus on environmental and social performance (Chin et al., 2015). This at the same time as aiming to achieve a high economic performance, in order to reach optimal levels of overall sustainability performance. Many authors describe sustainability as a business strategy with close relation to Corporate Social Responsibility (CSR) (Chin et al., 2015). In order for a company to reach a long-lasting competitive advantage, an organisational sustainability agenda requires a well-developed interface between economic, environmental, and social superiority. Chin et al. (2015) thus claim that businesses should focus on long-term profitability in such a way that risks regarding the environment and society are reduced. Here, SSCM has a prime position to leverage sustainability performance regarding all aspects of sustainability (Chin et al., 2015).

From a theoretical perspective, the core concept of SSCM aims to integrate the aspects of environment, society, and economy to allow organisations to achieve long-term viability in SCM (Tseng et al., 2015). The authors also claim that SSCM serves as a strategic factor in increasing organisations effectiveness and realising sustainable goals set by the organisations. This does in turn enhance competitiveness, improve customer service and finally increase profitability (Tseng et al., 2015). Going more into detail this means that SSCM includes all movement and storage of sustainable material and green products all the way from the point of origin to sustainable consumption (Tseng et al., 2015). The authors also claim that SSCM practices leads to reduction of resources, material, and waste due to better utilisation of resources and plays a significant role in the achievement of better social, environmental, and economic performance.

According to Winter & Knemeyer (2013), the most commonly used definition of SSCM which can be found in academia, including the TBL approach calling for equal consideration of economy, ecology, and society, is the following:

*"The management of material, information, and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e. economic, environmental, and social, into account which are derived from customer and stakeholder requirements." (Winter & Knemeyer, 2013).*

Furthermore, Kim et al. (2014) argues that a definition should include that a sustainable supply chain not only should create profits and achieve its full potential, but also be responsible towards customers, suppliers, societies, and environments by innovative strategic, tactics, and management technologies. The authors further state that the TBL (economic, environmental, and social values) should be well incorporated in the definition. The economic value of SSCM can be represented by supply chain-profitability, the difference between revenue generated and the overall cost across the supply chain

(Kim et al., 2014). SSCM should also consider the social costs of external factors such as emissions and working conditions by increased internalisation of externalities into managerial decision-making according to the authors. Environmental value in SSCM should be represented by eco-efficiency, which is the delivery of competitively-priced products and services that satisfy human needs and bring quality of life, while progressively reducing environmental impacts and resource intensity throughout the product's or service's life cycle (Kim et al., 2014). Finally, the authors define the social value of SSCM as social effectiveness, which is the consideration of the supply chain's impact on social systems. The components of SSCM is compared in relation to the traditional functions of SCM in Figure 2 below.

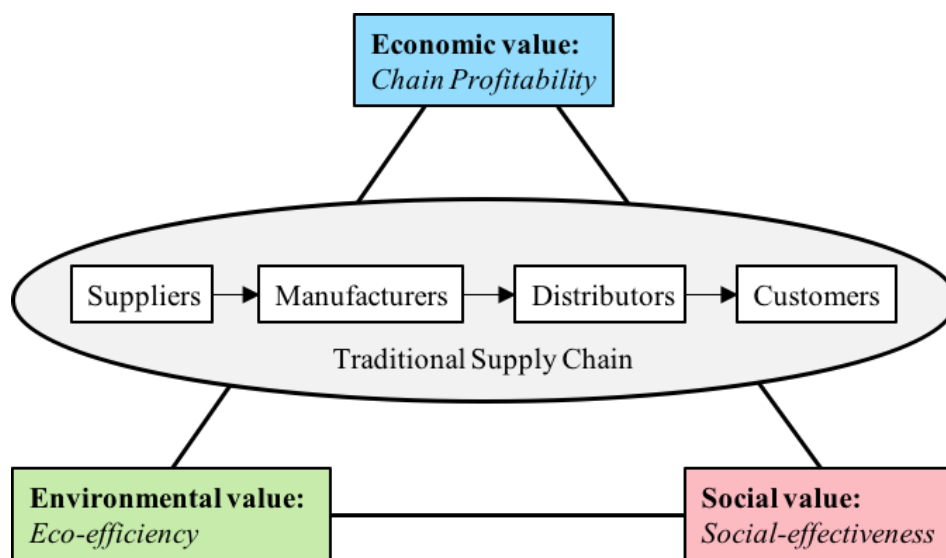


Figure 2. Components of SSCM in relation with the traditional functions of SCM based on the definition by Kim et al. (2014), p. 9.

The definition of SSCM is thus well developed, taking TBL into consideration as well as accounting for interorganisational information sharing as a key aspect for management. It also includes the stakeholders as an important actor in SSCM (Winter & Knemeyer, 2013). It is however difficult to measure all three dimensions of SSCM through the same analytical framework. For example, conflicts could arise within one dimension (for example individual versus collective interests) and between the dimensions (for example between economic and environmental aspects regarding costs) as well (Winter & Knemeyer, 2013). The authors claim that applying organisational practices which incorporate a mixture of best practices from traditional SCM and new proactive behaviours from sustainable practices lead to the most sustainable supply chains. It is thus important to take the dynamic interactions between the sustainable dimensions into account (Winter & Knemeyer, 2013). For example, changing one parameter could possibly affect one or several other parameters and may cause changes to the complete system. The key challenges of SSCM are thus in the interfaces of the three dimensions of sustainability (Winter & Knemeyer, 2013).

## 2.4 Areas and Practices of Sustainable Supply Chain Management

Literature on SSCM contains many studies on various topics such as purchasing, ethics, remanufacturing and reverse logistics, supplier certifications, and transports. The following section aims to describe activities regarding SSCM in various stages and parts of the supply chain. The stages presented below are sourcing, operations as well as logistics, which are the areas investigated in this thesis.

### 2.4.1 Sourcing

Sourcing in context of this thesis includes the areas of procurement, supplier evaluation, and risk management, and has according to authors below the largest potential for sustainable improvements in supply chains. Additionally, the following principles can be derived as sustainable practices regarding sourcing in SCM and will be described in further detail in following sections:

- Risk identification
- Considering alternative sourcing arrangements
- Contingency insurance
- Risk assessments and supplier audits
- Awareness campaigns and training programs
- Collaboration
- Risk-based monitoring
- Code of conducts

#### *Procurement*

Procurement is an important enabler to improve the sustainability of the overall supply chain (Grant et al., 2013). Especially if the corporation's own internal operations only have a small share of the total sustainability footprint of the supply chain. Since much pressure to improve the sustainability performance of supply chains often come from the consumers, buying power like public procurement and procurement strategies of large market leaders play an important role in the development of more sustainable products and practices (Grant et al., 2013).

Drivers and barriers of procurement vary heavily between countries and industries, but regulation plays the most essential role especially for corporations with little motivation to improve sustainable performance (Grant et al., 2013). An increase of internalisation of external costs regarding environmental and social issues also enable companies to easier consider sustainability issues when making purchasing decisions (Grant et al., 2013).

The issue of implementing sustainable practices in procurement is however becoming more difficult due to the often increased cost which is derived when having more sustainable products and services, and due to the fact that sustainable achievements are harder to measure from an economical aspect (Grant et al., 2013). The authors argue that performance targets and well-developed sustainability specifications are required in order to lay the path for purchasing managers in the execution of their purchasing operations.



### *Supplier Evaluation*

Within SCM, supplier selection and evaluation decisions are one of the critical issues for many operations and purchasing managers to help organisations maintain strategically competitive (Bai & Sarkis, 2009). Increased globalisation, outsourcing, and offshoring have during the years added to the competitive burden where both the selection and evaluation of suppliers have become even more critical, since suppliers are required to supply companies with necessary material and components in a timely and efficient way in order for the companies to keep an competitive advantage (Bai & Sarkis, 2009).

Since more consumers and retailers are requesting products that are ever more sustainable, supplier selection and evaluation processes have evolved beyond financial and transactional relationships into reviewing sustainable aspects regarding the environment and society as well (Ladd, 2013). According to the author, it is imperative for companies to adopt a more holistic view on supplier evaluation and managing the relationships with them in a sustainable manner. Instead of only focusing on conventional practices and the suppliers' financial capabilities, it is also necessary to analyse how a partnership may influence the company's sustainability goals and business practices regarding sustainability. It is thus necessary to also consider supplier's practices regarding energy efficiency of manufacturing processes, water usage, waste management, and working conditions for labourers (Ladd, 2013). This means thorough investigation of employee health and welfare, contributions to local communities, and diversification of workers.

### *Risk Management*

Risk has many perspectives. The key elements of risk are according to Grant et al. (2013) potential danger, probability of occurrence, and variability of outcomes. From a business perspective, risk often involves variability of outcomes of a particular decision.

According to Grant et al. (2013), most risks regarding SCM include demand, supply, and operational risks but can also include risks from external parties such as policy, macro-economic, reputational, and environmental risk. In particular, environmental and sustainability risks are an increasing concern among global international companies, especially companies with famous brands who could be subject of causing serious health or environmental damage or social problems (Grant et al., 2013). Once the trust with consumers is broken, there is a tendency that past consumers boycott the brand, leading to decreasing market shares according to the authors.

Increased globalisation means greater risks and ethical dilemmas for many supply chains. New types or risks have emerged such as reputational and sustainable risks originating from society, stakeholders, and the environment (Grant et al., 2013). The public has also started to realise the consequences of resource depletion around the globe and many businesses are facing ever higher competition for scarce resources. Businesses have thus started to realise that the pursuit of revenue have to be in balance with the needs from society and the sustainable development in order to not be punished by governments, authorities, NGOs or consumers for being ignorant towards health, safety, and environmental concerns (Grant et al., 2013).

Progress is, however, not always satisfactory according to the authors. The main obstacle is often the increased cost of regulations and many companies tend to neglect sustainability in favour of short-term profits. Still, many decision makers see damage to the environment from their supply chain activities as a reputational risk that could eventually reduce profits, but do not derive the conclusion that such damage has the possibility to make the supply chain unsustainable (Grant et al., 2013). Incentives and regulations have thus been developed to push the industries forwards, but without viewing sustainable responsibility not only as an obligation but as part of company values, progress is difficult. Without such values, regulations would not make much difference according to Grant et al. (2013).

## 2.4.2 Operations

In the context of this thesis, the area of operations is a consolidation of all production-related activities in a supply chain, and includes both production, packaging, as well as waste and water. In relation to these areas, the following principles can be derived as sustainable practices in the operations phase of supply chains according to Grant et al. (2013) and will be further explained in following sections:

- Reduction in consumption of raw materials and energy used in production processes.
- Increased productivity by ensuring a more efficient use of raw materials, energy, and water.
- Promotion and adoption of standards and regulations, such as ISO 14001.
- Promotion of better environmental performance through reduction of waste and emissions.
- Reduction of the environmental impact of products throughout their lifecycle by the design of sustainable but cost-effective products.
- Using minimum packaging volume and weight as long as it meets minimum requirements to maintain the necessary levels of safety, hygiene, and acceptable for the packaged product and for the consumer.
- Design, production, and commercialisation of packaging for reuse, recovery, recycling, and to minimisation of environmental impact when disposed.
- Reduction of quantity and toxicity of emissions and wastes generated and released.
- Elimination of the use of toxic and dangerous materials.

### *Production*

It is according to Grant et al. (2013) possible to design cleaner production processes. A sustainable holistic production strategy should not only include pollution prevention but also take into account waste minimisation, greener packaging, green productivity as well as energy and eco-efficiency (Grant et al., 2013).

The authors argue that companies working pro-actively in this area have large potential of becoming market leaders and creating new business opportunities, gaining more recognition and reputation from their sustainable performance and practices. The concept of cleaner production processes emphasises an integrated and preventive production strategy instead of traditional end-of-pipe strategies (Grant et al., 2013).

## *Packaging*

Packaging is a necessity for many types of manufactured goods, such as dairy products, electronics, clothing and retail, and is typically made of paper, plastic or cardboard. Sometimes, as for beverages, packaging is also the most expensive part of the product (Grant et al., 2013). Packaging plays an important role as a supporting function throughout the supply chain both regarding production, logistics, and marketing by both protecting goods inside, allowing for standardised stacking and shipment, and attracting customers by providing information and using attractive design (Grant et al., 2013).

With the use of innovative design, technology, and by using appropriate materials, packaging plays an important role in conserving resources, reducing emissions, and improving the cost-effectiveness of supply chains (Grant et al., 2013). A large portion of all packaging materials can be directly reused or recycled, however, packaging is currently the largest waste stream which harms the environment if not properly managed according to the authors. For example, plastic waste from packaging is relatively difficult to collect and recycle, resulting in millions of tonnes of plastic from packaging ending up in landfills around the world (Grant et al., 2013).

The following principles and practices are currently being developed and implemented in a bid to increase the sustainability of packaging in supply chains globally according to Grant et al. (2013), which are also a part of the EU directive for packaging and packaging waste:

- Using minimum packaging volume and weight as long as it meets minimum requirements to maintain the necessary levels of safety, hygiene and acceptable for the packaged product and for the consumer.
- Design, production and commercialisation of packaging for reuse, recovery, recycling and to minimisation of environmental impact when disposed.
- Production of packaging with minimisation of the presence of noxious and other hazardous substances.
- Design of packaging to allow optimisation of energy recovery.
- Design of packaging for composting shall be biodegradable to enable separation, collection, and composting processes.
- Biodegradable packaging shall be capable of undergoing physical, chemical, thermal or biological decomposition to allow the finished compost to decompose into carbon dioxide, biomass, and water.

## *Waste and Water*

Recent time has seen a growing recognition that the way products are designed, produced, and delivered have to change (Grant et al., 2013). Not only is it important for a company that its products generate income, but also that the natural resources and chemicals used have to decrease, while at the same time making sure that no harmful health effects exist towards workers and consumers (Grant et al., 2013). Not only carbon emissions are the important factor here either, but also water consumption and energy usage. Preventing pollution by using cleaner production processes and cleaner product bill-of-materials is of high importance for many companies with production in their supply chains. Here, many innovate designs and processes have emerged emphasising

that products should consider reducing energy and material consumption both during production and use (Grant et al., 2013).

### 2.4.3 Logistics

The area of logistics includes all activities of storage, transportation, and recycling of a supply chain in the context of this thesis. This section thus involves the areas of warehousing, transportation, and also reverse logistics practices such as recycling. The following principles can be derived as sustainable practices regarding logistics in SCM and will be further explained and discussed in the following sections:

- Incorporating sustainable aspects in logistics business decisions.
- Increase energy efficiency of logistics operations.
- Increase use of more sustainable energy sources.
- Promotion and adoption of standards and regulations regarding logistics, such as ISO 14001.
- Increase transport efficiency in terms of routes, vehicles and fill rates.
- Implement and further increase use of reverse logistics practices.

#### *Warehousing*

According to Grant et al. (2013), 13 percent of all emissions in supply chains stem from logistics buildings and warehousing. Issues regarding logistics, however, receive significantly less attention in comparison with transports which account for the other 87 per cent of logistics emissions (Grant et al., 2013). However, large cost savings potential can be derived from efficient warehousing and logistics and regulatory pressure and land use cost is increasing incentives to consider environmental issues regarding design and operation of warehousing (Grant et al., 2013).

Logistics have an impact on sustainability in different ways and not only air pollution and emissions, especially regarding warehousing. Warehousing adds heavy and light traffic of vehicles, cause noise, and can cover large areas of land, interfering with nature and wildlife (Grant et al., 2013). From a social aspect warehousing also offer employment and from an economical aspect they enable product availability towards customers in order to keep supply chain operations functional. Warehousing is also the the network nodes in logistics. They greatly affect the need of transports and transport modes in close connection with the warehouses (Grant et al., 2013).

According to Grant et al. (2013), logistics and transport providers should encourage a wider industry commitment with the aim to improve warehousing facilities and logistics operations through implementation of green construction and technologies. They should also work to increase commitments of boosting investments in new building technologies, reducing running costs and emissions throughout warehousing facilities' lifecycles, and develop new solutions in recycling and waste management in collaboration with consumers (Grant et al., 2013). The authors also claim that policy makers and authorities should encourage industries to commit to improvements that consider the boundaries of possibilities with current and future technologies, both through individual and industry-wide actions.

## *Transportation*

With the increased globalisation of supply chains, transportation activities have disproportionately outgrown economic development the last couple of years, deriving from increased offshoring and specialisation of supply chains resulting in increased international trade (Grant et al., 2013). Even simple products are now affected by even more complex and long supply chains according to the authors, and a debate is growing regarding the increasing supply chain risks and that a growing world economy will result in even higher growth of global transportation. Furthermore, all transportation activities contribute to environmental emissions. Although the share is smaller than manufacturing, the pressure is increasing to reduce emissions from transport activities (Grant et al., 2013).

According to Grant et al. (2013), transportation is arguably the most visible issue in the discussion on making supply chains and particularly logistics activities more sustainable. It can be stated that the environmental impact from transports and distribution varies massively between different supply chains, but the one aspect they have in common is that every goods or services supply chain contains transportation activities (Grant et al., 2013). The authors estimate that most carbon emissions in logistics are caused by transportation activities, however, external costs from a wider sustainable perspective includes more than only emissions such as noise, vibration, and accidents.

Emissions vary significantly between available transport modes. Slower transports generally emit lower emissions in comparison with faster transports (Grant et al., 2013). However, avoiding transports altogether will greatly reduce emissions, with solutions such as local sourcing, or by using cleaner technologies and fuels or by implementing operational improvements with increased technological support and collaboration (Grant et al., 2013).

It is believed that much of the shift towards greener transportation activities and practices will derive from public pressure and government regulations, for example by increasing costs for emissions and pollution (Grant et al., 2013). Applications and solutions have, however, great variability and can be highly individual according to the authors. Many sustainable practices and technologies are still at an early stage, and might not be suitable for every context or company. Companies active in transportation and freight activities should however increase the adoption of new technologies and fuels according to Grant et al. (2013), and seek to integrate optimisation efforts across multiple supply chain networks, enabling further collaboration between shippers and carriers. The authors also state that development towards sustainability can be performed by implementing environmental performance indicators in the contracting phase with transportation providers, and work with consumers to support their understanding of emissions and help facilitate recycling and reverse logistics.

## *Reverse Logistics*

Taking care of all waste and end-of-life material in an effective and sustainable way is called reverse logistics. Reverse logistics differ from traditional forward logistics with the simple explanation that it is moving in the reverse direction, up the supply chain moving from consumers to producers and manufacturers (Grant et al., 2013). Reverse logistics is closely connected to material recycling and waste management in order to cut costs and

maximise value from reverse flows by activities like product returns, source reduction, reuse or remanufacturing of materials, waste disposal, and refurbishing and repair (Grant et al., 2013).

From a management perspective, the definition of reverse logistics is according to Grant et al. (2013) the process of planning, implementing, and controlling the efficient flow of materials from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal. It is an important concept for many companies and is by many referred to as the backbone of sustainable development with both positive economic and environmental impact on businesses (Grant et al., 2013). It is also a crucial element of a closed-loop supply chain according to the authors, since reverse logistics prevents disposal of end-of-life products in less environmental friendly channels such as landfill or incineration.

The authors argue that reverse logistics is crucial for maintaining a healthy environment and a sustainable development due to the increasing scarcity of natural resources and the negative effects of disposing end-of-life products. In recent years, this has led to increasing regulatory and competitive pressures, where companies are committing to reverse logistics and creating the necessary infrastructure and business processes in order to reuse, recycle, and remanufacture products (Grant et al., 2013). Companies have also been able to demonstrate that it is possible to create a closed-loop sustainable supply chain without increased costs compared to competitors. In the future the authors argue that increased pressures from regulations on extended producer responsibility will drive investments in reverse logistics further, increasing further innovation and investments in the area. Consumers are also an important factor, and their changing behaviour and requirements will ultimately decide the outcome of reverse logistics when they realise they need to pay for reverse logistics and recycling of the products they dispose of (Grant et al., 2013).

## 2.5 Drivers for Sustainable Supply Chain Management

SSCM has since its implementation had several positive effects on supply chain performance, particularly regarding the economic and social aspects (Tseng et al., 2015). However, mostly managers in operations, purchasing and SCM are integrating environmental and social issues, including standards such as ISO9001 and ISO14001 in their daily activities. Even though there are significant environmental reasons to motivate increased sustainability in supply chains, regulatory, competitive and economic issues also play important roles in the implementation of sustainability across industries (Tseng et al., 2015). The following section presents multiple areas experiencing benefits from SSCM that serves as drivers for an increased adoption and implementation of the SSCM practices.

### 2.5.1 Customer Demand

Customers are increasing awareness of sustainable products and services, and have an increased concern of sustainability regarding their consumption (Kulsum, 2012). This awareness and concern has translated into market pressure for corporations to integrate sustainability concerns and practices into their SCM. Pressure from customers is most widely recognised for agro-commodities such as palm oil, cocoa and coffee, and forest

products such as timber and paper. Customers of these products are increasingly demanding that corporations implement sustainable sourcing and are active in the development of sustainable sources (Kulsum, 2012).

Literature state that consumers' belief that they individually have the impact to solve environmental and sustainable issues is the best predictor of sustainability conscious consumer behaviour (Maon et al., 2013). Many stakeholders have played key roles in the increased corporate responsiveness with regards to sustainability and customers, communities, and NGOs encourage corporations to consider their sustainable impact in their decision making (Maon et al., 2013).

The most common case in all supply chains, is that the end-consumers are the ones responsible for a monetary flow. According to Grant et al. (2013) this means that even though companies have an interest in investing in efforts for sustainability, they also rely on the consumers' willingness for pay for the extra costs and adapt to restrictions. Thus, Grant et al. (2013) suggest that companies should work in closer collaboration with consumers and making them realise the sustainable implications of products.

### 2.5.2 Regulations

Research has shown that regulations is an important driver for corporate sustainability responsiveness (Maon et al., 2013). With escalating fines and legal costs, the importance of complying with regulations and laws have been underscored. Companies also have the possibility to avoid expensive capital refits by apply a proactive approach and stay ahead of regulations and laws (Maon et al., 2013). According to the authors, companies are adopting environmental and sustainable management practices as a response to an increasingly difficult regulatory business environment and increased market pressure. Maon et al. (2013) further state that the largest motivation for increased sustainability initiatives in companies involves compliance with legislations and cost or quality considerations and that these legislations is the sustainability-related issue with the greatest impact on companies.

The movement towards greater sustainability responsibility and sustainable practices is a result of several recent developments, including the introduction ISO14001 certification and the emphasis on waste reduction from both external and governmental agencies (Maon et al., 2013). Furthermore, the authors state that the requirements of sustainability is also influencing decision making and management regarding product design, process design, manufacturing practices, and purchasing and that these sustainable management practices are becoming increasingly popular due to both voluntary and international standards and certifications. Since the release of ISO certifications, there has been an increased pressure on corporations and supply chains to address sustainable performance (Maon et al., 2013).

### 2.5.3 Financial Benefits

It is often difficult to link major advantages of profitability with sustainability. Implementing sustainable practices create a good reputation, employer branding, and can help increase the productivity of internal business activities, but the external effects are difficult to monitor (Tseng et al., 2015).

Furthermore, there is increased pressure from the public and politics to increase the sustainability among companies, and many studies has during the years been performed regarding companies move towards environmental issues and the subsequent business performance (Maon et al., 2013). These studies have, according to Maon et al. (2013), shown that companies with higher responsiveness regarding sustainable issues and with increased eco-orientation perform better in the competitive market. The authors further state that economic opportunities drive corporate sustainability and eco-orientation. For example, by intensifying production processes and increase effectiveness, companies are able to reduce environmental impact and increase sustainability, while at the same time lowering costs of inputs and waste. The authors also state that sustainability initiatives could indirectly benefit the economic bottom line of companies. The ISO14001 standard could for example help prevent expensive environmental non-compliances but also pushes companies to go above and beyond, and increase pro-activeness of regulations (Maon et al., 2013).

However, Mefford (2011) argue that the economic rationale to operate a global supply chain with a high level of sustainability is well developed. The author anchors this argument on the idea that decisions based on marketing, finance, and production which by engaging sustainable behaviour will increase sales, decrease costs, reduce risks, and increase profits. For example, production improvements could cause effects marketing and financial risks which are complementary and effects which provide important benefits towards stakeholders, such as employees, customers, environment, and society (Mefford, 2011). Companies with global supply chains often have a trade-off between cost savings from labour costs which could arise with “sweatshop” conditions and other unsustainable practices against the possibility of negative publicity and harm to companies’ reputation (Mefford 2011). Negative publicity and customer boycotts are difficult to anticipate and quantify in terms of effects on revenues but could however lead to lower profitability as the brand is weakened.

Furthermore, Mefford (2011) state that sustainable practices in production processes have the possibility to significantly boost quality and productivity, which in turn could lead to better brand equity, higher sales, and greater revenue in compliance with marketing effects of sustainability. For example, the implementation of higher degrees of lean in production results in better working conditions, improved employee morale, better training, and increased skills of workers, which in turn results in higher quality of production and productivity of resources, resulting in lower costs (Mefford, 2011). Furthermore, the author state that financial effects also occur due to the greater predictability of cash flow and reduced risk which results in a lower cost of capital.

#### 2.5.4 Competitive Advantage

Maon et al. (2013) state that much previous research has discovered that excelling in sustainable behaviour create opportunities to achieve competitive advantage. Maon et al. (2013) further state with the aid of reviews of integrating environmental management, mostly purchasing and supply chain managers have a major impact on the ability of a company to both develop and sustain a competitive advantage through sustainable practices.



The authors further state that there exist several frameworks used to categorise different types of competitive environmental strategies that can be utilised by decision-makers and managers in order to optimise the economic return on different sustainable investments, and ultimately transform these investments into opportunities for competitive advantage. Maon et al. (2013) also identifies four types of environmental strategies which are based on the structure and composition of the industry that companies operate in, the position of the company within the industry, the types of markets the company serve, and its capabilities. According to the authors, these strategies include eco-efficiency, beyond compliance leadership, eco-branding, and environmental cost leadership, and these strategies can be used as a foundation from which companies can prioritise sustainable investments.

## 2.6 Towards a Definition of Sustainable Supply Chain Management

It has been discovered that there exist various definitions of both sustainability in contemporary literature, depending on the context, as well as regarding SSCM. Numerous authors and experts have proposed multiple definitions of the terms and all definitions suggest that not only a focus on economic aspects is sufficient. Aspects concerning nature and society as a whole is also required (Winter & Knemeyer, 2013).

As previously mentioned, SCM can be defined as the systematic, strategic coordination of traditional business functions both within an individual company and across companies within supply chains, both for the purpose of improving long-term performance of individual companies and the supply as a whole (Mentzer et al., 2001). Additionally, this thesis focus on the three major areas of sourcing, operations, and logistics of the supply chain and includes aspects of SCM towards these areas. Furthermore, companies have increased their focus on environmental and social performance in addition to economic aspects. Companies, therefore, have an increased focus on long-term profitability to reduce risks regarding environmental and societal impact, (Chin et al., 2015) and this is where SSCM comes into context. There exist a variety of definitions regarding SSCM, each one well developed in its own context. But as stated by Tseng et al. (2015), the core concept is to integrate sustainable aspects of environment, society and economy into SCM to allow organisations to achieve long term viability.

The concept of SSCM can additionally be applied to the different areas of SCM analysed in this thesis; sourcing, operations, and logistics. As previously mentioned, this allows further insight into the different practices performed in each areas, as well as an understanding that sourcing activities often have the largest impact on sustainable aspects of SCM (Grant et al., 2013). Furthermore, the drivers for SSCM previously mapped in this study is of importance for the further implementation of SSCM practices. Among these drivers, increased customer demand, tightened regulations, as well as benefits from increased competitive advantage and financial benefits are perceived as the most important.

### 2.6.1 How Should Sustainable Supply Chain Management Be Defined?

For the development of a definition of SSCM for this thesis, using the definition of SSCM by Winter & Knemeyer (2013) in combination with the three factors suggested by Kim et

al. (2014), supply chain-profitability, eco-efficiency, and social-effectiveness, the definition is perceived to be well developed for this study. The definition takes into consideration all aspects of TBL and includes key stakeholders of SCM. Furthermore, while the authors discuss that it is difficult to measure all dimensions of SSCM with the same analytical framework, with potential conflicts arising in the interfaces between dimensions, applying organisational practices which incorporate best practices from sustainability and traditional SCM the impact of these challenges can be minimised.

Conclusively, the development of a definition of SSCM in this thesis can thus be said to result in the following:

*“Sustainable Supply Chain Management is the management of material, information and capital flows as well as cooperation among companies in the supply chain network while simultaneously taking into account goals of sustainable development, regarding supply chain-profitability, eco-efficiency, and social-effectiveness.”*

To illustrate the developed definition of SSCM in this study, Figure 3 has been produced. It aims to illustrate the three aspects of sustainable development; supply chain-profitability, eco-efficiency, and social effectiveness, applied towards SCM.

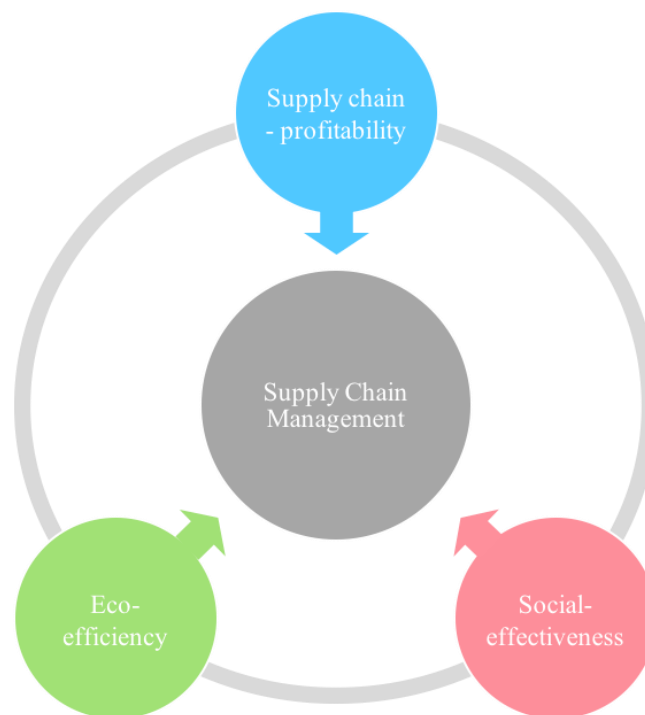


Figure 3. Illustration of the developed definition of SSCM for this study.

## 3. Methodology

The following section explains the methodology used throughout the performed study, in order to reach the aim and answer the research questions. This section, therefore, presents the research approach, selection of industries and companies part of the study, the research process as well as reliability and validity.

### 3.1 Research Approach

A research approach is defined as how relations between theoretical data and empirical findings are created. Most commonly, there exist two different approaches: inductive and deductive (Bryman & Bell, 2003). An inductive research approach aims to progress from single observations to general judgements. Furthermore, an inductive research approach also often uses a vague problem definition and this is used together with empirical data to create new theories (Bryman & Bell, 2003). According to Bryman & Bell (2003), theory is, therefore, the outcome of research when using an inductive approach.

A deductive research approach on the other hand aims to test theories and hypotheses against collected empirical data in order to draw conclusions (Bryman & Bell, 2003). A deductive approach represents the most common view on the relationship between theory and research. This research approach aims to deduce a hypothesis based on known literature that is subjected to empirical scrutiny (Bryman & Bell, 2003).

An inductive research approach has been used in this study. This choice was made based on the importance of conducting observations and later be able to progress those into general judgements. Moreover, it was concluded that a broad perspective and an open approach was of high importance in order to not overlook theory or empirical findings of significance due to subjective or predetermined values.

### 3.2 Selection of Industries and Companies

The industries selected in the study are the manufacturing, automotive, textile, and transportation industry. The industries investigated in the study has been selected in unison with ÅF, in which ÅF has suggested several industries of interest. The suggestions were based on ÅF's current interests and the potential for additional clients for ÅF. Based on these suggestions, the study made a final decision regarding which industries to investigate, based on the following criteria:

- The industry has a high focus on sustainability
- The industry is eminent in sustainability

Furthermore, there are eleven companies included in the study, divided between investigated industries. These companies were mainly selected by the members of this study, in addition to some input from ÅF, due to their sometimes recent contact with companies in the selected industries or previous knowledge. The manufacturing industry includes ABB, Ericsson, and IKEA. Furthermore, companies studied in the automotive industry are Volvo Cars and Volvo Group. H&M, Inditex, KappAhl, and Lindex are companies included in the textile industry, and finally DB Schenker and DHL are the

companies of the transportation industry. These companies are chosen based on the following criteria:

- Recommended by ÅF based on:
  - Previous knowledge about the companies' sustainability work
  - Part of ÅF's customer base
- Have an international presence
- Have operations in Sweden
- Information available regarding their sustainability work

The companies included in the study are further presented in the empirical section. In the empirical section each company is presented and the company's respective work with SSCM and related practices is presented in terms of focus areas, objectives, drivers and benefits, as well as challenges.

### 3.3 Research Process

The process used in this project contains of five major phases. Those phases are the defining and planning the project, literature review, empirical findings with included analysis, discussion, and conclusion and recommendations. Figure 4 illustrates a view of the process that is used containing the five major phases.

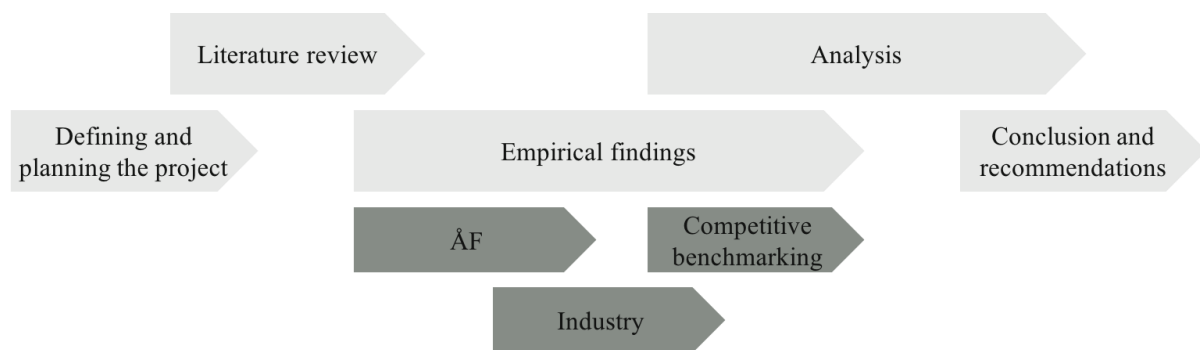


Figure 4. Research process used for the study.

In the phase of defining and planning the project the research questions and goal of the project was decided. This together with the planning of what to do when, e.g. how to conduct the literature review, what interviews to conduct, and industries to target. Furthermore, the literature reviews were conducted by collect relevant information in articles and literature to continue with forming the outline of the review, i.e. deciding the structure. See chapter 3.3.1 for more information.

The empirical findings were conducted through interviews and data collection from other sources, e.g. the homepage of the company studied, sustainability reports, and interviews. The empirical finding is divided into three main sections ÅF, industries, and a mapping of consulting companies working with SSCM. The section about ÅF contains information regarding their sustainability work and the different departments part of the study, as well as the findings from the interview study conducted at ÅF. Furthermore, the industry sections provide the empirical findings regarding the four different industries with

corresponding companies taking part of this study. For instance, information about their needs in SSCM, and trends. Finally, the mapping of additional consulting companies working with SSCM, provides the empirical findings from potential competitors of ÅF and how they work with sustainability and SSCM. See chapter 3.3.2 and 3.3.3 for more information of how the empirical findings was collected.

The analysis and conclusion and recommendations analyses the collected data and conclude answers to the research questions. Analysis of collected data is done by structure the data collected and systematic mapping the data points together in order to create a foundation for conclusions and recommendation, i.e. analyse the data to answer the research questions. The conclusions and recommendations is then based on the analysis of the collected data. This process was conducted iterative, meaning that the steps was not conducted sequential rather systematic combined together (Dubois & Gadde, 2002).

## 3.4 Data Collection

The main aim of the data collection in this study has been to collect qualitative data that, according to Wideberg (2002), aims to analyse low structured data, such as interviews, surveys, and decisions. The qualitative methods of data collection have been a literature review and interviews.

Data can be collected both as primary and secondary data (Bell, 2000). Primary data is according to Bell (2000) information that is collected specifically for the performed study, e.g. interviews. Secondary data is data already collected previously from other sources, e.g. literature, articles, and websites. Therefore, primary data is information that the researcher collects personally whilst secondary data is information already existing and collected by a third party. This study uses both primary and secondary data that is used of both the literature review and empirical finding. These two sections lay the foundation for the result, conclusion, and recommendations.

Following, in this section, the different approaches used to collect data is explained more thoroughly. The approaches are literature review, interviews, and additional sources of information.

### 3.4.1 Literature Review

The literature review is done by firstly collect relevant information needed to cover the following subjects from articles, journals and books:

- Sustainability
- Supply Chain Management
- Sustainable Supply Chain Management
- Areas and practices of Sustainable Supply Chain Management
- Drivers for Sustainable Supply Chain Management

The articles, journals and books are mainly accessed through two databases. One of the databases used is the one provided by the library of Chalmers University of Technology, Sweden, and the second database is Google Scholar. They both have a similar structure

where the user can type in different relevant keywords in order to search among journals, articles, and books.

Following is the keywords used to find information:

*“sustainability”, “supply chain management”, “automotive”, “textile”, “manufacturing”, “transportation”, “procurement”, “production”, “packaging”, “logistics”, “reverse logistics”, “risk management”, “supplier evaluation”, “corporate social responsibility”*

There exist a vast amount of information regarding these areas of literature. To facilitate this amount, a selection of literature has been made based on relevance to the scope of this thesis and the industries investigated, as well as how the sources can be applied to add value to this study. Furthermore, throughout the study original sources has been used to the fullest extent possible. According to Eriksson & Wiedersheim-Paul (2008), using original sources lowers the risk of bad quality input and misleading information in the study.

### 3.4.2 Interviews

Data collection in the form of interviews has been performed in large extent in this study. The majority of interviews has been performed at ÅF as an internal process to gain knowledge of their current situation as well as goals and targets for the future. Interviews to gain an external perspective of the different industries analysed has also been performed. These interviews have been performed to the fullest extent as possible, with the limitation that not all companies for each industry was available for interviews. This limits the exhaustiveness of industry interviews, however, this limitation is instead replaced by an exhaustive collection of additional data collection, further presented below, for these companies.

The interviews performed in this study was conducted through physical meetings and via telephone. The structure of the interviews followed a semi-structured approach, meaning that the interviews was conducted following pre-set questions created before the interview with a possibility to ask follow-up questions (Bryman & Bell, 2011). This approach was picked with the aim of allowing the interviewee to further develop their answers and for both the interviewee and interviewer complement the core areas addressed.

The interviews roughly contained of 15-20 questions, see Appendix A for interview questions used at ÅF and Appendix B for interview questions used during industry interviews, and lasted 40-80 minutes each. The questions asked are covering the dimensions of AS-IS, e.g. how the companies work with sustainability today, what projects are conducted, and TO-BE, e.g. how they want to work with sustainability, how to implement, future trends, areas that affect sustainability and it usability. The main part of the interviews was conducted by two persons, whereas one asked the questions and the other person listened to the answers, took notes, and complemented with follow-up questions.

After conducted interview the answers were discussed in order to summarise the main and most important aspects. In a few cases the interview was recorded, then the

recording was transcribed so no important information would be missed. The process of summarising the interviews straight after the interview reduces the risk of misunderstanding and losing information.

### *Interviews at ÅF*

In total, 17 interviews have been performed at ÅF to achieve an internal perspective of the company's sustainability work as now and how to increase sustainability in the Supply Chain Management department's services. Contact information regarding internal data collection at ÅF has primarily been provided by the thesis group's supervisor. Furthermore, section managers for different regional areas of ÅF regarding SCM has provided local contact information as well. See Table 1 of interviewees at ÅF for whom participated in the interview study.

Table 1. Interviewees at ÅF.

<b>Location</b>	<b>Department</b>	<b>Position</b>	<b># of Persons</b>
<b>Gothenburg</b>	SCM	Senior Project Manager	2
	Infrastructure	Project Manager	1
	Corporate Management	Sustainability Manager	1
<b>Malmö</b>	SCM	Head of Department	1
		Consultant	2
		External Consultant	1
	Packaging	Head of Department	1
		Consultant	1
<b>Stockholm</b>	SCM	Head of SCM	1
		Project Manager	2
		Consultant	2
	Management Consulting	Head of Management Consulting	1
	Infrastructure	Manager	1

### Industry interviews

In total, 7 interviews with companies in the industries investigated has been performed. Contact information has partially been provided by ÅF, however, the information has primarily been provided from the industry companies' own websites and reports in addition to recommendations from the analysed companies. See Table 2 of industry interviews of companies participated in the interview study.

Table 2. Industry interviews.

<b>Industry</b>	<b>Company</b>	<b>Department</b>	<b>Position</b>
<b>Manufacturing</b>	Ericsson	Compliance Management	Manager
	IKEA	IKEA Range and Supply	Sustainability Manager
		IKEA Industry	SCM Manager
<b>Automotive</b>	Volvo Cars	Value Chain Development	Senior Director
		Inbound & Outbound Logistics	Vice President
		Operational Development, Environment	Manager
<b>Transportation</b>	DHL	Global Forwarding	Environment & Quality Manager
<b>Textile</b>	-	No interviews conducted	No interviews conducted

### 3.4.3 Benchmarking of Current Service Offerings

For the mapping of additional consulting companies' work in the area of SSCM, data collection has consisted of reports and information through the consulting companies' web-pages. This data has been the primary source of information in the benchmarking of competitors in the consulting industry. Data collection for the performed competitive benchmarking has been facilitated by contact information provided by ÅF and contact with respective company. The benchmarking is primary based on additional sources such as Sustainability Reports or other presentations presenting the companies' way of working. The purpose of this benchmarking has been to further understand how consulting firms currently work with SSCM and how other firms have developed their service offering based on their customers' demand regarding SSCM. However, only a brief benchmarking of the service offering of these companies has been performed, due to the high amount of secrecy regarding the consulting industry in general. The benchmarking thus consists of a brief overview of why and how these consulting companies work with sustainability and SSCM, as well as what service offering the companies have in the area of SSCM.



The companies included in the benchmark are Accenture, Deloitte, and PwC. These consulting companies are chosen based on their high focus of service offerings regarding sustainability and SSCM, as well as well-documented work in these areas. It is important to understand that these consulting companies work on a more strategic level in comparison with ÅF, but it is still believed that synergies are discoverable and that it is possible to draw conclusions applicable towards ÅF based on findings.

#### 3.4.4 Additional Sources of Information

In addition to the theoretical framework and interviews, additional sources of information have been used regarding the industry study. Additional sources of information have mainly been data collection from companies' Sustainability Reports, which has been used as a source in order to collect data about their work as a part of the empirical findings. These reports present the companies' view on sustainability and SSCM, how they work within the area today as well as their goals. In total, 10 of the 11 analysed companies had Sustainability Reports, and these have all been analysed. Furthermore, information regarding companies' sustainability work was collected through their company web-pages. Some companies did not have a documented Sustainability Report to collect data from, and in those cases the data was replaced by further collection from websites and articles.

### 3.5 Reliability and Validity

Reliability and validity of a study deals with emphasising possible uncertainties and unknowns in the study's execution that could affect the result. When performing a qualitative study, the process of data analysis is of critical importance for the reliability. Since the process involves a transformation of raw data towards an explanatory theory there is a high risk of variation in how the data is analysed, depending on the researchers and approach of use (Vishnevsky & Beanlands, 2004). This can sometimes be really difficult if the collected data is not well documented and structured (Bryman & Bell, 2011). Therefore, the quality of the data and the analysis is strongly correlated to continuous documentation of field notes and interviews. If the way of dealing with qualitative data is not properly conducted this can affect the credibility of the analysis. However, in order to gain credibility, the researchers first individually analyse the collected data before comparing and merging the results together into a common conclusion (Bryman & Bell, 2011).

The thesis has dealt with a big amount of qualitative data. The data was thoroughly documented by a structured approach, e.g. by documenting the answers of the interviews with a structured approach, notes during the interview was conducted in an excel matrix and later reviewed for adding more information in possible gaps, so that no data was lost and easy to interpret when analysed. By having structured data with clear notes a solid foundation for the analysis was created. The analysis of the data was systematically conducted, i.e. the analysis was carefully conducted in order to bring all data at hand into the analysis avoiding to miss important data points. Furthermore, the analysis was systematically combined with the different data sources as well as theory. By using several different sources of data, interviews, literature and articles, and additional sources increased the reliability. Both reliability and validity has been enhanced by conducting several interviews with different people about the same area of subject.

Therefore, data from different interviews could be verified and/or new points of views be added.

According to Denscombe (2009) all collected data must be assured to be valid, reliable and objective in order to guarantee that the study maintains a high quality throughout. Since the information used from the data collection have been mostly qualitative a validation process of triangulation has been used (Denscombe, 2009). Triangulation means that researchers understanding and knowledge of the collected data increases by collecting data from multiple perspective and standpoints and compiling it to investigate convergences or divergences between different sources. This is done by collecting primary data through interviews, secondary data from literature and articles, and finally comparing those findings with data from companies in different industries.

By critically examine the sources being used reliability is reached. Furthermore, by being open minded meanwhile the data collection and comparing different theories against each other the objectivity whilst conducting the study has been reached.

Reliability has been achieved by critical examination of sources and their trustworthiness. Generalisability has been achieved by using a broad perspective and through the application of an open mind and attitude towards the sources and work areas, and weigh the contradictory theories against each other having the objectivity achieved (Bryman & Bell, 2011). The generalisability is achieved by creating an overall definition of SSCM and conducting empirical findings in the industry meaning that the data found, e.g. trends of SSCM, can be applicable in other areas, e.g. by any company interested in developing their products and/or services targeting a specific industry.

## 4. Focal Company Description; ÅF

This chapter includes the empirical findings of ÅF. First information about ÅF is presented followed by their work with sustainability and the two departments, Supply Chain Management and Purchasing, studied in this project. Furthermore, a brief overview of a few reference cases conducted by ÅF is presented, and finally the empirical findings of sustainable supply chain management at ÅF's offices in Gothenburg, Stockholm, and Malmö as well as identified interfaces between ÅF, customers, and society.

### 4.1 ÅF

ÅF was founded in year 1895 and is an engineering and consultant company that since their foundation has been helping clients with assignments in the energy, industrial, and infrastructure sectors. Today ÅF is about 8,000 employees spread all over the world in their 30 offices, spanning from Brazil to Vietnam. In year 2015 ÅF conducted projects in more than 100 different countries (ÅF, 2016).

ÅF is divided into four divisions acting in three sectors. The four divisions are Industry, Infrastructure, International, and Technology. The sectors of energy, industry and infrastructure each contain a large number of industry areas and private and public activities. The Industry and Infrastructure division of ÅF is based in Scandinavia, however, the Technology division is based in the Swedish market. All divisions participate in international projects and often work jointly in-order to create cross-functional and stronger teams (ÅF, 2016).

### 4.2 Sustainability

Sustainability is a part of the business model and strategy that ÅF work towards. ÅF maintains a constant focus on sustainability in order to create value for its shareholders, employees, clients, and society as a whole (ÅF, 2015). They strive to build a profitable company based on a long-term balance between social, environmental, and economic interests. See Figure 5, the three dimensions of ÅF's sustainability work (ÅF, 2014).

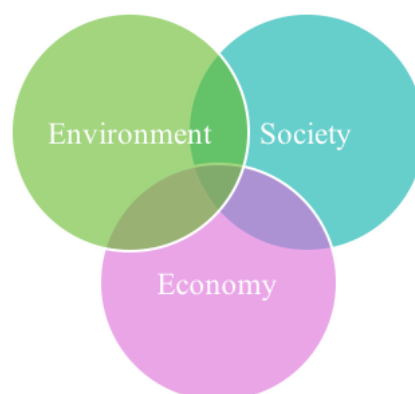


Figure 5. ÅF's three dimensions of their strategy of sustainability that they strive to build a profitable company base from (ÅF, 2014).

The sustainability strategy is based upon the ten principles supporting human rights, labour, the environment, and anti-corruption that are enshrined in the UN's Global Compact. However, the three dimensions of ÅF's strategy of sustainability are further decomposed into nine key sustainability indicators. The nine key sustainability indicators are created in order to make the positive effects of their consulting activities as clear as possible and is a way to describe projects. In summary, the three dimensions of ÅF's strategy of sustainability, i.e. three dimensions of sustainable development, and the UN Global Compact regarding human rights, labour laws, the environment, and anti-corruption creates the foundation upon which all ÅF's work rests upon (ÅF, 2015).

The nine key sustainability indicators are divided as three, each under each group. The three indicators of social interests are improving health and safety, promoting social inclusion and supporting human rights, and supporting diversity and equality. Reduced greenhouse gas emissions, renewable energy, and pollution-free environment are the indicators of environmental interests. Furthermore, the three indicators of the economic interest are supporting local economic growth, more efficient use of resources, and improving production efficiency. A deeper explanation of the nine key indicators of sustainability and their role in projects is presented in Table 3 below (ÅF, 2015).

Table 3. ÅF's nine indicators of sustainability decomposed from the three dimensions of ÅF's sustainability work (ÅF, 2015).

<b>Dimensions of sustainability work</b>	<b>Key indicators of sustainability</b>	<b>Explanation</b>
<b>Social</b>	Improving health and safety	Leads to improve health and safety in workplaces, or more generally in society. Includes both psychological and physical aspects, for example, improved lightning, reduced use of chemicals, or other measures that improves the safety of personnel in the workplace.
	Promoting social inclusion and supporting human rights	Aims to improve the social inclusion and supports human rights. Including measures to reduce poverty and the risk by improving access to electricity.
	Supporting diversity and equality	Promotes diversity and equality, for example by development of urban and infrastructure planning that provides enhanced access and raises perceptions of safety and security.
<b>Environment</b>	Reduced greenhouse gas emissions	A positive contribution to projects by improving energy efficiency, promoting renewable energy and reducing overall energy use or the use of fossil fuels.
	Renewable energy	Comprises feasibility studies or the actual construction of facilities that use energy from renewable sources, or that

		are converted to expedite the transition from fossil fuels to renewable sources of energy.
	Pollution-free environment	Delivers environmental benefits in terms of reduced emissions of pollutants to air, water, and land. Introduction of substances that are less harmful, or technology that facilitates the recycling and reuse of substances emitted is included.
<b>Economic</b>	Supporting local economic growth	Promotes new solutions or innovations, providing local communities with opportunities of economic growth. Projects resulting in improved management and stewardship of natural resources, reduction of pollution or better access to energy so people can provide for themselves and increase their income.
	More efficient use of resources	Reuse of raw material or identifies a new use for previously unexploited resources.
	Improving production efficiency	Change in production processes and a more efficient use of resources that raise overall production efficiency.

During the year of 2015 ÅF identified three focus areas for long-term profitability. The three areas of sustainable solutions, responsible business, and attractive employer. Following is an explanation of the three areas (ÅF, 2015).

#### 4.2.1 Sustainable Solutions

ÅF claims they have good opportunities to make a difference with sustainable solutions in the projects conducted for their clients due to the full presence in e.g. the value chain. The knowledge in technology and engineering enables a possibility for ÅF to propose sustainable all-round solutions throughout the entire value chain of the clients – from choice of material till production to ÅF’s client’s customers. ÅF advocates that the solution and key to success to tomorrow’s challenges is new technologies and knowledge. However, ÅF emphasise that technical solutions must be integrated with other changes to produce results: successful solutions are built on cooperation and collaboration. They find that creating new technical solutions is a way to help their clients to meet their sustainability targets, contribute towards more positive social development and at the same time enhance their and ÅF’s competitive advantage and strength (ÅF, 2015).

#### 4.2.2 Responsible Business

ÅF is present in more than 90 countries worldwide and, therefore, have a chance to influence the businesses and communities within which they work. Due to the global

presence and the complexity of some markets ÅF works in ÅF finds that the markets they working are having a big demand on the way they work and conduct business. Therefore, it is crucial for ÅF to follow the principles they state they do e.g. the ten principles of UN Global Compact. Before starting a new project ÅF works with deep risk assessments in-order to assure that the project to be started is aligned with their own guidelines and the Global Compact (ÅF, 2015).

#### 4.2.3 Attractive Employer

In addition to creating sustainable solutions and being responsible in the business conducted ÅF identified the importance of being an attractive employer. This means that they need to stay competitive in-order to attract the personnel suitable for consulting and having the knowledge needed. For instance, due to the increase of sustainability they have to expand the knowledge base of their employees and attract the competence needed. However, ÅF is also taking a strategic initiative increasing the proportion of female employees and managers at the workplace. This with the focus of creating their workplace equal. This is not only in terms of mix of gender, also trying to guarantee equal opportunities regardless of gender or ethnicity and a sustainable career development (ÅF, 2015; ÅF, 2014).

### 4.3 Supply Chain Management Department

The SCM department of ÅF offers logistics and sourcing consultants with skills in process optimisation, inventory control, and strategy. ÅF optimise their customers' business in several industries, for example manufacturing, automotive and food and pharma. They often take on big and complex projects or assignments whereas they sometimes have a cross functional team spanning over different areas of technology and departments of the company. By doing so they managed to reduce lead times and cost of the project or assignment conducted.

The services ÅF conduct includes improving their customers' competitive advantage. This is done by synchronising suppliers, manufacturers, distributors, and customers meanwhile meeting their customers' needs of adaptation, i.e. finding tailored solutions for their problems and situations.

The SCM Department offers services within seven different areas. Those are:

- Market & Sales
- Service & After market
- Recycling & Disposal
- Purchasing
- Quality
- Logistics
- Production

Additionally, ÅF illustrate their service offering in SCM in accordance with the following Figure 6.



Figure 6. ÅF's service offering regarding SCM.

For instance, ÅF both have junior and senior consultants with knowledge and experiences of operational logistics, i.e. within logistics processes, lean management, flow simulation, and continuous improvements. Furthermore, ÅF offers consultants within purchasing that have experience of sourcing and procurement. They are often working with anticipation of risks, secure quality, and resolve conflicting objectives between departments.

#### 4.4 Packaging Department

The Packaging Department is a separate department from SCM working with different packaging solutions and processes. Packaging is working throughout the entire value chain, from raw materials till production till recycling, with development of e.g. new packages, optimisation, and improvements of existing packages and process. The packaging department and SCM department have a close collaboration in projects or assignments.

Packaging categorise their projects into three categories. Those are Transportation Optimisation, Complete Solution, and Change of Material. The projects within Transportation Optimisation are cost reduction projects focusing on the overall strategy for their customers packaging and e.g. reduce number of parts, decrease transportation costs, and/or decrease carbon footprint for example due to reduced number of containers and scrapped material. Projects within Complete Solutions often are development projects where a complete solution for the customer is developed containing e.g. construction, material specifications, cost analysis, and implementation. Change of Material is in the form of cost reduction projects working with existing solutions e.g. focusing on reducing amount of material, changing material, and constructional changes to reduce number of parts.

## 4.5 Reference Cases

In the following section, a selection of reference cases is presented related to SSCM performed by ÅF. The section aims to illustrate how ÅF has worked with sustainability aspects regarding SCM in the past, both directly and indirectly. Due to confidentiality issues, only a brief overview of the reference cases is presented below:

- Logistics centre for reverse logistics: Development of a logistics centre for increased capacity to match future requirements on flexibility and volumes regarding reusable pallets.
- Simulation of flow for localisation of production site: Aiding in logistics planning of new production site in terms of providing data on cost, environmental aspects as well as staffing concerns.
- Increased efficiency of transports: Mapping and development of possibilities for increased efficiency of transports between production sites, accounting for facility layouts, logistics, traffic intensity, and bottlenecks.
- Evaluation of internal transports by trucks: Development of decision basis for investments regarding selection of transportation, number of vehicles, staffing requirements as well as inventory needs.
- Development of packaging concepts: Performed at ÅF Packaging Development department. Development of packaging solution concept to showcase the products in a good way, increase logistics efficiency, decrease environmental impact, and increase assembly efficiency.
- Consolidation and increased efficiency of production operations: Aiding a company in need of heightened consolidation and increased efficiency with resource support in terms of competence and experience regarding project management and production development.
- Development of future-state for production site: Development of future-state with 30 per cent reduced transport distances, and 15 per cent reduced transport costs for a company required to create a safe, distinct, and effective future-state for future production and transport operations.

## 4.6 Sustainable Supply Chain Management at ÅF's Offices in Gothenburg, Stockholm, and Malmo

The interviews conducted in the study at ÅF is completed with people from the Gothenburg, Stockholm, and Malmo office. In section 3.3.2 is a list of whom participated in the interview study. Following is the findings from the interviews presented divided into the subsections of interviews and interfaces.

Sustainability is part of the project that is conducted today from the SCM department, however, only Stockholm conduct projects that are directly related to sustainability meaning that the topic or main goal of the project is to create something more sustainable. Those projects conducted in Gothenburg and Malmo do not have a direct connection to sustainability, instead an indirect connection. This means that the projects they conduct have a positive effect on e.g. the environment from optimising logistics flows, which reduce the CO2 footprint for example.



At ÅF they spot a trend of increasing focus on sustainability. This is both in general terms, but also within SCM. Their customers are in greater need of having services that directly or indirectly have an impact on sustainability. However, the customers are not willing to pay the price for sustainability, unless they have to. The general trend of increased focus on sustainability is highly connected to the society, as of sustainability being a hot-topic, as well as from political initiatives. In short, the increased focus and development of sustainability among customers is mainly based on laws and regulations as well as pressure and awareness from society, by changing customers to ÅF improves their competitiveness, i.e. having increased competitive advantage.

Identified areas of where in SCM sustainability can have the most impact is varying between the different offices of ÅF. However, overall a common answer is that sustainability can play a role in the entire chain, from resources till finished goods. Certain areas identified in the interviews are logistics, transportation, packaging, and purchasing.

A key area is the interaction with customers, in this case of how to sell SSCM services. Most of the people interviewed agreed that the obstacle of conducting sustainable SCM projects is not the project itself, it is motivating customers to focus and spend money on those type of projects. As earlier mentioned, this is not done unless the customer are forced to do a change or find some sort of competitive advantage. Unless a customer can see a economic benefit, very few customers will invest and spend the money on sustainability in services, i.e. it is all about economy. In addition to economy, if it is possible to highlight any customer advantages of investing money in SSCM services this may as well help. To sell a SSCM service it is, therefore, necessary to connect the service to economic benefits, create sustainability measurements and show improvements if the service is implemented, and be able to highlight customer advantages.

ÅF do find a gap of knowledge when it comes to sustainability. Broadly speaking, they find themselves to be aware of what it is but seldom be aware of when they use it in projects, again the direct versus indirect use of sustainability in SCM services. It is also a gap of how to create sustainability measurements and connect the services to economic benefits.

Table 4 below is a summary of the interviews conducted at ÅF. It as well contains a comparison between the offices.

Table 4. Work with SSCM in Gothenburg, Stockholm, and Malmo.

	<b>Gothenburg</b>	<b>Stockholm</b>	<b>Malmo</b>
<b>Is SSCM part of projects today?</b>	Indirect part of projects, e.g. economic optimisations.	Indirect and direct, e.g. conducting projects with sustainability as one of main goals.	Indirect part of projects, e.g. economic optimisation and CO2-minimisation.
<b>Trends of sustainability:</b>			
<b>In general</b>	Increasing trend of sustainability in projects.	Increasing trend of sustainability in projects.	Increasing trend of sustainability in projects.
<b>Within SCM</b>	Increasing trend of sustainability within SCM.	Increasing trend of sustainability within SCM.	Increasing trend of sustainability within SCM.
<b>Reasons for development of SSCM</b>	Competitive advantages. Laws/regulations.	Customer awareness. Laws/regulations.	Competitive advantages.
<b>Areas of SSCM</b>	Transportation Entire supply chain Suppliers Products	Transportation Purchasing	Logistics Purchasing Packaging process
<b>Customer interactions</b>	Customer advantages Economy Measurements Definition	Customer advantages Economy Measurements Definition	Customer advantages Monitoring Economy
<b>Current SSCM competence</b>	Not enough	Not enough	Not enough

In short, SSCM is highly connected to regulations, the market, as well as economy. It is the regulations that forces companies to create sustainability as a demand. However, there are also pressure from the market through increased pressure and awareness from society, e.g. a trend on market that people buy fair-trade products can influence companies to change their way of operating and from where they purchase resources. Furthermore, it is important that SSCM is connected to economy, in any way be able to show companies what they can gain on being sustainable. However, how to measure the economic value of sustainability is somewhat difficult and, as off yet, not to the fullest extent manageable.

Conclusively, four criteria have been identified in order to create services regarding SSCM. Those are:

- Have a clear definition of sustainability and SSCM.
- Be able to highlight customer advantages.
- Connect sustainability to economic benefits.
- Make sustainability measurable, i.e. develop measurements.

## 4.7 Interfaces with Customers and Society

Based on the findings in previous chapters the interfaces of ÅF is mapped. Figure 7 illustrate the mapping of the interplay when it comes to sustainability. Meaning, what and who affect whom. The main driver, as already mentioned, is regulations in combination with pressure and awareness from society.

The figure also explains the found behaviour of ÅF's customers, i.e. what is needed in order to sell SSCM to them. As previously mentioned it is about creating sustainability measurements for example by connecting sustainability to economic benefits. Furthermore, the customers also have to feel the need to change e.g. by new political decisions, laws, and regulations for example adding a new ISO standard to follow.

Furthermore, Figure 7 includes the situation of ÅF. In interviews it was found that consultants, managers and so forth have to increase their competence regarding sustainability, or even more important, their awareness of how it is used in their services. Moreover, ÅF do conduct projects today that are pure SSCM projects and plenty of projects that have an indirect connection to SSCM, anyway their overall sustainability initiative throughout the company is in progress and have a big focus.

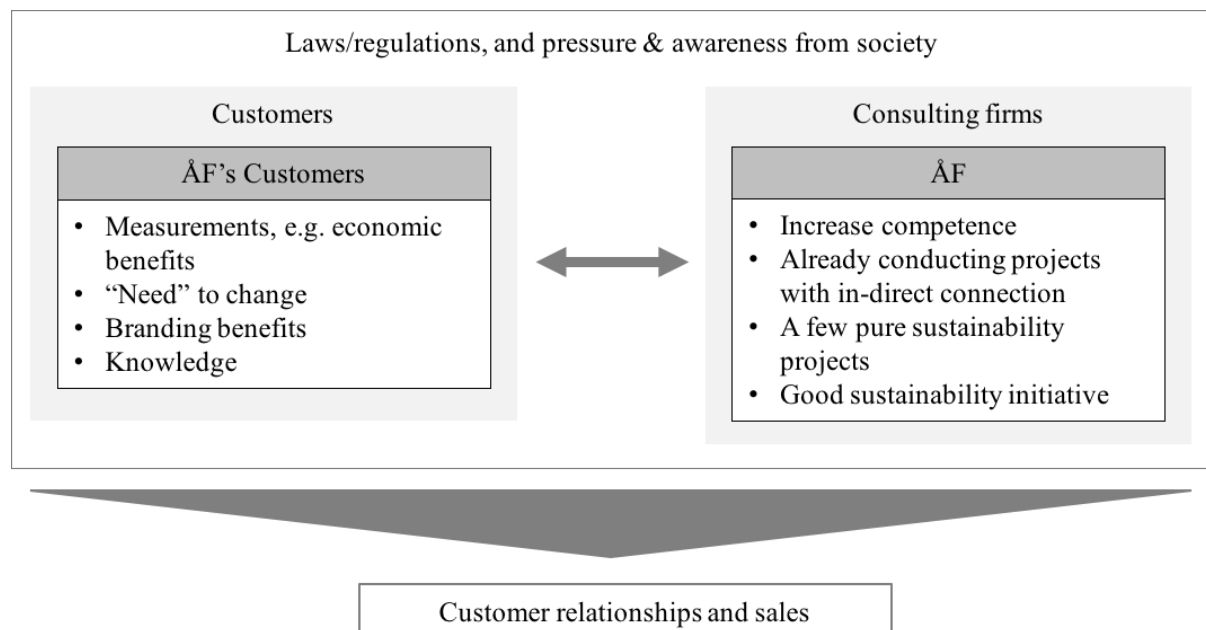


Figure 7. Interfaces between ÅF, ÅF's customers, and society.

Instead of developing actual services within SSCM it is important to focus on the process of sales and customer relationships to enhance perception of sustainability. Services conducted by ÅF today is indirect affecting sustainability and selling sustainability related services is something that ÅF find hard. Focusing on how to sell existing services and how to maintain and increase the indirect sustainability in SCM services can be the way to go.

## 5. Findings from the Industry Study

The following section presents the four industries; manufacturing, automotive, textile and transportation, as well as its respective companies investigated in this thesis. Firstly, each industry is presented as well as the companies in each industry. Then the company's respective work with SSCM and related practices is presented in terms of focus areas, objectives, drivers and benefits, as well as challenges. This is followed by concluding remarks and analysis of each industry in terms of collected information regarding SSCM. Finally, the section is concluded by a summary of findings for each industry and a cross-analysis between industries, in terms of focus areas, objectives, drivers and benefits, as well as challenges regarding SSCM.

### 5.1 The Manufacturing Industry

The following section presents companies investigated in the manufacturing industry, ABB, Ericsson and IKEA. Each company is presented with a summarised company overview and is followed by information regarding each company's work with SSCM practices and perspectives of SSCM. This information is conclusively summarised and analysed in the end of the section, with additional support from academic research.

The definition of manufacturing industry in the context of this thesis is broad, including companies both towards the ICT and retail sector. Companies in this industry is characterised by large-scale manufacturing operations, high differentiation of operations between different production processes and a global presence regarding production.

#### 5.1.1 ABB

ABB is a company specialised in power and automation technologies that enable their utility and industry customers to improve performance regarding all aspects from SCM to energy consumptions and lowering environmental impact (Baloglu & Arunachalam, 2010). The complete ABB group operates in around 100 different countries and employs around 100.000 people. Furthermore, the company has categorised its operations into four primary business segments which are electrification products, discrete automation and motion, process automation, and power grids.

Regarding SSCM, ABB has the areas of sourcing, production, and waste as main focus. Their main objectives are to increase their share of assessed suppliers, increase identification of risks in their supply chain and mitigate risks, increase resource efficiency in production processes, reduce share of hazardous materials used in production, as well as reduce water and waste from operations (ABB, 2015).

According to ABB (2015), their main drivers as well as perceived benefits of working with SSCM practices are the increased requirements from customers and stakeholders, stricter regulations and laws, as well as the enabling of reducing risk in the supply chain and improving resilience. However, the challenges of implementing SSCM and the continuous work with SSCM is the insurance of safety and security of employees, managing social and environmental risks of suppliers, and how to prioritise activities with the highest benefits for both sustainability and costs.

Conclusively, their main practices regarding SSCM with high focus include the following, according to ABB (2015):

- Ensuring supplier's compliance with ABB's Code of Conduct and to support continual improvement in the sustainability performance of suppliers.
- Requiring suppliers to identify sustainability risks and requesting evidence of social and human rights policies, and sustainability improvement programs.
- Safety training for suppliers and roll out of supplier safety reviews performed by local manager.
- Requiring ABB's most energy-intensive sites to undertake energy audits requiring all sites to develop an energy saving program.
- Implementing energy-efficient lighting solutions and optimising heating, ventilation and cooling processes and investments in more efficient equipment.
- Continuously phasing out hazardous substances in products and processes, with the ambition to use these substances in closed loops or not at all.
- Optimising product packaging by reviewing needs and assessing the potential to optimise packaging type, size and weight.
- Examining water flows at facilities and redesigning processes to enable increased recycling or reuse of wastewater.
- Optimising material use and increase the share of waste that is reused or recycled regarding metals, oil, plastic, wood and cardboard.
- Developing program to optimise logistics, resulting in cost savings, improved quality and reduced emissions.

### 5.1.2 Ericsson

Ericsson is one of the largest suppliers of mobile telecom systems on the globe, and have been active worldwide since the 1870s, currently employing around 61.000 people in more than 140 countries (Norrman & Jansson, 2004). Among their customers are the world's ten largest cell phone operators and around 40 percent of all mobile phone calls are performed through Ericsson's systems according to the authors.

Regarding SSCM, Ericsson mainly have the area of sourcing as main focus. Their main objectives are to properly identify and mitigate supplier risks related to sourcing, manage corporate responsibility risks, and to reduce environmental impact of production processes (Ericsson, 2014).

According to Ericsson (2014), their main drivers as well as perceived benefits of working with SSCM practices are both competitive benefits, increased pressure from market, customers and management, as well as the reduction of supplier risks in the supply chain. Furthermore, sustainability has for a long time been an integral part of the company. However, the challenges of implementing SSCM and the continuous work with SSCM is the enabling of industry-wide cooperation to ensure sustainability in all activities, proper traceability to avoid conflict materials, as well as challenge of obtaining proper data from suppliers to gain knowledge of material origins (Ericsson, 2014).

Conclusively, their main practices regarding SSCM with high focus include the following, according to Ericsson (2014):

- Taking further steps to increase the transparency regarding conflict minerals in the supply chain and improving the quality of supplier data.
- Informing suppliers and providing clarity around Ericsson's sustainability and Corporate Responsibility requirements.
- Engaging with suppliers through audit follow-ups and training to ensure continuous improvements.
- Evaluating suppliers' sustainability performance through monitoring and audits, also identifying high-risk suppliers.
- Reducing energy use in facilities and prioritizing purchase of green certified energy.
- Shifting to low-carbon product transport, from air freight to surface shipping
- Increasing fuel efficiency of fleet vehicles.
- Providing product take-back services to customers globally as part of Ericsson's Extended Producer Responsibility.

### 5.1.3 IKEA

IKEA is one of the top leading home furnishing companies in the world, and with their current vision of creating a better everyday life for the many people, the company employs around 127,000 people and has reached annual sales of 208 billion SEK in 2013 (Jonsson et al., 2013). The supply chain of IKEA has a wide global spread with both sales and purchasing in all regions of the world, where all stores are supplied through 30 distribution centres by around 1,400 suppliers from 55 different countries according to the authors.

Regarding SSCM, IKEA mainly have the areas of sourcing of materials, operations, and circular economy as main focus. Their main objectives are to increase share of sustainable suppliers, expand the reach and compliance of their supplier Code of Conduct, increase traceability of the supply chain, increase share of renewable energy sources, increase energy efficiency and reduce carbon emissions, as well as reduce waste from operations and increase the use of circular economy practices for products (IKEA, 2015).

According to IKEA (2015), their main drivers as well as perceived benefits of working with SSCM practices are the interest of staying proactive to stay ahead of regulations and standards, reducing both costs and risks in the supply chain, increased pressure from stakeholders, competitive benefits, as well as a win-win situation with benefits for both profitability and sustainability. However, the challenges of implementing SSCM and the continuous work with SSCM are finding sustainable improvements with direct relation to cost, the increasing complexity of sustainability issues, as well as staying updated with trends and regulations regarding sustainability (IKEA, 2015).

Conclusively, their main practices regarding SSCM with high focus include the following, according to IKEA (2015):

- Working towards increasing share of sustainably sourced materials, e.g. wood, board material, paper, cotton, and palm oil.
- Promoting the benefits of using legal, responsibly sourced, sustainable timber.
- Encouraging suppliers to work towards FSC Chain of Custody certification.

- Using a Sustainability Index to measure suppliers regarding management and impact, energy, water, waste, and chemicals.
- Expand and maintain reach of IWAY Code of Conduct of all direct suppliers and continue to secure sub-suppliers of critical material and processes.
- Prolonging product life, designing for circularity, and increasing the use of secondary materials.
- Aiming for 100% renewable energy, producing as much as is consumed (stores, warehouses, and industry group) and investing in becoming more energy efficient.
- Making responsible water management the norm across the supply chain, both for supplier factories, stores, and distribution centres.
- Aiming to eliminate waste from operations by creating less waste and changing mind-set to think of waste as a resource.
- Reducing emissions by making transport as efficient as possible and by using greener options.

#### 5.1.4 Analytical Comments on the Manufacturing Industry

Although there currently exists a variety of tools and guidelines in the area of sustainability in the manufacturing industry to assist companies in moving toward increased sustainable development, further development is needed according to authors and companies. Developing and providing better support for measuring, improving, and managing performance related to sustainability is required but still in an early phase (ABB, 2015; Ericsson, 2014; IKEA, 2015; Koho et al., 2015). Sustainability performance measurements and indicators have been recognised as important enablers towards a change to SSCM in the manufacturing industry according to the authors and companies. Identifying and developing sustainability performance indicators is of high importance, but also to understand sustainability in the specific manufacturing industry, in which performance measurements can be linked to companies' specific improvement and management systems (ABB, 2015; Ericsson, 2014; IKEA, 2015; Koho et al., 2015). Thus, there is an increased need to develop sustainability performance indicators and to further link these to decision-making and improvements.

Additionally, companies in the manufacturing industry have a high interest in identifying and linking financial benefits and impact from development and initiatives in SSCM. There has to be a rational business decision with decent payback for change to occur and also the initiatives with highest impact on both sustainability and economics should be prioritised (ABB, 2015; Ericsson, 2014; IKEA, 2015).

All companies in the manufacturing industry investigated have a high focus on sourcing operations regarding their development of sustainability in SCM. Both IKEA, ABB, and Ericsson are focusing on their sourcing operations, which includes procurement, supplier management, and risk management. Furthermore, IKEA also have a high focus on operations and circularity in their SSCM whereas ABB are more focused towards operations (ABB, 2015; Ericsson, 2014; IKEA, 2015). The objectives for SSCM in the manufacturing industry are, in accordance with the focus areas, related to sourcing issues. Many objectives concerns auditing and evaluating suppliers to reduce risks and increase traceability of the supply chain. Since especially ABB and Ericsson often have exotic materials in their products, a high focus is also to ensure that no conflict materials



are involved in their supply chain and that the amount of hazardous materials are reduced.

Drivers for the companies to work with SSCM includes increased pressure and requirements from stakeholders, such as customers, as well as requirements from regulations and standards, and top-management involvement. The benefits of SSCM are that the supply chains become more competitive and can receive a competitive advantage in comparison to the rest of the industry as well as documented benefits of profitability. Furthermore, the companies are able to reduce the risks of the supply chains and thus increase their resilience (ABB, 2015; Ericsson, 2014; IKEA, 2015). The challenges related to SSCM and its further development and implementation concerns the difficulty of finding direct relations between sustainable initiatives and improvements, and its relation to financial benefits. It is also a constant difficulty to keep in line with the development of new regulations and standards. Additional challenges are ensuring proper traceability of the complete supply chain and proper auditing of suppliers, to collect verified data and information.

There is a wide spread of practices used and implemented by companies in the manufacturing industry, stretching from increasing the share of renewable and sustainable materials in the supply chain all the way towards increasing auditing and compliance of suppliers. The companies are also working with reducing emissions and energy use of operations both regarding production and logistics as a mean to reduce costs and increase sustainability.

## 5.2 The Automotive Industry

The following section presents companies investigated in the automotive industry, Volvo Cars and Volvo Group. Each company is presented with a summarised company overview and is followed by information regarding each company's work with SSCM practices and perspectives of SSCM. This information is conclusively summarised and analysed in the end of the section, with additional support from academic research.

The automotive industry is not only one of the largest economic sectors in the world by revenue, but also a large contributor to global sustainable development (Kannegiesser et al., 2014). The automotive industry is according to the authors highly exposed to sustainability challenges, both regarding limited resources and climate change during both during the phases of production and usage, where greenhouse gas emissions is a challenging factor.

### 5.2.1 Volvo Cars

Volvo Cars, currently owned by Geely Holding company in China, is a Swedish car manufacturer with an annual turnover of 106 billion SEK and employing around 21,500 people worldwide (Samuelsson & Gustafsson, 2004). The company is driven by four core values, quality, design, environment, and safety, in order to distinguish themselves from competitors. Additionally, Volvo Cars currently have a vast supplier base with around 500 business partners delivering production material for their serial production from all over the world, resulting in a complex structure of the supply chain (Samuelsson & Gustafsson, 2004).

Regarding SSCM, Volvo Cars mainly have the areas of sourcing, production, waste, and logistics as main focus. Their main objectives are to ensure supplier compliance and risk reduction with suppliers, reduction in environmental impact of production processes, increase sustainability in water and waste management, increase use of sustainable logistics providers, as well as reduce waste in transports (Volvo Cars, 2014).

According to Volvo Cars (2014), their main drivers as well as perceived benefits of working with SSCM practices are increasing market pressure, a more sustainable corporate strategy which has evolved into requirements from management, as well as the possibility to reduce both costs and risks in the supply chain. However, the challenges of implementing SSCM and the continuous work with SSCM are reducing resource usage with ever increasing production volumes, increasing expectations from customers and stakeholders, and ensuring compliance with continuously developing legislations and standards (Volvo Cars, 2014).

Conclusively, their main practices regarding SSCM with high focus include the following, according to Volvo Cars (2014):

- Requiring suppliers to comply with social and environmental requirements from Volvo Cars' Code of Conduct.
- Continuous auditing and evaluation of suppliers and promoting supplier self-assessments.
- Requiring suppliers to comply with substance-use restrictions outlined in the Volvo Cars Restricted Substance Management Standard (RSMS).
- Obliging suppliers to adhere to chemical legislation to be able to put substances, preparations or articles on intended markets.
- Extending ISO 14001 certifications to all corporate functions and suppliers.
- Development of risk analysis process to prevent environmental incidents and spillage.
- Working with energy optimisation to improve efficiency at all sites and educating employees on the importance of energy saving and efficiency.
- Using climate-neutral electricity from certified hydroelectric sources and using a paint shop with low emissions to air in Sweden.
- Using a design for closed loop water treatment system, full facilities equipped with LED lights and wastewater treatment plant in China.
- Transition from LPG and natural gas to biogas to take place as soon as possible for energy consumption.
- Designed an in-house inbound logistics network with investments in IT systems to perform network planning and operational management more efficiently.
- Minimising transportation distance between two locations and avoiding multiple handling and reloading activities by using direct shipping.
- Better planning and optimisation of transports by cooperation with transport shippers to increase utilisation, reduce emissions and reduce empty driving.
- Investing and taking control of returnable materials of packaging from suppliers.

## 5.2.2 Volvo Group

Volvo Group is one of the world's top leading manufacturers of commercial vehicles and engines (Yr Bjarnadottir & Halldorsdottir, 2015). Today, the company includes various brand of heavy-duty vehicles such as trucks, buses, and engines, as well as offering financial services for customers. According to the authors, the core products of the company besides the Volvo brand consists of Renault, UD Trucks, Mack, and joint ventures with Eicher and more recently Dongfeng. Additionally, part of the product range from Volvo Group include buses, construction equipment, as well as marine- and industrial engines and accessories from Volvo Penta (Yr Bjarnadottir & Halldorsdottir, 2015).

Regarding SSCM, Volvo Group mainly have the areas of sourcing, operations, and logistics as main focus. Their main objectives are to reduce environmental impact and risks of suppliers, reduce environmental impact of production processes, as well as increase the use of reverse logistics (Volvo Group, 2015).

According to Volvo Group (2015), their main drivers as well as perceived benefits of working with SSCM practices are the increased pressure from stakeholders, cost benefits and quality assurance for the supply chain, as well as the fact that sustainability is an integral part of the business model for the company. However, the challenges of implementing SSCM and the continuous work with SSCM are reducing resource usage with increasing production volumes, high expectations from customers and stakeholders, and ensuring compliance with continuously developing legislations and standards (Volvo Group, 2015).

Conclusively, their main practices regarding SSCM with high focus include the following, according to Volvo Group (2015):

- Increasing supplier requirements on environmental issues, business ethics, human rights, and social issues.
- Ensuring all automotive product suppliers are ISO 14001 certified.
- Using a self-assessment approach to evaluate potential and current suppliers' performance and compliance with Volvo Group's requirements.
- Assessing all automotive product suppliers in high risk countries.
- Encouraging and supporting suppliers to improve energy efficiency.
- Working to increase number of plants with zero lost time accident rate.
- Achieving ISO 14001 certification for all major production plants.
- Sorting and quantifying all waste and implementing measures to reduce the quantity of waste and increase reuse, material recycling, and energy recovery.
- Working to use less material as well as processes to integrate more recycled materials, reduce waste and energy, recover heat, and assess water footprint.
- Optimising rail transport in Sweden by utilising free space and enhancing on- and offloading.
- Offering refurbished spare parts (remanufacturing) to extend the useful life of products, and to reduce costs for customers.

### 5.2.3 Analytical Comments on the Automotive Industry

For the automotive industry, sustainability issues regarding pollution, congestion, noise, and accidents are key challenges for the automotive industry (Kannegiesser et al., 2014; Volvo Group, 2015; Volvo Cars, 2014). A large challenge is also sourcing, especially supplier evaluation and risk management of suppliers, where the companies are focusing on further reducing the environmental impact of suppliers. Additionally, one of the main priorities when it comes to SSCM is the logistics operations performed in the supply chain, both upstream and downstream, and increasing the use of reverse logistics. The main focus areas for the companies investigated in the automotive sector is thus both sourcing, production, and logistics.

In response to these challenges, policymakers aim at installing regulations with the right incentives and market rules for greening the industry regarding less emissions both from the use of vehicles but also from the total supply chain (Kannegiesser et al., 2014). The EU commission has for example defined targets regarding average fleet CO<sub>2</sub> emissions for vehicle usage, which vehicle manufacturers operating in EU are required to comply to towards year 2020. Meeting these targets has become increasingly difficult for the automotive industry however, according to the authors and the companies. Due to the significant growth of demand in emerging countries such as China, India, and Brazil, adding up even more production capacities and vehicles to the global amount of automotive, extensive efforts are required to supply this demand of growth and also reducing emissions (Kannegiesser et al., 2014). The industry has however already started to take actions and develop low emission powertrains and electrification of vehicles plays a key role in this according to the authors. A transition towards electric vehicles can also come with additional changes to supply chains, since many components for traditional petrol or diesel engines are no longer needed, while at the same time new supplier components regarding electrification of vehicles such as batteries emerge (Kannegiesser et al., 2014; Volvo Group, 2015; Volvo Cars, 2014).

The vision and operational implementation of sustainable development is for the automotive industry an overall objective in order to satisfy the requirements and needs of society for individual mobility (Koplin et al., 2007). Several actors in the automotive industry are thus making efforts to integrate and transfer sustainability to both their business strategies and decisions according to the authors. This can be said to form a part of a wider drive towards increased sustainable mobility, where the impact on nature and humans is minimised for each phase of the cars product life cycle (Koplin et al., 2007; Volvo Group, 2015; Volvo Cars, 2014).

One particular field that many actors are focusing on which have a large influence on these impacts are the product design and manufacturing. Adverse side effects of manufacturing processes are minimised these day, however a large part of the process is performed by suppliers. Companies are thus increased their requirements on suppliers regarding environmental and social policies such as ISO 14000 implementation (Koplin et al., 2007; Volvo Group, 2015; Volvo Cars, 2014). However, so far such standards have according to the authors and companies only been implemented into the structures and processes of the company's supply management and concern how automotive manufacturers cooperate with and integrate suppliers into their processes regarding product development and innovation technology. These initiatives have implied a reduction of the supplier base of automotive companies as well as closer cooperation

between manufacturer and supplier (Koplin et al., 2007; Volvo Group, 2015; Volvo Cars, 2014). Both Volvo Cars and Volvo Group are in response to these challenges also increasing their sustainability requirements of operations and logistics, where both companies are working with reducing waste and increasing efficiency of both operations and logistics processes and optimising transportation routes.

According to Hunke & Prause (2014), implementation of sustainability aspects in SCM has up to now only been performed in order to comply with law or regulations, and not only due to economic benefits of SSCM. The authors argue that while in addition to laws and regulations, customers and competitors are seen as important drivers, the government and management only play a secondary role, and SSCM can thus be regarded as market driven in the automotive industry. Customers can thus be seen as a large driver of SSCM and many companies see it as a way to gain competitive advantage (Hunke & Prause, 2014; Volvo Group, 2015; Volvo Cars, 2014).

## 5.3 The Textile Industry

The following section presents companies investigated in the textile industry, H&M, Inditex, Lindex, and KappAhl. Each company is presented with a summarised company overview and is followed by information regarding each company's work with SSCM practices and perspectives of SSCM. This information is conclusively summarised and analysed in the end of the section, with additional support from academic research.

During the recent decades, the textile industry has been characterised by widespread operations in many developing countries. Due to increasing sustainable issues in developing countries, many companies are focusing on increasing sustainability in their supply chains and ensure the same quality and standards in working conditions and production processes throughout their supply chains (Turker et al., 2014; H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014).

### 5.3.1 H&M

H&M is an international clothing company in the fast-fashion industry originating from Sweden. With several fashion brands and a total of around 4,000 stores worldwide in 61 markets, the company is one of the world's leading fashion companies (H&M, 2015). In addition to clothes, the company also offer shoes, bags, jewellery, makeup, and underwear to customers. Additionally, H&M employs a long-term approach, guided by the same shared values as when the first store opened in 1947 (H&M, 2015).

Regarding SSCM, H&M mainly have the areas of supplier evaluation, water and waste, as well as transportation and reverse logistics. Their main objectives are to set long-term relationships and mutual growth with suppliers, sustainable selection and evaluation of suppliers, improving working conditions in developing countries, reduce chemical waste and water usage, as well as increase use of recycling and reverse logistics practices (H&M, 2016).

According to H&M (2016), their main drivers as well as perceived benefits of working with SSCM practices are increased pressure from customers and markets, reducing costs and risks in the supply chain, mitigating supplier risks, increased competitive advantage,

and the perception that sustainability more and more will become a hygiene factor in the textile industry. However, the challenges of implementing SSCM and the continuous work with SSCM are the intense use of water and chemicals in production processes, the fact that H&M do not own any factories themselves and thus have to have close collaboration with suppliers, difficulties with official evaluation of suppliers in developing countries, as well as having a large amount of textiles eventually ending up as waste instead of recycled (H&M, 2016).

Conclusively, their main practices regarding SSCM with high focus include the following, according to H&M (2016):

- Requiring suppliers to comply with H&M's Code of Conduct, which sets out their environmental and social requirements.
- Not accepting child labour based on UN's Convention on the Rights of the Child and the International Labour Organization's conventions.
- Implementing the Fair Wage Method in selected role model factories, which has resulted in an increase in wages even though overtime has decreased.
- Aiming for long-term partnerships with suppliers and engaging in strategic partnerships with the most progressive ones.
- Using organic and recycled cotton and other more sustainable materials in products.
- Shifting all electricity used to renewable sources wherever this is credibly available.
- Promoting responsible use of water along the product's lifecycle, from cotton farmers to how customers wash their clothes.
- Banning chemicals considered hazardous from production processes and set limit values for finished products through H&M's Chemical Restrictions list.
- Transporting 90 % of all products to warehouses from suppliers by ship and train.
- Developing and using a garment collecting system with garment collecting boxes in all stores in every country for customers.

### 5.3.2 Inditex

Inditex is a large international fashion retail dating back to 1963 when it was first founded in Spain, originally only producing women's clothing (Inditex, 2016). The company has more than 7,000 stores around the world today, consistently continuing with a focus on listening closely to customers to offer the most up-to-date fashion. The company currently offers several brands to customers, the most prominent being Zara, but also fashion brands such as Massimo Dutti, Pull&Bear, Bershka and Oysho to name a few (Inditex, 2016). Additionally, the company's brands strive to sell fashionable products of highest quality, ensuring that all 150,000 employees are working as effective as possible to underpin the organisational structure of high customer focus.

Regarding SSCM, Inditex mainly have the areas of sourcing, waste and water, as well as reverse logistics as main focus. Their main objectives are to ensure traceability of the supply chain, increase supply chain integrity, improve working conditions in developing countries, increase efficiency of resources in production, increase responsible use of water in the supply chain, as well as increase the use of reverse logistics and recycling practices (Inditex, 2014).

According to Inditex (2014), their main drivers as well as perceived benefits of working with SSCM practices are increased requirements from stakeholders, their contribution to economic growth, jobs, stability, and CSR in developing countries, reducing costs and risks in supply chain, as well as creating a positive social and economic impact that contributes to the development of the community. However, the challenges of implementing SSCM and the continuous work with SSCM are the intense use of water and chemicals in production processes, the fact that Inditex do not own any factories themselves and thus have to have close collaboration with suppliers, ensuring continuous development and audits of suppliers, difficulties with official evaluation of suppliers in developing countries, as well as creating mature relationships with suppliers and a holistic approach to SSCM (Inditex, 2014).

Conclusively, their main practices regarding SSCM with high focus include the following, according to Inditex (2014):

- Continuously working with ensuring traceability of suppliers, improving auditing quality and ensuring compliance with Code of Conduct.
- Assessing the supply chain, including strengths and areas for improvement.
- Optimising the supply chain with the aim of improving auditing processes, training suppliers, and consolidating the supply chain.
- Creating effective and efficient reference partners with whom Inditex can share good practices and create shared strategies.
- Endorsing international initiatives to promote lower energy consumption and access to safer energy sources in the supply chain.
- Prioritising recycled, reused or locally sourced materials to use as little energy as possible for extraction, manufacturing, and transportation processes.
- Anticipating and responding to more stringent environmental regulations for the future.
- Reducing overall energy consumption of the supply chain, with a particular focus on the reduced use of energy sourced or derived from fossil fuels.
- Reducing emissions of greenhouse gases produced in the supply chain through more sustainable energy use, management, and sourcing practices.
- Optimising packaging as well as management of waste and the process of distribution and logistics.
- Developing more efficient water consumption in the supply chain and ensuring the conservation of the environmental quality of rivers and marine ecosystems.
- Using ISO 14001 certified environmental management systems for all logistics centres and employee sustainability training.
- Developing efficiency projects that have achieved optimisation of shipments, improved occupation, and a total reduction of trucks.
- Using material reuse and recycling in all logistics centres, stores, office buildings, and factories.

### 5.3.3 KappAhl

KappAhl is a Nordic fashion clothing company founded in Sweden in 1953 and the company currently sustains 400 stores in both Sweden, Norway, Finland, and Poland, employing around 4,500 people (KappAhl, 2015). The company offers cost-effective

fashion with own design aimed towards common people, with a quarter of all products sold coming from sustainable sources.

Regarding SSCM, KappAhl mainly have the areas of sourcing, water and waste management, and reverse logistics as main focus. Their main objectives are to increase evaluation and requirements on suppliers, improve working conditions in developing countries, increase resource efficiency of production processes regarding water, chemicals and energy, as well as increase the use of reverse logistics and recycling practices (KappAhl, 2015).

According to KappAhl (2015), their main drivers as well as perceived benefits of working with SSCM practices are the close connection between sustainability and business success, heightened expectations from customers, as well as the importance of keeping up with competitors. However, the challenges of implementing SSCM and the continuous work with SSCM are the intense use of water and chemicals in production processes, the fact that KappAhl do not own any factories themselves and thus have to have close collaboration with suppliers, as well as continuously increasing space utilisation of transports and increase the share of sea freight (KappAhl, 2015).

Conclusively, their main practices regarding SSCM with high focus include the following, according to KappAhl (2015):

- Educating cotton suppliers to become more sustainable according to "Fast Track Programme".
- Continuously audit supplier's production sites.
- Helping suppliers to achieve higher energy efficiency.
- Participating in the four-year programme Partnership for Cleaner Textile (PaCT) together with seven other international fashion companies.
- Involved in Sustainable Water Resources Management (SWAR), a pilot project in India for improving resource management in textile suppliers' production.
- Developing KPIs and methods to measure products sustainability performance.
- Consolidating high standard of chemical restrictions by biannual audits.
- Aiming to only use renewable sources of cotton.
- Aiming to only use renewable energy in all operations.
- High requirements for the procurement of transports regarding safety, environment and working conditions.
- Increasing use of sea freight from transportation of goods and decreasing use of air freight.
- Participating member of Clean Shipping Index, working with environmental issues of sea freight.
- Continuously working to use shipment space as efficiently as possible with packaging innovations.
- Implementing textile collection returns in all stores.

#### 5.3.4 Lindex

Lindex is a Finnish-owned fashion company in the textile industry owned by the Stockmann Group with over 480 stores around the Nordics, Baltics, Central Europe, the Balkans and Middle-east (Lindex, 2014). The company has recently experienced a rapid



international expansion and development of sales recent years. Additionally, the company's products contain women's fashion, underwear, children clothing, as well as cosmetics.

Regarding SSCM, Lindex mainly have the areas of production, waste and water, and transportation as main focus. Their main objectives are to improve working conditions in developing countries, increase resource efficiency of production processes regarding water, waste, and chemicals, reducing use of chemicals in production, minimising environmental impact of transportation, as well as increase efficiency of transport space (Lindex, 2014).

According to Lindex (2014), their main drivers as well as perceived benefits of working with SSCM practices are requirements from stakeholders, reduced costs in the supply chain, and the importance of keeping up with competitors. However, the challenges of implementing SSCM and the continuous work with SSCM are the intense use of water and chemicals in production processes, the fact that Lindex do not own any factories themselves and thus have to have a close collaboration with suppliers, difficulties with official evaluation of suppliers in developing countries, as well as continuously increasing space utilisation of transports and increase the share of sea freight (Lindex, 2014).

Conclusively, their main practices regarding SSCM with high focus include the following, according to Lindex (2014):

- Developing resource-efficiency procurement requirements.
- Requiring suppliers to comply with Lindex's Code of Conduct, with requirements on working conditions and performing internal and external audits.
- Involving suppliers to participate in different improvement projects together with Lindex regarding water, energy efficiency, and chemical use.
- Involved in Sustainable Water Resources Management (SWAR), a pilot project in India for improving resource management in textile suppliers' production.
- Participating in the four-year programme Partnership for Cleaner Textile (PaCT) together with seven other international fashion companies.
- Helping suppliers increase their capacity and spreading technical knowledge of sustainable practices.
- Requiring suppliers to follow the Lindex "Chemicals Restrictions" list, which lists chemicals that are not allowed at all in production.
- Accessing to finance for cleaner production investments at suppliers.
- Continuously work to use shipment space as efficiently as possible with packaging innovations.
- Increasing use of sea freight from transportation of goods and decreasing use of air freight.
- Participating member of Clean Shipping Index, working with environmental issues of sea freight.

### 5.3.5 Analytical Comments on the Textile Industry

Due to the characteristics of the textile industry, with requirements on high flexibility and agility, the supply chains require a high degree of responsiveness in combination with high efficiency. However, these requirements on the supply chains has led to several

negative impacts on both the environment and society according to the authors and companies. The investigated companies in the textile industry are thus increasing their work with sustainability in SCM, with focus on sourcing, supplier evaluation, waste and water usage, and reverse logistics.

The textile industry is according to Grant et al. (2013) one of the major contributors to many Asian economies in terms of job opportunities and economic growth, but the industry is also well known for many dirty processes in terms of chemicals involved and water usage, as well as poor working conditions. Many chemicals including heavy metals, such as mercury and lead, and bleaches and detergents are used in the various processes when producing yarn and fabric. The authors further state that the workers involved in these processes thus are exposed to many hazardous chemicals directly impacting their health. Furthermore, a large amount of wastewater is discharged from textile factories and related processes, damaging the environment as well (Grant et al., 2013; H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014).

To control this usage of chemicals and also the selection of chemicals, companies are starting to adopt eco-labelling or standards. These standards require suppliers to declare all raw material inputs in the production processes and detailed information regarding chemicals in every production phase (Grant et al., 2013). Suppliers are also increasingly required to audit working conditions and social issues towards the companies in the textile industry. However, a current issue is that not all chemicals are sourced from established chemicals manufacturers, many are sourced from local producers or trading agents and information is thus prone to be insufficient, according to the authors. Problems thus often arise, especially in China, regarding the lack of proper records of chemical usage and an often passive attitude from suppliers towards customer demand for compliance with proper documentation (Grant et al., 2013; H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014).

An additional important impact regarding sustainability in the textile industry is the heavy environmental burden that all transportation and distribution of goods impose. The time pressure, especially for fast fashion textile goods, is often high resulting in the majority of shipments are delivered by air, increasing the environmental impact of the industry (Turker et al., 2014). The high time pressure often result in employee abuse and unethical working practices in production processes as well, according to the authors. Many workers are young and poorly educated with low wages, and the use of children as labour is also common (Turker et al., 2014; H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014).

In recent time there has been an increase in the implementation of sustainable practices in the operations of the textile industry, where the most important factors stimulating the rise of sustainable practices has been the globalisation of both sourcing and distribution (Turker et al., 2014). As a response to these issues, sustainable production practices has for many companies, whose factories use a large amount of water and chemicals, become a main strategic objective. Authors and companies further state that different practices have been used in the fashion industry to achieve sustainability objectives both as individual companies as well as for whole supply chains. The most important methods are the use of organic and recycled fibres and materials, increased use of recycling and reverse logistics to reduce resource consumption, improved

manufacturing technologies to reduce energy and waste, green certifications and standards, and complete supply chain traceability (Caniato et al., 2012; H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014).

The reasons for many companies to integrate environmental and social aspects in their supply chains has been due to increased interest and pressure from media, consumers, and governmental organisations (Henninger et al., 2015; H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014). The industry has experienced changes in consumer behaviour towards more sustainable products, and the authors and companies state that the environmental movement has extended to a wider range of organisations in the industry. Furthermore, the concept of SSCM has gained a greater importance with people working within the industry becoming increasingly aware of the effects that the textile supply chains has on sustainability issues (Henninger et al., 2015). Furthermore, Turker et al. (2014) and the investigated companies state that many companies in the textile industry significantly focus on supplier compliance with their code of conducts and in employing further monitoring and auditing of activities to prevent production problems. Companies also focus on overall supply chain performance and setting sustainability criteria for suppliers (H&M, 2016; Inditex, 2014; KappAhl, 2015; Lindex, 2014).

## 5.4 The Transportation Industry

The following section presents companies investigated in the transportation industry, DB Schenker and DHL. Each company is presented with a summarised company overview and is followed by information regarding each company's work with SSCM practices and perspectives of SSCM. This information is conclusively summarised and analysed in the end of the section, with additional support from academic research.

The transportation industry is characterised by large global companies focusing on logistics and freight aspects of supply chains. The companies investigated in the transportation industry in this study are mainly focusing on the areas of transportation and warehousing. The performance of the transportation industry is extensively depending on fossil fuels and the price of oil. Due to the fact that the majority of operations in the transportation industry revolve around the use of vehicles, fuel prices represent a significant share of total costs in the industry (Investopedia, 2016). With an incline in oil prices and the increased significance of sustainability of transports, companies in the industry are seeking alternative ways to stay profitable and cope with increased pressure from stakeholders.

### 5.4.1 DB Schenker

DB Schenker is currently one of the largest suppliers of logistics services in the world, with a global presence and strong growth with more than 64,000 employees in 130 countries (DB Schenker, 2016). The company is aiming to be a leading driver and shaper of the future of transport networks of transports by air, road, sea, and rail as well as warehousing and storage. Additionally, the company offers transportation and logistics services for all aspects of the value chain. The company serves customers in a wide range of industries, such as healthcare, manufacturing, spare parts logistics, pulp and paper, food, chemicals, automotive, fashion, and retail as well as e-commerce (DB Schenker, 2016).

Regarding SSCM, DB Schenker mainly have the areas of warehousing and transportation as main focus. Their main objectives are to reduce energy consumption of warehouse facilities regarding heat, water, and electricity, increase efficiency of transports, as well as increase use of intermodal transports (DB Schenker, 2016).

According to DB Schenker (2016), their main drivers as well as perceived benefits of working with SSCM practices are complying with legislations and standards, increased needs and expectations from customers, increased efficiency and reduced cost of operations, as well as competitive advantage towards customers. However, the challenges of implementing and the continuous work with SSCM are the high use of energy and fuel on a daily basis in all operations, finding and developing alternative sources of energy, and ensuring compliance with continuously developing legislations and standards (DB Schenker, 2016).

Conclusively, their main practices regarding SSCM with high focus include the following, according to DB Schenker (2016):

- Using supplier evaluation and selection according to carriers' and subcontractors' environmental targets and measures.
- Recording, evaluating, and increasing the energy and material efficiency of processes within the company.
- Using electricity for hydroelectric sources.
- Intending to increase energy efficiency in operations and production activities by measures such as renewing its fleets of vehicles.
- Changing driver behaviour for higher efficiency and lower costs.
- Changing to fuel with higher efficiency.
- Increasing use of intermodal transports.
- Increasing optimisation of transport sizes - longer vehicles and increased fill rates.

#### 5.4.2 DHL

DHL is also one of the leading companies in the logistics sector, present in over 220 countries and territories around the globe, making it one of the most international companies in the world, employing around 325,000 employees (DHL, 2016). The company provides logistics solutions and transportation for almost all industries, offering services categorised into six different business units, DHL Express, DHL Parcel, DHL eCommerce, DHL Global Forwarding, DHL Freight, and DHL Supply Chain (DHL, 2016).

Regarding SSCM, DHL mainly have the areas of areas of transportation and warehousing as main focus. Their main objectives are to reduce energy consumption and increase efficiency of warehouse facilities, reduce energy consumption of transports, increase use of alternative energy sources for transports, as well as reduce local pollution and noise of transports (DHL, 2015).

According to DHL (2015), their main drivers as well as perceived benefits of working with SSCM practices are ensuring long-term profitability and growth, compliance with legislations and standards, meeting needs and expectations from customers, increased

efficiency and reduced cost of operations. However, the challenges of implementing SSCM and the continuous work with SSCM are the high use of energy and fuel on a daily basis in all operations, finding and developing alternative sources of energy, ensuring compliance with continuously developing legislations and standards, the increasing transports demands from e-commerce, as well as performing audits for transport providers from mainly Eastern Europe with potentially bad working conditions (DHL, 2015).

Conclusively, their main practices regarding SSCM with high focus include the following, according to DHL (2015):

- Complying with environmental regulations, and taking additional measures to continually improve environmental performance.
- Working with suppliers to minimise the environmental impact of the goods and services procured.
- Considering environmental aspects in all major investment and procurement decisions.
- Involved in a number of initiatives to achieve greater transparency and comparability in the area of greenhouse gas emissions data collection and reporting.
- Developing and maintaining an environmental management system which is ISO 14001 compliant.
- Implementing an energy management system based on the ISO 50001 standard at sites within the EU.
- Improving energy efficiency of logistics facilities.
- Implementing smart metering and energy-efficient heating and cooling systems in facilities and using electricity generated from renewable energy sources.
- Implemented a smart metering systems throughout Germany to improve the efficiency of buildings.
- Applying efficiency measures to vehicle fleet, reducing emissions of pollutants, and by using electric vehicles reducing noise in dense urban areas.
- Continuous rollout of electric vehicles in transport operations in EU.
- Improving fuel efficiency of operations.
- Optimizing networks and routes of operations.

#### 5.4.3 Analytical Comments on the Transportation Industry

As aforementioned, policy makers aim at installing effective regulations which set the right incentives and market rules in order to green both the automotive and transportation industry, with respect to lower emissions primarily caused by the use of vehicles (Kannegiesser et al., 2014). For example, the European Union is confronted with the growth of the transportation industry and the fact that the industry is the only industry expected to grow emissions in the future and beyond year 2020, due to the increased growth of fossil-fuel based transport volumes (Kannegiesser et al., 2014). The need for decisions and effective regulations to reach reduction of emissions and resource usage in the transportation industry is currently one of the major challenges (Kannegiesser et al., 2014; DB Schenker, 2016; DHL, 2015).

The transportation and logistics industry is arguable the most visible industry in the global effort to curb climate change, and the industry's highest priority is to reduce fuel consumption and emissions to air (DB Schenker, 2016; DHL, 2015; PwC, 2016a). Regulation is also reinforcing these priorities, in terms of emissions caps and road tolls. In relation to air transport, transportation via ground is becoming an increasingly viable replacement but is also under a lot of pressure (DB Schenker, 2016; DHL, 2015; PwC, 2016a).

Strategies to reduce fuel consumption and emissions range all the way from using more alternative energy and hybrid vehicles towards developing new business models where some companies also are encouraging customers and employees to control energy use and emissions (DB Schenker, 2016; DHL, 2015; PwC, 2016a). Other sustainable aspects of high importance in the transportation industry also concerns noise pollution, reducing energy consumption of warehouses and logistics facilities, and congestion in urban areas.

## 5.5 Cross-analysis of Industry Findings

This section serves to summarise the findings from the investigated industry, in regards to focus areas, objectives, drivers and benefits, as well as challenges. The findings for each industry has in Table 5 below been consolidated and summarised for each respective industry. This table aims to provide a brief overview of main findings with high importance for the different industries.

When further analysing collected industry findings, it is possible to distinguish trends in the different industries based on the industry contexts as well as the type of companies that operate in each industry. It can be stated each company and industry is very much dependent on its own context and environment, as well as their own developed logic regarding sustainability and SSCM, which they incorporate differently. The different companies and industries are furthermore highly dependent on both customers and suppliers, which in turn affects e.g. requirements of SSCM or how different companies implement SSCM practices. To further illustrate this point, a few examples of identified aspects and trends regarding the textile and transportation industry follows.

In general, the textile industry has come a long way regarding SSCM and the implementation of SSCM practices. A possible explanation is that textile companies often are close to the final customers, as well as often having a close relationship with customers due to the short lifecycle of textile apparel. Furthermore, all investigated companies in the textile industry of this study have high similarity in their objectives, drivers, benefits, challenges as well as SSCM practices. It is believed that this results from a high homogeneity in the textile industry and some sort of flock behaviour among companies, due to high competition and similarities between companies. It has previously also been mentioned in this study that customers of fashion-apparel often are more sustainability-minded, which could be an additional explanation for this behaviour.

Furthermore, the transportation industry is often a part of operative sections of supply chains in a large extent, which can serve as an explanation to why companies in the transportation industry are more focused on operative measures and objectives regarding SSCM. Companies in the transportation industry can furthermore be stated to be highly connected to the other industries investigated in this study, responsible for

transportation and logistics of other industries and companies. Due to this connection and relationship, it can be stated that the different involved industries and companies influence each other regarding SSCM requirements, objectives and implementation of practices, to satisfy each other and comply with each other's requirements. Thus, it can be stated that both companies and industries involved must relate to each other's objective, requirements, and contexts, which can be stated to be a large contributor to why the situation of SSCM in investigated industries is the way it is.

Table 5. Summary of main findings for investigated industries.

Industry	Focus areas	Objectives	Drivers & Benefits	Challenges
<b>Manufacturing</b>	Sourcing Production	Expand reach of supplier code of conduct and compliance. Increase traceability of the supply chain and reduce risks. Increase share of renewable energy sources and reduce hazardous materials. Increase energy efficiency and reduce carbon emissions.	Reducing both costs and risks in the supply chain. Increased pressure from stakeholders. Benefits between profitability and sustainability. Competitive benefits.	Finding sustainable improvements with direct relation to cost. Prioritising activities with highest benefits for both sustainability and costs. Obtaining proper data from suppliers to gain knowledge of material origin.
<b>Automotive</b>	Sourcing Production Logistics	Reduce environmental impact and risks of suppliers. Reduce environmental impact of production and transportation processes. Increase use of reverse logistics.	Increasing requirements from stakeholders. Sustainability critical for the industry's survival. Reducing both costs and risks in the supply chain.	Reducing resource usage with increasing production volumes. High expectations from customers and stakeholders. Ensuring compliance with continuously developing legislations and standards.
<b>Textile</b>	Sourcing Water & waste Reverse logistics	Ensure traceability of the supply chain in all processes. Improving working conditions in developing countries. Responsible use of water & chemicals in the supply chain. Increase use of reverse logistics & recycling.	Pressure from stakeholders. Reducing costs and risks in the supply chain. Sustainability increasingly a hygiene factor in the industry. Keeping up with competitors.	Intense use of water and chemicals in production processes. Required to have close collaboration with suppliers. Ensuring continuous development and audits of suppliers. Difficult with official evaluation of suppliers in developing countries.

<b>Transportation</b>	Warehousing Transportation	Reduce energy consumption and increase efficiency of warehouse facilities. Reduce energy consumption of transports. Increase use of alternative energy sources for transports.	Compliance with legislations and standards. Meet needs and expectations from customers. Increased efficiency of operations. Reduced cost of operations.	High use of use energy and fuel on a daily basis in all operations. Finding and developing alternative sources of energy. Ensuring compliance with continuously developing legislations and standards.
-----------------------	-------------------------------	--	--	--

### 5.5.1 Understanding the Situation of Sustainable Supply Chain Management in Industries

Lifting the perspective further, viewing SSCM from a context not specific for any given industry, general trends and aspects can be identified as well. As previously mentioned, main identified information regarding SSCM has been from a industry contextual perspective, with the aim of identifying differences and information specific for the industries. However, similarities exist as well, between industry contexts. Identified findings show that general trends and aspects of SSCM regardless of industry context are increasing, with increasing speed and intensity.

More specifically, it has been identified that activities regarding both sourcing (i.e. procurement, supplier evaluation, risk management), operations (i.e. production, packaging, waste and water), as well as logistics (i.e. warehousing, transportation, reverse logistics) are present from a general industry perspective. Sourcing has however been identified as the focus area with highest impact and potential regarding SSCM, due to many aspects of SSCM related to especially procurement, supplier evaluations and auditing, as well as risk management regarding conflict material and child labour.

Furthermore, it can be stated that objectives regarding SSCM in a general perspective is highly related towards reducing risks and environmental impact of suppliers, operations and logistics, ensuring proper auditing of suppliers and traceability in the supply chains, as well as increasing the use of reverse logistics and recycling. Regarding drivers and benefits, reducing costs and risks in the supply chain, with identified benefits between profitability and SSCM, as well as due to increased pressure and requirements from stakeholders are general factors of SSCM from a general perspective. It can also be stated that increased SSCM-activities bring competitive advantages as well and SSCM is increasingly becoming a hygiene factor and a prerequisite for the survival of many industries as well.

When it comes to challenges of SSCM in a general perspective, it can be stated that there exist difficulties regarding ensuring compliance with e.g. Code of Conduct of suppliers and staying up-to-date with current and future regulations of sustainability. The increased collaboration with suppliers to ensure SSCM has additionally proven to be



difficult, as well as finding sustainable improvements with direct relation to costs and properly prioritise these activities with highest potential.

Conclusively, it can be stated that the importance of SSCM is indeed increasing among industries. As previously mentioned, industries do not only face economic challenges in their daily activities, but also societal and environmental challenges as well. If not able to meet these challenges, the risk of losing competitive advantage to competitors or losing attention or respect from stakeholders is high, which often is the origin or main driver for working with SSCM. In addition, this has led to increasing auditing and monitoring upstream in the supply chains towards suppliers. Furthermore, it has been identified that practices of SSCM extends to both operational drivers of profitability as well as governing strategy of companies. This has led to the increased implementation of SSCM in the whole range of operations and activities in the supply chains.

## 6. Benchmarking of Current Service Offerings Within Sustainable Supply Chain Management

The following section serves to introduce the reader to additional consulting companies working with SSCM, their perspective on the issue and what services they offer to customers, however on a more strategic level. The section serves to work as a benchmark of how SSCM practices can be implemented and used by consulting companies in their service offering towards customers. The consulting companies presented below are Accenture, Deloitte, and PwC.

### 6.1 Accenture

Accenture (2016) state that many companies are looking towards SSCM to deliver improvements regarding economic, environmental, and social performance. The company further state that they help clients develop more sustainable supply chains by creating an integrated view of supply chain processes and by providing solutions which delivers benefits both in the short- and long term (Accenture, 2016). More specifically, Accenture (2016) offers specialised sustainable solutions regarding SCM specific to logistics, fleet management, waste management, procurement, and packaging.

Furthermore, the company states that a large share of all decision-makers perceive sustainability as an opportunity to drive growth and innovation, and is a key to overall success. According to Accenture (2016), the commitment is thus there to increase implementation of sustainable practices, but that the challenge of accurately assessing the benefits of these practices remain. Accenture (2016) believes that in most cases the key obstacle is not having in place an effective sustainable performance management, which enables companies to measure, manage, analyse, and report performance related to SSCM.

In accordance with the aforementioned sustainable performance management, the company has defined a cycle of performance management in which the following activities are included (Accenture, 2016):

- Defining the sustainability strategy and identifying the value at stake.
- Identifying what to measure, manage and report.
- Planning the optimal processes and tools to manage the overall journey.
- Collecting relevant and accurate data to understand and improve performance.
- Analysing performance to measure the value delivered and to identify opportunities.
- Implementing projects to deliver the targeted business and sustainability benefits.
- Reporting the value delivered and discussing findings with stakeholders.

Furthermore, Accenture (2016) state that the with effective sustainability performance management processes, companies are able to increase their benefits originating from the sustainable initiatives related to SCM. These tools also allow companies to increase revenues by identifying opportunities to increase sales with new products and services, reduce costs by understanding where and how to drive costs from the bottom line, build

intangible assets by creating long term relationships, and reduce risks by understanding and mitigating risks posed by sustainability initiatives.

Additionally, Accenture (2016) has identified four common challenges that companies face when implementing and using SSCM and sustainable performance management. These challenges are (Accenture, 2016):

- Linking sustainability to wider business performance: Understanding sustainability impacts and opportunities, measuring and managing data, and identifying the most important investment opportunities.
- Executing effective data capture and management: Collecting the right amount of data to manage performance, capture accurate and complete data, and deploying appropriate software solutions and systems to manage data.
- Driving significant business and sustainability benefits: Instituting programs and projects to drive performance across the organisation, identifying complex root causes of performance issues, deriving insight from data with integrated systems and processes as well as comparing existing capabilities with best practices.
- Reporting the right information to the right stakeholders: Identifying the information required by different stakeholders, and ensuring key stakeholders receive the right information.

## 6.2 Deloitte

According to Deloitte (2016), one of their areas of service regarding sustainability concerns reducing waste and simultaneously improving margins. Deloitte (2016) state that many companies are starting to recognise the impact of their global sustainable impact and are increasingly experiencing financial benefits of efficient resource management. Companies are according to Deloitte (2016) also finding that implementation of SSCM not only improves the public perception of the company in media and news, but that it additionally has the potential to result in financial benefits by using resources more efficiently and reducing waste.

More specifically, Deloitte (2016) offers specialised sustainable solutions designed to help clients reduce materials, energy, and waste. These solutions are related to particular areas of focus, which are:

- Sustainability strategy: Development of strategy to address sustainability risks and opportunities in support of business growth objectives, stakeholder engagement and communications, and brand enhancement programs, as well as prioritising sustainability initiatives through detailed value quantification.
- Resource productivity and risk mitigation: Identifying ways to address energy, water, and materials risks across the supply chain.
- Sustainable operations and supply chain: Refining the supply chain by addressing diverse issues such as supplier engagement, sourcing and procurement, packaging, closed loop recycling, supply chain transparency, and human and labour rights.
- Reporting and disclosure: Identifying ways to improve collection and reporting of data in compliance with laws, regulations, and stakeholder expectations.

Deloitte (2016) state that their solutions and services help develop practical and business-focused approaches in order to help companies build sustainability into their strategy and operations related to SCM. These solutions and services allows companies to improve and protect financial performance, increase brand value, and increase management of risks in the supply chain, both in the short- and long-term (Deloitte, 2016).

Additionally, Deloitte (2016) have identified potential bottom-line benefits related to these focus areas of SSCM, which the company provide services and solution in. These benefits are (Deloitte, 2016):

- Ability to prioritise sustainability activities and employ strategies to understand where program investments should be focused on capturing value.
- Sustainability strategies that analyse various aspects of a business to identify where sustainability initiatives might have significant impact.
- Supply chain improvements, including significant savings in manufacturing and sourcing costs, as well as product quality enhancements that can contribute to increased market share and improved margins.
- Improved supply chain transparency that can help reduce risk for social issues around human rights, labour rights, and anticorruption issues.
- Risk mitigation by understanding business operations and supply chain through a sustainability lens.
- Improved reporting, from basic compliance to third-party assessment scores that can help enhance brand and social license to operate.

### 6.3 PwC

PwC (2016b) work with solutions and services related to sustainability regarding two areas of SCM: risk & compliance and supply chain & operations. As many companies face increasing restrictions on material usage, governance and compliance around sustainability to manage risks is growing according to the company. Additionally, companies are looking at the impact that their operations are having on the environment and society in which they operate in as aforementioned (PwC, 2016b).

In response to this, PwC (2016b) offers specialised sustainable solutions regarding SCM in the following areas:

- Develop codes of conduct, policies and procedures that meet company's stakeholders' expectations and ensure that the organisation's values are respected and reinforced.
- Manage risk and regulatory compliance to understand their impact on strategy and operations. For example, examining sustainable development legal requirements, company policies, and industry/voluntary codes to assess compliance levels, improvement potential, and how future planned operational changes might interact with these.
- Monitor and manage environmental, social, and governance risks associated with the supply chain.

- Measure the financial cost or potential impact of carbon, water, and other usage on the environment, and local communities.
- Redesign global supply chains to be cost-efficient, minimising their impact on the environment and delivering products and services on time.

## 7. Analysis and Discussion of Sustainable Supply Chain Management Services

As found in the study of ÅF, chapter 4 Focal Company Description, the key aspect of sustainability SCM services is about being able to create sustainability measurements e.g. by connecting sustainability to economic benefits, and highlighting customer advantages. However, concluded in chapter 4.6, these three key dimensions are part of the interplay in the interfaces of ÅF, ÅF's customers, and the society and government. Following is a recap of findings from chapter 4.

Figure 7, in chapter 4.7, is a mapping of the interplay when it comes to sustainability. Meaning, what and who affect whom. The main driver is politics and regulations, in combination with pressure and awareness from society. Figure 7, explains the found behaviour of ÅF's customers, i.e. what is needed in order to sell SSCM services to them. As previously mentioned in chapter 4 it is about creating sustainability measurements, for example by connecting sustainability to economic benefits. Furthermore, the customers also have to feel the need to change e.g. by new political decisions, laws, and regulations, for example adding a new ISO standard to comply with.

Figure 7 have a central role when it comes to SSCM in this study, or sustainability in general as part of a service offering. The main area in the figure is the 2-way connection (interaction) between ÅF and ÅF's customers. The interaction of customer relationships and sales is of importance, and probably one of the key takeaways. Instead of only developing actual services within SSCM it is important to focus on the process of sales and customer relationships to enhance perception of sustainability.

However, adding the findings from chapter 5 and chapter 6, interfaces between ÅF, ÅF's customers, and society is further expanded. There are two extra dimensions added into the interfaces, those are competitors and customers and suppliers of ÅF's Customers. See Figure 8 for interfaces between ÅF, ÅF's customers, and society, expanded with competitors and customer's suppliers.

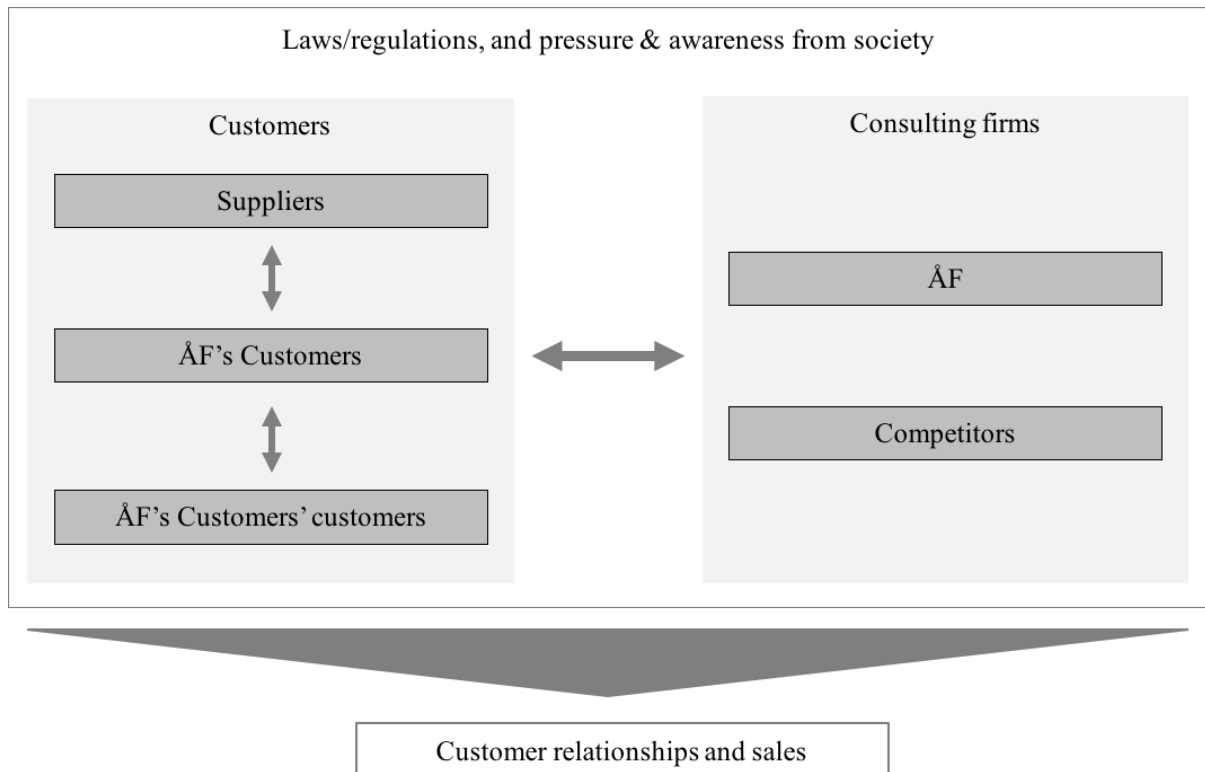


Figure 8. Interfaces between ÅF, ÅF's customers, and society, expanded with competitors and ÅF's customer's suppliers.

In addition to the already known figure, competitors to ÅF is added as well as customer and suppliers to ÅF's customers are added. The competitors to ÅF are affecting ÅF in the way of creating competitive pressure, either by offering similar services as ÅF and/or services that ÅF cannot offer their customers. In the second case, this can affect ÅF in the way of them losing customers or forcing ÅF to develop new services in order to be more competitive.

Based on the interfaces three main areas of activities are identified. Those are:

- Monitoring of context
- Customer relationships and sales
- Service offerings

These three areas are deeper explained later in this chapter. However, these three main areas of activities are in short followed explained.

Monitoring refers to how ÅF should monitor the different parts of Figure 8. It is important for ÅF to both monitor the external aspects and players, e.g. what laws/regulations are instituted, how is the society reaction on sustainability, what demand does their customers have, and industry trends, as well as internal at ÅF, e.g. education and SSCM initiatives. The monitoring is of importance for ÅF in order to have the latest information available.

Customer relationships and sales is about the interaction between ÅF and ÅF's customers. Discussing what importance the relationship ÅF have with their customers

and how to sell sustainability, e.g. by creating sustainability measurements and connect it to economic benefits.

Furthermore, service offerings relate to more hands-on recommendations regarding what services of SSCM ÅF should include in their service offering or further investigate. The recommendations are based on identified needs and requirements from companies and industries, benchmarking from consulting firms already working with SSCM, as well as what is performed already at ÅF.

## 7.1 Monitoring of context

Figure 9 maps the internal and external areas to monitor for ÅF, i.e. areas of monitoring. The external areas are society, political decisions/laws & regulations, competitors, ÅF's customers, and the industry as a whole. The internal areas for ÅF to monitor are competence/education, internal SSCM consciousness, and having internal communication with different departments working with sustainability to enable cross-functional teams.

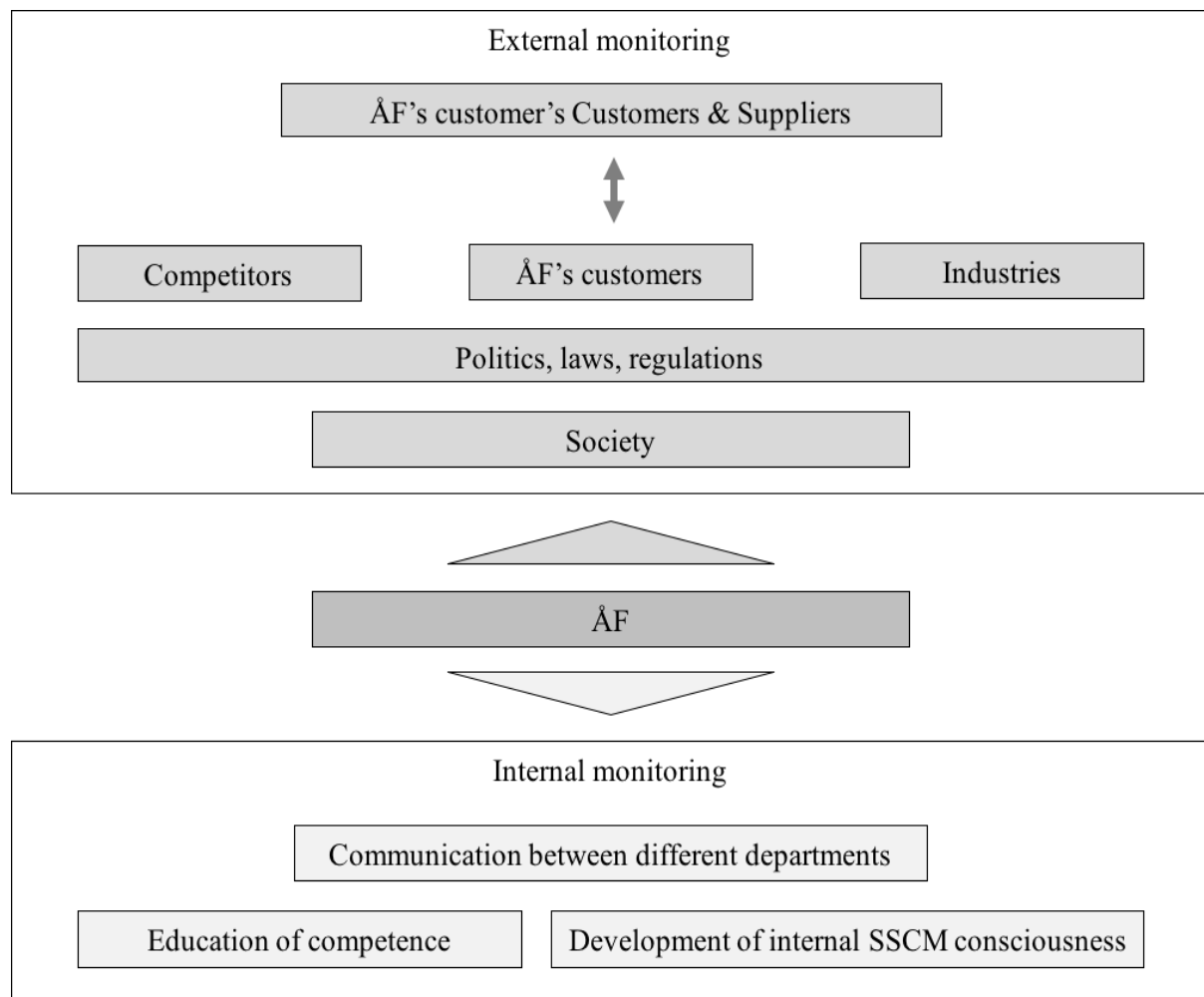


Figure 9. Internal and external areas to monitor for ÅF.

The internal monitoring at ÅF should include activities to keep track of the sustainability work conducted at ÅF, for example tracking trends in projects, and initiatives performed



at ÅF. Furthermore, it is important for ÅF to follow a clear goal for their SSCM work in order to have a reference. One part of the reference should include the knowledge and competence, in order to find potential gaps among employees and the knowledge needed to conduct the services and projects on hand. When the gaps of knowledge are identified, ÅF will be able to match the gaps with e.g. education of their employees.

Moreover, there are certain departments at ÅF that are working with sustainability and are experienced within the field. It is important to be able to map what departments that are working within this field and keep track of their knowledge and development. This, in order to be able to see the possibility of using the knowledge from different departments in projects conducted, i.e. using cross-functional teams.

The external monitoring for ÅF includes monitoring of society, political decisions/regulations, competitors, ÅF's customers, and the industry. Monitoring political decisions such as entry of new laws and regulations, what is coming up, both on domestic and international level, e.g. ISO certification connected to CO2 emissions or environmental measurements. Having the information on hand of what is happening within the area of sustainability is important to be able to use it as a business advantage, follow the trends and needs on the market, and be able to sell services wanted from the customers.

Another aspect to monitor is the market. Monitoring trends on the market and among society and the way they affect the companies. For example, a trend could be that consumers request to buy fair-trade produced groceries, which companies have to adapt to, e.g. a change that may affect the customers of ÅF. Knowing about trends and what is happening among customers and their behaviour, e.g. by monitoring media and the society at a whole, is crucial in order for ÅF to adapt their service offering to what is needed. The companies in this case are referred to companies that directly and/or indirectly are customers to ÅF.

Furthermore, in order to stay competitive among competitors, another area to monitor are other consultancy firms, i.e. competitors of ÅF. Monitoring what competitor advancements ÅF have based on what services they offer within SSCM, but also learn from their competitors about what they are doing and offering their customers. Conducting competitor analysis and monitor their service offerings within SSCM can help ÅF to develop new and/or better service offerings regarding SSCM, i.e. help ÅF to develop and enhance.

## 7.2 Customer Relationships and Sales

As previously mentioned, it is important to create SSCM measurements, for example economic benefits, in order to create services towards companies, e.g. ÅF's customers. Furthermore, it is also important that sustainability is turned into a management issue. Thus, there are plenty of different aspect affecting the area of how to marketing a service offering regarding SSCM.

Selling a SSCM service offering is not entirely about having a proper offer, it is more about the relationship to the customer and knowing what their requirements and needs are. Based on the customer demand, a service can then be drafted and offered. ÅF is today

conducting projects that are both directly and/or indirectly connected to SSCM. However, the amount of projects is at the current state not enough. However, some key areas have been found to increase the amount of projects, including sustainability within Supply Chain Management. Those areas are:

- Turning sustainability into a management issue.
- Be able to connect sustainability to economic benefits.
- Have different KPIs that measure sustainability, i.e. create sustainability measurements.

It is here forth assumed that a good relationship is maintained with the customer, though, not interested in buying SSCM services. Some practical aspects to think of has been identified that can be of help whilst selling SSCM, aspects to practice in sales meetings or similar:

Ask proper questions, identify the core needs of the customer, and ask questions that make the customer realise a need of change. For instance, use upcoming political decisions that, when instituted, will force the customer to change. Use reference cases of previous projects connected within SSCM, either directly or indirectly connected. Have a good KPI-base illustrating the benefits, e.g. economic benefits of the change, i.e. highlight benefits achieved with SSCM. If no explicit need is addressed, still get to know the customer, understand who is the stakeholder of sustainability questions, how the customer is affected by the changes e.g. political decisions related to sustainability.

In order to fulfil the mentioned areas a core tool among the aspects to practice in sales is to use/show proper reference cases to the customer. The cases should include a minor explanation of the situation, complication addressed, and the action and result. The result part of the case is where ÅF should present the SSCM measurements proving the success and results with numbers. To emphasise the economic benefits and outcome, it is of importance to show the customer, which focus might mainly be on economic aspects, that it is beneficial to invest in SSCM. Examples of economic connections are CO2 calculations (reduced pollution and, therefore, e.g. tax reduction), lowering of taxes, losses of e.g. market shares if no change is conducted or increase of potential market shares due to the change, and how future changes can affect the organisation and, therefore, loss of revenue and increased costs.

In summary, it is important to be able to turn SSCM into a management issue, connect SSCM to economic benefits, and have different KPIs that measure sustainability. The sales contact with customers are about developing and building relationships, i.e. sales is the same as relationship building. It is important to understand the problem and need of the customer in order to match those with a suitable service. This means that the core is not to develop and offer correct service offerings, rather, is about understanding the need of the customer and be flexible. However, one core tool to use during customer meetings are the use of reference cases that illustrates the situation, complication, action and result of the case. The result of the case is the essence whereas ÅF should prove the benefits and enhancements of the investment.

## 7.3 Service Offering

The following section discuss more hands-on recommendations regarding what services of SSCM ÅF should include in their service offering or further investigate. The recommendations are based on identified needs and requirements from companies and industries, benchmarking from consulting firms already working with SSCM, as well as what is performed already at ÅF. As previously mentioned, the aspects of monitoring of context and customer relationships and sales are of high importance when working with SSCM. However, in addition to these aspects, a more hands-on approach regarding what services should be included in a service offering or further investigated is also of interest.

Regarding ÅF's department of SCM and Packaging Development, gathered findings has identified instances of ÅF currently working with sustainable aspects in the areas of SCM. As gathered reference cases has identified, a portion of projects that are performed at ÅF regarding SCM also involve SSCM aspects, since a portion of SSCM regards increased effectiveness and efficiency of both production and logistics processes. Thus, it can be stated that SSCM exists in ÅF's service offering already, however, in a more indirect manner.

SCM and Packaging Development are currently two separate departments at ÅF. However, both departments are included in the definition and areas of SCM as well as SSCM in this study, and in many general cases. Thus, it would be recommended for ÅF to find synergies or consolidation opportunities between both departments and their service offerings, to be able to fully satisfy customer needs regarding SSCM. As previously mentioned, the Packaging Department is working throughout the entire value chain, from raw materials to production to recycling, with development of e.g. new packaging, optimisation, and improvements of existing packaging and processes, which is argued to be closely linked with SCM and sustainability aspects of SCM. The Packaging Development department and the SCM department have a close collaboration in projects or assignments already, however, the link between these departments as well as their service offerings should be strengthened, with the aim of developing additional cross-functional services and projects.

When analysing the situation for investigated industries of this thesis, as well as a general industry perspective, some services, which could be referred to as 'low-hanging fruit', has furthermore been identified. These services are ISO certifications, supplier audits in terms of risk management and procurement, as well as working with increased effectiveness and efficiency projects regarding procurement, operations, and logistics processes. These services are areas which investigated companies and industries are currently working with, or the industries and companies have objectives and goal regarding these areas. Thus, the aforementioned services are, according to gathered findings in this study, in demand and focused upon by customers. On this basis, it is therefore recommended that ÅF should further investigate whether these aforementioned services can be included in their service offering and be provided to customers, either in the short-term or long-term.

Additionally, ÅF can be analysed and benchmarked in comparison with other consulting firms with existing service offerings of SSCM, as identified in this study. The consulting firms, which data have been gathered upon, are as previously mentioned Accenture,

Deloitte, and PwC. Accenture, Deloitte, and PwC currently have a service offering regarding SSCM, however on a more strategic level compared to services provided by ÅF. However, it is still believed to be possible to benchmark how SSCM practices can be implemented and used by consulting companies in their service offering towards customers. As previously mentioned, both Accenture, Deloitte, and PwC offers services regarding SSCM in the following areas:

- Financial cost and impact measurements
- Procurement
- Reporting and disclosure
- Risk mitigation and compliance management
- Development of code of conducts, policies and procedures
- Material and energy reduction
- Packaging
- Waste management
- Logistics and transport management

Although the investigated consulting firms might operate on higher, more strategic level, in comparison with ÅF, the service offerings from these firms are still recommended to be taken into account when developing ÅF's service offering of SSCM. Both in terms of inspiration and when it comes to actual needs by customers, since the benchmarking of the aforementioned consulting firms illustrate that a need of these services currently exist. Some of the services are recommended by the researchers of this study already, such as supplier audits in terms of risk management and procurement, and working with increased effectiveness and efficiency projects regarding procurement, operations, and logistics processes. The reason is since these services are in line with Accenture's, Deloitte's, and PwC's current service offering of procurement, compliance management, development of code of conducts and policies, general material, energy, and waste reduction of SCM processes, and logistics management.

It is furthermore recommended to ÅF to develop and apply KPIs and measurements in connection with their service offering regarding SSCM. Since the economic aspect of sustainability often is difficult to quantify regarding SSCM, KPIs and measurements of the services provided by ÅF's SCM department could help measure the success of projects performed. This is believed to be valuable for both ÅF and ÅF's customers. ÅF can use these measurements as reference for future projects, to visualise SSCM improvements for future potential customers if similarities can be found. ÅF's customers on the other hand, can use these measurements to justify the investment of ÅF's performed projects towards the management or use the measurements to further improve their organisations.

Additionally, the definition of SSCM previously developed in this study can in turn be applied on ÅF's current service offering in SCM. As previously mentioned, their service offering consist of seven areas; Market & Sales, Service & After market, Recycling & Disposal, Purchasing, Quality, Logistics, and Production. Applying the developed definition of SSCM on ÅF's service offering regarding SCM can allow the company to increase and diversify their service offering towards SSCM. By applying sustainability services in combination with their current traditional SCM services, their service offering can be said to incorporate SSCM. The following Figure 10 illustrates how an application of this thesis' developed definition of SSCM on ÅF's current SCM service offering would

look like, in addition with monitoring of context, customer relationships and sales, and a SSCM service offering.

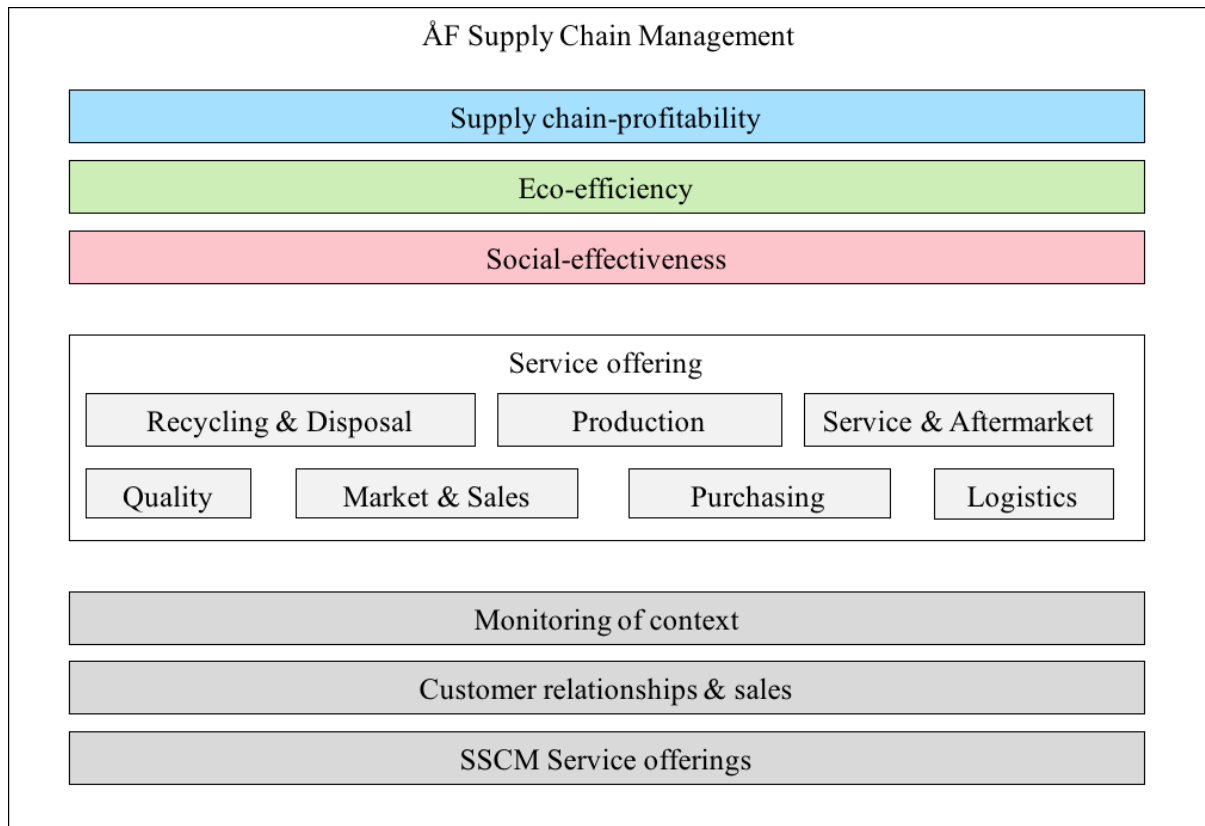


Figure 10. Illustration of The developed definition of SSCM applied on ÅF's current SCM service offering.

Furthermore, ÅF's current service offering correlates with the analysed areas of SSCM performed in this study. The areas analysed are as previously mentioned Sourcing (Procurement, Supplier evaluation, and Risk management), Operations (Production, Packaging, as well as Waste and water), and Logistics (Warehousing, Transportation, and Reverse logistics). Since this study has identified activities (i.e. services) for each of these areas in terms of SSCM, it is a possibility that they can be transferred and added to ÅF's current service offering, to achieve a thorough service offering for both SCM and SSCM.

## 8. Conclusions and Recommendations

The aim of the following section is to present conclusions of the final results of this thesis, based on gathered theory, empirical findings and conducted analysis regarding empirical findings. The aim of the section is also to deliver answers to thesis' research questions presented in the introduction.

### 8.1 Definition of Sustainable Supply Chain Management

As initially mentioned, sustainability is a broad and contextual definition with just as many definitions as applications. The aim has been to develop a general definition of SSCM that can be applicable in general, for investigated industries in this thesis, as well as for ÅF.

For the development of a definition of SSCM for this thesis, the definition of SSCM by Winter & Knemeyer (2013) in combination with the three factors suggested by Kim et al. (2014), supply chain-profitability, eco-efficiency and social-effectiveness has been used. The definition takes into consideration all aspects of TBL and includes key stakeholders of SCM. The development of a definition of SSCM in this thesis has, therefore, resulted in the following:

*“Sustainable Supply Chain Management is the management of material, information and capital flows as well as cooperation among companies in the supply chain network while simultaneously taking into account goals of sustainable development, regarding supply chain-profitability, eco-efficiency, and social-effectiveness.”*

### 8.2 The Situation of Sustainable Supply Chain Management Among Companies in Industries

As previously mentioned, in order to successfully satisfy customers regarding SSCM, it is of importance to have a service offering aligned with industry's contextual situation and to understand needs and requirements of the targeted industries. The following section thus presents conclusions of the situation regarding SSCM among companies in manufacturing, automotive, textile and transportation industry in a summary below.

The summary of industry findings of investigated industry, in regards to focus areas, objectives, drivers and benefits, as well as challenges is again presented below as part of the conclusion. As previously mentioned, the findings for each industry has in previously presented Table 5 been consolidated and summarised for each respective industry. The table aims to provide a brief overview of main findings with high importance for the different industries.

As previously mentioned, the perspective can be lifted even further, viewing SSCM from a context not specific for any given industry. This has shown that similarities exist between industry contexts as well and it has been identified that activities regarding both sourcing (i.e. procurement, supplier evaluation, risk management), operations (i.e. production, packaging, waste and water), as well as logistics (i.e. warehousing, transportation, reverse logistics) are present from a general industry perspective. In

Table 6 previously presented, the main findings regarding a general industry perspective is summarised, in terms of focus areas, objectives, drivers and benefits, as well as challenges.

### 8.3 Recommendations to ÅF Regarding Sustainable Supply Chain Management Service Offerings

Three activities based on the interface between ÅF and ÅF's customers have been identified. These activities are monitoring of context, customer relationships and sales, and service offerings. It is concluded that the main part of the interface and interplay between ÅF and ÅF's customers is necessarily not about developing a service offering. However, the key essence is rather to build good relationships with their customers and be flexible in the offerings, i.e. match the customer demand with a suitable service. However, today ÅF conduct projects that direct and/or indirect is connected to SSCM. It is important to maintain the amount of SSCM related projects and increase the amount.

ÅF have to monitor both external and internal aspects of sustainability. The external areas to monitor are political decisions and regulations, the society, competitors, the industry, and their customers. Internally, ÅF have to monitor their knowledge and competence about SSCM in order to find gaps between what to offer and what they are able to offer.

The key take away from customer relationships and sales is the importance of building customer relationships rather than traditional sales. However, a key aspect of signing SSCM service offerings is the ability to have proper measurements, e.g. economic benefits. A major tool to highlight the benefits is by having proper reference cases including the situation, complication, action and result of the case. The result of the case is the essence whereas ÅF should prove the benefits and enhancements of the investment, i.e. SSCM is here connected to economic benefits.

Additionally, recommendations that are more hands-on regarding the development of ÅF's service offering have been presented as well. Those are to investigate further synergies or consolidation opportunities between SCM and Packaging Development departments and further investigate whether aforementioned services identified as being in focus and in demand today can be included in ÅF's service offering and be provided to customers, either in the short-term or long-term. These identified services are ISO certifications, supplier audits in terms of risk management and procurement, as well as working with increased effectiveness and efficiency projects regarding procurement, operations, and logistics processes. Furthermore, it is recommended for ÅF to take into account and benchmark what services regarding SSCM competitors or other consulting firms offer towards customers when developing a final service offering. Both in terms of inspiration and when it comes to actual needs by customers, since the benchmarking of the aforementioned consulting firms illustrate that a need of these services currently exist. Conclusively, it is recommended for ÅF to also develop and apply KPIs and measurements in connection with the development of a service offering regarding SSCM to use as reference to visualise benefits gained from SSCM.

## References

- ABB. (2015). *Sustainability Performance Report 2015*. [Online]. Available at: <http://new.abb.com/docs/default-source/sustainability/abb-group-sustainability-performance-report-2015.pdf> (Accessed 2016-04-07)
- Accenture. (2016). *Accenture Sustainability Performance Management - Delivering Business Value from Sustainability Strategy*. [Online]. Available at: [https://www.accenture.com/t20150523T042357\\_w\\_/us-en/\\_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries\\_15/Accenture-Sustainability-Performance-Management-Delivering-Business-Value.pdf](https://www.accenture.com/t20150523T042357_w_/us-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries_15/Accenture-Sustainability-Performance-Management-Delivering-Business-Value.pdf) (Accessed 2016-04-12)
- Ashby, A., Leat, M., & Hudson-Smith, M. (2012). *Making connections: a review of supply chain management and sustainability literature*. *Supply Chain Management: An International Journal*, 17(5), 497-516.
- Bai, C., & Sarkis, J. (2009). *Supplier selection and sustainability: a grey rough set evaluation* (No. 2009-05). Working paper.
- Baloglu, A., & Arunachalam, S. (2010). *Reengineering the supply chain in the internet age: ABB Turkey Inc*. *International Journal of Logistics Economics and Globalisation*, 2(3), 233-249.
- Bell, J. (2000). *Introduktion till forskningsmetodik*. 3 uppl. Lund: Studentlitteratur.
- Bryman, A. & Bell, E. (2011). *Business Research Methods*. 3 uppl. Oxford University Press Inc., New York.
- Bryman, A., Bell, E., Books24x7 (e-book collection), & Books24x7, I. (2003). *Business research methods*. Oxford;New York;: Oxford University Press.
- Caniato, F., Caridi, M., Crippa, L., & Moretto, A. (2012). *Environmental sustainability in fashion supply chains: An exploratory case based research*. *International journal of production economics*, 135(2), 659-670.
- Cetinkaya, B., Cuthbertson, R., Ewer, G., Klaas-Wissing, T., Piotrowicz, W., & Tyssen, C. (2011). *Sustainable supply chain management: practical ideas for moving towards best practice*. Springer Science & Business Media.
- Chin, T. A., Tat, H. H., & Sulaiman, Z. (2015). *Green Supply Chain Management, Environmental Collaboration and Sustainability Performance*. *Procedia CIRP*, 26, 695-699.
- Chopra, S., & Meindl, P. (2007). *Supply chain management. Strategy, planning & operation* (pp. 265-275). Gabler.
- Christopher, M. (2005). *Logistics and supply chain management: creating value-added networks*. Pearson education.
- DB Schenker. (2016). *Sustainability*. [Online]. Available at: <https://www.dbschenker.com/homen/sustainability/> (Accessed 2016-04-07)
- Deloitte. (2016). *Sustainability*. [Online]. Available at: <http://www2.deloitte.com/us/en/misc/search.html#qr=sustainability> (Accessed 2016-04-12)



- Denscombe, MD. (2009). *Forskningshandboken*. Uppl. 2:2. Lund: Studentlitteratur AB.
- DHL. (2015). *Corporate Responsibility Report 2015*. [Online]. Available at: <http://cr-report2015.dpdhl.com/> (Accessed 2016-04-07)
- DHL. (2016). *Company portrait*. [Online]. Available at: [http://www.dhl.com/en/about\\_us/company\\_portrait.html](http://www.dhl.com/en/about_us/company_portrait.html) (Accessed 2016-04-18)
- Dubois, A., & Gadde, L-E. (2002). *Systematic Combining: an Abductive Approach to Case Research*. *Journal of Business Research* 55 (2002), 553-560.
- Ericsson. (2014). *Sustainability and Corporate Responsibility Report 2014*. [Online]. Available at: <http://www.ericsson.com/se/res/thecompany/docs/corporate-responsibility/2014-corporate-responsibility-and-sustainability-report.pdf> (Accessed 2016-04-07)
- Eriksson, L & Wiedersheim-Paul, F. (2008). *Rapportboken*. 1st edition, Malmö:Liber.
- Grant, D. B., Trautrim, A., & Wong, C. Y. (2013). *Sustainable logistics and supply chain management: principles and practices for sustainable operations and management*. Kogan Page Publishers.
- Gold, S., Seuring, S., & Beske, P. (2010). *Sustainable supply chain management and inter-organizational resources: a literature review*. *Corporate social responsibility and environmental management*, 17(4), 230-245.
- H&M. (2015). *Annual Report 2015*. [Online]. Available at: [http://about.hm.com/content/dam/hm/about/documents/en/Annual%20Report/Annual%20Report%202015\\_en.pdf](http://about.hm.com/content/dam/hm/about/documents/en/Annual%20Report/Annual%20Report%202015_en.pdf) (Accessed 2016-04-18)
- H&M. (2016). *About H&M - Sustainability*. [Online]. Available at: <http://about.hm.com/en/About/sustainability.html#cm-menu> (Accessed 2016-04-07)
- Henninger, C. E., Alevizou, P. J., Oates, C. J., & Cheng, R. (2015). *Sustainable Supply Chain Management in the Slow-Fashion Industry*. In *Sustainable Fashion Supply Chain Management* (pp. 129-153). Springer International Publishing.
- Hunke, K., & Prause, G. (2014). *Sustainable supply chain management in German automotive industry: experiences and success factors*.
- IKEA. (2015). *Sustainability Report 2015*. [Online]. Available at: [http://www.ikea.com/se/sv/pdf/yearly\\_summary/IKEA\\_Sustainability\\_report\\_2015.pdf](http://www.ikea.com/se/sv/pdf/yearly_summary/IKEA_Sustainability_report_2015.pdf) (Accessed 2016-04-07)
- Inditex. (2014). *Annual report 2014*. [Online]. Available at: [https://www.inditex.com/documents/10279/18789/Inditex\\_Annual\\_Report\\_2014\\_web.pdf/a8323597-3932-4357-9f36-6458f55ac099](https://www.inditex.com/documents/10279/18789/Inditex_Annual_Report_2014_web.pdf/a8323597-3932-4357-9f36-6458f55ac099) (Accessed 2016-04-07)
- Inditex. (2016). *Inditex at a glance*. [Online]. Available at: [https://www.inditex.com/en/our\\_group/at\\_glance](https://www.inditex.com/en/our_group/at_glance) (Accessed 2016-04-18)
- Investopedia. (2016). *Definition of 'Transportation Sector'*. [Online]. Available at: [http://www.investopedia.com/terms/t/transportation\\_sector.asp](http://www.investopedia.com/terms/t/transportation_sector.asp) (Accessed 2016-05-05)

- Jonsson, P., Rudberg, M., & Holmberg, S. (2013). *Centralised supply chain planning at IKEA*. *Supply Chain Management: An International Journal*, 18(3), 337-350.
- Kannegiesser, M., Günther, H. O., & Gylfason, Ó. (2014). *Sustainable development of global supply chains—part 2: investigation of the European automotive industry*. *Flexible Services and Manufacturing Journal*, 26(1-2), 48-68.
- KappAhl. (2015). *Annual Report 2015 - Part 1*. [Online]. Available at: [http://www.kappahl.com/globalassets/about-kappahl-corporate/documents/ir-documents/annual--interim-reports/20142015/kappahl\\_annual\\_report\\_2015\\_part1.pdf](http://www.kappahl.com/globalassets/about-kappahl-corporate/documents/ir-documents/annual--interim-reports/20142015/kappahl_annual_report_2015_part1.pdf) (Accessed 2016-04-07)
- Kim, K., Jeong, B., & Jung, H. (2014). *Supply chain surplus: comparing conventional and sustainable supply chains*. *Flexible Services and Manufacturing Journal*, 26(1-2), 5-23.
- Koho, M., Tapaninaho, M., Heilala, J., & Torvinen, S. (2015). *Towards a concept for realizing sustainability in the manufacturing industry*. *Journal of Industrial and Production Engineering*, 32(1), 12-22.
- Koplin, J., Seuring, S., & Mesterharm, M. (2007). *Incorporating sustainability into supply management in the automotive industry—the case of the Volkswagen AG*. *Journal of Cleaner Production*, 15(11), 1053-1062.
- Kulsum, A. (2012) *Getting to Green-A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness*. Washington DC: World Bank Group.
- Ladd, S. E. (2013). *Supplier Sustainability Evaluation Utilizing Multi Attribute Utility Modeling*.
- Lindex. (2014). *Sustainability report 2014*. [Online]. Available at: <http://about.lindex.com/se/wp-content/uploads/sites/3/2015/04/Lindex-Sustainability-Report-2014.pdf> (Accessed 2016-04-07)
- Maon, F., Sen, M. S., Vanhamme, J., & Lindgreen, A. (Eds.). (2013). *Sustainable Value Chain Management: A Research Anthology*. Gower Publishing, Ltd.
- Mefford, R. N. (2011). *The economic value of a sustainable supply chain*. *Business and Society Review*, 116(1), 109-143.
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). *Defining supply chain management*. *Journal of Business logistics*, 22(2), 1-25.
- Morana, J. (2013). *FOCUS Series: Sustainable Supply Chain Management*. Somerset, NJ, USA: John Wiley & Sons. Retrieved from <http://www.ebrary.com.proxy.lib.chalmers.se>
- Norrman, A., & Jansson, U. (2004). *Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident*. *International journal of physical distribution & logistics management*, 34(5), 434-456.
- PwC. (2016a). *Addressing sustainability issues in the transportation and logistics industry*. [Online]. Available at: <http://www.pwc.com/gx/en/industries/transportation-logistics/sustainability.html> (Accessed 2016-04-07)
- PwC. (2016b). *Sustainability & Climate change*. [Online]. Available at: <http://www.pwc.com/gx/en/services/sustainability.html> (Accessed 2016-04-12)

Rossi, A. (2014). *Towards Better Work: Understanding Labour in Apparel Global Value Chains*. Palgrave macmillan.

Samuelsson, H., & Gustafsson, C. H. (2014). *Socially Responsible Sourcing in Automotive Supply Chains - The Case of Conflict Minerals at Volvo Cars*.

Seuring, S., Sarkis, J., Müller, M., & Rao, P. (2008). *Sustainability and supply chain management—an introduction to the special issue*. *Journal of cleaner production*, 16(15), 1545-1551.

Tseng, M., Lim, M., & Wong, W. P. (2015). *Sustainable supply chain management: A closed-loop network hierarchical approach*. *Industrial Management & Data Systems*, 115(3), 436-461.

Turker, D., & Altuntas, C. (2014). *Sustainable supply chain management in the fast fashion industry: An analysis of corporate reports*. *European Management Journal*, 32(5), 837-849.

Vishnevsky T., Beanlands, H. (2004). *Qualitative research*. *Nephrol Nurs J* 31(2): 234–8

Volvo Cars. (2014). *Sustainability Report 2014*. [Online]. Available at: <http://www.volvocars.com/intl/about/our-company/sustainability/sustainability-reports> (Accessed 2016-04-07)

Volvo Group. (2015). *Annual and sustainability report 2015*. [Online]. Available at: [http://www3.volvo.com/investors/finrep/ar15/ar\\_2015\\_eng.pdf](http://www3.volvo.com/investors/finrep/ar15/ar_2015_eng.pdf) (Accessed 2016-04-07)

Winter, M & Knemeyer, M.A. (2013). *Exploring the integration of sustainability and supply chain management: Current state and opportunities for future inquiry*. *International Journal of Physical Distribution & Logistics Management*, Vol. 43 Iss: 1, pp.18 - 38

Yr Bjarnadottir, A. & Halldorsdottir, H. (2015). *The impact on the aftermarket supply chain with increased pre-planned service activities - A case study at Volvo Group*. Göteborg: Chalmers University of Technology (Master thesis. E - Department of Technology Management and Economics, Chalmers University of Technology, Göteborg, Sweden, nr: E2015:065)

ÅF. (2014). *Green Advisor Report 2014*. [Online]. Available at: <http://ipaper.ipapercms.dk/AAFGroup/GreenAdvisorReport/GreenAdvisorReport2014SWE/> (Accessed 2016-05-14)

ÅF. (2015). *Green Advisor Report 2015*. [Online]. Available at: <http://ipaper.ipapercms.dk/AAFGroup/GreenAdvisorReport/GreenAdvisorReport2015SWE/> (Accessed 2016-05-14)

ÅF. (2016). *ÅF - At a glance*. [Online]. Available at: <http://www.afconsult.com/en/about-af/at-a-glance/> (Accessed 2016-05-14)

# Appendix A

Interview guide used during the semi-structured interviews at ÅF.

- What is your position and role at ÅF?
- What department are you part of?
- What type of projects is conducted within your department?
- Any of those related to SCM?
- How/in what way is Sustainability part of the projects conducted today?
- Have you spotted any trend(s) due to increase focus of Sustainability in projects conducted or demand from customers?
- What are the customer benefits and business advantages for customers from a Sustainability project?
- Would you say that ÅF is in forefront and have a higher focus on Sustainability compared with your competitors within consulting?
- In what business areas are Sustainability important for ÅF?
- How do you think the selection and development of sustainability services looks like the nearest couple of years?
- What do you believe the development will be based on?
- Do you think your department have the knowledge and competence needed to fill the upcoming need and demand of sustainability?
- What is missing? How to fill those gaps?
- What part of SCM do you believe affects most of sustainability?
- If you were about to develop a service of SSCM, what aspect(s) do you find most critical to have in consideration? What aspects to investigate?

Additional questions:

- Asked during interviews and varies based on answers from interviewee.

# Appendix B

Interview guide used during semi-structured interviews during industry benchmarking.

- What is your position and role at your company?
- What is on your agenda regarding SCM and what challenges are you facing in this area?
- Have you noticed an increased focus on sustainability within your organisation?
- In what business areas are sustainability important to you?
- How are you currently working with sustainability in SCM?
- Have you noticed any trends of an increased importance of sustainability in the SCM projects you perform?
- What trends exist in your industry regarding SSCM?
- What are the underlying reasons for wanting to work with sustainability and SSCM?
- How do you think that sustainability in SCM will develop in the coming years? For your company and for your industry?
- Do you believe to have the required skills to meet future challenges in SSCM? Are there any gaps?
- Which areas in SCM are most affected by an increased focus on sustainability within your industry?