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PROCUREMENT'S ROLE IN SUPPLY CHAIN CARBON MANAGEMENT

A multiple-case study in the fast-moving consumer goods industry

Master's Thesis
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Abstract

Increasing amount of greenhouse gas emissions, especially carbon, have been proven to accelerate climate change to a worrying degree. Among other aspects of sustainability, reducing carbon emissions has become an important agenda for companies looking to compete in a modern world where people are starting to weigh in sustainability in their consumer choices. Previous research has shown that in order to make smart decisions on carbon reduction, companies should investigate their supply chains and not only their own operations. Succeeding in this is not an easy task and requires a collaborative effort from multiple functions, procurement being an important one.

Current research has not yet drawn a connection between the procurement function and supply chain carbon emissions. To address this research gap, this study aimed at uncovering what is the role of procurement in supply chain carbon management. Two main themes were investigated: changes in the procurement processes and collaboration between procurement and its stakeholders. A multiple-case study focusing on large companies from the fast-moving consumer goods industry was conducted to address the research question. Collected data consisted of six semi-structured interviews with individuals who work closely with procurement and sustainability. Based on the current literature, a conceptual framework was built, which guided data collection and analysis.

An underlying finding of this study was that while procurement is considered to have large potential to address supply chain carbon emissions, its role is still immature. Effective ways for procurement to address carbon emissions are supplier selection, supplier relationship management and being involved in product development. The field is still emerging, and thus it is important for procurement to engage and collaborate actively with internal sustainability specialists, product functions and suppliers. To accelerate and support the implementation of low-carbon practices in procurement processes, top management should make it clear that procurement is expected to have a large role in carbon reduction. At the same time, companies should work towards establishing a scope 3 carbon baseline, and procurement should then use those data to drive carbon reduction actions.

Keywords procurement, carbon management, FMCG, supply chain

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Tiivistelmä

Kasvavan kasvihuonepäästöjen määrän, etenkin hiilidioksidin, on osoitettu kiihdyttävän ilmastonmuutosta huolestuttavaa tahtia. Kuten muistakin kestävän kehityksen osa-alueista, hiilidioksidipäästöjen vähentämisestä on tullut tärkeä tavoite yrityksille, jotka kilpailevat modernissa maailmassa, jossa ihmiset huomioivat kestävän kehityksen kulutuspäätöksissään. Aiempi tutkimus on osoittanut, että tehdäkseen tehokkaita päätöksiä päästöjen vähentämisessä, yritysten tulisi kääntää katse myös niiden toimitusketjuihin. Tässä onnistuminen on vaikea tehtävä, joka tarvitsee yhteisen panoksen useilta eri funktioilta, hankintatoimen ollessa yksi tärkeimmistä.

Tämänhetkinen tutkimus ei ole vielä yhdistänyt hankintatoimen roolia ja toimitusketjujen hiilijalanjälkeä. Tutkimusvajeeseen vastatakseen, tämä tutkimus keskittyi tarkastelemaan hankintatoimen roolia toimitusketjujen hiilidioksidipäästöjen hallinnassa. Kysymystä tarkasteltiin kahden pääteeman kautta: muutoksissa hankintatoimen prosesseissa, sekä hankintatoimen ja sen sidosryhmien välisessä yhteistyössä. Tutkimusmenetelmänä käytettiin monitapaustutkimusta, joka kohdistui suuriin yrityksiin, jotka toimivat nopeasti liikkuvien kulutustavaroiden alalla. Kerätty data sisälsi kuusi puolistrukturoitua haastattelua henkilöiden kanssa, jotka työskentelivät tiiviisti hankintatoimen ja kestävän kehityksen parissa. Tämänhetkisen tutkimuksen perusteella muodostettiin käsitteellinen viitekehys, joka ohjasi sekä datan keräystä että sen analysointia.

Tutkimuksen tuloksia alleviivasi käsitys siitä, että vaikka hankintatoimen potentiaali hallita toimitusketjujen hiilidioksidipäästöjä on merkittävä, sen roolia ei vielä osata hyödyntää tehokkaasti. Toimittajien valinta, toimittajasuhteiden hallinta ja osallistuminen tuotekehitysprosesseihin koettiin tärkeiksi hankintatoimen vaikutuskanaviksi hiilidioksidipäästöjen vähentämiseksi. Koska hiilidioksidipäästöjen hallinta aiheena on tuore, on erityisen tärkeää, että hankintatoimi tekee aktiivisesti yhteistyötä yrityksen sisäisten kestävän kehityksen ammattilaisten, tuotefunktioiden sekä toimittajien kanssa. Tukeakseen hiilidioksidipäästöjen vähentämistä hankintatoimen prosesseissa, on tärkeää, että yrityksen johto tekee hankintatoimelle selväksi sen suuren roolin yrityksen päästövähennyksissä. Samaan aikaan yritysten tulee selvittää toimitusketjunsa hiilidioksidipäästöjen lähtötaso. Tämä tieto antaa hankintatoimelle entistä paremmat lähtökohdat edistää hiilidioksidipäästöjen vähentämistä yrityksen toimitusketjussa.

Avainsanat hankintatoimi, hiilidioksidipäästöjen hallinta, nopeasti liikkuvat kulutustavarat, toimitusketju

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1 Introduction

Climate change and global warming should not anymore come as a surprise to anyone. The report from Intergovernmental Panel on Climate Change, IPCC, paints a worrying picture of what will happen unless the world acts fast in mitigating greenhouse gas emissions (IPCC, 2018). Rising sea levels will put millions of people at risk, and the impacts on biodiversity and ecosystems are severe (IPCC, 2018). Global warming is no longer a distant concern at the hands of policymakers, but present in the everyday lives of ordinary citizens.

Over the last decades we have seen how more and more people are starting to weigh in sustainability in their consumer choices, and this can be reflected in the increased market share of sustainable products. Nielsen, a US-based research firm, notes that the sales for sustainable fast-moving consumer goods (FMCG) has grown 20% since 2014, and estimate that this trend will continue as the millennials are increasingly sustainability conscious (Nielsen, 2018). It is clear consumers are demanding sustainability, and companies are picking up on what appears to be not only a transient trend, but the way of the future.

Not only is being more sustainable helping to keep customers happy but it has also been shown to have a positive impact on company's financial performance (Alshehhi et al. 2018). Therefore, it can be argued that there is no reason for companies to overlook sustainability in all areas of their operations. But what does sustainability mean in business? Traditionally, sustainability is said to be composed of the so called 3Ps: people, planet and profits. When companies are looking into becoming more sustainable, all three are important to address (Carter and Rogers, 2008).

In terms of sustainability of the people and planet dimensions, focus has increasingly shifted towards companies' supply chains (Seuring and Müller, 2008). Krause et al. (2009) even go as far as to suggest that a company's overall sustainability is dictated by how sustainable its supply chain is. Considering news surrounding supplier violations of different types of regulations, this statement is not hard to believe. Often these violations have to do with the people dimension, such as the use of child labor or dangerous working environments. Griggs et al. (2013) argue that while the people dimension is important, more extensive incorporation of enhancements in the planet dimension is needed for truly sustainable development. Without stable functioning of earth's ecosystems, it is difficult to build a better future for next generations (Griggs et al., 2013). If we think about addressing the planet dimension, the reduction of carbon emissions is one key priority, as described by

the IPCC report (IPCC, 2018). Linking this to companies' supply chains, studies have shown that emissions originating from the supply chain can make up for as much as 75% of a business' total emissions, and direct emissions from company-owned resources and from the generation of energy a company uses account for the rest (Huang et al., 2009). Procurement operates mostly in the upstream supply chains, meaning the network of suppliers responsible for the flow of materials and services up to the focal company. This upstream chain is noted to contribute to most overall supply chain emissions (Huang et al., 2009; Downie and Stubbs, 2013; WRI and WBCSD, 2011). In cost reduction the largest savings usually lie where there is largest spend, and same goes for emission reduction. We start to see why supply chain is among the key focus areas in managing carbon emissions, and why procurement should be involved.

Managing a company's supply chain is a complex task in which multiple different functions participate in. This brings the procurement function to the discussion. Procurement has many different responsibilities ranging from identifying and managing the company's supplier base to making sure the supply of goods and services meets the internal needs of the company. If we begin to think how these responsibilities can affect the sustainability of supply chains, areas such as supplier selection and management, determining quality standards and purchase planning immediately come to mind. Whether or not a corporate sustainability strategy is incorporated as part of these processes has major implication to the sustainability of supply chains. Procurement's role in carbon reduction is also highlighted by many researchers (e.g. Ellis, 2018; Prasad, 2017). While supply chains and supply chain management encompass features outside of procurement's direct responsibilities, there is no denying the impact procurement has on supply chains. Therefore, a connection between procurement and supply chain carbon management can be drawn.

The sad news is that studies have shown that procurement is not always considered as a key strategic function in a company. Rather, their role, especially perceived by other functions, can be on the transactional side (Tassabehji and Moorhouse, 2008). Often, procurement struggles to prove its value contribution beyond securing supply and cost reduction. In a recent study on how procurement can influence the sustainability of supply chains, it was concluded that procurement is not kept in the loop when sustainability criteria are discussed with suppliers (Villena, 2019). At the same time, sustainability is listed as a future requirement for procurement professionals (Bals et al., 2019). Therefore, there is an opening for research focusing on procurement's role on a more specified aspect of sustainability, carbon management.

The importance of sustainability and carbon emissions and their link to supply chain management has experienced an increased trend among researches during the last decade (Das and Jharkharia, 2018). At the same time, guidelines for carbon accounting, such as the Greenhouse Gas Protocol by World Resources Institute and World Business Council for Sustainable Development, have emerged to help companies measure and report their emissions. However, there seems to be a lack of research specifically focusing on procurement's contribution in supply chain carbon management (Correia et al., 2013).

This study aims to provide a more uniform picture of procurement's role in supply chain carbon management (referred to as SCCM from now on). A multiple-case study on large organizations operating in FMCG industry is conducted. The cross-case analysis aims at explaining how the procurement function is typically involved in carbon management activities such as carbon emission measurement, developing their processes to support carbon reduction strategies and engaging both with other functions and suppliers. Research on procurement's role in carbon management can also uncover findings on how or if procurement's strategic contribution is expanding and if something is preventing it from doing that.

1.1 Motivation

After working for over three years at his current employer, a SaaS company delivering procurement analytics for large international companies, it was clear for the author that combining work experience and master's thesis in some way would make perfect sense. Over the years the company had grown significantly, and the expanding business environment presented multiple interesting opportunities for research. Especially over the past two years the company had started to receive increasing amount of inquiries from customers about procurement analytics capabilities in the sustainability space.

The message from customers was clear: their companies' boards had set sustainability targets and procurement was now either trying to contribute proactively or then by request from the board of directors. Sustainability evaluation, risk of their supplier base and carbon emission measurement based on expenditure data were among the common areas of interest. The author's employer had already implemented some solutions for its clients regarding supplier base sustainability, and a proof of concept about carbon emission measurement.

While there seemed to exist clear need for combining expenditure and emissions data to estimate carbon emissions caused by procurement operations, the company was unsure of what problems its customers specifically were trying to solve and if it could provide them

with something both feasible and valuable. Carbon emission measurement and reporting is not a topic to be taken lightly considering the legislation and overall importance of the area. Due to resource limitations the company had to constantly evaluate between different development areas and so far, carbon emission measurement had not been top priority. Therefore, taking the first steps in this area in the form of a student writing his master's thesis on the topic was warmly welcomed.

In addition to the author's employer being interested in this topic, it also presented an intriguing opportunity for the author himself. During fall 2019 the author spent three months on a secondment at a customer's office, experiencing firsthand how a procurement organization of a multinational company operates, what problems they are solving in their daily jobs and how procurement analytics software helps them reach their goals. During this secondment the researcher got to witness how the procurement organization was launching a project with the aim at gaining visibility into their supply chain sustainability risk. The key challenge for the procurement function to overcome was collaboration between other functions, proving that procurement can have a strategic contribution in areas other than just cost reduction. This gave the author the idea that it could be useful to include procurement's role in his thesis topic.

Being closely exposed to the aforementioned topics and having a personal interest in sustainability, combining this all together in a master's thesis felt like a natural continuum. As both the researcher and his employer could benefit from a study centered around carbon management and procurement's role in that, it did not take long to decide on the general direction of this study.

1.2 Research Gap

Emergence of procurement and SCCM in business context seems to apply to the stage in current academia as well. For example, research on low-carbon supply chain management is described by Das and Jharkharia (2019) to be in "nascent stage". While there exists literature on many different aspects of building low-carbon supply chains and how important they are, there has not been much focus specifically on the procurement function's role in all this. Given the urgency of greenhouse gas reduction and the magnitude of supply chain's contribution to a firm's total emissions, the topic is well positioned for further research.

In their literature review on SCCM, Das and Jharkharia (2019) identify two major perspectives of current research. One focuses on management of carbon emissions, while the other on carbon footprint measurement. The definition of carbon management is

similarly split into two main aspects, as it is described as "the measurement and management of the six greenhouse gases covered by the Kyoto Protocol, including carbon dioxide (CO_2)" (Chan, 2009, p.11). From this we can conclude that discussion and research on SCCM should not only encompass the act of measuring carbon emissions but also the processes and actions that are part of achieving a more sustainable supply chain.

Decision-making and process practices in supply chain are undergoing notable changes due to the increased pressure from different stakeholders to cut carbon emissions (Das and Jharkharia, 2019). Research in areas such as supplier selection, transportation planning and inventory management has shown that by incorporating emission-issues and reduction targets criteria in process planning, emissions can be significantly reduced. (Diabat and Al-Salem, 2015; Glock and Kim, 2015; Hammami et al., 2015; Kuo et al., 2015; Rudi et al., 2016; Shaw et al., 2012) What these studies seem to be lacking, however, is the inclusion of organizational dimension: which functions are responsible for driving and implementing these changes?

The other aspect of carbon management, measurement of carbon footprint, has not received similar attention in research, especially when it comes to empirical results and practical approaches to measuring supply chain carbon emissions (Das and Jharkharia, 2019; Shaharudin et al., 2019). Different types of approaches have been taken in carbon footprint measurement such as the input-output analysis (IOA), process analysis (PA) and the composed method of financial accounts (MC3). In addition to academic research, there exists guidelines for carbon accounting such as the Greenhouse Gas Protocol, which is considered the highest regarded and used carbon accounting guideline (Harangozo and Szigeti, 2017). Despite the growing importance and attention carbon emission measurement is receiving, the consensus appears to be that companies are still struggling with both the theory and practical aspects of it, leading to incomplete and imprecise carbon footprints. (Blanco et al., 2016; Downie and Stubbs, 2013; Harangozo and Szigeti, 2017; Penela et al., 2009)

To summarize, it seems that there is a clear research gap in combining the elements of supply chain management, carbon management and procurement's role. This study is focused on exactly that and will do so by conducting a multiple case-study analyzing how SCCM is approached in the case companies, and how their procurement plays a role in that.

1.3 Research Questions and the Scope

The aim of this research is to explore procurement's role in contributing to a company's SCCM. To meet this objective, procurement professionals from FMCG industry are interviewed to understand if procurement's role is close to what the current literature suggests.

The following research question is at the core of this research:

- What is the strategic role of procurement in supply chain carbon management?

Together with the main research question, two closely linked sub-questions are considered:

- How is the process of procurement changed to address carbon emissions in supply chains?
- How does procurement collaborate with stakeholders for supply chain carbon management?

Focusing on the listed research questions, this study will contribute to the status of procurement's role in carbon management in supply chains. In addition to purely an academic contribution, the study will help companies, not just their procurement organizations, to see if their procurement organization is enabled to be valuable in this area. The author hopes that the findings of this study can be leveraged in other companies with a notable procurement organization.

As mentioned in the motivation-section of this paper, the aim of this study is not only to build theory on procurement's role in SCCM but also to provide concrete recommendations for companies to improve in that area. It is hoped that this research uncovers ways for companies to, for example, take steps towards managing carbon emissions as part of their procurement processes such as supplier selection and management, incentivizing procurement to contribute actively to the company's carbon reduction strategy and collaborating with other important stakeholders in SCCM.

1.4 Outline of the Research

This thesis consists of six chapters. The following chapter introduces the reader to the theoretical basis used for this study. A conceptualization of procurement's role in SCCM is introduced at the end, which is then used as the guiding principle for the empirical section of this research. The third chapter explains the chosen research methodology and fast-moving consumer goods industry context. This is followed by first presenting the findings, after which the results are discussed and mirrored against the theoretical basis presented earlier. To conclude, summarization of the main findings, managerial implications and limitations and further research suggestions are presented.

2 Literature Review

The purpose of this chapter is to review the academic literature that is relevant for the topic of this study. The first section will focus on providing a clear picture of SCCM and how it differs from, for example, sustainable supply chain management. The second section will then introduce the reader more closely to procurement, its tasks and role in companies. This is necessary, as procurement is not a term or function to be used interchangeably with supply chain management. The third section will then start introducing the conceptual frameworks used in this study. Finally, the fourth section will bring the literature review to an end and presents the adapted conceptual model used as a guiding principle for the empirical part of this research.

2.1 Towards a Working Definition of SCCM

In order to present a clear scope for this research and provide clarity for the reader, it is needed to present the concepts and practices that constitute SCCM. Terms such as procurement and supply chain management are sometimes falsely used interchangeably, and SCCM as a practice is relatively new and perhaps not that well understood. Therefore, this section will familiarize the reader with the concepts and present a working definition for SCCM that is applied in this study.

2.1.1 Supply Chain Management

Supply chain management is the oldest of the concepts. It first appeared in academic literature in the mid-1980's (Jones and Riley, 1985), and during 1990's it started gaining momentum for reasons such as global sourcing, increased performance-based competition and new technology (Cooper et al., 1997; Mentzer et al., 2001). As is typical with emerging fields of both research and practice, at first there was no unanimous conclusion of supply chain management's meaning (Mentzer et al., 2001). This is what Mentzer et al. (2001) aimed at clarifying in their article titled "Defining Supply Chain Management". For effective both managerial and research implications, it is important that a generally accepted definition of a research area is reached.

In their article, Mentzer et al. (2001) define a supply chain as "a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of product, services, finances, and/or information from a source to a customer." Two things should be highlighted from this definition. First, it encompasses the complexity of

supply chains. Supply chains extend far beyond the first-tier suppliers and the immediate customers, and lately it has become increasingly critical to look past these first tiers (Huang et al., 2015; Villena, 2019; Wilhelm et al., 2016). Second, it differentiates the upstream and downstream parts of supply chains. Upstream supply chain means the network of suppliers (and their suppliers) that is responsible for the materials and services coming into the focal company. On the contrary, downstream supply chain then describes the network that is responsible for delivering the product or service leaving the focal company to the final customer (Cooper et al., 1997; Quain, 2019). This differentiation is important when we later start to look more closely into what are procurement's responsibilities, goals and how the function interacts with other functions in a company's supply chain. The below Figure 1 illustrates a simplified supply chain and its upstream and downstream parts.

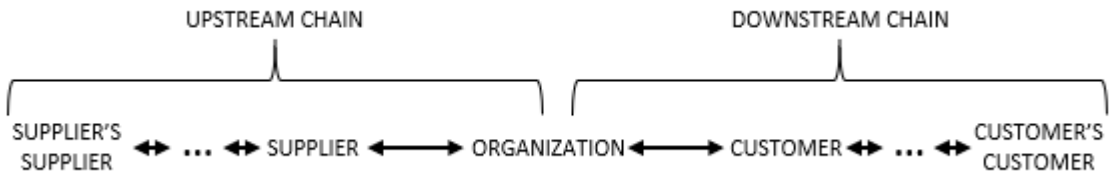

Figure 1. Simplified supply chain. (Menzer et al., 2001)

Whereas the definition for supply chain is rather commonly agreed, this has not always been the case with the definition of supply chain management. Mentzer et al. (2001) used three different categories to classify supply chain management definitions: a management philosophy, implementation of a management philosophy and a set of management processes. As a management philosophy, supply chain management focuses on viewing the supply chain as a whole instead of seeing each part as a stand-alone component. This forces companies to collaborate with each other to create customer value. Implementation of such management philosophy is then focused on activities that support this view, and a set of management processes then describes the ordered totality of such activities. After reviewing the literature and different approaches taken to define supply chain management, Mentzer et al. (2001) believed that a single definition is possible. They define supply chain management as "the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole." (Mentzer et al., 2001 p.18)

In essence, the difference between a supply chain and supply chain management is that while a supply chain always exists it does not mean that they are necessarily always managed by the supply chain partners (Mentzer et al., 2001). It is crucial to note that in this article the importance of inter-functional coordination is highlighted, and purchasing is listed as one key business function. It also raised an interesting future research question about the role of each of these business functions in supply chain management. This study aims at contributing in that area.

2.1.2 Sustainable Supply Chain Management

Especially during the 2000's, pressure from different stakeholders has forced companies to adapt sustainability as part of their operations (Carter and Easton, 2011; Seuring and Müller, 2008). This development is reflected in academia as well, as in the beginning of 2000's researchers started to form a more cohesive description of what sustainability means and how it plays a role in supply chain management (Carter and Rogers, 2008).

Before this, areas of sustainability were considered mainly as standalone issues and there was a lack of a broader conceptualization that put these issues together (Carter and Jennings, 2002). Carter and Rogers (2008) argue that while the work by Carter and Jennings (2002, 2004) and Murphy and Poist (2002) started to fill this research gap, organization's economic responsibility was still omitted in the research. Therefore, Carter and Rogers (2008) concluded that a consistent definition of sustainability in the field of supply chain management did not yet exist. In their work, Carter and Rogers end up defining sustainable supply chain management (SSCM) as "the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chains.". Similar definition is also used by Seuring and Müller (2008), who in addition specifically mention that the goals in all three dimensions, social, environmental and economic, are driven by customer and stakeholder requirements and should be weighted equally.

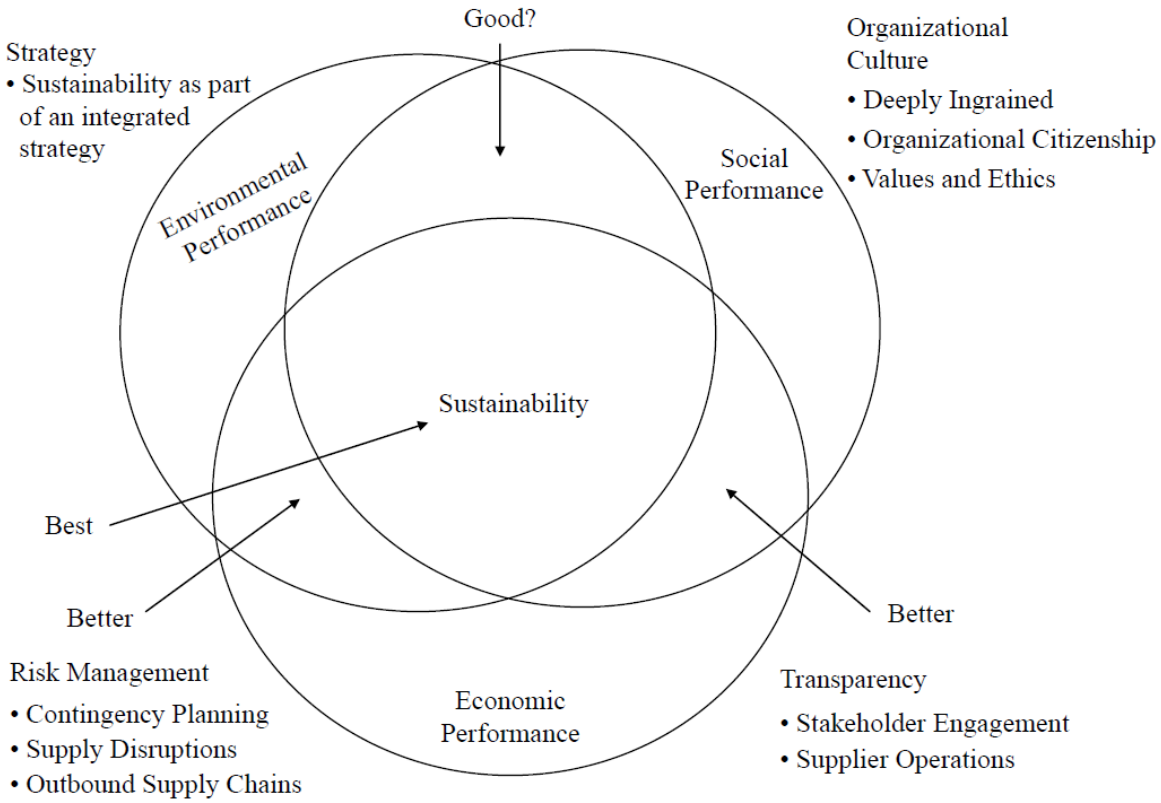

Figure 2. Sustainable supply chain management. (Carter and Rogers, 2008)

Such definition has been widely accepted, as it describes the importance of the Triple Bottom Line (TBL) introduced by Elkington (1998), highlights that sustainability is not limited to a single company in the supply chain and reminds that stakeholders are an important part of the equation.

Now with an understanding of what sustainable supply chain means, we can take a closer look at one of its core components: environmental performance. Given the media attention on global warming, it is no surprise that this dimension of sustainability has received the most focus in research (Carter and Easton, 2011; Seuring and Müller, 2008). Environmental sustainability can mean many things however, and thus it should be made clear that for example, green supply chain management (GSCM) is not to be used as a synonym to SCCM. Srivastava (2007) defines GSCM as "integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life." Encompassed in this definition is the fact that GSCM is a broader definition of environmental sustainability than SCCM. While GSCM activities can result in lower carbon emissions, this is not the sole focus of the

practice. Important aspects can be for example waste reduction through efficient manufacturing operations, using more environmentally friendly materials in the manufactured products and planning for repairing, re-using and recycling of the product.

2.1.3 SCCM

Recently, more and more focus has been placed on greenhouse gas emission reduction due to the effect they have on the climate (Das and Jharkharia, 2019; IPCC, 2014). For this reason, research has emerged in the field of reducing carbon emissions in the context of supply chain management. Das and Jharkharia (2019) note that in research, the issues regarding management of carbon emissions are often separated from the measurement of carbon footprint. Therefore, the following sub-sections discuss these sub-sections separately as well.

2.1.3.1 Management of Carbon Emissions

Management of carbon emissions refers to actions that aim to reduce carbon emissions. Carbon emissions have been taken into consideration in inventory-related issues such as inventory routing and ordering policy (Diabat and Al-Salem, 2014; Hammami et al., 2015). Transportation planning, mode selection and demand consolidation as means of carbon reduction have also been researched (Glock and Kim, 2014; Rudi et al., 2016). Supply chain network design research has included issues such as location and production costs, closed-loop supply chain and strategic and operational supply chain network design to reduce carbon emissions (Elhedhli and Merrick, 2012; Rahmani and Mahoodian, 2017; Tao et al., 2015). Studies in the low carbon sourcing space have mostly dealt with supplier selection, applying mathematical models that take carbon criteria into consideration along with traditional economic performance criteria (Govindan and Sivakumar, 2016; Hu et al., 2015; Hsu et al., 2014; Kuo et al., 2015; Shaw et al., 2012; Yu et al., 2018).

Having covered the important concepts relating to supply chain management and what sustainability means in that, we can advance to explain SCCM in more detail. For that, we need to understand the latter part, carbon management.

Chan (2009) defines carbon management (CM) as “the measurement and management of the six greenhouse gases covered by the Kyoto Protocol, including carbon dioxide (CO_2)”. This definition is fitting for the purpose of this study, as it highlights that carbon reduction comprises many different steps and activities, such as deciding measurement scopes and methods, setting targets and planning reduction initiatives and engaging and incentivizing employees and suppliers (Chan, 2009). The definition is close to how Das and Jharkharia

(2019) define low-carbon supply chain management, meaning that CM also separates management of carbon emissions from measurement of carbon footprint. Furthermore, carbon management is described as a collaborative effort, which poses an opportunity for this study to explore procurement's role in it.

For the context of this study, SCCM is defined as *the process of organizations managing the supply chain in such a way that incorporates carbon dioxide (CO2) emission measurement and reduction as one key business objective*.

This definition implies that carbon management requires consideration of both measurement and management of carbon emissions that happen along the supply chain. The reason we focus here only on carbon dioxide is that it is the most well-known of the greenhouse gases, perhaps due to it accounting for more than 80% of overall GHG emissions (EPA, 2020). The chosen definition, SCCM, enables open discussion around the practices procurement professionals feel are an important part of carbon reduction, and gives an opportunity for new and interesting findings on the topic.

2.1.3.2 Measurement of Carbon Footprint

The measurement of carbon footprint, often referred to as 'carbon footprinting' or 'GHG accounting', is often considered separately from management of carbon emissions. In business context, it is important to understand the concepts relating to it. One of the most important one is the categorization of GHG emissions into three different scopes:

- **Scope 1**: direct emissions from operating company owned resources, such as company facilities and vehicles. These are emissions that the operating company has direct control over.
- **Scope 2**: indirect energy emissions, meaning emissions caused by the generation of the energy that the operating company purchases and consumes.
- **Scope 3**: all other indirect emissions that are generated somewhere in the operating company's supply chain which do not fall in any of the previously mentioned scopes.

Together, these three scopes make up the total corporate carbon footprint. What is interesting about these scopes, is that studies have shown that even as much as 70-90% of the total corporate carbon footprint can lie in Scope 3 (Matthews et al., 2008; Huang et al., 2009). Therefore, companies looking for effectively reducing their carbon footprint should

place significant focus on the emissions caused in their supply chains (Downie and Stubbs, 2013; Huang et al., 2009; Matthews et al., 2008). Further, as supply chains consist of both upstream and downstream activities, it is worth noting that upstream emissions are found to contribute to the majority of Scope 3 carbon emissions and thus receive more attention than downstream emissions (Downie and Stubbs, 2013; Huang et al., 2009; WRI and WBCSD, 2011). This places procurement organizations into an important position, as they operate mainly exactly in this space. Procurement's important role in this arena has been recognized by both public and private organizations (Correia et al., 2013).

Measurement of the emissions belonging to each of the three scopes is not a simple task, and for this reason, protocols have been created to assist companies in their carbon footprinting efforts. Such protocols include for example the GHG Protocol by World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) and ISO 14064 from the International Organization for Standardization. Of the available protocols, the GHG Protocol is the most widely adopted by companies (Harangozo and Szigeti, 2017). These protocols have a weakness in that they mainly focus on scopes 1 and 2, with considerably less focus on scope 3 (Huang et al., 2009; Matthews et al., 2008), which is the largest source of carbon emissions out of the three scopes. On top of less focus on the supply chain emission guidance, disclosing these emissions is voluntarily (Blanco et al., 2013).

The GHG Protocol has a specific reporting standard created for accounting for scope 3 emissions. This is perhaps the reason it is the most used (Harangozo and Szigeti, 2017), and is often mentioned in research on scope 3 emission measurement (Blanco et al., 2016; Correia et al., 2013; Downie and Stubbs, 2013; Huang et al., 2009; Lee and Vachon, 2016; Matthews et al., 2008). In that reporting standard, the needed steps for building a scope 3 inventory are explained from start to finish. The process is summarized in below Figure 3.

Figure 3. Overview of scope 3 accounting and reporting process. (WRI and WBCSD, 2011)

The general principle that the protocol promotes is that GHG accounting should be always based on relevance, completeness, consistency, transparency and accuracy. As emission measurement is a difficult task, the focus is in helping companies to create a scope 3 inventory that has a clear audit trail and can be used by decision makers to make informed decisions on their emission management activities (WRI and WBCSD, 2011).

For one of the steps of scope 3 accounting and reporting process, collecting data for calculating the scope 3 inventory, GHG Protocol recommends prioritizing the data collection in a way that maximizes the achieved results. The first step should be to use initial, less accurate, methods to estimate where the biggest emissions lie. Such methods include for example the use of environmentally-extended input output data or industry averages. For the prioritized activities included in scope 3, more specific data can be then collected from for example suppliers and other supply chain partners to reach a more accurate scope 3 emission inventory (WRI and WBCSD, 2011).

In research, the two most recognized methods for calculating GHG emissions are input-output analysis (IOA) and process analysis (PA) (Downie and Stubbs, 2013). In process analysis, the supply chain activities are analyzed in great detail and input is needed from the supply chain partners (Lenzen, 2002). Input-output analysis on the other hand takes a macroeconomic approach and analyzes how monetary transactions create interdependencies between different industry sectors (Lenzen, 2002). Of these two approaches, input-output is mostly used in studies calculating GHG emissions (e.g. Hertwich and Wood, 2018; Huang et al., 2009; Matthews et al., 2008). Perhaps the reason for this is that IOA is simpler to implement for research purposes, whereas PA would require information that is too difficult to collect in such magnitude.

Interestingly, the situation is the opposite in practice. Downie and Stubbs (2013) evaluated Australian companies' scope 3 assessments and found out that not a single company involved in the study used IOA for calculating their scope 3 emissions. All companies used some form of PA where companies quantified their supply chain activities and applied an emission factor to reach a GHG estimate. Also, the number of included scope 3 emissions sources varied greatly between companies, and generally the companies were unsure of what should be included. The findings from this study are in line with a more recent one by Blanco et al. (2016), in which the researches estimated that in 2013 US firms reported only 22% of their total scope 3 emissions. Further, the study concludes that the firms' reporting of scope 3 emissions is not at a mature state.

These studies highlight the challenges of scope 3 emission measurement. While scope 3 emissions are recognized to be of great importance, companies seem to struggle with understanding what emission sources they need to include in their calculations and how and where to collect the data (Blanco et al., 2016; Downie and Stubbs, 2013). Existing standards and protocols, such as the mentioned GHG Protocol, are important tools for better understanding and validity of GHG accounting (Díaz et al., 2012; Huang et al., 2009). Lastly, existing research and GHG measurement protocols do not take a firm stance on who or which department should oversee leading the carbon accounting efforts. GHG Protocol (WRI and WBCSD, 2011) does however note the impact scope 3 measurement has on procurement practices, and that procurement should be involved in emission data collection. Therefore, there is a clear opening for examining procurement's role in carbon emission accounting in more detail.

2.2 Procurement and Its Role in Organizations

The previous chapter covered the basics of supply chain management, how carbon management is linked to it and presented a working definition for SCCM. This chapter introduces the reader more closely to procurement, its role in organizations and why the function matters in SCCM.

2.2.1 Procurement's History in Brief

Procurement has not always been seen as a source of strategic competitive advantage in firms. Carr and Smeltzer (1997) note that the attitudes towards procurement stemmed from managers not recognizing its critical role. Changes in global business environment and the need for procurement to adapt to new developments such as outsourcing and supply chain management have helped organizations to realize that procurement can and should have a larger role as a strategic partner (Giunipero and Pearcy, 2000; van Weele and Rozemeijer, 1996). Carter and Narasimhan (1996) studied purchasing's role in corporate strategy and found multiple ways how purchasing can contribute to it, concluding that a firm's performance is highly correlated with purchasing tactics used.

These developments led to academics considering procurement to have a strategic role in a company and being a source of competitive advantage (Giunipero et al., 2006; Humphreys, 2001; Paulraj et al., 2006). Studies have highlighted that procurement's focus should shift from focusing solely on cost to a more value-based approach (Mehra and Inman, 2004; Noonan and Wallace, 2004). There appears to be wide consensus that procurement

can and should focus on wider set of responsibilities than just purchasing. This is also highlighted in the terminology used, as previously more popular terms “purchasing” or “buying” have been slowly replaced by “procurement” and “supply management” (Paulraj et al., 2006).

In fact, this transition has been ongoing for decades: one cornerstone of this development is the article “Purchasing Must Become Supply Management” by Peter Kraljic back in 1983. Despite being over 30 years old, the purchasing portfolio model presented in that article is still relevant and widely used to this day. Already then, Kraljic recognized that a well-functioning procurement organization can yield significant performance benefits. Procurement’s alignment and connections with the rest of the company, having the right systems to support its operations and matching the procurement professionals’ skill level to the increased importance are all mentioned as prerequisites to untapping procurement’s potential. Despite the general consensus on procurement’s strategic role in academia, this does not always realize in actual business setting (Tassabehji and Moorhouse, 2008). This topic will be covered in more detail in a later section of this chapter.

2.2.2 Procurement’s Objectives

Because procurement as a function has seen significant changes over time, it is necessary to introduce the reader to what procurement is and what it is not. Procurement is often confused or used interchangeably with purchasing or supply chain management. While these activities overlap in some ways, it is important to note that as this research focuses on procurement’s role, it is necessary to explain why and how procurement is its own entity. By doing so, it provides the reader with a better understanding of why some issues regarding SCCM implementation exist in the procurement context.

The most important objective of procurement is to make sure that the purchasing organization gets the goods and services it needs when it needs them in order to perform its own operations (Tate, 2013). An important part of this process is not only caring about the quality, amount and timing of the goods and services, but also price. For this reason, cost reduction is still considered by chief procurement officers (CPOs) as the key priority of the procurement function (Deloitte, 2019). Essentially, the procurement process starts with the identification of a requirement or need for a product or service and ends when the goods have been received and payment been made. However, the development of the procurement function has made this definition outdated, as procurement nowadays is responsible for more complex objectives, such as supplier development, managing supplier relationships and

sustainability (Tate, 2013). In essence, when procurement is performing well the purchasing organization is set to perform its operations in a smooth manner. However, in today's global business environment the effects of bad procurement can be substantial.

Procurement as a term is sometimes used interchangeably with purchasing. This may stem from the history of procurement, as decades ago procurement was not granted the responsibilities and recognition it receives today. Purchasing is essentially a subset of the procurement process, which mainly considers the buying part of it (Bals et al., 2019). One of the key reasons why procurement and purchasing should not be confused with each other is that procurement is a strategic function that needs to reflect overall corporate strategy (Tate, 2013), while purchasing is mainly a transactional part of it that does not need to be so closely connected and tailored to the strategic objectives of the company.

Similarly, while procurement operates closely with a company's supply chain, procurement professionals are not the same as supply chain professionals. As described in the earlier part of this study, supply chain represents the agents involved in the end-to-end process of getting your product or service at the hands of the end customer. Therefore, procurement is a subset of supply chain management which is concerned of getting the needed goods and services for the company to perform its operations. Once the needed goods are at the hands of the company, procurement stops but supply chain management continues. Essentially, procurement operates mainly in the upstream part of supply chains and has less responsibilities in the downstream part of it.

2.2.3 Procurement's Link to Corporate Sustainability

Having established that procurement is receiving increased recognition and responsibility within organizations, we can start examining how it can play a role in corporate sustainability strategies. First off, companies can no longer be concerned only of what happens inside their own offices and factories. External stakeholders increasingly hold companies accountable for violations that happen in their supply chains (Villena, 2019). Krause et al. (2009) go as far as to state that "a company is no more sustainable than its supply chain", indicating that in order for a company to be truly sustainable it must foster sustainability not only within its own operations but also with its supply chain partners, and propose that sustainability criteria should be an additional objective for the procurement function.

An argument could be made that sustainability issues should be handled by a separate organizational function and not procurement, as sustainability has not traditionally been a core competency or responsibility of procurement. There is evidence that procurement may

not want to act proactively in sustainability issues as there is a lack of incentives to do so (Villena, 2019). Simultaneously, procurement professionals are better positioned to impact supply chain sustainability than sustainability professionals as they work more closely with suppliers and have more leverage over them (Villena, 2019). Pagell et al. (2010) noticed that procurement organizations need to rethink their purchasing strategies when implementing sustainability across the supply chain. The way procurement places emphasis on social and environmental sustainability in relation to economical sustainability has strong implications to the sustainability of a company's supplier base. Also, Schneider and Wallenburg (2012) studied the implementation of sustainable sourcing and place the procurement function at the very core of successful implementation of corporate sustainability goals. In addition to procurement's great role in sustainability, Schneider and Wallenburg (2012) emphasize that by implementing sustainable sourcing, procurement can further strengthen its strategic importance and role within organizations.

While sustainability poses a great opportunity for procurement to expand its value proposition, it is important to highlight the contradiction between sustainability goals and how procurement is typically measured and rewarded. Procurement has a long history of focusing on securing supply and cost reduction. Even though over time it has been recognized that procurement can deliver value beyond cost savings, it is not uncommon that the way procurement's performance is measured still reflects the past objectives. Schneider and Wallenburg (2012) note that a purchasing function's history affects their willingness to implement sustainable sourcing in a negative way. Correia et al. (2013) identify that implementing low carbon procurement is challenging if procurement is facing strong pressure to cut costs and act as a buffer during economic downturn in a global business environment. Long and Young (2016) recognize conflicting objectives and costs associated with carbon reduction as the main barriers for more effective supply chain GHG management. Villena (2019) also noticed that the companies involved in the research did not incentivize procurement to care about sustainability, as cost reduction and quality improvement were the metrics that determined procurement performance. This trade-off between short-term costs and carbon emission reduction is something that needs to be addressed in procurement performance reviews (Das and Jharkharia, 2019). If procurement managers are left with the decision to either risk their job by cutting carbon emissions and incurring higher cost or keep doing what they have been doing in the past, it is not likely that we see significant improvement in procurement's role in SCCM.

Taking a closer look at carbon emissions, research has shown that as much as more than 70% of emissions are caused in supply chains (Huang et al., 2009; Matthews et al., 2008), and majority in the upstream part of them (Blanco et al., 2016). As discussed previously, this is the area where procurement operates and has control over. Therefore, procurement has multiple ways to contribute to carbon management efforts. Key is to communicate environmental goals with suppliers and implement carbon criteria as part of the procurement process (Tate, 2013). Correia et al. (2013) present low carbon procurement as an emerging agenda which has been picked up by both public and private sectors.

An OECD background paper by Baron (2016) suggests that procurement has a large role in low-carbon innovation. In 2014, 27 out of 32 OECD member countries had green public procurement strategies, and public procurement was recognized to contribute to increased sustainability (Baron, 2016). One of the most important ways how procurement can help to manage and reduce carbon emissions is through the tendering process. Just as procurement in private companies, countries should focus on making sure public procurement strategy is in line with their overall objectives. If one objective is to reduce carbon emissions, this should be reflected in the tenders. Through creating demand for low-carbon products and services, procurement can foster sustainable innovation in the market. This is not always made easy due to a strong focus and history on lowest possible upfront cost, lack of resources and skills of procurement professionals and difficulties with measuring procurement's carbon footprint which makes performance tracking complex. (Baron, 2016)

In conclusion, procurement is a key strategic function that has a major potential for affecting and implementing carbon management strategies in supply chains.

2.2.4 Procurement's Competencies and Role in Organizations

Procurement's role and required competencies have been studied in earlier research. Also, the need for both internal and external collaboration by procurement in order to meet its strategic goals have been highlighted. The sad news is that while procurement has great potential, this potential appears to be largely untapped and there exists a gap between what the academia suggests procurement's role to be and what it is in practice. For example, Giannakis (2012) studied procurement's role in supplier relationship management and found that there is a significant gap between the academia and practice. While an active role is suggested by the literature, in practice this does not occur. One reason for this is that as

procurement has granted more responsibilities and recognition in companies, procurement professionals' skills in these newly required competency areas has not kept up.

The literature appears to confirm that procurement is suffering from its legacy of being considered a transactional, rather than strategic, function. Especially in the early 2000's some of this contradicting thinking appeared, as some authors recognized the strategic role of procurement and some others still saw procurement having a more transactional role (Cox et al., 2005). Further, as is noted by Ramsay (2004), the academia does not necessarily always accurately describe the adaptation of theory in practice. As mentioned, Giannakis (2012) reached a similar conclusion.

A study by Tassabehji and Moorhouse (2008) is among studies that started more closely looking into how procurement is perceived within organizations and what does it take for procurement to exceed in its developing strategic role. After interviewing senior procurement professionals, they found out that the way other functions perceive procurement often hinders procurement's ability to make a strategic contribution. A common problem across the study participants was that they struggle with communicating their value across to other functions, which then leads to a culture where procurement is seen as a necessary evil in the process of acquiring goods and services. Effective ways to fight against such culture are procurement representation at executive level, being involved early in the procurement process and collaborating actively with other functions and stakeholders (Schneider and Wallenburg, 2012; Tassabehji and Moorhouse, 2008; Villena, 2019).

The importance of communication skills, internal selling and customer management and collaboration with cross-functional teams for procurement professionals has been recognized by multiple studies (Bals et al., 2019; Karttunen, 2018; Schneider and Wallenburg, 2012; Tassabehji and Moorhouse, 2008; Villena, 2019). Schneider and Wallenburg (2012) apply stakeholder theory in their study on implementing sustainable sourcing, and what implication it has on the purchasing function. In their findings, Schneider and Wallenburg state that a collaborative and well-networked purchasing function is better positioned to implement sustainable sourcing and add strategic value. However, they do note that as the purchasing function has been traditionally concerned mainly about the suppliers and not about other stakeholders, purchasing is not living up to its potential in implementing sustainability practices. The authors call for further research on purchasing's collaboration with other functions and how it is positioned within organizations.

Villena (2019) has studied procurement's role in implementing sustainability across supply chains. The findings suggest that procurement's role is indeed strategic, but

successful promotion of sustainability in supply chains by procurement requires strong cooperation with both internal and external stakeholders. If procurement is not sitting at the tables where sustainability requirements are discussed and goals set, companies run the risk of setting ambitious goals with low chance of successful implementation (Villena, 2019). This collaboration between procurement and other functions has been an identified issue for long (Ellinger et al., 2006; Fawcett and Magnan, 2002).

A recent study by Bals et al. (2019) focuses on purchasing and supply management competencies: how they have developed over the past years, what are the current requirements for a purchasing and supply management (PSM) professional and what are the future trends this profession must pick up. The authors used the procurement skill framework established by Tassabehji and Moorhouse (2008) as the basis for their work. Among the ten most important current competencies, communication skills, cross-functional abilities and knowledge, stakeholder management, strategic thinking and sustainability were mentioned. As for future competencies, skills related to digitization, innovation and sustainability were considered as the most important. It was emphasized by the interviewees that the future requirements are not replacing the current ones, rather they are added to the total mix of skills required by PSM professionals. This is in line with the overall development of procurement as a function: as time has passed, procurement's contribution is more and more recognized and therefore the function is nowadays considered a strategic one.

These studies have made it clear that for procurement to perform well at a strategic level, it must collaborate with other stakeholders and be an active and attractive business partner for others. However, we must not forget that procurement needs to possess the necessary skills to be able to support strategic organizational objectives (Tassabehji and Moorhouse, 2008). In terms of carbon management, Correia et al. (2013) stress that procurement professionals must be aware of the key concepts related to carbon management if they wish to be successful in reducing carbon emissions in their operations.

2.2.5 Procurement and Carbon Management Competencies

While there appears to be consensus on the fact that proper training and skills are needed for procurement to be a valuable partner in carbon emission management, the level of procurement professionals' carbon management skills has not been covered by academia. According to Correia et al. (2013), research around the incorporation of carbon management in procurement processes is still very immature. Long and Young (2016) enforce this statement showing that poor understanding of methodologies is a significant barrier to better

GHG management, and both public and private organizations would benefit from improved methodologies, awareness and overall knowledge on the topic. On a more general sustainability level, the lack of proper training for procurement to be able to address sustainability is seen as an issue and something that needs to be focused on (Bals et al., 2019; Schneider and Wallenburg, 2012; Villena, 2019). Unless this happens, procurement functions will not be able to deliver strategic value in carbon management issues, according to the procurement effectiveness matrix by Tassabehji and Moorhouse (2008). This framework will be explained in more detail in a later section of this study.

This presents a challenge to organizations wishing to empower their procurement function in carbon management. As mentioned, carbon management and its implications to procurement processes has not been thoroughly researched (Correia et al., 2013). As a practice, SCCM has not received much attention from researchers before 2010, making it a relatively new phenomenon (Das and Jharkharia, 2019). While carbon management issues are still open for further research, other aspects of sustainability have been more popular (Das and Jharkharia, 2019). This may be in part due to the importance of regulatory pressure and guidelines available for companies to start implementing carbon emission reduction programs (Correia et al., 2013; Das and Jharkharia, 2019; Schneider and Wallenburg, 2012).

SCCM considers both the management and measurement of carbon emission in the supply chain, so procurement organizations should be trained to manage both aspects. A previous section of this study addressed these topics and from that we can conclude that this is not an easy task. Much of the emission reduction methods studied so far have to do with processes such as transportation and inventory planning, which are not the primary task of the procurement function. In the sourcing space, carbon emissions have mainly been considered in supplier selection. This is highly relevant for procurement, as supplier selection is one of procurement's core responsibilities (Tate, 2013). However, other relevant methods for carbon reduction for the procurement function, such as supplier development towards low carbon operations have not been popular among researchers.

Scope 3 carbon emission measurement, while recognized as of utmost importance (Blaco et al., 2013; Huang et al., 2009; Lee and Vachon, 2016; Matthews et al., 2008), is also a difficult task with complex methodologies and requires participation from many different functions of the organization (WRI and WBCSD, 2011). According to Blanco et al. (2016) companies have still a long way to go in terms of valid and reliable scope 3 carbon emission disclosures. Furthermore, Long and Young (2016) studied ways to improve supply chain GHG management and concluded that methods that increase awareness and improve

the information quality related to GHG emissions in supply chains are the best for achieving emission reduction. Based on this, the researcher argues that due to the lack of maturity in carbon management methodologies, especially in ones that are highly relevant for procurement professionals, it is difficult for organizations to construct carbon management training programs directed at the procurement function.

2.3 Framework for Procurement's Role in SCCM

Due to the immature nature of research around carbon emission issues within the supply chain, choosing suitable conceptual framework for this thesis was not straight-forward. Remembering that this thesis aims at examining procurement's role, changes in procurement process and skills and investigating the level of collaboration with key stakeholders in SCCM, two frameworks stand out that can be used as guidance for the empirical part of this study. The first is the framework for procurement skills effectiveness by Tassabehji and Moorhouse (2008). The framework evaluates procurement's performance against two dimensions, level of skills of the procurement function and the degree of internal collaboration with the rest of the organization. The second is framework for collaboration-driven sustainable procurement by Villena (2019). Similarly to the framework for procurement skills effectiveness, this framework highlights the importance of internal collaboration, but adds external collaboration as the second dimension. Further, it highlights that companies must master three areas of sustainability implementation if they wish to be successful: assessing, incentivizing and training. The frameworks and their relevance for this thesis will be explained in more detail in the following sub-chapters.

2.3.1 Framework for Procurement Skills Effectiveness

In their study, Tassabehji and Moorhouse (2008) aimed at uncovering how procurement professionals see their role in their organizations, how their role has changed and what skills are needed for procurement to perform well in its duties. The Procurement Skills Effectiveness framework was then developed based on their study findings. The framework conceptualizes how for procurement to be able to make a strategic contribution within its organization, it needs to exceed in both needed skills and internal integration of the role. The underlying premise of these two dimensions is that Tassabehji and Moorhouse (2008) stress the importance of having the necessary skills before procurement can gain a more strategical role. This is very much in line with Cousins et al.'s (2006) findings, where the authors

concluded that without proper procurement skills the function is not able to progress into a strategic one.

Tassabehji and Moorhouse (2008) evaluate the level of procurement skills according to the taxonomy they created based on their literature review. This taxonomy includes five groups: technical skills (including advanced procurement process skills), interpersonal skills, internal enterprise skills, external enterprise skills and strategic business skills. The authors argue that procurement functions should ideally develop these skills in their respective order, meaning that technical skills are the foundation for an effective procurement function, and improving in the other skills then helps procurement to make a wider contribution and gain internal recognition. This view is backed up by Reinecke et al. (2007) who show that increasing procurement performance requires much more than improving in just procurement-specific areas. This is well in line with procurement's development as a function over time. Whereas procurement used to be mainly an operational function with limited strategic contribution, over time the function has adopted a wider set of responsibilities. It is understandable that meeting these responsibilities requires a broader set of skills than what has been needed in the past.

The second dimension, degree of internal support and integration, plays a large role in determining to which extent procurement can expand their contribution. Many of the study participants raised the issue of procurement being perceived as an administrative function, which leads to lack of involvement in the processes where procurement could make a large impact (Tassabehji and Moorhouse, 2008). It is important to note that while good procurement skills help, it is essential that procurement acts proactively and proves its value contribution to the organization (Cousins et al., 2006; Tassabehji and Moorhouse, 2008; Zheng et al., 2007). For achieving this, interpersonal, internal and external enterprise and strategic business skills are key. Even a capable procurement function's potential will remain untapped if it does not collaborate and communicate effectively with other stakeholders. Tassabehji and Moorhouse (2008) mention early involvement, cross-functional collaboration and representation at board level as effective ways to improve the level of internal recognition. Lastly, the way procurement is measured is mentioned as a factor affecting how others view the function. Targets can be either beneficial or hurtful depending on if procurement meets them or not.

The framework rates procurement organizations along these two dimensions and categorizes them then into four categories: constrained procurement, administrative

procurement, disempowered procurement and effective and recognized procurement, as shown in Figure 4.

While this framework is developed to evaluate procurement's effectiveness to contribute to an organization's performance, it is relevant for the purpose of this thesis as well. As noted in earlier sections, effective carbon management requires procurement managers to understand the underlying concepts and practices that relate to it. In other words, procurement's contribution in an organization's carbon management strategy will be limited unless it possesses the necessary skills to be able to change the procurement processes to address carbon emissions in supply chains. Furthermore, carbon management is an organization-wide challenge, just as sustainability, and requires strong cross-functional collaboration. Unless procurement is recognized as an important function in this regard and the measurement and incentives reflect this, it is unlikely that procurement will add much value in carbon management issues. Therefore, it is needed that we explore how procurement collaborates internally with other functions for SCCM.

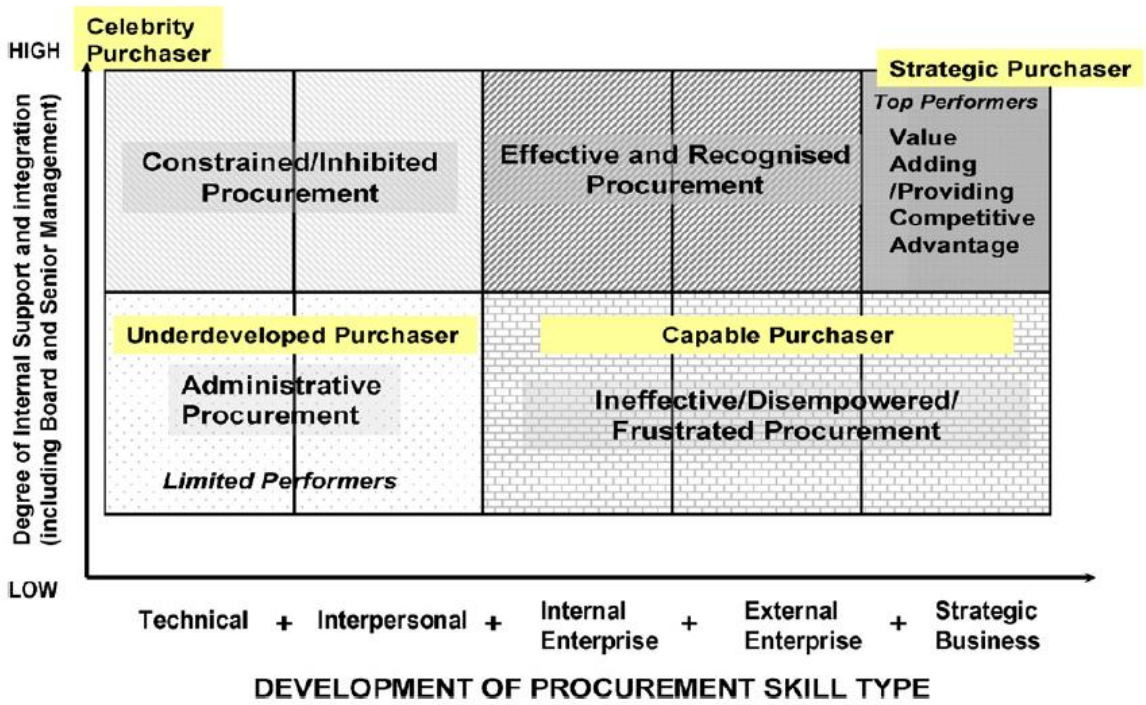

Figure 4. Procurement Skills Effectiveness Framework (Tassabehji and Moorhouse, 2008)

2.3.2 Framework for Collaboration-Driven Sustainable Procurement

While Tassabehji and Moorhouse (2008) focused on procurement's role and skills within the organization, Villena (2019) studied procurement's role in the development of

sustainable supply networks. The findings of the study are illustrated in the framework for collaboration-driven sustainable procurement, shown in Figure 5. The two dimensions include internal and external collaboration.

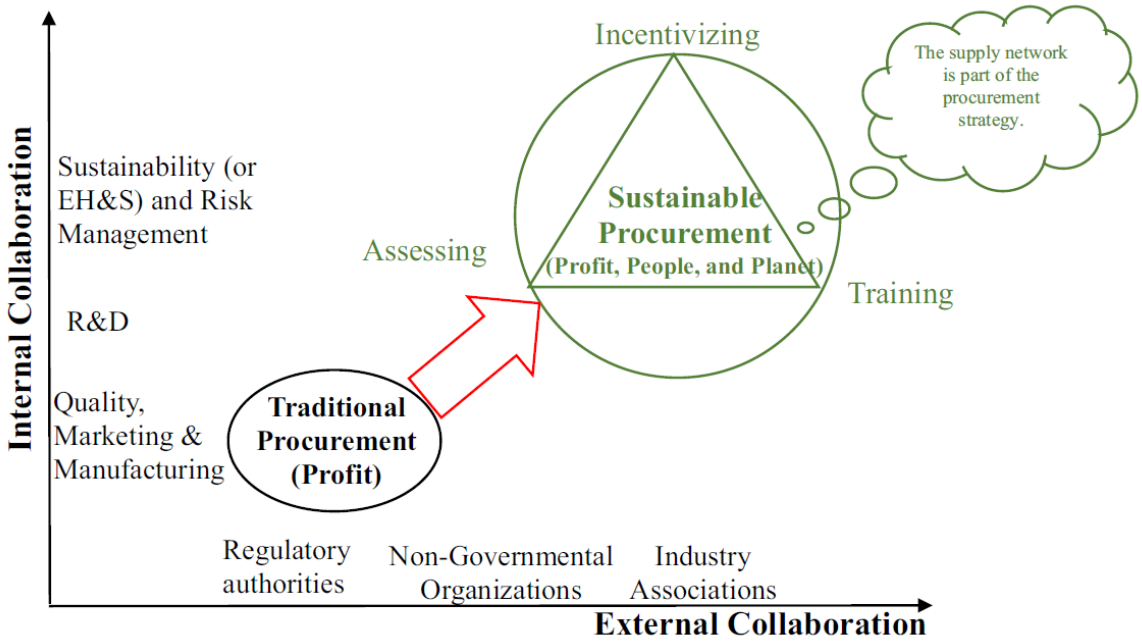

Figure 5. Sustainable Procurement and Its Collaboration Internally and Externally (Villena, 2019)

The level of internal collaboration underlines the importance of different functions working towards a common goal and having incentives to do so. Villena (2019) explains this through a situation where the R&D function had "pre-approved" a supplier based on their technical expertise and procurement then did not have the power nor incentives to make sure that the supplier meets their sustainability criteria. The misalignment of incentives and lack of collaboration between the functions thus lead to lack of consideration of the sustainability aspects in the supplier relationship. Such situation could have been avoided if the message to include sustainability criteria as part of the process came from top management (Schneider et al., 2012), and the incentives for all functions reflected this.

The second dimension, external collaboration, highlights the importance of outside organizations in sustainability implementation. Villena (2019) raises two important benefits of such organizations. First, they help in standardizing sustainability assessments. This means that both focal companies and suppliers benefit as they are less confused of what is required and end up using less time managing these assessments (Villena, 2019). Second benefit is the training these organizations have started providing regarding sustainability. On top of providing training, industry associations tend to be larger than any individual company

and thus have more influence over companies, leading to a wider adoption of sustainability standards.

In addition to collaboration between procurement and its internal and external stakeholders, the framework raises assessing, incentivizing and training at the core of achieving good sustainability performance. For assessing, it is noted that typically a mix of industry standards and own assessments is used. It is noted that while having a solid sustainability assessment process in place, this limits procurement's ability to perform well at the traditional metrics such as cost and time-to-market (Villena, 2019).

Incentives were found to be used for suppliers, whereby performing well at sustainability metrics the suppliers were rewarded by the buying company in various ways. However, despite incentivizing suppliers to be more sustainable, the companies included in the study had no incentives for their own procurement unit to implement sustainability in their operations. This leads to a situation where procurement prioritizes the metrics that they are measured against (Villena, 2019).

Lastly, training is needed for procurement professionals to be able to implement sustainability in their processes, as well as for communicating requirements to suppliers and other stakeholders.

This framework adds multiple interesting aspects in addition to the ones present in the framework for procurement skills effectiveness described earlier. The importance of consideration of the level of external collaboration and adoption of industry standards in sustainability and carbon issues has been highlighted by multiple other researchers (Blanco et al., 2016; Correia et al., 2013; Das and Jharkharia, 2019; Downie and Stubbs, 2013; Long and Young, 2016; Schneider et al., 2012). As carbon management issues are complex in both theory and practice, companies and procurement managers are looking at industry standards and guidance to help them get started (Correia et al., 2013). To which extent this happens currently and how helpful these standards are perceived in business context is still relatively unclear.

The three areas, assessing, training and incentivizing, are also relevant for carbon management. There is wide consensus that measurement of carbon emissions and identification of potential areas where they can be reduced is imperative for effective carbon mitigation strategies (Blanco et al., 2016; Correia et al., 2013; Das and Jharkharia, 2019; Downie and Stubbs, 2013; Hertwick and Wood, 2018; Huang et al., 2009; Long and Young, 2016; Matthews et al., 2008). Similarly, training is needed for procurement to be capable of implementing carbon criteria in their work (Correia et al., 2013; Long and Young, 2016).

Unless carbon management concepts and theory are well understood, trying to implement them will likely fail. Lastly, lack of incentives has constantly been identified as a barrier for sustainability implementation within procurement (Long and Young, 2016; Villena, 2019). Procurement has a history of focusing mainly on cost improvement (Tate, 2013), and implementation of low carbon practices comes with a price (Das and Jharkharia, 2019; Liu and Cui, 2016; Long and Young, 2016). This trade-off will not be resolved to carbon emission reduction's benefit unless there is a strong message from top management to do so, and procurement's performance measurement and rewards are adjusted to reflect this.

2.3.3 Adaptation of the Presented Frameworks

Having examined the two frameworks and their relevance to carbon management, the first area to be explored has to do with how the procurement process has been changing to address supply chain carbon emissions. As discussed earlier, incorporating SCCM in the procurement processes requires an understanding of carbon management methodologies (Correia et al., 2013). These include quantifying supply chain carbon footprint and incorporating carbon criteria for example as part of tenders and supplier relationship management. Furthermore, it is important to assess how or if procurement is being measured in SCCM as the lack of incentives has been recognized as a key barrier to more sustainable procurement operations. Lastly, it will be interesting to see if SCCM has posed any other important requirements new to the procurement function, such as improved training programs for carbon management.

The other key aspect is to investigate how procurement collaborates with stakeholders regarding SCCM. Importance of collaboration is emphasized by both mentioned frameworks: without proper collaboration and alignment with other functions, procurement's contribution will be less than ideal. In terms of SCCM, it is important to start with how procurement perceives their role in it. If procurement's view is that carbon management is not part of their responsibilities, it is not likely that we see procurement acting in a proactive manner regarding these issues. Such attitude could stem from the rest of the organization not involving procurement in the discussions regarding SCCM strategy. It would be important that procurement is involved, and that its goals should be aligned with corporate strategy. In addition to assessing procurement's involvement, the aim is also to see which stakeholders procurement considers to be the most important in SCCM and how well it feels the collaboration with them is working.

As no clear priori theory exists for the purpose of this study, it is theory-generating by nature. Therefore, the presented frameworks have been incorporated in a way that gives direction to the empirical data collection and brings structure to the findings and discussion. Ketokivi and Choi (2014) stress that with theory generating case study research, generality of the study can be improved by incorporating existing theory in the research even if it does not fit perfectly. In such case the role of theory should be explained clearly, which is what this section aims at doing.

3 Research Methodology

This chapter introduces the reader to the methodology applied in this research. First, background of fast-moving consumer goods industry context is introduced. Second, rationale for choosing a qualitative multiple case study approach is provided. Thirdly, the data collection method, semi-structured interviews, is described. Lastly, the quality of the research is assessed through dimensions suggested by the literature. The aim is to justify the chosen methodology from both theoretical and practical standpoints, as well as openly disclose the research design process prior to presenting the findings and discussion.

3.1 Industry Context: Fast-Moving Consumer Goods

This study examines companies operating in the fast-moving consumer goods (FMCG) industry. There are multiple reasons for making this decision. Being a consumer-facing industry and all things sustainability-related are popular in the media, companies operating in the FMCG industry have made their carbon strategies very visible to the public. This hopefully indicates a larger probability that their procurement function is part of these strategies. What strengthens this hypothesis is that the author's employer has received carbon emission related request mostly from the FMCG industry. Lastly, FMCG is a large industry in Europe and therefore presents an opportunity to examine interesting, well-established companies.

Fast-moving consumer goods mean products that have a relatively short shelf life due to high demand or the product being perishable (Kenton, 2020). There are multiple sub-categories of FMCGs, including food and beverages and everyday supplies such as office supplies and hygiene products. Due to the products being perishable and used in everyday life, the FMCG market is large and extremely competitive.

The products being fast-moving and sold at large volumes and strong competition over consumers' attention create interesting characteristics for the FMCG industry. First, the role of efficient supply chain management is crucial as the flow of goods from suppliers to end customers is continuous, fast and large in volume. Avoiding shortages in supply is key for FMCG companies and is considered the main factor impacting return on investment according to decision-makers (Supply Management, 2015). Not only does the supply chain need to be consistent but it also needs to be fast in bringing products to market, especially when talking about new products. Getting your product to the market before competitors is essential for FMCGs. For this reason, FMCG supply chains are a popular field of research

among the academia. In practice, FMCG supply chains are considered as innovators pushing the field forward and introducing new ideas to other industries (Bala and Kumar, 2011).

Strong focus on supply chain management in the FMCG industry is good news for the procurement function. In an environment where close supplier relations, effective sourcing operations and connecting both internal and external customers are emphasized, procurement is put in a position where it can deliver significant strategic value. Due to the tight margins FMCG products typically have and much of the costs of the final product being associated with the purchased materials, procurement is in a position where it manages a substantial portion of the products profitability.

Much of the costs and efforts in FMCG industry being associated with its supply chains also means that implementing sustainability and carbon management requires companies to turn their attention to their supply chains as well. As mentioned earlier, majority of a company's total emissions come are emitted somewhere in their supply chains. As modern consumers are increasingly aware of environmental concerns and the market for sustainable products is growing, FMCGs have formulated visible and ambitious sustainability strategies, including targets for carbon emission reduction. When these strategies are to be implemented across supply chains, procurement is at the core of sustainable sourcing.

For these reasons, FMCG industry presents a good opportunity to examine how procurement is contributing in carbon management and how its processes have changed to meet the emerging needs.

3.2 Qualitative Multiple-Case Study

This research is conducted with a qualitative research approach. Qualitative research is an "approach that examines concepts in terms of their meaning and interpretation in specific contexts of inquiry" (Ketokivi and Choi, 2014). Qualitative research does not try to quantify the research topic, rather understand it from the perspective of the participants of the phenomenon under investigation (Kaplan and Maxwell, 2005). For this reason, qualitative research primarily makes use of data such as interviews, observations and texts (Eriksson and Kovalainen, 2008). Qualitative research can also be useful when there exists only a limited prior knowledge of the topic at hand (Ghauri and Gronhaug, 2005). This research aims at examining procurement's role in SCCM, a topic relatively unfamiliar to this day. The purpose is to explore and interpret the topic from the perspective of procurement professionals, not to quantify procurement's contribution or to test any priori hypothesis. For

this reason, qualitative research was found to be the most fitting research approach in this case.

Qualitative research can be conducted in many ways, and this research uses the case study method. Eisenhardt (1989) defines case study as a "research strategy which focuses on understanding the dynamics present within single settings". Case study research has enjoyed growing popularity during last decades (Ketokivi and Choi, 2014; Yin, 2018), one reason being that case study research can examine and present complex issues in an understandable manner (Eriksson and Kovalainen, 2008). It is important to know that case study research is methodologically diverse and can be used for different purposes, namely theory generation, theory elaboration and theory testing (Eisenhardt, 1989; Ketokivi and Choi, 2014). Case studies can be either single- or multiple-case studies. Single-case studies enable more in-depth observation of the case (Voss et al., 2002), whereas including multiple cases can enhance external validity of the research (Yin, 2018). While both approaches have their advantages and disadvantages, Yin (2018) recommends opting for a multiple-case study if the situation at hand allows it. As the topic of this research, procurement's role in SCCM, is not unique to one single organization nor does it contain a longitudinal aspect, multiple-case study was chosen. Examining multiple cases presents an opportunity for broader set of views and more robust findings.

This case study is theory generating by nature, as no prior theory for procurement's role in SCCM exists. At the end of the previous chapter, we conceptualized procurement's role in SCCM. The conceptual framework is used to guide the research design and explain clearly the areas to be studied. This should not be confused with applying the presented frameworks to the empirical setting of this study. Ketokivi and Choi (2014) note that while theory generating case research process is very much focused on situational groundedness, incorporating existing theory, even if it does not fit the empirical setting perfectly, can help establishing generality. Similarly, Eisenhardt (1989) and Voss et al. (2002) advocate for setting up such a conceptual framework in order to better define the study's focus and design.

This research applies critical realism as its philosophical paradigm. Critical realism is typically considered to combine elements of positivism and interpretivism, in that while it accepts there to be one independent reality, it recognizes that humans may not always interpret this reality in a correct way (Wynn and Williams, 2012). In critical realism research, it is therefore important to explain the observed phenomena within its context, as some presented 'facts' may be misinterpretations. It would be difficult to apply a positivism paradigm in this study due to the strict generalizations it implies, and interpretivism would

not allow any comparisons to be made as every interpretation is considered equally valuable. Easton (2010) sees critical realism as "well suited to relatively clearly bounded, but complex, phenomena such as organizations, interorganizational relationships or nets of connected organizations". As this research is focused on procurement and touches upon how it collaborates with other functions, critical realism fits the purpose.

3.3 Sampling Method

This study focuses on companies operating in the FMCG (fast-moving consumer goods) industry. Purposive sampling method was used in selecting the case companies. Purposive sampling means that "elements selected for the sample are chosen by the judgement of the researcher. Researchers often believe they can obtain a representative sample by using sound judgement, which will result in saving time and money." (Black, 2010 p.225) This study relies mostly on purposive homogeneous sampling, meaning that cases were selected so that they share similar characteristics. The aim of this approach is to predict similar results among the cases, known as literal replication (Yin, 2018).

Purposive homogeneous sampling was seen fit for this study as it is a resource-effective sampling method, and SCCM as a topic is something that limits the number of potential case companies. The author's aim was to select companies that have in some way expressed interest towards managing their carbon footprint as this would result in more fruitful findings and discussion. As mentioned, FMCG was recognized by the author as an industry that seemingly had more focus on carbon emission related issues than others. In addition to FMCG companies reaching out to the author's employer about carbon emission analytics, many of these companies had visible carbon reduction targets on their website.

The chosen companies are similar in that they are all large companies operating in multiple countries and have strong procurement focus. Such organization are fitting for this study as they have enough scale to focus on issues like carbon management, and the procurement function being quite large presents a good opportunity to examine the collaboration between procurement and other functions.

3.4 Data Collection: Semi-Structured Interviews

Primary data were collected through semi-structured interviews. Semi-structured interviews typically make use of a pre-defined interview guide which covers the topics the researcher wishes to cover, but during the interview there is an opportunity to change the wording and order of questions. Aim of this method is to cover the necessary topics but let room for

emergence of new themes the researcher may not have thought of beforehand (Eriksson and Kovalainen, 2008). This allows for updating the interview guide based on the findings from the conducted interviews (Barratt et al., 2011). Stuart et al. (2002) see this flexibility pivotal in case studies as only by adjusting to the interviewees style and knowledge can the researcher uncover all relevant insights.

As SCCM is a recently emerged research area, semi-structured interviews were seen fit for the purpose of this thesis as they present an opportunity for findings not yet mentioned in the available literature. While this flexibility is a strength of semi-structured interviews, it has its disadvantages as well. As the interviewees may answer questions in varying detail and the interviewer may focus on certain topics more in some interviews than others, this leaves room for error in interpreting the results and comparing the cases to one another (Johnson and Weller, 2001).

A total of six semi-structured interviews were conducted, one per each case company. The targeted case companies were contacted by sending an email to the most senior contact within the company, as that is considered a good way to open doors and seek out the most knowledgeable person within the organization (Voss et al., 2002). Some of the contacted companies declined the invitation to take part in this research, mentioning that they do not yet have much experience with SCCM in procurement context.

All the interviews were conducted online using Teams due to the coronavirus situation, and 60 minutes was reserved for each. Three of the case companies were Finnish and those interviews were conducted in Finnish language. With others, English was used. All interviews were recorded and transcribed with permission from the interviewees. All six of the interviewed companies chose to remain anonymous in this study. Being large companies, interviewees expressed that doing otherwise would require them to go through extensive administrative work to get an approval for mentioning their name. Two also mentioned that due to the immaturity of carbon management in their organization, they are not comfortable with having their name shown on this study.

An interview guide was developed based on the conceptualization of procurement's role in SCCM presented earlier. So called funnel method was used, meaning that the interviews started with more general questions and then progressed into discussing more detailed topics (Voss et al., 2002). Such approach was taken so that the interviewee has time to get comfortable with the interview setting and answering questions. After the general questions the interview guide was split into two main themes: changes in the procurement processes to address SCCM, and procurement's collaboration with other stakeholders in

SCCM. The questions and sub-questions under both themes were ordered and grouped so that they would cover all necessary topics while leaving room for insight discovery outside of the pre-defined questions based on the interviewee's knowledge and experiences.

Below is presented an overview of the interviews: product characteristics of the case company, role of the participants, interview duration and date.

Table 1: Overview of case interviews

Case interviews	Product characteristics	Interviewee's role	Duration	Date
Company A	Bakery and food service	Senior Manager, Business Development, Procurement	42 min 48 sec	20.5.2020
Company B	Brewing	Senior Director, Procurement Excellence	42 min 19 sec	25.5.2020
Company C	Grocery brand conglomerate	Senior Manager, Sustainable Sourcing	30 min 19 sec	26.5.2020
Company D	Household accessories	Sourcing Specialist	44 min 14 sec	27.5.2020
Company E	Food/beverage	Head of Direct Sourcing	48 min 53 sec	28.5.2020
Company F	Food	Project Manager, Quality and Innovation	47 min 21 sec	8.6.2020

3.5 Data Analysis: Inductive Approach

This study is theory generating by nature, and it employs an inductive approach to data analysis (Eisenhardt, 1989; Yin, 2018). Inductive data analysis starts with the collected data, examines what it compasses and begins working towards general findings across the data set (Braun and Clarke, 2012; Yin, 2018). Theories are generated in areas which existing research does not yet cover and there is no possibility to study the phenomena through existing theory (Ketokivi and Choi, 2014). However, being totally inductive can be difficult and suboptimal approach, as researchers often use some existing theory in data collection and analysis, and this can for example improve establishment of generality in the study (Braun and Clarke, 2012; Ketokivi and Choi, 2014). In this study, the research focus and data collection were structured by previous theory, as described earlier.

The data analysis followed a typical approach for multiple-case studies as first the cases were examined individually (within-case analysis), after which cross-case analysis took place. The analyzing process followed thematic analysis approach, which is "a method for systematically identifying, organizing, and offering insight into patterns of meaning

(themes) across a data set." (Braun and Clarke, 2012 p.58) Thematic analysis is an approachable and effective method of analyzing qualitative data, especially for an inexperienced qualitative researcher (Braun and Clarke, 2012).

Within-case analysis was conducted in a sequential manner and overlapped partly with data collection. Main reason for the sequential order was that this way, a deep understanding of each individual case could be formed. Before generalizing findings across all cases, a researcher should examine themes within individual cases (Eisenhardt, 1989). Yin (2018) describes this approach, maintaining the integrity of each individual case, as "case-based" approach. After each interview, the author transcribed the recordings and familiarized himself with the data. Then, the author carefully went over the transcripts and highlighted all potentially interesting and relevant parts. Different codes were used to describe the highlighted phrases. This helped with the last part, where codes were grouped into emerging themes in the data. By doing this, an in-depth view on each case was achieved before cross-case analysis.

Once all individual cases were analyzed separately, cross-case analysis followed. Cases were compared using the themes that emerged in the within-case analyses. By iterating between the emerging themes and the raw data supporting them, themes were sharpened and defined more closely. While doing this, the emerging themes and hypotheses were compared to existing literature to enhance generalizability and internal validity of the research.

3.6 Quality of Research Design

Yin (2018) recommends case study designs to be evaluated by four tests: construct validity, internal validity, external validity and reliability. Construct validity refers to how well the researcher can define the concepts examined in the research and developing accurate measures to match those concepts. This is generally not easy with qualitative case study research. As SCCM is a relatively new research area and procurement's role in it has not been previously studied, construct validity was addressed by forming a conceptual framework based on existing literature. This framework was then used as the backbone of the interview guide.

The second test, internal validity, is not relevant in this study as it concerns mainly explanatory studies and focuses on explaining causal relationships. External validity refers to how generalizable the findings of a study are outside of the study's sample, noted as one of the two essences of case research (Ketokivi and Choi, 2014). This study addresses external

validity by using the replication logic when selecting the case companies, that is, selecting them so that they would predict similar results.

Lastly, level of reliability can be determined by how well the study results can be replicated if someone would follow similar process as the initial researcher. To enhance the reliability of this study, the methods and procedures used are well documented throughout this study.

4 Findings

This chapter will present the findings of the empirical research. As in the conceptualization of procurement's role in SCCM, described earlier in section 2.3, the findings will be structured under two main themes. First, the impacts of SCCM on procurement processes are described. After that, the nature and need for collaboration between procurement and other key stakeholders for SCCM is presented. Along this chapter, noteworthy quotations are used to deepen the understanding of the themes the author found meaningful. Identified sub-themes and main findings are summarized below in Table 2.

Table 2: Summary of identified themes and main findings

Theme	Sub-theme	Main findings
SCCM's impact on procurement processes	Overall procurement's potential in SCCM	Procurement is well-positioned to impact SCCM as it is the function that often has the best relations with a company's supplier base.
	Supplier selection and relationship management	Supplier selection is effective way to address carbon emissions, however companies struggle with how to do this. First steps towards carbon reduction have been taken with key strategic suppliers.
	Procurement's competence in carbon management	Procurement needs to improve in understanding carbon accounting methodologies, but focus should be in learning to address emissions in category strategies and negotiations with suppliers.
	Measurement of supply chain carbon footprint	Heavy focus on establishing scope 3 carbon baseline, procurement has a supporting role in carbon accounting. Reaching a baseline is important for procurement to drive effective carbon reduction projects, however actions can be taken beforehand as well.
	Procurement's carbon performance measurement	Procurement is not yet measured against carbon reduction due to difficulties with carbon accounting and differences between categories. Potential trade-offs between cost and carbon reduction should be discussed to avoid conflicting interests.
Procurement's collaboration for SCCM	Category management's impact on collaborative SCCM	Differences between categories make it difficult to harmonize SCCM in procurement. Role of category managers in reducing carbon emissions within their categories is expected to be pronounced.
	Procurement's important stakeholders in SCCM	Collaboration between procurement, internal sustainability specialists and product functions is key. Involving procurement early in sustainability strategy and product development increases procurement's chances for SCCM success.
	Supporting procurement's engagement in SCCM	Clear call-to-action from top management, coordination of SCCM responsibilities and providing necessary training increase procurement's engagement in SCCM.

4.1 SCCM's Impact on Procurement Processes

All firms expressed that their procurement function, as their organization overall, has only taken first steps towards embedding supply chain carbon emission management practices in their procurement processes. Procurement is seen as having great potential, however this potential for now is not much utilized. Companies all agreed that procurement's focus on managing carbon emissions will only grow in the upcoming years, and they were able to point out how they anticipate this to impact procurement processes, as well as list obstacles they are struggling with currently.

4.1.1 Overall Procurement's Potential in SCCM

Current literature, while acknowledging the immature state of research (Das and Jharkharia, 2019), notes procurement's potential in SCCM (Baron, 2016; Correia et al., 2013). This view was strongly shared with four companies, and two mentioned that it depends on what category we are talking about, and how the responsibility of carbon emission issues will be shared between different functions in the company. Companies who were knowledgeable of the different emissions scopes and scope 3's contribution to a company's total carbon footprint were quick to comment that procurement is operating in the space where majority of carbon emissions come from. Overall procurement is recognized as a function that is in a good position to impact SCCM.

> *"It (procurement's potential) is very large as procurement can optimize the whole supply chain, how things are delivered, what we buy, where we buy from and how we buy." Company E*

> *"It is very significant because majority of the carbon footprint of a company like ours is coming through our supply chain. – It's upstream, it's coming from our suppliers." Company B*

> *"I think procurement will play a major role in carbon reduction. Even though our facts are not in yet, I think what we can expect is your typical result where it says our supply chain is actually going to be the major contributor to scope 3 impact. This will result*

> *in a hot-spot analysis, so which raw material categories or origins are those we should really focus on." Company F*

> *"Actually, I see it being very important. Surely there are lots of things that procurement cannot do alone, but if we think about the product composition, procurement plays a big role in the price of the product, so why wouldn't it play a big role in carbon emissions as well? That's where the biggest emission streams come from." Company A*

Procurement controls supplier negotiations and often has best relations with existing suppliers. This gives procurement in a position where it has more leverage over suppliers than other functions. This was considered to be key to procurement's potential. Hence, while managing carbon emissions in the supply chain is a collaborative effort, procurement operates in a position where it can push the agenda forward better than many other functions.

> *"I mean in our company it's a bit of a split (of responsibility) because we have a person working with environment and she's responsible for that area. But she primarily works with internal matters, so I collaborate with her with regards to the supply chain part. So, I think probably that procurement should drive it, but you might need to have other expert functions as well." Company C*

> *"Obviously when you use the word "suppliers" you very quickly end up with procurement as the function that can influence the most. If there were no other constraints the function that has the most ability to influence the carbon coming from our supply base would be procurement." Company B*

While procurement's potential in managing emissions in the supply chain was recognized, all companies noted that the potential has not yet been realized due to the topic becoming relevant only a few years ago, and the complexity surrounding carbon management methodologies. The following sections will focus more specifically on how the low-carbon agenda has impacted procurement professionals and processes.

4.1.2 Supplier Selection and Relationship Management

All firms felt that they have only taken small steps in integrating carbon management into their procurement processes. As carbon emissions have become relevant to the procurement function not so long ago, the companies expressed that so far there has not been a clear way forward. This uncertainty has made it difficult to embed carbon criteria into procurement processes such as supplier selection, which was identified as an effective way to address emissions.

> *"We have just last year started a project focused on addressing these elements in our supplier approvals. So no (supplier selection process does not address carbon emissions), but it is coming." Company E*

> *"I wouldn't say so directly, I mean, we do include our supplier Code of Conduct which has like a paragraph about environment, but it's not directly addressed." Company C*

The difficulty of assessing suppliers' carbon performance is something all companies struggled with. There is no single tool or methodology that can be used to compare suppliers against each other on carbon emissions, so for now carbon emissions are not addressed specifically, rather through generic sustainability certifications and supplier code of conduct. Companies felt that these are not enough for efficient carbon management and reported the need for more tangible methods.

> *"So, in theory what you would have in an ideal world is that when you're evaluating a supplier you can evaluate them on things such as price, terms and quality, and on carbon contribution. We're not anywhere near that." Company B*

> *"We have not thought of specific selection criteria or something that would affect decision-making at this point. So no, we don't have concrete guidance or thought on that." Company A*

> *"And that (supplier evaluation based on carbon) at this point is difficult, I think. We have many suppliers that already work on their environmental impact, on carbon*

> *problems, and it is at this moment very difficult to compare them to say is one better than the other." Company F*

While supplier selection was considered an area that was still underdeveloped in terms of carbon management, progress had been made in supplier relationship management and supplier innovation. Over half of the companies described that among the first actions their organization had taken to understand their starting point for SCCM were discussions with key strategic suppliers. This is natural for many reasons. First, it is always the manufacturing company themselves who are best knowledgeable of their own carbon footprint. Scope 1 and 2 emissions of a supplier are part of scope 3 emissions for the buying company. Therefore, it makes sense to have discussions with the strategic suppliers to understand what they are doing in their own operations to manage and measure carbon emissions. Furthermore, supply chains extend far past the first-tier suppliers. It has been shown that in order to achieve sustainability along the complete chain, the role of these first-tier suppliers is very important (Wilhelm et al, 2016). Companies looking to reduce their scope 3 carbon emissions should collaborate actively with their suppliers, and these discussions are a good starting point.

Second, carbon reduction agenda is not limited to the buying companies, suppliers are also investing in being more environmentally friendly (Lee and Klassen, 2008; Tate et al., 2011). Company D mentioned that over the past years, it has witnessed how their biggest suppliers are becoming increasingly environmentally friendly, and willing to share their innovations. Carbon management being a relatively new and immature field, companies can learn a lot from their suppliers and vice versa. Thirdly, FMCG supply chains need to be strong and operate smoothly, which means that the role of your key partners and the relationship with them is very important (Bala and Kumar, 2011). As companies have set ambitious carbon reduction targets, it sends a message to their suppliers that in order to continue doing business with them, the companies expect suppliers to care about carbon emissions as well. Company B highlighted this in the following quote.

> *"So, if a supplier has also made commitments on reduction of their carbon footprint, that will be something that will be in their favor compared to one who is refusing to make any commitments." Company B*

Three companies, E, D and F, noted that the discussions with key strategic suppliers have led to collaborative effort on improving the carbon efficiency with products or services that make up a significant portion of their carbon footprint. Overall, key to carbon reduction success was reported to be cooperation between the buyer and supplier.

> *"We have started a pilot with our biggest supplier, talking about milk cartons, what would be the right packaging for us. – We have started with that, but we need to look past optimizing only that package and investigate other packages that are delivered by them as well." Company E*

> *"In direct purchasing (we collaborate) continuously. We have both own factories and subcontractors and we have ranked all our suppliers. Be them either preferred or approved, we collaborate with our suppliers. – After all this is collaboration, figuring out the solutions together." Company D*

> *"We are focusing on closer contact with our suppliers so that we together understand where the carbon impact might be in the supply chain. So that we together with our suppliers can identify where we can help them or where they might improve their performance when it comes to carbon emissions." Company F*

4.1.3 Procurement's Competence in Carbon Management

When asked about skills procurement professionals should have to be able to effectively impact carbon management in procurement processes, most of the companies found it difficult to pinpoint specific competence areas – in every case, there was a moment of silence and some hesitation before answering. This is not surprising considering the topic being relatively new and procurement only recently starting to take first steps towards managing their carbon emissions in practice.

All except two companies, E and F, stated that knowledge about carbon accounting methodologies would be the key area that needs to be improved in the future for procurement to take a larger role in carbon management. However, it seemed as if the companies were thinking more about general barriers for carbon management when answering, instead of thinking what the relevant skills and competencies for procurement are specifically. This is illustrated in the following quotes.

> *"It's still a domain that not many people have the level of expertise that you need… You don't need to be an expert in this, but you do need to invest some time to understand how, what methodologies are used for carbon accounting and how does it impact supplier, where can they work on to reduce their footprint. So, there's definitely up-scaling required for procurement as a function." Company B*

> *"You need someone who is an expert I would say, luckily, we have that kind of people in-house, but you need someone who understands emissions and how to calculate them and how it works." Company C*

> *"That's a difficult question… I don't know if I have an answer. But we need to understand more about the calculation methodologies and how the data are processed so that it is not just a number, that's one thing. Also, it probably is included in everyone's own category knowledge what kind of decisions can make an effect. So, it has to do with each category manager's expertise, and you learn that by doing." Company A*

Company E took a different stance and answered that while measurement of carbon emissions is important, procurement should focus on its core strengths. By this, the company meant that procurement people are experts in implementing category strategies and negotiating with suppliers, not very specific data analysis. There is a need for procurement to take data-driven actions, but the data processing should be rather handled by a specialized data analyst, not procurement professional. Procurement professionals should, according to the company, focus on understanding those data and driving procurement decisions accordingly.

Even though this view was not expressed by the other companies when directly asked about procurement's skill requirements, it was implied as part of answers to other questions. Not a single company felt that the advanced expertise related to carbon accounting methodologies should reside within the procurement function, especially among category managers. Rather, category teams should focus on driving actions within their responsibilities once provided the necessary data, which is exactly what the one company mentioned. Throughout the interviews, it was not easy for the companies to come up with ways to describe how procurement will embed carbon management into procurement

processes. This is natural due to the topic being quite new to everyone working in procurement, as mentioned. This could have steered companies' focus to the barriers of carbon management, difficulties with measuring carbon footprint being the largest one.

4.1.4 Measurement of Supply Chain Carbon Footprint

All companies reported difficulties with scope 3 emission measurement being the number one challenge they are facing in terms of managing their supply chain carbon emissions. This is not surprising, as it is noted also in the literature that companies' scope 3 assessments are lacking in terms of coverage and companies struggle with the complexity of different methodologies (Blanco et al., 2016; Downie and Stubbs, 2013; Matthews et al., 2008). The main themes that arose in the interviews regarding measurement of carbon emission were the role of establishing a carbon footprint baseline, dealing with the complex methodologies and deciding on procurement's role in scope 3 measurement.

Four out of six companies (B, C, E and F) reported that their company is running an active project to calculate their scope 3 carbon footprint. Of these four companies, three (C, E and F) specifically mentioned that they are doing this in accordance to the Science Based Targets initiative. Two companies (A and D) which did not specifically mention an active project still highlighted that their company is actively looking into scope 3 emissions but have not yet decided on how to move forward with the calculations.

Interestingly, there were mixed views on how important it is to establish a carbon baseline as a result of these projects. Two of the companies, C and D, felt that procurement's hands are mostly tied before an accurate baseline is set up. Their rationale was that in order to take actions to reduce the supply chain carbon footprint, they need to know where the carbon emissions are coming from and how much are the amounts. Without having a clear picture in all categories, setting up targets would be inefficient and difficult. Company C even said that in their organization, procurement is for now purposefully left out of the loop in carbon management issues, as the baseline is not yet set.

> *"I mean (procurement does not need to be on board) not at this point, because we are keeping them outside of this because we need to establish the proper data first and then yeah, they will probably need to be involved. But it depends really on the action we need to take." Company C*

Others, while acknowledging the importance of a carbon footprint baseline in determining targets and keeping track of development over time, thought that there is still progress to be made while the scope 3 assessment is a work-in-progress. Among such companies, a common practice was to leverage the expertise of an in-house sustainability team in identifying categories with biggest emissions and discussing the options to reduce their carbon footprint. The companies felt that this could be done effectively without having an audited carbon baseline – for example, one does not need advanced carbon calculations to know that purchasing a lighter glass bottle than before will result in less carbon emissions. In one company, the board of directors was pushing heavily on everything sustainability-related, and while the scope 3 assessment project was still ongoing, category managers were instructed to start formulating their sustainability strategies. This strategy had to address carbon emissions, and to do this, category managers were in active dialogue with their internal sustainability experts.

> *"Procurement has their own pillar on the sustainability strategy, and I think just that their targets are going to be more directed more oriented as soon as we have this baseline on the table. But they're not sitting still at the moment, that's for sure." Company F*

Another major theme that was discussed in all interviews was the complexity related to the different methodologies that exist for measuring scope 3 carbon footprint. All companies felt that there are so many ways to measure emissions and they can vary from category to category, resulting in an information overload especially for procurement professionals who are not specialized in that area.

> *"If you think about travel, that is pretty simple, that is no problem. But in logistics you have at least 10 different ways to measure (carbon emissions), so getting a coherent and truthful number out of the analysis is difficult. And of course, when you make these assessments you need to have them audited, so we need to show them everything, what we have done, where we have done it, how we have reached this result and what methods did we use." Company D*

> *"The biggest challenges include that you don't have visibility, each of our suppliers at the moment is calculating it differently. And are those numbers really comparable and are we talking about the same things here." Company E*

Without clear guidance on what to do with scope 3 measurement, procurement feels powerless to drive the assessment initiatives forward. All companies agreed that the ownership of scope 3 measurement ideally should not be handed over to procurement due to this type of work being far outside of procurement's core competencies. Reason for this did not seem to be related to procurement wanting to avoid extra work and responsibilities, but companies critically assessed if procurement really would have the expertise and manpower to drive the measurement forward. The scope 3 assessment projects were already driven by a specialized sustainability team, often in collaboration with consultants, in all but one company, and in this company the project manager that sat in procurement was working closely with an external consultant.

> *"It is not a problem for procurement (to participate in scope 3 measurement), it is just that Corporate Relations and Environment, they have the best expertise. Once we have the guidance, I don't think procurement has any problem with measuring and following emissions. But it is not part of our core competence that we would know how to assess the (carbon emission) numbers, if they are right or not." Company A*

Rather than claiming that procurement cannot help with scope 3 measurement, all companies noted that procurement is able to make a significant contribution by communicating with suppliers, collecting data and consulting the team leading the measurement efforts when they have questions about the company's supply chain.

> *"It is done by an external consultant and this project manager is aligning and managing through that project. Whenever data are required from our supply base, that project manager will coordinate with the category owner who will then reach out to the suppliers to collect the data that are needed." Company B*

> *"We have a group level target of carbon neutrality, and we have a separate function doing that work. -- We deliver information, we don't participate in the calculations*

> *per say, but we can consult and pass information forward, explain things, but we don't do the calculation itself." Company E*

Lastly, all companies expressed frustration with the lack of harmonized methodology that could be used by all companies when calculating scope 3 emissions or reaching out to suppliers for data collection. For now, companies reach out to suppliers asking for similar information in different forms, resulting in inefficiency and the numbers not being comparable. Achieving carbon reductions in the supply chain is much about collaboration and working together with suppliers, and suppliers would be able to speed up their carbon initiatives if their customer base would talk about carbon issues in the same way.

> *"I mean suppliers have to respond to the same questions in 50 different ways, but it's the same question because every company is just reaching out to them separately. So I would very much welcome in the future a process that is much more harmonized for this capturing of carbon emission data." Company B*

4.1.5 Procurement's Carbon Performance Measurement

None of interviewed procurement functions were measured on carbon emissions reduction. However, all expressed that setting a KPI would be an effective way to enforce certain behavior in the procurement processes. If carbon emissions are not part of how procurement is measured, companies felt that this would lead to a culture where carbon emissions are not addressed effectively, and the effort put in would vary based on procurement professionals' personal views on the subject.

> *"It (engagement with carbon emission issues) depends a bit on the individual who is leading a category. There are individuals who are more passionate about the topic of sustainability and carbon reduction in general, and you see those individuals much more actively trying to support the internal business." Company B*

There were two main reasons why a KPI of some sort had not been set. The most important reason was the inability to measure carbon emissions accurately and efficiently. Unless companies can effectively keep track of their scope 3 emissions and how procurement decisions affect them, setting up a target is near impossible. The second reason

was the category-dependent carbon impact. Some categories emit more carbon emissions than others, and the ease of addressing emissions can vary significantly. Companies felt that such situation could easily lead to inequality between category managers as targets could be easy to meet in one category and difficult in another.

> *"We have not included it (carbon as a KPI) because it needs to be done at the individual level. Our categories are very different, for example the category manager for logistics would get full points while me with the other categories would score very low. It is difficult to measure fairly." Company D*

Procurement functions are traditionally focused on cost reduction, and literature mentions this being a potential hurdle for sustainability implementation due to the higher cost that is typically associated with more sustainable operations (Correia et al., 2013; Das and Jharkharia, 2018). As the interviewed companies were not very far in their carbon management journey, the trade-off between cost and carbon efficiency had not yet been clearly discussed. All felt that such discussion should take place in order to make it clear to procurement how they should weigh in carbon emissions as part of the equation. Company B mentioned that when procurement is confronted with such trade-offs, they need to consult senior leadership to get an approval for cost increase. This created inefficiencies in the process, and it was hoped that these decisions would be automated in the future. Two companies, E and F, raised discussion about the other benefits carbon reduction can bring, such as increased brand awareness. They felt that cost increases would be tolerated as long as carbon reduction would support these other important objectives of the company.

4.2 Procurement's Collaboration for SCCM

There was unanimity in that supply chain carbon emissions are an issue that companies need to address through strong collaboration, and procurement plays an important role in it. The level of procurement's engagement correlated with how well procurement's strategic importance is recognized at top management level, and if the company understands that most of their emissions are coming from scope 3. Active dialogue with other functions, especially an internal sustainability team, and a strong message from top management to procurement were considered as important drivers in getting procurement involved in SCCM. The nature of category management and the inconsistency it causes in carbon management between different category teams was recognized as one key challenge.

4.2.1 Category Management's Impact on Collaborative SCCM

All companies identified the structuring of their procurement organization into category teams a major theme making it difficult to standardize carbon management processes in procurement. Category teams are responsible for specific areas of spending, and categories differ significantly from one another in terms of the amount of spend they address, how large of a supplier pool they manage and how much their category contributes to the overall supply chain carbon footprint. Furthermore, some categories are recognized in the company to have a more strategic role than others, which puts those categories under more pressure from top management, also in terms of carbon emissions.

> *"In direct procurement yes (the potential is realized), in indirect logistics category has developed immensely, but I'd say that other categories have work to do. Size of the supplier pool surely makes it more difficult to control (carbon emissions), and due to that we perhaps cannot look for areas of carbon reduction as effectively (as in other categories)." Company D*

> *"(Carbon management is an active agenda) Especially for categories where we know we have a lot of emissions, such as meat and dairy, which I mentioned. And also of course for the deforestation commodities, like any commodities that are in risk of deforestation, those are also quite important to look into carbon emissions." Company C*

> *"All these (categories), they have their own set of raw materials with their own set of challenges. So, I think that for these different categories we are going to need different types of actions." Company F*

These distinctive responsibilities of the different category teams make it difficult to discuss procurement as one cohesive function that should follow strictly harmonized processes. What works in direct procurement may not work with indirect categories. Logistics, travel and energy were mentioned as categories where most progress has been made. Logistics-related research has been most active in current literature, and this was found to be the case in practice as well. One company mentioned that procurement has an active role in working together with the supply chain professionals to make sure that what

procurement purchases reaches its destination in a carbon effective manner. Other mentioned that procurement ran a large project where it calculated emissions coming from every single shipment of goods, set targets for next year and now works closely with their suppliers to meet these goals.

Similarly to logistics, travel and energy were considered as categories where working with carbon emissions is easier, mainly because procurement has close relations with the suppliers and calculating emissions in those categories is easier as suppliers have data available of the emitted carbon emissions. Once having accurate data from the suppliers, companies felt that it is straight forward to set a target and then find ways to reach it. Most common way to achieve this was expressed to be working in collaboration with the suppliers, for example exploring more carbon efficient modes of transport. Company D mentioned that they had great success in the travel category by reviewing current travel habits and then changing their company's travel policy:

> *"We identified business travel to contribute a great deal of our CO_2 footprint. After the investigation, we changed our policy so that business travel is practically forbidden. Through this work we were able to cut over 30% of those carbon emissions." Company D*

This illustrates well how the management of carbon emissions needs to be tailored category by category – such policy changes as described above wouldn't work in direct purchasing as companies need a certain amount of specific materials to manufacture their products. In such cases, the companies stressed that procurement needs to discuss internally with their Product and R&D functions, as well as with suppliers, to come up with strategies to make the products more carbon effective. As noted earlier, one company mentioned how they have started a pilot to optimize their milk carton packaging. Another one described packaging changes to be one of the "low-hanging fruits" of carbon reduction, as it is beneficial for the company beyond just carbon reduction.

> *"I would say that one third (of procurement's carbon reduction potential) is low-hanging fruit. By low-hanging fruit I mean things such as purchasing a lighter product, so if you buy a glass bottle which is less heavy you have a significantly lower carbon footprint. So those are low-hanging fruit because they combine the positive story of carbon reduction and the positive story of cost reduction." Company B*

The companies all agreed in that as carbon management will only grow in importance within procurement going forward, the role of category managers will be pronounced. According to the views expressed, category managers should be responsible for meeting the carbon reduction targets within their categories, just as they are responsible for meeting any other KPI. Role of category managers was seen to be focused on understanding the big picture and steering the category to a more carbon efficient direction in collaboration with other important stakeholders, namely suppliers and internal sustainability experts. Category managers have a plethora of responsibilities, and they cannot be expected to have an in-depth knowledge of topics such as carbon footprint measurement methodologies. Rather, they should understand the basics and then leverage the expertise of specialists to realize their categories' carbon strategies.

> *"I think what we are moving towards more and more will be an expectation that a category manager can demonstrate or share when he's selecting a supplier, if that supplier has a relevant material contribution to our company's footprint." Company B*

> *"Category knowledge and how you can make an impact is important. So, the category manager or procurement manager should see and deal with the totality." Company E*

All participants had a function in their company specialized in sustainability-related matters, including carbon emissions. However, only one company mentioned that they had set meetings between category managers and these sustainability professionals to review the carbon reduction potential in their categories. These meetings were considered to be effective ways to get started with carbon management, as the category managers could listen to the recommendations from the sustainability experts, and then discuss the different options.

> *"Together with the sustainability team, we went through my categories and if there is something we should change, what we should investigate, can we target some areas, where the potential lies. -- The sustainability team is really important and valuable in my opinion because that's where the expertise is. They are researching these (carbon*

> *emission) things, so procurement does not need to have such a deep understanding of all these methodologies." Company D*

Other companies, while recognizing the specialist function an important source of knowledge, had not yet set up such close collaboration with it.

4.2.2 Procurement's Important Stakeholders in SCCM

All interviewed organizations had a specialized team or function focusing on sustainability, and carbon emissions were part of that team's responsibility. Such function was considered the driving force of carbon agenda within the organization, and where the most updated knowledge of carbon emission matter resides. Companies expressed that active collaboration with such function is key to procurement's success in managing supply chain carbon emissions. However, ways for procurement to leverage this collaboration were not optimal in all cases.

The organizations which seemed to be ahead of others in carbon management issues had set up active dialogue between the sustainability specialist and category managers to identify carbon hotspots and formulate plans to address those. Such approach was perceived by procurement to be effective and caused little extra effort. At the same time, procurement feels that this is also helpful to the sustainability experts, as they can gain important insight into the company's supply chain. As procurement is under constant pressure to cut costs and sustainability-teams are often dealing with longer-term vision, proper alignment between the two functions is important.

> *"The supply chain deals with the real world today, group Corporate Affairs needs to think about the future world our company will operate in. -- So, there is a healthy kind of, wouldn't call it conflict, but a healthy kind of check and balance between these two functions." Company B*

Some companies on the other hand mentioned that procurement people are not so much in contact with sustainability professional due to there not being a clear picture of what is expected of procurement in terms of carbon emissions. Interestingly, one company that reported procurement being left out of the loop also mentioned that this has created stress on procurement's side, as they are just waiting when the workload hits them. Discussions between category managers and the sustainability professionals could alleviate this problem.

In addition to sustainability specialists, companies considered internal product functions important in carbon emissions matters. Especially in direct procurement, companies reported that procurement is very much limited in terms of what they can buy. It was agreed that there is an opportunity to work together with suppliers to streamline their production and make the materials less carbon heavy. On top of this, companies should also review their product composition and look for more sustainable alternatives. An example that was mentioned by three companies was packaging. Purchasing packages which are less heavy or made from more sustainable materials will result in carbon reduction. However, procurement alone cannot make this decision, it needs to be approved by the product functions.

An important aspect of the collaboration between procurement and other functions was recognized to be early involvement. The companies which were further in their supply chain carbon emissions reduction were more eager to involve procurement early in the processes. These companies reported that procurement is an active member in the discussions about their carbon reduction strategy, while others had not involved procurement to such extent. Involving procurement early helps the function to both act on the agenda and convince others of its potential.

> *"Procurement will be at the table on those (carbon emission) decisions. -- It is quite clear now within our company that majority of that footprint sits at the hands of our suppliers and they will look at procurement for answers on those questions." Company B*

> *"We have this separate sustainability forum, where we discuss things related to environment and sustainability overall. Procurement is actively engaged there. -- Procurement has all the time been part of formulating our green vision, what kind of materials we are buying, how they have been produced and what kind of emissions we are emitting." Company A*

External stakeholders, such as industry associations or sustainability forums, were mentioned by only one company. In that company, procurement was participating in a forum where procurement professionals from different functions gathered to discuss sustainability-related topics, including carbon emissions. This was considered as a valuable source of

information, and a good way to share best practices. The rest of the companies considered external parties relevant, but mostly just for the specialized sustainability function.

4.2.3 Supporting Procurement's Engagement in SCCM

The interviews uncovered many themes that affect procurement's engagement in SCCM. Most importantly, a strong message from top management highlighting the importance of carbon management in the company's processes was a good driver for implementing carbon reduction activities. In most of the interviewed companies, such message was delivered through the companies' general sustainability strategy. While such approach had made it clear to procurement that carbon reduction is something that needs to be taken seriously and will grow in importance over time, a more targeted message received appreciation from three interviewees. In company B, procurement was part of the Supply Chain organization, and the head of that function was looking firmly at procurement for answers. In company A, a Corporate Relations team was leading the carbon agenda implementation and had set up task forces in which procurement was actively involved. Lastly, one procurement function had received a direct message from top management to start thinking how carbon emissions can be mitigated in different categories. All these three ways were reported to lead to concrete actions within procurement, rather than simply acknowledging the strategy, but doing little to realize it. Some felt that the message from the top needs to be strong enough to drive wanted behavior.

> *"I think the question is how come people are allowed to do the bare minimum. They wouldn't do that if they didn't sense that they would be allowed to do it. So, I guess it comes back to what type of message they are receiving from the top." Company B*

There was correlation between how directly the organization calls out procurement in carbon issues, and how strategic procurement function is perceived overall. Especially two companies mentioned above described procurement to be perceived by others as a highly strategic and appreciated business partner, and this was reflected in its engagement is carbon management as well. On the other hand, some companies reported procurement's role as more tactical, and in these organizations procurement's carbon competencies and engagement were not as sophisticated as in others.

In addition to a clear message towards procurement to start working towards carbon reduction in the supply chain, it is important that procurement actively discusses with its

stakeholders about who is responsible of different aspects of SCCM. As noted, SCCM requires strong collaboration, and there are areas where it may not be clear who should be driving the efforts. Measurement of scope 3 carbon emissions was raised as the most confusing, as companies are taking first steps in that domain. Often such project included external consultants, a specialized internal sustainability team, procurement, and many other functions. To reduce complications and needless double work, careful coordination is needed.

> *"From time to time we are having discussions on whether this (supply chain carbon emission measurement) should belong to Corporate Relations and the environment experts, or procurement. This is still under discussion." Company A*

Lastly, all companies mentioned that so far, procurement has not received formal training for SCCM. The main reason for this was lack of expertise within the companies about carbon management matters. So far, many reported that procurement has been learning by doing, but expect to receive stronger support going forward. A common view was that a specialized sustainability function should act as the main channel to bring necessary training and information to procurement. Companies noted that this would be a natural arrangement, as carbon management is outside procurement's core competencies or focus. Only one company expressed the need for dedicated carbon management resources inside the procurement function. With regards to training content, companies felt that due to the category-oriented structuring of their procurement function, there is a need for both a more general training as well as active engagement between category managers and the sustainability experts.

> *"I think there'll be a global program that directs activities at different departments, where our procurement community definitely will be one. And we'll have to see if we need to focus specifically on certain raw material groups that we do a deep dive into dairy, we do a deep dive into greenhouse production, etc. So that'll have to be determined. And like I said, we need an expert to help us with that. We're learning ourselves as we go. To spread knowledge, it's probably more efficient if it's done by an expert instead of self-taught person." Company F*

5 Discussion

This section will elaborate the findings of the study and discuss those in relation to the current literature on the topic. At times, evaluating the findings of this study was difficult as SCCM is not a mature area in either academia or practice. This was very much present in the interviews, as even though the companies were all FMCG companies, they had different ways to approach SCCM in their procurement function. On a general level, their goals and views were in line with each other, but their ways of getting started differed somewhat. While such situation makes it difficult to establish universal best practices, it gives valuable insight into the range of options companies have and what seems to work and what does not. This research was focused on uncovering what is the strategic role of procurement in SCCM, and that was done through examining how procurement processes have changed, and how procurement is collaborating with others for SCCM. The following sections will discuss these two main themes, along with some recommendations.

5.1 SCCM's Impact on Procurement Processes

SCCM was considered an important topic that will have significant effect on procurement processes. In the interviews, procurement's potential to reduce carbon emissions in the supply chain was among the first themes discussed, and the potential was recognized to be significant. Companies in general shared the view that for a company to be truly sustainable, it needs to make sure that its supply chain is sustainable as well. Villena (2019) found that procurement is well-positioned to impact supply chain sustainability, as it has close relations with the suppliers. The interviews confirmed that this appears to be the case with carbon emissions as well – when the interviewed companies are having discussions with their suppliers about cutting emissions, procurement is sitting at the table.

Secondly, some companies specifically mentioned that as majority of a FMCG-company's total carbon emissions is coming from scope 3 (Huang et al., 2009; Matthews et al., 2008), the attention turns to procurement to address these emissions through their operations. There appears to be a connection between how well a company recognizes where the biggest streams of emissions lie, and how much procurement is expected to play a part in reducing them. Therefore, a way to accelerate procurement's contribution to carbon reduction strategies is to gain a better understanding of how a company's total carbon footprint is composed.

The literature is not mature in terms of research on ways for procurement to affect supply chain carbon emissions. Areas such as transportation planning and supply chain network design are not procurement's core competencies or responsibilities. Logistics as a category was raised in the interviews, but not in the sense that procurement would be leading the operational day-to-day planning. Rather, the focus was in collaborating with the suppliers to find ways to reach a certain emission reduction target, by for example using more carbon efficient transportation modes. Such collaboration cannot rely on the use of advanced optimization algorithms, which are mostly unknown to the procurement function.

In the sourcing space, most papers have researched ways to incorporate carbon emissions as part of supplier selection (Govindan and Sivakumar, 2016; Hu et al., 2015; Hsu et al., 2014; Kuo et al., 2015; Shaw et al., 2012; Yu et al., 2018). The results of these studies have proven to result in efficient carbon reduction, but the interviews seem to draw a gap between theory and practice. In fact, not one company mentioned that carbon emission criteria have been introduced as part of their supplier selection processes. Supplier selection was recognized as an area where it would be natural and effective to address emissions, but so far procurement was unsure how this could be done in a reasonable way. Careful mathematical modeling would require time and effort for which procurement does not at this point have capacity or expertise. Such would also put pressure on suppliers to have the ability to disclose the carbon emissions their products and services emit, and this is not yet realistic. To further complicate the setup, suppliers' emission data should be comparable with each other which is difficult due to the variety of methodologies that can be applied to carbon accounting.

While detailed carbon calculations are still developing and will most likely take years before they can be applied practically to supplier selection, one option would be to start with less tangible methods. This study found that companies had made good progress on sustainability in general, and different types of certifications and supplier code of conducts are used to enforce sustainability in the supply chain. Similar approaches could be piloted with carbon emissions, for example requesting information on suppliers' carbon reduction strategies and what actions they are taking or planning to take to lower their carbon emissions.

When thinking of skills that procurement professionals need to develop for managing supply chain carbon emissions, organizations need to think carefully how responsibilities should be divided within the company and what is realistic to expect from procurement. Tassabehji and Moorhouse (2008), as well as Bals et al. (2019), have shown that

procurement's expanding role requires them to have a wider set of skills as well. Companies expect this theme to continue with carbon management but were unsure how exactly it will play out. There was consensus on that procurement would benefit from being able to calculate carbon emissions, but the companies were not sure if that should be procurement's responsibility due to the field being constantly evolving and so complex, that it would be unrealistic to expect procurement to do it on the side of their primary tasks.

Literature has highlighted the difficulties companies are having in calculating their scope 3 emissions (Blanco et al., 2016; Downie and Stubbs, 2013) and this message was strongly reflected in the interviews. Common problems mentioned included difficulties in collecting data, understanding the complex methodologies used to calculate emissions and how to establish a baseline against which the development of carbon emission quantities could be measured against. The carbon accounting projects were driven by, apart from one single company, an internal sustainability team, often in close collaboration with external consultants. This study confirms the views of current literature, in that companies are still far away from being able to measure their scope 3 carbon emissions efficiently. It also uncovered that procurement plays an important role in these projects by acting as a link between suppliers and the team doing the calculations. Communicating with suppliers, collecting data and consulting the team responsible for the calculation were raised as effective ways for procurement to support scope 3 emissions measurement.

An important finding of this study was that procurement considers setting up a carbon baseline as a key barrier to more active management of carbon emissions in the supply chain. Half of the companies felt that establishing such baseline will enable procurement to address the emissions effectively and were unsure of how much progress can be made before this. On the other hand, while the other half agreed that a baseline is important, they recognized that carbon reduction activities can be initiated while the work is still ongoing. It is difficult to say what exactly leads into such thinking that the company needs to have a clear scope 3 inventory before it sets targets and begins the work to reduce emissions. One possible explanation could be the way that existing protocols and guidelines, such as Greenhouse Gas Protocol and Science Based Targets initiative, frame the carbon reduction journey: first you identify and calculate your emissions, and then you set a target and start working towards it. One way to activate procurement would be to start demanding category managers to address carbon emissions in their category strategies, as had been done in one of the case companies.

Lastly, this study confirmed the literature's view that procurement must balance trade-offs between short-term cost impact and sustainability. As the interviewed companies were

not yet at a point where such trade-offs could be evaluated in an effective manner, there was some confusion on how this should be done and whether cost increases are acceptable. To further complicate the picture, procurement is moving towards a more strategic role overall and with that comes new ways of creating value beyond cost savings, such as potential to enhance brand awareness through sustainable operations. How this will affect the way procurement is measured was not addressed in the interviewed companies, and one company reported that this leads to a culture where the effort put into carbon management depends on the individuals' personal beliefs on the importance of the topic. It was commonly agreed that having a KPI for carbon management would drive the operations to a certain direction. A few of the companies were having discussions on how this could be done, but none had yet made any decisions on it. The two main issues standing in the way were the inability to track scope 3 emissions and how category-dependent carbon management is. While these issues are being worked on, procurement could start driving carbon reduction by addressing it in category strategies and raise discussions on the trade-offs and the implications carbon reduction has on costs once they have discussed the theme with suppliers.

5.2 Procurement's Collaboration for SCCM

In addition to examining SCCM's effects on procurement processes, this study set out to investigate how procurement is collaborating with others to address carbon emissions in the supply chain. The findings confirmed that for procurement to utilize its potential, it needs to engage in close collaboration both with internal and external stakeholders.

Procurement needs to engage the company's supplier base in their quest of reducing carbon emissions along the supply chain. Even rough evaluation of suppliers' willingness and competence to reduce carbon emissions would send a message to the suppliers that in order to keep doing business, this is an area where they must be ready to invest in. Tate (2013) considers this alignment between the buyer and supplier crucial to ensure sustainability in the supply chain. By doing so, procurement could make sure that the supplier base is receptive towards collaborative work for carbon reduction. In fact, majority of the companies reported that discussions about carbon reduction plans with strategic suppliers were among the first steps taken towards reducing supply chain carbon emissions. Carbon reduction has become an important agenda within suppliers as well, and there is an opportunity for collaborative learning. Companies mentioned that these discussions have led to piloting carbon reduction projects together with their suppliers. This goes to show that

progress in SCCM can be made even without precise supplier assessments or carbon emission calculations.

An interesting theme that arose in the interviews was category management's impact on collaborative SCCM. Not all categories are equal in terms of their strategic importance or carbon emissions. It quickly became evident that direct categories were to be at the forefront of carbon management implementation, as they are both strategically important for FMCG companies and they are the greatest source of carbon emissions. Indirect categories, such as logistics and travel were also mentioned. Companies felt that categories being so different from one another poses a challenge to carbon management implementation, as it is difficult to establish universal rules or best practices that work in all categories. Rather, carbon management should be tailored category by category. This makes it especially difficult to share and create best practices within the procurement functions, as the collaboration between category teams is limited by nature.

The literature does not yet provide many answers to this. Pagell et al. (2010) found that organizations implementing sustainable sourcing activities are using the purchasing portfolio framework, introduced by Kraljic (1983), in a new way and propose a change where the profit impact axis is replaced by triple bottom line impact. Such a shift could be noticed with regards to carbon management as well. Companies foresee the role of category managers to increase going forward, as they need to plan for carbon reduction as part of their category strategies. This study revealed that this has not yet happened to a great extent in the interviewed organizations, one major barrier being the incomplete picture of scope 3 carbon emission quantities. There was one organization which seemed to exceed in this area, demanding carbon emissions to be addressed as part of the category strategies even though scope 3 accounting was not yet complete. To conclude, organizations should look for ways to engaging category managers in SCCM. One option to do this is to set up review sessions between category managers and internal sustainability specialists. As collaboration between category teams can be difficult, procurement should not forget to leverage other types of in-house collaboration.

A key internal stakeholder for procurement in carbon management turned out to be an in-house function focusing on sustainability. While collaboration with such function was recognized as pivotal to carbon management success, the findings revealed that the collaboration is far from mature in most organizations. This is in line with Villena's (2019) findings, which highlight how misalignment between procurement and sustainability can cause suboptimal sustainability implementation across the supply chain. The interviewed

organizations that had most success in their carbon management efforts had involved procurement closely early in the discussions and planning. Best results were achieved by having individual review sessions between category managers and the sustainability specialists on how carbon emissions can be addressed in their categories. Such approach enforced the importance of SCCM within procurement, while not doing so was reported to lead to procurement feeling left in the dark.

Correia et al. (2013) and Long and Young (2016) note that organizations would benefit from a general increase in knowledge of different aspects of carbon management. In order for procurement to have an effective role, it should focus on its core competencies and adapt those for advancing carbon reduction. The companies felt that procurement should collaborate with the internal sustainability experts and then implement the learnings in procurement processes. Different functions specialize in their own area and procurement cannot be expected to be an expert in everything. Rather than carbon management being introduced as a separate skillset, competencies such as cross-functional abilities, communication skills and strategic thinking can be used to drive carbon reduction activities. The role of collaboration between procurement and an in-house sustainability function is key in building up the necessary level of carbon competency within the procurement function.

Villena (2019) also mentions in her findings that procurement sometimes struggles with having their hands tied in terms of what they can buy, in the worst case resulting in abandoning of sustainability practices. This study confirms that message, and several companies raised the need for close collaboration between procurement and internal R&D and product functions. Cutting carbon emissions often is a collaboration between the buyer and supplier, so when planning for carbon reduction projects or investments with suppliers, the buyer organization needs to be internally aligned to avoid a situation where the end result is something other than what the product team approves of. Therefore, it would be good for R&D to involve procurement early on in product development, as procurement acts as an important link between the buyer and supplier. Baron (2016) lists such multi-disciplinary teams as a best practice for procurement to understand what they need to communicate towards the suppliers as well as understanding the suppliers' capabilities to innovate.

Even though the importance of external collaboration and role of outside parties and guidelines in carbon management is emphasized in current literature (Correia et al., 2013; Long and Young, 2016; Villena, 2019) only one of the companies mentioned procurement participating in a forum where procurement professionals discussed carbon emission

management, among other things. In other organizations external collaboration was done by the specialized sustainability function. Even though the external collaboration rate was low within the interviewed procurement functions, they all wished for further harmonization in carbon management practices relevant to procurement function. Therefore, it could be suggested that procurement functions should look into engaging themselves in such collaboration.

This study also looked into the different ways procurement is involved and incentivized to engage in SCCM. This was done as previous research has shown that incentives and a clear message from top management is important for getting procurement to address sustainability in their operations (Schneider et al., 2012; Villena, 2019). The interviews confirmed this, as a strong message from top management was a driver of active SCCM. It is important to note that management should place emphasis on the way this message is delivered. While communicating the importance of carbon reduction through company strategy did make procurement recognize the targets, a direct message addressing procurement individually seemed to generate concrete actions towards carbon reduction.

Procurement's contribution in carbon management also appeared to be correlated with how strategic the function is considered within the company. Companies that reported the function to struggle with proving its strategic value were also less involved when carbon emission issues were discussed in the company. A well-networked procurement function is more likely to be involved early, setting up a better foundation for future success in carbon management. Getting involved and delivering good results in carbon reduction can create a positive chain of events through which procurement can raise its strategic image within a company.

Lastly, the findings show a lack of carbon management training directed at procurement which has also been identified by the literature as a barrier in carbon management (Correia et al., 2013; Long and Young, 2016). To build the necessary carbon management capabilities within procurement, companies should investigate leveraging the knowledge of their in-house sustainability function. A good option would be to start with the basic principles of understanding scope 3 carbon emission sources, and then have sessions between the category teams and sustainability specialists to look more closely into how carbon emissions can be addressed within each category.

6 Conclusions

This study set out to explore what is procurement's role in managing supply chain carbon emissions. A research gap was identified, as the current state of literature had not yet drawn a connection between SCCM and procurement's role in it. Existing literature on procurement's role and SCCM was used to conceptualize the phenomenon and structure the empirical section of this study. Through interviewing procurement professionals from the FMCG industry a picture of the current state of procurement's role in SCCM was drawn, and suggestions for further engagement were given.

6.1 Main Findings

The underlying finding of this study was that while procurement is recognized to have a large potential to impact supply chain carbon emissions, its role is still immature. Procurement's role in managing carbon emissions was expected to grow significantly in the future, but it was not certain in what way. Supplier selection, supplier relationship management and being involved in product development were recognized as effective processes for procurement to affect scope 3 emissions. However, at best, companies had only started pilots to embed carbon management into these processes. Procurement considers difficulties with carbon emission measurement methodologies and heterogeneity of different categories to be the most significant barriers to more active carbon management engagement. Not being able to accurately and effectively measure carbon emissions also causes procurement to not be measured against their carbon reduction efforts, which it considers an important driver of desired actions.

Active collaboration between procurement, internal sustainability specialists and product teams was found to be the foundation for SCCM success. As carbon emissions issues are not part of procurement's core competencies, procurement expects support from internal sustainability specialist in carbon management methodologies. Other important ways to increase procurement's role were found to be a strong message from top management to address carbon emissions in procurement processes, involving procurement in discussions about carbon reduction strategy and setting up incentives so that carbon management is considered a priority within procurement.

6.2 Managerial Implications

While the key objective of this study was to understand procurement's role in SCCM, the findings present an opportunity for managerial implications as well. Although companies still struggle with calculating their scope 3 carbon emissions baselines, they should nevertheless start working towards reducing their supply chain carbon emissions. A good way to get started is to require category managers to address carbon emissions in their carbon strategies. In order to do so, it is natural that category managers seek help from internal sustainability specialist. This would accelerate the level of collaboration and knowledge within procurement. It would also be valuable for companies to start wider discussions on procurement's strategic contribution overall: procurement has become an increasingly strategic function, and this trend is unlikely to change. Therefore, assessing how procurement's traditional values, mainly cost reduction, should be weighed against benefits such as sustainability, carbon reduction and brand image, is important in order to give procurement the opportunity to contribute in those areas. Without a clear call and mandate for action, procurement is more likely to play the waiting game and not address carbon emissions until absolutely necessary.

6.3 Limitations and Further Research

The nature of the topic and methodology of this study present multiple limitations that need to be addressed. First, large FMCG companies with heavy procurement focus were chosen as the sample for this study. FMCG as an industry is very much end customer oriented, and it has picked up the low-carbon agenda in a rapid timeframe, at least partly in response to consumers' increasing interest in sustainability. Also, the nature of FMCG supply chains can differ significantly from other types of supply chains. In terms of company size, smaller companies tend to have a weaker procurement function due to less bargaining power. For these reasons, the findings of this study may not be fully generalizable to companies in other industries, or companies of smaller size. Furthermore, as SCCM as a topic has emerged only recently and is still immature in both academia and practice, it is difficult to predict how exactly it will evolve over the next decade or so.

The study also opens possibilities for further research. It would be valuable to investigate scope 3 carbon accounting further, especially from a company perspective. This was a challenge with all participants of this study, and there were many different approaches taken. Secondly, further research would be necessary to understand best practices for low-

carbon innovation between a buyer and supplier. Such would provide lots of real-life implications for companies getting started with their carbon reduction journey. Thirdly, it would be interesting to conduct longitudinal case studies on how procurement functions implement carbon reduction in their processes. These studies could address important challenges raised by the participants of this study, such as SCCM's effect on category management, incentives and performance measurement and collaboration between internal and external stakeholders.

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Appendix A: Interview outline (English)

Introduction:

- Introduce myself and the research topic
- Mention the time reserved for the interview
- Overview of the interview method, ethical concerns and outline
- Answer any questions the interviewee may have at this point
- Turn on the recorder and start the interview

Interview method

- Name of the company can be anonymized if you so wish
- The name of the interviewee, but the title of the interviewee will be shown
- Interview will be recorded, and a written transcript will be made. Both the interview and the transcript are only available to the researcher and not anyone else.
- The interviewee should answer the questions according to his/her own perspective and knowledge. There are no right or wrong answers. Purpose of the study is to explore, not to give recommendations or evaluate the current processes.
- The interviewee may not have input to all questions. In such cases the question can be skipped.
- Any questions at this point?

Interview questions

General

- What is your title and how long have you been working in the company?
- Can you briefly describe your role and responsibilities in the company?
- How would you describe procurement's role in your organization?
    - How is it perceived by others?
- Why do you think your company is interested in managing its carbon emissions? Why is it important?

How the procurement process has changed to address SCCM?

1. How significant do you see procurement's potential in reducing emissions in the supply chain? Is this potential utilized?
2. Why and how has the procurement process changed to address supply chain carbon emissions?
    a. How much attention does carbon management receive?
    b. Example of a project/situation you were involved in that had to do with carbon management?
    c. Are carbon emissions addressed in your company's supplier selection/supplier relationship management/supplier innovation? Can you describe how?
    d. Are carbon emissions part of the way procurement is being measured at your organization?
    e. How is procurement measuring or helping in measuring supply chain carbon emissions? Can you describe what are the main challenges in measuring supply chain carbon emissions in your organization and how you are trying to solve those?
    f. Any other changes or requirements that come to mind?
3. What skills do you think are relevant for addressing carbon emissions in procurement processes? Do you think these skills exist in your procurement function?
4. Do you think that it is made clear to you how to balance trade-offs, when incorporating carbon criteria to procurement processes? If reducing carbon emissions increases costs, is the acceptable level of trade-off made clear?

Collaboration with other stakeholders

1. How involved is procurement when carbon emission goals and issues are discussed in your company? How do you think other functions perceive procurement's role in those?
2. Which functions or persons do you think are the most important in your company in terms of carbon management? How would you describe procurement's relationship with those functions/persons?
3. Has there been a message from the board (or any other function) to procurement to address supply chain carbon emissions in the procurement process?

4. How would you describe procurement's engagement in carbon management issues? Is it more collaborative or separative? Why?
5. Have you been engaging with any key external stakeholders in carbon management matters? Who and how?
6. Is it clear what is expected of procurement, and what is the division of responsibilities in supply chain carbon emission management?
7. How are you being incentivized to engage in carbon management activities? How could the incentives be better?
8. How would you describe the level of support and training you receive to help procurement become aware and capable of managing carbon emission related issues?

- Is there anything that you'd like to mention that was not covered by the questions?

Appendix B: Interview outline (Finnish)

Johdanto:

• Esittelen itseni ja tutkimusaiheen

• Mainitse haastatteluun varattu aika

• Haastattelumenetelmän kertaus, eettiset huolenaiheet ja haastattelun pääpiirteet/kulku

• Vastaa mahdollisiin kysymyksiin tässä kohtaa

• Aloita nauhoitus ja haastattelu

Haastattelumenetelmä

• Yrityksen nimi mainitaan vain, mikäli yritys suostuu tähän

• Haastattelu on anonyymi, mutta haastateltavan titteli näytetään

• Haastattelu tallennetaan ja siitä tehdään kirjallinen kopio. Sekä haastattelu että kopio ovat vain tutkijan käytettävissä eikä kenenkään muun.

• Haastateltavan tulee vastata kysymyksiin oman näkemyksensä ja tietojensa mukaan. Kysymyksiin ei ole oikeita tai vääriä vastauksia. Tutkimuksen tarkoituksena on tutkia ja tarkkailla, ei antaa suosituksia tai arvioida nykyisiä prosesseja.

• Haastateltava ei välttämättä tiedä vastausta tai hänellä ei ole sanottavaa kaikkiin kysymyksiin. Tällaisissa tapauksissa kysymys voidaan ohittaa.

Haastattelun kysymykset

Yleiset

• Mikä on tittelisi ja kuinka kauan olet työskennellyt yrityksessä?

• Voitko kuvailla lyhyesti rooliasi ja vastuitasi yrityksessä?

• Kuinka kuvailisit hankintatoimen roolia organisaatiossa?

o Kuinka muut näkevät sen?

• Miksi luulet yrityksesi olevan kiinnostunut sen hiilijalanjäljestä ja kuinka vähentää sitä? Miksi se on tärkeää?

Kuinka hankintatoimen prosessit ovat muuttuneet hiilijalanjäljen hallinnan johdosta?

1. Kuinka merkittävänä näet hankintatoimen potentiaalin vähentää päästöjä toimitusketjussa? Hyödynnetäänkö tätä potentiaalia?
2. Miksi ja miten hankintaprosessi on muuttunut toimitusketjun hiilidioksidipäästöjen huomioon ottamiseksi?
    a. Kuinka paljon huomiota hiilidioksidipäästöjen hallintaan kiinnitetään?
    b. Esimerkki projektista / tilanteesta, johon osallistuit ja joka liittyi hiilidioksidin hallintaan?
    c. Otetaanko hiilipäästöt huomioon toimittajien valinnassa / toimittajasuhteiden hallinnassa / toimittajainnovaatioissa? Voitko kuvailla kuinka tämä tapahtuu?
    d. Ovatko hiilidioksidipäästöt osa hankintatoimen tulosmittausta?
    e. Kuinka hankintatoimi mittaa tai on osana toimitusketjujen hiilidioksidipäästöjen mittausta? Mitkä tässä ovat suurimmat haasteet, ja kuinka yritätte ratkoa niitä?
    f. Tuleeko mieleesi muita muutoksia tai uusia vaatimuksia hankintatoimen prosesseja kohtaan hiilidioksidipäästöihin liittyen?
3. Mitkä taidot ovat mielestäsi merkityksellisiä hiilidioksidipäästöjen käsittelemisessä hankintaprosesseissa? Omaako hankintaorganisaationne näitä taitoja?
4. Oletteko sitä mieltä, että teille tehdään selväksi, miten trade-offit päästöjen vähentämisen suhteen tulee huomioida? Jos hiilipäästöjen vähentäminen lisää kustannuksia, tehdäänkö hyväksyttävä trade-off selväksi?

Yhteistyö muiden sidosryhmien kanssa

1. Kuinka hankintatoimi on mukana, kun hiilidioksidipäästötavoitteista ja niihin liittyvistä hankkeista keskustellaan yrityksessäsi? Kuinka muut toimijat näkevät hankintatoimen roolin näissä?
2. Mitkä funktiot tai henkilöt ovat mielestäsi tärkeimmät yrityksessäsi hiilidioksidin hallintaan liittyvissä asioissa? Kuinka kuvailisit hankintatoimen suhdetta näihin funktioihin / henkilöihin?
3. Onko johtoryhmä (tai jokin muu funktio) viestinyt hankintatoimelle, että hiilidioksidipäästöt tulisi nyt tai jatkossa ottaa huomioon hankintaprosesseissa?
4. Kuinka kuvailisit hankintatoimen osallistumista hiilidioksidipäästöjen hallintaan? Onko se yhteistyöhön nojaavaa vai muista funktioista eristäytynyttä? Miksi?
5. Oletko ollut tekemisissä ulkoisten sidosryhmien kanssa hiilidioksidin hallintaan liittyvissä aiheissa? Kenen kanssa ja miten?
6. Onko selvää, mitä hankintatoimelta odotetaan ja mikä on vastuunjako toimitusketjun hiilidioksidipäästöjen hallinnassa?
7. Kuinka hankintatoimea kannustetaan sitoutumaan hiilidioksidin hallintaan? Kuinka kannustimet voisivat olla parempia?
8. Kuinka kuvailisit tuen ja koulutuksen tasoa, jotta hankintatoimi tulisi tietoiseksi ja kykeneväksi hallitsemaan hiilidioksidipäästöihin liittyviä haasteita?

• Onko jotain mitä haluaisit mainita, mitä ei kysytty haastattelussa?