TOWARDS GREENER SUPPLY CHAINS

INCLUSION OF ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS
BETWEEN LOGISTICS SERVICE PROVIDERS AND SHIPPERS

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“Towards greener supply chains - Inclusion of environmental activities in relationships between logistics service providers and shippers”

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ABSTRACT

It is well-recognised that companies are under pressure to take responsibility for the environmental impact of their operations. Logistics service providers (LSPs), who through their transport and logistics operations have a large negative impact on the environment, are one type of supply chain actor that is under such pressure. However, in order for LSPs to be able to lower their environmental impact sufficiently, their customers, the shippers, also need to take responsibility. This thesis takes its starting point in the relationships between LSPs and shippers and argues that in order for LSPs' environmental activities to reach their full potential, the shippers must be included in the activities.

The purpose of this thesis is to describe and explain how supply chain actors, with a specific focus on logistics service providers and shippers, can include environmental activities in their relationships with each other. This comprises identifying those environmental activities that are relevant for relationships between LSPs and shippers, as well as describing the extent to which environmental activities are included in such relationships. By means of the theoretical perspective of power between supply chain actors, the thesis also sets out to further understand how power balances between LSPs and shippers can influence the extent to which they include environmental activities in their relationships with each other. Finally, the use of the theoretical perspective of coordination aims, through the analysis of coordination mechanisms, to shed light on how environmental activities are included in LSP-shipper relationships.

The research in this thesis has mainly descriptive and explanatory aims, although due to the novelty of research into LSP-shipper relationships in an environmental context, the research process as such is mainly exploratory. Following an abductive approach, the insights from literature are combined with empirical data from two cases studies, a homepage scan, a survey and a study of city logistics projects. Most of the applied research methods take a dual perspective of relationships between supply chain actors and thus include both LSPs and shippers.

One conclusion from the research conducted for this thesis comprises the identification of environmental activities as well as a suggestion for a classification based on the activities' role in the business between LSPs and shippers. With a starting point in the identified activities, a comparison of a market perspective and a relationship perspective of environmental activities in LSP-shipper relationships indicates that LSPs are able to fulfil the requirements set by shippers and that shippers' requirement thus are met. The research does, however, point to a passiveness among LSPs in their relationships with shippers, who in turn would like the LSPs to be more proactive.

Further, based on an analysis of power balances in LSP-shipper relationships, it is suggested that in an LSP-shipper relationship in which the shipper has a power advantage, the shipper's environmental ambitions for logistics sets the agenda for the environmental activities in that relationship.

An analysis of coordination of environmental activities in LSP-shipper relationships indicates that the mechanisms of direct supervision, which is when one actor tells the other actor in the relationship what to do, and mutual adjustment can be chosen to be used in order to include environmental activities in LSP-shipper relationships. While direct supervision is suggested to be a coordination mechanism that is easy for shippers to apply, mutual adjustment appears to hold greater potential for the development of environmental activities.

Finally, these findings in combination are suggested to have implications for the coordination of environmental activities in LSP-shipper relationships. More specifically, this thesis offers a categorisation of different types of LSP-shipper relationships and the involved actors' environmental ambition. Depending on whether the environmental ambition of the LSP and shipper in a specific relationship is high or low appears to have implications for the possibility to work towards greener supply chains for each type of relationship.

Keywords: green supply chain management, inter-organisational relationships, environmental activities, logistics service providers, shippers

MOT GRÖNARE FÖRSÖRJNINGSKEDJOR: MILJÖÅTGÄRDER I RELATIONER MELLAN LOGISTIKFÖRETAG OCH VARUÄGARE

SVENSK SAMMANFATTNING

Många företag känner av pressen av agera för att minska sin miljöpåverkan. Flera företag har också insett att ett sådant agerande även har affärsmässiga fördelar. När det gäller miljöpåverkan så tillhör logistikföretagen, till stor del på grund av sina transporter, de företag som insett att något måste göras. Möjligheten för dessa företag att göra olika miljöåtgärder påverkas av varuägarna som köper logistikföretagens tjänster. Som en följd av detta blir länken mellan dessa företag – relationen – viktig för att möjliggöra förbättringar när det gäller påverkan från logistiken. Denna avhandling har som syfte att beskriva och förklara hur aktörer i försörjningskedjan, med ett speciellt fokus på relationer mellan logistikföretag och varuägare, kan inkludera miljöåtgärder i sina relationer med varandra.

För att över huvud taget kunna diskutera miljöåtgärder i relationer mellan logistikföretag och varuägare så är det viktigt att veta vad för typer av miljöåtgärder detta kan röra sig om. Första forskningsfrågan i avhandlingen behandlar detta och i avhandlingen identifieras ett antal sådana åtgärder. Det kan röra sig om relativt tekniska åtgärder så som alternativa bränslen, olika typer av fordon och energieffektiv körning, till åtgärder som handlar om styrning av logistiken, så som design av logistiksystemen, till åtgärder som är väldigt relationsspecifika som exempelvis specifika projekt eller miljögrupper.

Med avstamp i de identifierade åtgärderna analyseras sedan relationerna mellan logistikföretag och varuägare i några olika steg. En jämförelse mellan logistikföretagens och varuägarnas perspektiv på de miljöåtgärder som erbjuds, efterfrågas samt ingår i relationerna dem emellan visar att logistikföretagen ofta kan tillgodose sina kunders önskemål. Samtidigt som detta visar att varuägarnas önskemål verkar vara uppfyllda, så finns det en frustration från varuägarnas sida över att logistikföretagen inte är mer proaktiva.

En av anledningarna till detta kan vara maktbalansen mellan logistikföretag och varuägare. Resultaten i avhandlingen pekar nämligen på att varuägarna oftast har makten över logistikföretagen, vilket verkar leda till att varuägarens ambitioner gällande miljö ofta är det som sätter agendan för vilka miljöåtgärder som inkluderas i relationen mellan dessa företag.

Vidare så kan de miljöåtgärder som ingår i en relation mellan logistikföretag och varuägare koordineras på olika sätt och flera sådana tas upp i avhandlingen. Resultaten pekar även på att maktbalansen i relationerna påverkar i vilken grad miljöåtgärder inkluderas i relationer mellan logistikföretag och varuägare samt hur dessa koordineras. En matris, som bygger på logistikföretagets och varuägarens ambitioner gällande miljö för en specifik relation, sammanfattar resultaten i avhandlingen. Beroende på om denna ambition är hög eller låg för de båda aktörerna påverkar i sin tur möjligheten för varje typ av relation att arbeta mot gröna försörjningskedjor.

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During the last months of writing I have had a clear picture in my head of what writing a thesis means. Picture a square box that needs to be filled with content. At the beginning, you do not even know what the content looks like. Should the box be filled with cotton wool, dogs or smaller square boxes? During the last months I have pictured smaller boxes going into the large one. But which boxes should be placed in the large box? The writing process includes putting boxes in, testing, taking some out and trying again. This is done over and over again, until the box is filled with both the right number of small boxes and the right type of boxes. I have done my best to fill this thesis with what I believe is the right type and amount of content and I feel very happy and even proud of the result. This would, however, not have been possible without the help and support of a number of people whom I would like to take this opportunity to thank.

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keeping the freezer filled with food and well...everything. Nina, my big little Ironman sister, thank you for being who you are and for being as crazy (at least some people think so) as me when it comes to challenging yourself with races, runs and whatnot. What's our next adventure? Petter, you are the solid rock I can lean on when I go a little crazy. Thank you for always believing in me and for putting up with me during these last few months. And lastly, Topsy, thanks for being...well, the cute, annoying little dog that you are.

Linköping, December 2013

Uni Martinsen

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PAPER II: BJÖRKLUND, M., MARTINSEN, U. & ABRAHAMSSON, M. 2012. PERFORMANCE MEASUREMENTS IN THE GREENING OF SUPPLY CHAINS.

PAPER III: MARTINSEN, U., BJÖRKLUND, M., HUGE-BRODIN, M. 2012. THE IMPORTANCE OF STAKEHOLDER RELATIONSHIPS IN CITY LOGISTICS PROJECTS.

PAPER IV: MARTINSEN, U., BJÖRKLUND, M. 2012. MATCHES AND GAPS IN THE GREEN LOGISTICS MARKET.

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1 INTRODUCTION

This thesis focuses on environmental activities in relationships between supply chain actors. It aims to describe and explain how supply chain actors, with a specific focus on logistics service providers and shippers, can include such activities in their relationships with each other. The objective of this chapter is mainly to provide a background for why this is an important field of research, from a theoretical as well as a practical viewpoint. The background leads on to the purpose of the thesis, after which four research questions are developed. The final parts of the chapter clarify some important concepts and provide the outline of the thesis.

1.1 THE GREENING OF SUPPLY CHAINS

It is well recognised that companies are under pressure to take responsibility for the environmental impact of their operations. It is also increasingly accepted that it is no longer enough to focus on the impact of single companies and instead, the supply chains in which companies find themselves need to be taken into account (Ashby et al., 2012; Kogg, 2003; Rao and Holt, 2005; Sarkis, 2012; Simpson et al., 2007). Logistics service providers (LSPs) are one type of supply chain actor that have noted this development and in the sustainability report of the Swedish LSP PostNord, the following can be read:

"Many corporate customers have their own ambitious environmental targets and look beyond their own operations. In addition to efforts to reduce their own environmental impact, customers place demands on their suppliers. This particularly applies to the purchase of logistics services. For example, many customers demonstrate interest in and impose requirements for specific environmental data for the services they buy, environmental and quality certificates, the use of alternative vehicle fuels and training drivers in fuel-efficient driving." (PostNord, 2012, p. 21)

The citation above includes two types of supply chain actors that are of large relevance for this thesis: logistics service providers (LSPs), who offer logistics services to their customers, who in this thesis are called shippers. The shippers in turn demand logistics service of various types from the LSPs. However important logistics and transports may be in supply chains, they have a downside: they have a large negative impact on the natural environment (EEA, 2007; Murphy and Poist, 1995; Ribeiro et al., 2007; Roth and Käberger, 2002). The next section aims to further describe the role of LSP in the context of greening supply chains.

1.1.1 THE ROLE OF LOGISTICS SERVICE PROVIDERS (LSPs)

Evaluations show that the single most environmentally damaging operation within logistics is transport (World Economic Forum, 2009; Wu and Dunn, 1995). Further, the negative effects can include local air quality, noise and vibration, accidents and global warming (McKinnon, 2010). Due to a growing concern of climate change, CO₂ emissions have become an increasingly important environmental measurement. Of the 50,000 mega-tonnes of CO₂ equivalents that human activity generates every year, around 5.5% are caused by the transport and logistics sector (World Economic Forum, 2009).

This information is not new to the logistics industry – on the contrary. LSPs to a large extent acknowledge that they are a part of the problem and also admit that they have to be a part of the solution. For example, in a report from 2009, DHL notes that:

"Climate change and its consequences will have a far-reaching effect on logistics. As one of the largest producers of CO₂ emissions, the logistics industry will find itself in a particularly difficult position – and under close scrutiny." (p. 52)

As a result of these challenges, many of the LSPs have set targets for a reduction of their CO₂ emissions. On the Swedish logistics market there are examples such as DHL, that has a goal to reduce emissions by 30% by 2020 (Deutsche Post DHL, 2012), DB Schenker, that aims to reduce emissions by 20% by 2020 (Schenker, 2013) and PostNord, that aims at a reduction of 40%, also by 2020 (PostNord, 2012)¹.

There are several possible reasons for the environmental focus of the LSPs. One can be derived from pressure from stakeholders such as governments and customers (Björklund, 2005; Isaksson, 2012; Lieb and Lieb, 2010; McKinnon, 2010). Another reason for LSPs' environmental focus is the business opportunity that can come from being "a green company"; increased competitiveness and improved brand images are, for example, identified as potential benefits of

¹ The reduction targets are compared to the CO₂ emissions in a certain year for each company and that year is different for all of them; DHL takes 2007, DB Schenker 2006 and PostNord 2009 as their base year.

such focus (Isaksson, 2012; Lao et al., 2011; Lieb and Lieb, 2010). DHL (2009) expresses the opportunity like this:

"The demand for 'green' supply chains will also open up an enormous growth market: Customers will have an increased need for consultation and expect logistics companies to design customized transport solutions for them that are low in CO₂ emissions." (p. 53)

There are several environmental activities through which LSPs can work towards a decrease of emissions, such as new vehicle technology, alternative fuels, eco-driving, choice of transport mode, transport planning and design of the logistics system (see for example Aronsson and Huge-Brodin, 2006; EEA, 2007; McKinnon, 2008). Even though some of these can be conducted, and might be conducted, by LSPs themselves, shippers' demands on different environmental activities appear to have an impact on the environmental activities of LSPs (Roth and Kåberger, 2002; Wolf and Seuring, 2010). For example, Wolf and Seuring (2010) write:

"/.../ a decisive part of the options for environmental actions seems to lie with the transport buying company, as it is this actor who makes the choices on where and how locations are set up and also chooses the service providers, whereas the 3PL is more bound to adapt his services to related customer demands." (p. 85)

While this is one side of the coin, Isaksson (2012) notes that customers also can hinder the inclusion of environmental activities for LSPs, for example because of a reluctance to pay extra for environmental activities. Another barrier found by Isaksson is the lack of support from shippers in LSPs' processes of becoming greener.

According to the reasoning above, it appears as though shippers, who buy logistics services, play an important role for the environmental activities of LSPs. In addition, shippers find themselves in the same situation as LSPs in terms of pressure from various stakeholders as well as a potential business opportunity, due to the environmental challenges described in the beginning of this chapter (see for example Theyel, 2001; Vachon and Klassen, 2006; Zhu et al., 2005). Large Swedish companies such as H&M, IKEA and Clas Ohlson² recognise that they are a part of the problem and strive towards a decrease in emissions from logistics activities derived from their operations.

A main idea of this thesis is this: in terms of greening their activities, LSPs can only do so much on their own. In order for them to really be able to decrease their negative environmental impact, the shippers must be included in the process. As for the shippers, they are increasingly aware that greening one company's logistics operations is not enough. Due to these underlying assumptions, the inter-organisational relationships between LSPs and shippers are the main focus of the rest of this thesis.

1.2 PREVIOUS RESEARCH INTO THE GREENING OF SUPPLY CHAINS

Within academic literature, one field of research in particular recognises the need for an inter-organisational perspective on the greening of supply chains, so that several actors take joint responsibility (see for example Hervani et al., 2005). That field of research is *green supply chain management* (GSCM). GSCM can be said to integrate environmental considerations into supply chain management (SCM) (Sarkis et al., 2011; Srivastava, 2007; Zhu et al., 2012). SCM includes the flow of goods from suppliers to end customers and this includes sourcing of raw materials and parts, manufacturing and assembling products, storage, order entry and tracking, distribution through the various channels and, finally, delivery to the customer (Hervani et al., 2005). The focus of GSCM is thus to include environmental considerations in the supply chain concept.

² Specific information about the companies' goals can be found on their web-pages: www.hm.com, www.ikea.com and www.clasohlson.com.

The research area of GSCM includes a wide variety of topics, ranging from intra-organisational to inter-organisational (see for example Theyel, 2006; Vachon and Klassen, 2006; Zhu and Sarkis, 2004), from forward supply chains to reverse or closed-loop supply chains (Hervani et al., 2005; Simpson et al., 2007; Srivastava, 2007) and from upstream focus such as green supply and purchasing (Rao and Holt, 2005; Simpson et al., 2007; Zhu and Sarkis, 2006) to downstream practices with customers (Theyel, 2006; Vachon and Klassen, 2006; Zhu and Sarkis, 2004). Figure 1.1 illustrates the supply chain of a focal company, a shipper, and the stages and relationships included in it.

FIGURE 1.1. A GREEN SUPPLY CHAIN INCLUDING STAGES AND RELATIONSHIPS

The fact that both intra- and inter-organisational measures can be taken in order to lower a company's environmental impact (Abbasi and Nilsson, 2012; Zhu and Sarkis, 2004) deserves some further attention. While an intra-organisational focus has the potential to decrease the environmental impact from one company, researchers have highlighted the need for a more holistic approach (van Hoek, 1999; Vasileiou and Morris, 2006). Previous research into the inter-organisational aspects of GSCM has to a large extent focused on upstream parts of the supply chain, i.e. the suppliers (Abbasi and Nilsson, 2012) and focus has mainly been on manufacturing companies (Hassini et al., 2012). For example, in their classification of GSCM practices that go beyond company borders, Zhu and Sarkis (2004) include audit of suppliers, requirement for environmental management systems for suppliers and cooperation with suppliers as well as customers for environmental reasons. Other authors, such as Hu and Hsu (2010) and Vachon and Klassen (2006), mention similar practices that are often focused on suppliers and customers. Suppliers, in this context, almost exclusively include suppliers of physical goods, as opposed to suppliers of services.

From a supply chain management perspective, LSPs can be regarded as a type of supplier (see Golicic, 2007; Kovács, 2008) and although logistics and transports have been acknowledged by some authors as a part of GSCM, very little attention has been given to LSPs role in the greening of supply chains. Five recent literature reviews into GSCM confirms this picture: Two of them (Abbasi and Nilsson, 2012; Sarkis, 2012) recognise LSPs as a part of the supply chain and mention that they can be a part of reducing emissions in supply chains. Srivastava (2007) briefly mentions LSPs as one possible part of GSCM, while Sarkis et al. (2011) and Gupta and Palsule-Desai (2011) do not mention transports or the companies behind them (the LSPs) in their literature reviews. Thus, even though transports are recognised by some as a part of the supply chain, very little attention has been given to LSPs in the inter-organisational aspects of GSCM.

A step outside the field of GSCM and into the wider field of SCM reveals that LSPs have been given notably little focus there either, and that focus instead has been on manufacturers and retailers (Huemer, 2012). There are several reasons as to why LSPs might have had a secondary place in the SCM and GSCM literature. For example, Fabbe-Costes et al. (2009) suggest that LSPs are the forgotten actors of supply chain integrations. Spens and Bask (2002) note that LSPs are often merely seen as actors that support other members of the supply chain, providing resources, knowledge, utilities or assets for primary members and Lemoine and Skjoett-Larsen (2004) state that LSPs are the least integrated link in supply chains. Given the

interconnectedness between SCM and GSCM, it is perhaps not surprising that only limited attention has been given to LSPs within GSCM as well.

With regard to the above, it might be of importance to note that the scarce research into LSPs within the field of GSCM does not mean that no research field focuses on LSPs. As a matter of fact, research into LSPs' environmental work have gained increasing attention during recent years (examples include Colicchia et al., 2013; Evangelista et al., 2013; Isaksson, 2012; Lieb and Lieb, 2010; Maack, 2012; Perotti et al., 2012; Rogersson, 2013). Some of the topics dealt with in these studies are drivers of and barriers to environmental initiatives (Isaksson and Hugel-Brodin, 2013), purchasing in relation to environmentally sound logistics services (Evangelista et al., 2013; Rogersson, 2013) and LSPs' internal environmental management (Maack, 2012). These studies can be said to belong to the field of green logistics (McKinnon, 2010). However useful these studies may be, they mainly take an LSP perspective and focus on the greening of LSP's operations as such. As a consequence, they generally do not take an inter-organisational perspective.

By widening the perspective, the next section takes a step back from the LSP focus and concentrates on the importance of relationship between supply chain actors in the greening of supply chains.

1.2.1 GREENING LOGISTICS THROUGH SUPPLY CHAIN RELATIONSHIPS

Relationships between supply chain actors are suggested by several researchers to be of importance in the greening of supply chains (Ashby et al., 2012; Lamming and Hampson, 1996; Simpson et al., 2007; Theyel, 2001). For instance, Lamming and Hampson (1996) write:

"If a collaborative approach is employed in purchasing, suppliers may be able to help customers to understand the environmental effects and their causes in the supply chain. At the same time, customers may help suppliers to understand the related issues such as potential competitive advantage and the criteria used for evaluation and rating." (p. 52)

Lamming and Hampson thus find environmental benefits for suppliers as well as customers to be a result of increased collaboration between these two types of supply chain actors. Further, Simpson et al. (2007) study the effects of relationship conditions on manufacturing suppliers' environmental focus. They find that the more investment in terms of dedicated time, future goals, equipment or capacity that a supplier has in its relationship with a customer (relationship-specific investment), the more likely the customer is to influence the supplier with regard to environmental activities. In another study, Theyel (2001) finds indications that collaboration for environmental reasons in one supply chain relationship often lead to collaboration in other supply chain relationships as well. The details of the collaboration in the supply chain relationships are only studied to a very limited extent in the paper by Theyel.

According to the above, relationships between actors can be of importance in the greening of supply chains. Despite this, Ashby et al. (2012) conclude on the basis of an extensive literature review that there is

"...limited research into how supply chain relationships can be harnessed to achieve sustainability, especially within the environmental domain." (p. 508)

While Ashby et al. (2012) refer to supply chain relationships in general, Wolf and Seuring (2010) note in their study of LSPs and shippers with regard to environmental buying criteria that:

"The results of the empirical research presented, however, point toward an unclear picture of how the relation between 3PL and a focal company should be designed to maximise environmental effect or at least include environmental issues." (p. 95)

Notably, relationships between LSPs and shippers have to a limited extent been addressed in recent research. For example, as a result of her study of environmentally sustainable freight transport, Santén (2013) highlights the importance of communication and information-sharing between LSPs and shippers in order for them to better understand each other's logistics systems. This in turn leads to greater potential for the inclusion of environmental activities in the relationships between these two supply chain actors. However, while previous research suggests that LSPs and shippers need to collaborate, there is little evidence found that point to how such collaboration can be done.

This thesis sets out to fill the above identified gap in research by describing how LSPs and shippers can include environmental activities in their relationships with each other. There are various types of environmental activities that can be included in such relationships and while some potentially could be one-sided, others possibly have to be performed jointly by both actors. According to the reasoning above, involvement by shippers is likely to increase the potential of greening logistics and it is argued here that understanding the preconditions for such involvement can support the understanding of how to improve the collaboration. One question that arises in relation to this is whether there are relationship characteristics that influence the possibility for LSPs and/or shippers to include the various types of environmental activities in their relationships with each other. Thus, not only is there a need to describe how environmental activities can be included in LSP-shipper relationships; there is also a need to understand the reasons why various activities can or cannot be included.

1.3 PURPOSE AND RESEARCH QUESTIONS

According to the argumentation above, LSPs' operations have a large environmental impact and are under pressure to reduce this impact. Shippers, who buy logistics and transport services from LSPs, play an important role for LSPs' environmental work and can be both drivers and hinders in this process. This thesis takes as its starting point that relationships between LSPs and shippers are an important aspect of the road toward greener logistics. The previous discussion reveals that these relationships have to date largely been neglected within previous research. It is argued here that by investigating the inclusion of environmental activities in such relationships, it is possible to gain an increased understanding of the greening of logistics through supply chain relationships. Because of the novelty of the area, this thesis is in part focused on describing the inclusion of environmental activities in LSP-shipper relationships, but in order to further understand them, this thesis also has an explanatory aim. Based on this reasoning, the purpose of this thesis is to:

Describe and explain how supply chain actors, with a specific focus on logistics service providers and shippers, can include environmental activities in their relationships with each other.

In the following sections the purpose will be further elaborated on and research questions will be developed. Relationships between LSPs and shippers serve as the starting point for the development of research questions. However, even though these relationships are the ones of most importance for this thesis, that does not mean that other types of supply chain relationships are not relevant. It is instead argued here that taking other relationships into account could have a potential to contribute to the understanding of LSP-shipper relationships. As a result of this, each research question below includes, in addition to LSP-shipper relationships, an enquiry about supply chain relationships in general. However, the argumentation for the research questions is mainly focused on the contest of LSP-shipper relationships.

1.3.1 ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS

The research in this thesis to a large extent builds on the understanding of various environmental activities that can be included in relationships between LSPs and shippers. Environmental activities are activities that can be part of green offerings from LSPs, demands

from shippers or they can be performed jointly in relationships between these supply chain actors. In relation to this, details of general logistics service offerings have been thoroughly described in literature (see for example Berglund, 1997; Rajesh et al., 2011; Yu et al., 2010). The literature reviews of Rajesh et al. (2011) and Yu et al. (2010) will here provide the examples of general service offerings. Even though not all of the service offerings are mentioned, the following list gives an idea of the various categories that a logistics service offering can include

- Transportation
- Carrier selection
- Freight forwarding
- Freight consolidation
- Multimodal transportation
- Full truck load transportation
- Distribution
- Reverse logistics
- Logistics coordination
- Warehousing
- Inventory management
- Product assembly and kitting
- Customs clearing
- Packaging / Labelling
- Import / export management
- Order processing
- Vendor management
- Rate negotiation
- Marketing services
- Logistics information and IT solution

Whereas activities of general, non-environmental character have been thoroughly researched, the environmental aspects of the logistics service offering are rarely explicitly mentioned in the literature. Studies such as those by Wolf and Seuring (2010) and Isaksson and Huge-Brodin (2013) mention the service offering of LSPs but do not go into detail as to what environmental activities such offerings might include. However, environmental activities have to some extent received the interest of researchers in recent years and Colicchia et al. (2013), Perotti et al. (2012) as well as Weijers et al. (2012) do provide information about the subject. However, the studies are from an LSP perspective only and do not explicitly address the duality of environmental activities. It is argued here that there is a need for a more holistic approach as to what environmental logistics activities can include, both from the perspective of LSPs and shippers, as well as from a relationship perspective. The first research question is therefore:

Research question 1: *Which environmental activities can be included in a) relationships between logistics service providers and shippers and b) in supply chain relationships in general?*

1.3.2 INCLUSION OF ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS

It has been suggested that correspondence between customer needs and the service offers is essential in order to succeed with the service concept (Edvardsson, 1997). In relation to the environmental activities discussed above, this becomes an interesting issue to discuss further. In relationships between LSPs and shippers, the shippers could possibly be dissatisfied if the LSPs are not able to offer what is demanded in terms of environmental activities. On the other hand, if the LSPs' can offer more than the shippers want, one can wonder what the reason for this overachievement is. Such a situation is referred to by Lings and Brooks (1998) as a positive mismatch, which means that offerings exceed demands. According to Large and König (2009), such a situation leads to a waste of resources that could be used better elsewhere. With this background, it becomes of interest to understand to what extent the environmental activities are included in relationships between LSPs and shippers.

Although no studies to date appear to have gone into detail in this matter, two studies do touch upon the subject. Lieb and Lieb (2010) asked CEOs of American LSPs about their environmental activities, what they offer to shippers and what they perceive that the shippers want. The paper is for the main part a presentation of a survey and the authors do not analyse the results to a large extent, although there are several interesting findings. For example, their survey results appear to indicate that environmental activities in offerings from LSPs contain considerably

more than what the shippers actually ask for. A similar result was found in a case study by Wolf and Seuring (2010), who find that LSPs seem to be ahead of their customers with regard to environmental issues. The tentative results of the two mentioned studies do correspond to the findings from the more general logistics context, i.e. without the environmental aspect included. Specifically, Murphy and Poist (2000) as well as Langley (2014) note that there appears to be a mismatch between the services offered by LSPs and demanded by shippers.

Relating back to the research into environmental activities, one difference between the studies of Lieb and Lieb (2010) and Wolf and Seuring (2010) is that Lieb and Lieb have studied LSPs only, while Wolf and Seuring have studied both LSPs and shippers. However, the unit of analysis in Wolf and Seuring's paper is still the focal company, meaning that they study the two actor perspectives separately and not take the duality of LSP-shipper relationships into account. There thus appears to be a lack of detailed comparison between LSPs and shipper with regard to environmental activities. The second research question is therefore formulated as:

Research Question 2: *To what extent are environmental activities included in a) relationships between logistics service providers and shippers and b) supply chain relationships in general?*

1.3.3 POWER BALANCES AND ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS

Given that the results of RQ2a might produce various results regarding to what extent environmental activities are included in relationships between LSPs and shippers, it becomes of interest to understand some of the underlying rational behind such results. One concept that can contribute to an explanation of this is that of power balances in the relationships. In this respect, Kogg (2003) for example finds that a lack of power in supply chains can be used as an excuse for not taking more responsibility in terms of environmental activities.

On a general note, power in business relationships can have a large effect on how a specific business relationship evolves. Cook (1977) expresses this as:

"The more power an organization has, the more influence it has to determine the nature of the interorganisational exchange; that is, to determine the form of the interaction and the ratio of exchange." (p. 66)

In line with the reasoning of Cook, power could potentially affect if, and to what extent, companies include environmental activities in their relationships. In line with this reasoning, power is in this thesis defined as *the ability to evoke a change in a supply chain actor's environmental behaviour* (adapted from Gaski, 1984).

Looking at previous research within the general field of logistics, many studies have been conducted with a focus on power in business relationships. There are numerous examples of research into power within the general field of SCM (such as Belaya and Hanf, 2009; Benton and Maloni, 2005; Flynn et al., 2008; Maloni and Benton, 2000; Zelbst et al., 2009) and research has shown that the power balance in business relationships can be used as a tool to improve performance (Maloni and Benton, 2000; Zelbst et al., 2009).

Within the field of GSCM, studies into the concept of power are more scarce. Some research does however shed some light on the issue. The example of Kogg (2003) given at the beginning of this section is one example. Relating to her results, an inferior position in a relationship appears to be a reason for a passiveness with regard to environmental activities taken, while on the other hand a more superior position in a relationship could then possibly be a way to promote environmental activities. Such a power advantage could for example come from firm-size, which by Min and Galle (2001) is suggested to influence environmental activities in purchasing. Although not explicitly using the term "power", Hassini et al. (2012) find that the idea of green purchasing practices is that:

“the focal company in the supply chain will force its upstream suppliers to adopt and adapt technology and practices that result in more efficiently and environmentally friendly material sources, engage in labor practices that are considered ethical and result in lower greenhouse gas (GHG) emissions as well as low impact on the environment” (p. 73)

The use of the word “force” in the citation above indicates that one actor – the buying company – in the supply chain is more powerful than others and thereby has the ability to impact the environmental activities in its specific relationships with its suppliers.

In terms of supply chain actors, this thesis is mainly focused on relationships between LSPs and shippers. Although patterns could be similar to the ones found in the research presented above, previous research within the field of GSCM has not looked into the specifics of the LSP-shipper context. As described earlier in this chapter, research indicates that shippers play an important role for LSPs' environmental activities, both as drivers and barriers (see for example Isaksson, 2012). Could power possibly be one of the reasons for this situation? For example, a large shipper with environmental ambitions could potentially help drive the environmental activities in relationships with LSPs. On the other hand, a large shipper that shows no interest in greening logistics activities might instead have the power to hinder the inclusion of environmental activities in its relationships with LSPs.

While the size of the company can be one source of power in LSP-shipper relationships, there are other sources of power as well. Together, they can give an indication of the power balance in a specific LSP-shipper relationship. Can power balances explain how logistics service providers and shippers can include environmental activities in their relationships with each other? It is argued here that just as in relationships between buyers and physical goods suppliers in GSCM, the power balance can have an effect on the greening of logistics in terms of environmental activities in LSP-shipper relationships. The third research question is therefore:

Research Question 3: How can the power balance between actors influence the extent to which environmental activities are included in a) relationships between logistics service providers and shippers and b) supply chain relationships in general?

1.3.4 COORDINATION OF ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS

In relation to the purpose of this thesis, it is of interest to understand more with regard to how supply chain actors can include environmental activities in their relationships with each other. The concept of coordination is here suggested to be one way to gain increasing insight into this matter. Coordination of activities is at the centre of supply chain management and many of the definitions of SCM are in fact based on this concept (see for example Fugate et al., 2006). In line with this, Mentzer et al. (2001) describe their findings from a literature review of SCM:

“Reviewing the literature illustrated that supply chain management involves multiple firms, multiple business activities, and the coordination of those activities across functions and across firms in the supply chain.” (p. 17)

Coordination in this thesis refers to the management of dependencies between activities, in line with the definition of Malone and Crowston (1994). In the general logistics and SCM literature, it is suggested that coordination improves supply chain performance in general (see for example Cachon, 2003; Chen, 2003; Flygansvør et al., 2008; Stank et al., 1999). More specifically, coordination can bring about benefits such as cost reductions, decreased inventory levels, decreased order cycle time, improved relationships and reduction of different types of waste (Andersson et al., 2007; Sandberg and Bildsten, 2011; Stank et al., 1999). Judging by the diversity of these benefits, there are a wide variety of focus areas within the research of supply chain coordination, some of which are noted in the literature review by Arshinder et al. (2008).

Given that this is a thesis related to GSCM, and not SCM as such, one can wonder why the above information is of relevance. However, given the relatedness between SCM and GSCM, coordination is likely to be of importance also in the greening of supply chains. One example of this related back to a previously mentioned environmental activity: transport planning. Transport planning has the potential to be an attractive environmental activity for LSPs, since it can contribute to reduced costs as well as decreased environmental impact (Aronsson and Høge-Brodin, 2006; Oglethorpe and Heron, 2010). To some extent, transport planning can be viewed as an intra-organisational activity that LSPs must do as a natural part of their businesses in order to make money. However, various customer requirements might hinder LSPs to plan as efficiently as possible. Time restrictions is one such example; if shippers want deliveries at a specific time, this might have the effect that the LSPs cannot consolidate goods in an efficient manner, which might lead to the need for more trucks to operate in order to deliver all goods. This example aims to highlight that there are dependencies between environmental activities in LSP-shipper relationships, which according to the definition above can be managed by coordination between the two types of actors.

Looking at previous research, it appears as though inter-organisational coordination issues have received much attention in the general supply chain management literature, while the coordination of environmental activities between supply chain actors to a large extent has been overlooked. Swami and Shah (2013) for example find that *“very few studies have addressed the issue of coordinating the green supply chain”* (p. 337). The studies by Swami and Shah (2013) as well as Zhu et al. (2012) are two of the very few on the combined topic of GSCM and coordination. Swami and Shah (2013) study coordination between a manufacturer and a retailer in a specific setting where both have green ambitions, whereas Zhu et al. (2012) study the coordination between intra- and inter-organisational GSCM practices in manufacturing companies.

Just as coordination in SCM can enhance performance in general, coordination in GSCM is likely to improve green performance in supply chains. Based on the above discussion, it is here argued that the inclusion of environmental activities in LSP-shipper relationships could be better understood through increased knowledge of coordination in these relationships. The fourth research question is therefore:

Research Question 4: *How can environmental activities be coordinated in a) relationships between logistics service providers and shippers and b) supply chain relationships in general?*

1.4 CONCEPTS

In this section, some concepts of importance for the thesis are described. The concepts appear in alphabetical order.

ENVIRONMENT

The use of the word environment is extensive, as it can mean a variety of different things. There are business environments, competitive environments, organisational environments, to name a few. In this thesis, the word environment refers to the natural environment and will in this thesis be used interchangeably with the word “green”.

ENVIRONMENTAL ACTIVITY

This term refers to activities that aim to decrease environmental impact from logistics operations and that are of relevance for the LSP-shipper interface. Such activities can, for example, be environmental management systems (such as ISO 14 001), specific vehicle technologies, eco-driving or documentation of emissions data. The environmental activities can be a part of LSPs’ service offerings, shippers’ demand and/or a part of actual LSP-shipper relationships. In a similar manner, environmental activities can refer to activities in supply

chain relationships in general, such as in the interface between shippers and physical goods supplier or actors in a city logistics context.

GREEN SUPPLY CHAIN MANAGEMENT (GSCM)

As implied earlier in this introduction chapter, GSCM is an area of research that recognises that environmental impact is not limited to company borders (McKinnon, 2010) and instead, parts of or entire supply chains should be accounted for. Although this description of the GSCM concept provides some guidance as to what it includes, there is no consensus in the literature with regard to what is included in GSCM (Sarkis et al., 2011). Some of the difficulties lie in the fact that:

- 1) there are many different definitions (see for example Hervani et al., 2005; Hu and Hsu, 2010; Sarkis et al., 2011; Srivastava, 2007; Zhu et al., 2008);
- 2) the terminology is not consistent and includes examples such as environmental supply chain management (Walker et al., 2008), sustainable supply chain management (SSCM) (Gupta and Palsule-Desai, 2011), green supply (Simpson et al., 2007) and green purchasing (Rao and Holt, 2005; Zhu and Sarkis, 2006);
- 3) the boundaries vary between different studies and could for some researchers mean upstream parts of the supply chain (Ashby et al., 2012), whereas other researchers take a broader perspective and include upstream as well as downstream parts of the supply chain (see Zhu and Sarkis, 2004).

One reason for these ambiguities could be that several authors suggest that the boundaries of GSCM are dependent on the researcher, the type of study and the research or practitioner field (Hu and Hsu, 2010; Zhu and Sarkis, 2004; Zhu et al., 2005). Thus, it becomes important to narrow down what GSCM is in this particular thesis.

This thesis applies a definition of GSCM that is based on Sarkis et al. (2011), namely: *integrating environmental concerns into the inter-organisational practices of SCM*.

This definition highlights the inter-organisational aspects of GSCM, which is of great importance for this thesis. Moreover, it allows for both upstream and downstream aspects of parts of the supply chain to be taken into account.

LOGISTICS SERVICE PROVIDERS (LSPs):

As has been done in previous research (see for example Fabbe-Costes et al., 2009; Forslund, 2010), the term LSP will in this thesis include actors such as carriers, forwarding companies, transport(ation) companies, third party logistics providers/partners and logistics service companies/providers/suppliers. Differences between these types of companies will in this thesis possibly contribute to a wider range of results than if similar LSPs had been studied. No major analysis of these differences is, however, conducted in this thesis due to that LSPs are of interest because of their role as providers of logistics services.

SHIPPERS

Those actors who buy transport and logistics services from LSPs are in this thesis called shippers. In addition, shippers can also be buyers and/or suppliers of physical goods.

SUPPLY CHAIN ACTORS

A supply chain can include a large number of actors, all of which are often involved in the flow of physical goods through the supply chain. Of main relevance for this thesis are LSPs, who perform logistics services, and shippers, who buy logistics services and can for example include manufacturers, wholesalers or retailers. Other actors of relevance for this thesis are suppliers of physical goods and actors involved at the final part of the supply chain, i.e. in a city context.

SUPPLY CHAIN RELATIONSHIPS

Supply chain relationships in this thesis refer to business relationships between supply chain actors. Such relationships can include one-sided (environmental) activities from either actor in the relationship, as well as joint activities where both actors in the relationship are involved. Of specific interest in this thesis are relationship between LSPs and shippers.

1.5 SCOPE OF THESIS

One of the main focuses of this thesis is environmental activities conducted in supply chain relationships. Even though these activities are most likely undertaken in order to decrease environmental impact from the relationships on some level, this thesis does not aim to evaluate the actual environmental effects of the environmental activities. As a consequence, environmental activities are not ranked in the thesis, meaning that one activity is not claimed to be better than another.

As described previously in this chapter, this thesis is focused on GSCM. A closely related research field is that of sustainable supply chain management (SSCM), which has a wider scope than GSCM; whereas GSCM deals with the greening of supply chains and the economic aspects of this, SSCM deals with these two dimensions as well as an ethical dimension. Although this thesis is limited to the economic and environmental dimensions, the fields of research often are closely linked. In some cases it is therefore beneficial to include findings with regard to the environmental dimension from the field of SSCM to add to the knowledge of GSCM (Carter and Jennings, 2002).

1.6 THESIS OUTLINE

This thesis is a compilation thesis and includes one main part of six chapters as well as two appendixes. The first of these includes five academic papers and the second contains two case reports. It is possible to read the thesis frame without having read the three papers, but in many of the sections the papers and case reports play an important role. Table 1.1 illustrates the relationship between research questions, papers and case reports. As can be seen, Paper I and Paper II mainly contribute to RQ1, Paper IV mainly to RQ2 and Paper V mainly to RQ4. Paper III contributes to three out of the four research questions, whereas both case studies provide input to all of the research questions. It should be noted that case report I, which includes four cases of LSP-shipper relationships so some extent are analysed in Paper I and Paper V, whereas the case presented in case report II has not been analysed prior to this thesis.

TABLE 1.1. PAPERS AND CASE REPORTS IN RELATION TO THE FOUR RESEARCH QUESTIONS

	RQ1	RQ2	RQ3	RQ4
Paper I	Cover RQ	Partly cover RQ	Do not cover RQ	Do not cover RQ
Paper II	Cover RQ	Partly cover RQ	Do not cover RQ	Do not cover RQ
Paper III	Cover RQ	Cover RQ	Cover RQ	Cover RQ
Paper IV	Do not cover RQ	Cover RQ	Do not cover RQ	Do not cover RQ
Paper V	Do not cover RQ	Do not cover RQ	Do not cover RQ	Cover RQ
Case Report I	Cover RQ	Cover RQ	Cover RQ	Cover RQ
Case Report II	Cover RQ	Cover RQ	Cover RQ	Cover RQ

Cover RQ

Partly cover RQ

Do not cover RQ

Now that the basic relationships between the different parts of the thesis are clarified, a closer look at what the chapters in this main part of the thesis include is in order.

CHAPTER 1 – INTRODUCTION

The first chapter aims to give a background to the research topic and to describe, from a theoretical as well as a practical perspective, why the research in this thesis is of importance. The background leads on to the purpose of the thesis, after which four research questions are developed.

CHAPTER 2 – FRAME OF REFERENCE

The frame of reference includes three main sections. The first concerns relationships between supply chain actors as well as environmental activities that can be included in such relationships. The two subsequent sections comprise theoretical perspectives (the concepts of power and coordination) taken in order to understand the inclusion of environmental activities in supply chain relationships.

CHAPTER 3 – RESEARCH METHODOLOGY

In the third chapter, the research methodology is presented. This includes a description of the research process, unit of analysis and the research design. These sections are followed by an overview of the literature reviews conducted as well as a description of the different data collection methods used in the research for this thesis. The analyses conducted in this thesis are then explained and the chapter ends with an evaluation of the research quality.

CHAPTER 4 – APPENDED PAPERS AND REPORTS

As described above, this thesis includes five papers and two case reports. In order for the reader to gain initial insight into these appendixes, an overview of them is given in chapter four.

CHAPTER 5 – ANALYSIS

The fifth chapter contains the analysis of this thesis. Each research question is addressed separately, starting with a focus on relationships between LSPs and shippers, after which the focus widens to include supply chain relationships in general. The final section of the paper includes, in the context of LSP-shipper relationships, the analysis of all four research questions combined.

CHAPTER 6 – CONCLUSIONS AND DISCUSSION

In the final chapter of the thesis, the conclusions are provided. The findings are then related to previous research, after which managerial implications are proposed. A discussion follows and, lastly, suggestions for further research are given.

Following the final chapter are the appended papers and case reports. The reader is referred to Chapter 4 for an overview of these.

2 FRAME OF REFERENCE

The chapter is divided into three main sections. The first of these aims to give an overview of relationships between supply chain actors as well as of environmental activities that can be included in such relationships. While the first section has an environmental focus, the two subsequent sections comprise theoretical perspectives taken in order to understand the inclusion of environmental activities in supply chain relationships. Specifically, the second section deals with power balances in supply chain relationships, whereas the third concerns coordination between supply chain actors. To conclude the chapter, an overview of the frame of reference is given in relation to the research questions developed in the previous chapter.

2.1 ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS

Given the purpose of this thesis, which addresses environmental activities in relationships between supply chain actors, it becomes important to understand two things: 1) which environmental activities can be of relevance in such relationships, and 2) the different types of relationships that can exist between supply chain actors. As the types of environmental activities to some extent vary between different types of supply chain relationships, the following sections take their starting point in the latter of these two. Further, because of the focus of LSP-shipper relationships in this thesis, such relationships are described in the first section. However, as described in section 1.3, supply chain relationships in general are also of relevance for this thesis. Specifically, the research presented here includes two types of such relationships: 1) relationships between shippers and physical goods suppliers; and 2) relationships between supply chain actors in a city logistics context. These types of relationships will be presented in turn below, each section ending with a description of what types of environmental activities can be included in them.

2.1.1 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

The existence of relationships between LSPs and shippers is dependent on the outsourcing of transport and/or logistics functions by shippers. Outsourcing of such functions has increased during the past decades (Huiskonen and Pirttilä, 2002). While some shippers still manage their own logistics functions, the topic of this thesis is focused on contexts in which LSPs perform transport and logistics services for shippers. In this thesis, it is the relationships between LSPs and shipper as such that are in focus and no explicit distinction is therefore made with regard to whether the shipper buying the LSPs' services is a supplier or a customer in the supply chain. Figure 2.1 illustrates this by showing that one shipper can be involved in relationships with LSPs in upstream as well as downstream flows of the supply chain.

FIGURE 2.1. RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

As relationships can be said to reside on a market, an understanding of the logistics market is here suggested to help to describe the characteristics of LSP-shipper relationships. The logistics market is in this thesis regarded as a place where shippers' demand for logistics services meets LSPs' supply of such services. This corresponds well to what other authors often label a transport or a transportation market. Sheffi (1986, p. 2) for example writes that:

"Interactions between carriers and shippers can be considered supply and demand actions in a freight transportation 'market'. In the transportation market, carriers 'supply' and shippers 'consume' the transportation services."

Wandel et al. (1992) present a model of three layers: material flow, transport flow and infrastructure (see Figure 2.2). In the model, the transport market can be found in the interface between shippers, who represent the material flow, and LSPs, who represent the transport flow. This thesis applies the term logistics market, instead of transport(ation) market as used by Wandel et al. (1992) and Sheffi (1986). The difference between the logistics market compared to the transports market is that on the logistics market, supply and demand can, but do not necessarily, include other services than transports. These can be services such as freight consolidation, warehousing, reverse logistics, inventory management, import/export management and packaging (Rajesh et al., 2011; Yu et al., 2010) to name a few. The transport market, on the other hand, is limited to merely transport services.

FIGURE 2.2. THE THREE LAYER MODEL

It would appear that the actors on the logistics market can be classified into primary or supportive supply chain members. Specifically, the companies that belong to the demand side of the logistics market can be viewed as primary members of the supply chain. According to Lambert et al. (1998), primary supply chain actors are companies or business units that perform activities that aim to produce specific outputs for a customer or a market. The LSPs, who belong to the supply side of the logistics market, are on the other hand often seen as supporting actors in supply chains (Bask, 2001; Spens and Bask, 2002). This means that they provide resources, knowledge, utilities or assets for primary members of the supply chain (Lambert et al., 1998). The supporting actors are vital for the success of the supply chain, but they do not take an active part in the value-adding activities that lead to actual outputs for the market.

There are several additional characteristics of the companies on the logistics market that could have an impact on the specific relationships that arise as a result of the market. A general description of the supply and the demand side is in order. Starting with the former, there are different types of LSPs that belong to the supply side of the logistics market. They range from companies that offer basic transport services to so-called “one stop shopping” logistics companies that offer all transport and logistics needs a shipper might want (Sheffi, 1990). Furthermore, LSPs can be divided into two different categories: those who own transportation assets and those who do not (Sheffi, 1990). The majority of LSPs on the European logistics market have a small number of vehicles and offers a limited range of transport services (Sweeney and Evangelista, 2005). Further, the supply side of the logistics market is often characterised by a high degree of competitiveness between the LSPs present (see for example Langley, 2014; Lieb and Butner, 2007; Liu et al., 2010).

Similarly to the supply side, the demand side of the logistics market consists of a large variety of shippers that buy logistics services. These buyers can for example be divided according to type of products, where a few examples are: agriculture products and live animals; pulp wood, round timber and wood; solid mineral fuels; petroleum products; ores and metal waste and metal products (SIKA, 2006). The characteristics of products affect how they can or should be transported, for example if they can be transported on pallets or in containers or need more specific treatment (Lumsden, 2006).

Although considered as supportive actors in supply chains, LSPs can take, or be assigned, different roles within this position. For example, Fabbe-Costes et al. (2009) study supply chain integration and note that LSPs can be seen as proactive facilitators of supply chain integration or, at the other end of the scale, as passive participants adapting to the circumstances (see also

Andersson et al., 2007). On a similar note, Makukha and Gray (2004) find that shippers' perceive LSPs as being better as resource providers than designers of supply chain issues. LSPs, on the other hand, perceived shippers to want them to be involved in the more strategic parts of supply chain issues. In the context of logistics partnerships, the contradicting results lead Makukha and Gray (2004) to suggest that the reluctance of shippers to integrate with LSPs could be a barrier to the development of strategic partnerships. However, the study by Langley (2014) shows that closer collaboration between LSPs and shippers has increased during the past years. This could suggest a switch in shippers' perception of LSPs' roles in the supply chain as compared to the findings of Makukha and Gray (2004). Langley (2014) further suggests that this increase in collaboration gives potential for more strategic relationships between LSPs and shippers.

ENVIRONMENTAL ACTIVITIES

LSPs' environmental work has during recent years gained increasing attention from an LSP perspective and a few authors have addressed various environmental activities that could be of relevance for LSPs (Colicchia et al., 2013; Lieb and Lieb, 2010; Perotti et al., 2012; Weijers et al., 2012). Although the authors take an LSP perspective of environmental activities (as opposed to a dual LSP-shipper perspective), some of the findings of the authors concern environmental activities of interest in an inter-organisational setting and can thus be considered as relevant for LSP-shipper relationships. In the studies of Colicchia et al. (2013) and Perotti et al. (2012), relatively similar categorisations of LSPs' environmental activities are offered. Following from the categories suggested by Colicchia et al. (2013), the following list provides examples of LSP's environmental activities, and takes the findings from Lieb and Lieb (2010); Perotti et al. (2012) and Weijers et al. (2012) into account:

- *Distribution strategies and transportation execution*, which includes for example use of alternative fuels, less polluting vehicles, consolidation of goods, mode choice, efficient driving. All of the activities suggested by Weijers et al. (2012) fall into this category;
- *Warehousing and green building*, such as eco-friendly building design, energy efficiency, material handling equipment, use of alternative energy sources;
- *Reverse logistics*, such as waste reduction, transport and disposal, materials recycling whenever possible;
- *Packaging management*, which includes packaging recycling or reuse, reduction of packaging waste;
- *Internal management*, such as support of environmental activities from managers, environmental management systems, environmental performance measurement and monitoring;
- *Collaboration with customers*, which includes helping customers comply with certification programmes and supporting their efforts to attain the "green" goal, as well as cooperation with customers on reverse logistics and recycling programmes; and
- *External collaborations*, such as membership in environmental programmes and collaborative partnerships with other companies/LSPs.

The list above gives an overview of the environmental activities discussed in previous research in relation to LSPs. The list is derived from an LSP perspective, which means that not all the categories may be of relevance for LSP-shipper relationships. External collaboration, for example, is likely not to be of relevance, since it refers to other types of relationships than those between LSPs and shippers. Further, Colicchia et al. (2013) label the first five of the categories as intra-organisational and the last two as inter-organisational.

2.1.2 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN SHIPPERS AND PHYSICAL GOODS SUPPLIERS

This section is focused on relationships between shippers and physical goods suppliers (see Figure 2.3). Since this thesis includes relationships between different types of suppliers

(suppliers of logistics services and suppliers of goods), the term physical goods suppliers is, in line with Hartmann and De Grahl (2011) used to distinguish such suppliers from LSPs. In GSCM literature, physical goods suppliers are often simply referred to as suppliers (see for example Simpson et al., 2007; Theyel, 2006; Zhu and Sarkis, 2006). Further, to use the terminology of Lambert et al. (1998), relationships between the types of relationships discussed in this section include primary, as opposed to supporting, supply chain members. Another characteristic of these relationships is, as the terminology reveals, that the exchange includes products and not services (Andersson and Norrman, 2002), as in the case of LSP-shipper relationships.

FIGURE 2.3. RELATIONSHIP BETWEEN SHIPPERS AND PHYSICAL GOODS SUPPLIERS

ENVIRONMENTAL ACTIVITIES

Environmental activities in relationships between shippers and physical goods suppliers have either explicitly or implicitly been given a relatively large amount of attention in previous literature (see for example Green et al., 2012; Hu and Hsu, 2010; Rao and Holt, 2005; Simpson et al., 2007; Theyel, 2001; Vachon and Klassen, 2006; Zhu and Sarkis, 2004). For example, Zhu and Sarkis (2004) develop a framework of four types of categories of environmental activities: internal environmental management, external GSCM practices, investment recovery and eco-design. The framework has been widely used in subsequent GSCM research (Perotti et al., 2012). Other authors (such as Hu and Hsu, 2010; Vachon and Klassen, 2008) find similar types of categories of environmental activities, although not using the same labels. Given that the focus of this section is on relationships between shippers and physical goods suppliers, the external activities that relate to activities with suppliers are the ones of most relevance.

Theyel (2001) distinguishes between three ways to include environmental activities in relationships between shippers and physical goods suppliers, namely through environmental requirements, environmental information sharing and collaboration for environmental purposes. Vachon and Klassen (2006) instead divide environmental activities into two categories: environmental monitoring and environmental collaboration. Notably, the latter categorisation corresponds well to two of the categories suggested by Theyel (2001), but does not explicitly include information sharing. Instead, Vachon and Klassen (2006) appear to include information sharing in environmental collaboration. With a starting point in the two categories suggested by Vachon and Klassen (2006), Table 2.1 provides a list of examples of environmental activities it is possible to include in relationships between shippers and physical goods suppliers. The table is based on the findings of a number of previous studies into GSCM (namely Green et al., 2012; Hu and Hsu, 2010; Rao and Holt, 2005; Simpson et al., 2007; Theyel, 2001; Vachon and Klassen, 2006; Zhu and Sarkis, 2004) and aims to illustrate, not cover the whole range of, possible environmental activities in such relationships.

TABLE 2.1. ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN SHIPPERS AND PHYSICAL GOODS SUPPLIERS

Environmental requirements	Collaboration for environmental purposes
- Purchasing requirements	- Sharing personnel
- Employee training	- Sharing equipment
- Certification according to environmental management systems	- Co-development of recyclable products
- Pressuring suppliers to take environmental action	- Reducing water and energy use
- Choice of suppliers by environmental criteria	- Cooperation with supplier for environmental objectives
- Environmental requirements for purchased item	- Joint development of new materials and processes for environmental purposes
- Programmes focused on environmental compliance status	- Collaborative research and development with suppliers
- Compliance statements	- Sharing best practice
- Audits of suppliers	- Holding awareness seminars for suppliers
	- Suppliers meetings

2.1.3 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS IN A CITY LOGISTICS CONTEXT

Another type of relationship of interest in this thesis is those found in the context of city logistics. As opposed to the clear scope of the dyadic relationships described above, projects within city logistics can involve a number of different actors. Further, the success of city logistics projects is suggested to be linked to the collaboration between various actors (Hesse, 1995; Lindholm, 2012). As this thesis is concerned with relationships between supply chain actors, it becomes vital to describe the actors that can be found in the context of city logistics. Benjelloun et al. (2010) identify five different stakeholder groups involved in, or affected by, city logistics projects: *shippers, carriers and warehousing companies, the city, government* (national and regional), and *others*, such as citizens, consultants and universities. In a similar manner, Barceló (2003) includes four types of stakeholders in his categorisation: *shippers* (such as manufacturers, wholesalers or retailers that operate from, for example, warehouses or city logistics centres), *freight carriers* (transporters and warehouse companies), *residents* and *administrators*. Lindholm (2012) distinguishes between *actors* and *stakeholders* within the context of city logistics, where actors refer to those with a direct effect on the city logistics system and stakeholders are those with an interest in in the system. Consequently, all actors are stakeholders while all stakeholders are not actors. This thesis does not distinguish between actors and stakeholders in the same manner as Lindholm does. Instead, the term supply chain actor (or actor) can in this thesis in the context of city logistics include all those that might have an interest in city logistics. Consequently, the term stakeholder will not be used in the context of city logistics in the remaining sections of this thesis.

All the above-mentioned actors could potentially be included in relationships in a city logistics context. Figure 2.4 (based on Taniguchi et al., 2001) illustrates possible relationships between four types of supply chain actors which includes most of the actors mentioned above. As many actors can be involved, it is not sufficient to the same extent as in LSP and shippers to discuss dyadic relationships. Instead, there is a possibility that there are a number of different simultaneous relationships of interest when city logistics projects are conducted.

FIGURE 2.4. POTENTIAL RELATIONSHIPS WITHIN A CITY LOGISTICS CONTEXT

ENVIRONMENTAL ACTIVITIES

City logistics projects can have different aims and do not always focus on a decrease in environmental impact (Benjelloun et al., 2010). Freight transports, for example, cause a number of problems in urban areas, including pollution, congestion, safety issues, accessibility problems and decreased attractiveness of cities (Benjelloun et al., 2010; Crainic, 2008; Kennedy et al., 2005; OECD, 2003). The problems addressed in city logistics projects naturally have an influence on the activities conducted in order to improve. With that said, focus in this thesis is on environmental activities that focus on environmental improvements in urban areas. Such activities can typically include (Allen and Browne, 2010; Patier and Browne, 2010; Russo and Comi, 2010):

- Consolidation of goods flows through for example urban distribution centres;
- Use of environmentally sound vehicles; and
- Regulations such as such as environmental zones and access restriction schemes.

The description of environmental activities in a city logistics context ends the first section of the frame of reference. While this section has had a focus on environmental activities in the relationship between supply chain actors, the next two sections comprise theoretical perspectives taken in order to understand the inclusion of the environmental activities in such relationships. The following section deals with power balances in supply chain relationships.

2.2 POWER IN SUPPLY CHAIN RELATIONSHIPS

Following the argumentation put forward in section 1.3, it is possible that power in supply chain relationships can have an effect on the inclusion of environmental activities in such relationships. This section aims to go further into the concept of power and develop a tool for the analysis of supply chain relationships with regard to the power balance in them. For such a tool to be useful, it should focus on one dyadic relationship at a time. The reason for this is that power is essentially only relevant to discuss in the context of specific relationships (Dahl, 1957; French and Raven, 1959; Stannack, 1996). Further, power is always relative, which means that it cannot be counted and that it changes when the context changes (Cox et al., 2002). Because of this, actor A can have power over actor B in one relationship, whereas actor C has power over actor A in another. Moreover, the power balance in a relationship is not fixed, as it can change over time (Cook, 1977).

2.2.1 DEFINING POWER IN SUPPLY CHAIN RELATIONSHIPS

Before going into detail about power balances, a brief discussion about the definition of power is in order. Despite the challenges associated with the concept of power (see for example Dahl, 1957), the understanding of it as such appears to be rather consistent in the literature. Table 2.2 shows some examples of definitions of power from literature. In 1957, Dahl suggested that *"A has power over B to the extent that he can get B to do something that B would not otherwise do"* (p. 202). Many of the subsequent definitions of power stem from, or are closely related to, this definition. For instance, El-Ansary and Stern (1972) relied upon Dahl (1957) in their definition of power, but adapted it to a marketing channel context. Studies such as those by Hunt and Nevin (1974) and Etgar (1976) have come to apply a similar definition as that of El-Ansary and Stern but have adjusted it to fit their specific studies. The definition presented by Gaski (1984) (see Table 2.2) is an attempt to summarise several definitions of power in the literature.

TABLE 2.2. DEFINITIONS OF POWER

Author(s) (year)	Definition of power
Cox et al. (2002, p. 3)	"the ability of a firm /.../ to own and control critical assets in markets and supply chains that allow it to sustain its ability to appropriate and accumulate value for itself by constantly leveraging its customers, competitors and suppliers."
Dahl (1957, p. 202)	"A has power over B to the extent that he can get B to do something that B would not otherwise do."
El-Ansary and Stern (1972, p. 47)	"[a channel member's] ability to control the decision variables in the marketing strategy of another member in a given channel at a different level of distribution"
Emerson (1962, p. 32)	"The power of actor A over actor B is the amount of resistance on the part of B which can be potentially overcome by A."
Gaski (1984, p. 10)	"the ability to evoke a change in another's behavior"
Hunt and Nevin (1974, p. 186)	"Power, in its most general sense, refers to the ability of one individual or group to control or influence the behaviour of another."
Stannack (1996, p. 51)	"the capacity to optimize the behaviour of suppliers and subcontractors in accordance with desired performance objectives"

In this thesis, the concept of power is addressed in relation to environmental activities in supply chain relationships. More specifically, the question of interest is how the power balances in supply chain relationships influence the inclusion of environmental activities in such relationships. In relation to the definitions of power described above, the definition of power in this thesis takes its starting point in Gaski's (1984) definition, but it is modified to better fit the

context of green supply chain management. Consequently, power is suggested to be *“the ability to evoke a change in a supply chain actor’s environmental behaviour”*. This definition, unlike for example the ones suggested by Stannack (1996) does not take its starting point in a specific actor, but allows for more than one actor to be in possession of power. Moreover, it includes both the control and the influence aspect of power, such as suggested by Hunt and Nevin (1974), and therefore opens up for both coercive and non-coercive power.

The more power a supply chain actor has in a relationship, the higher possibility it has to influence the exchange in that relationship (Cook, 1977). Related to this is the power-dependence relation. The ability of one actor to affect another in the context of power is commonly thought of as related to dependencies between actors (Cook, 1977; Cox et al., 2002; Emerson, 1962; Pfeffer and Salancik, 1978; Provan and Gassenheimer, 1994). In the words of Emerson (1962, p. 33):

“the power of A over B is equal to, and based upon, the dependence of B upon A”.

2.2.2 POWER BALANCES IN SUPPLY CHAIN RELATIONSHIPS

Relating back to RQ3 in section 1.3.3, this thesis is concerned with how the power balances between actors can influence the extent to which environmental activities are included in supply chain relationships. One question that arises in relation to this is: How can the power balance in supply chain relationships be determined? One way to approach this issue is to understand the factors that determine the power balance in the relationships. Related to this, Dahl (1957) distinguishes between the *basis* of power and the *means* of power. The basis of power includes all the resources that one actor can exploit in order to affect another actor. Further, the basis of power can be viewed as potential power, meaning that it needs to be exploited in order for one actor to affect another actor (Dahl, 1957; Provan and Gassenheimer, 1994). In order for this to happen, the *means* of power are suggested by Dahl (1957) to be the instruments to use, such as threats or promises. Relating back to RQ3, this aims at understanding power balances in relationships between supply chain actors. Since the *bases* of power, as suggested by Dahl (1957), refer to resources that can be exploited in order to influence other actors in supply chain, these will be the focus of the remaining parts of this section on power. The *means* of power are related to exploiting power, and as this is not the focus of the research in this thesis, they will not be given further attention in the following sections.

BASES OF POWER IN SUPPLY CHAIN RELATIONSHIPS

In the literature field of marketing channels, which is closely related to distribution logistics, power is often discussed in relation to different *power sources*. This terminology is related to, but not entirely consistent with, the terminology of Dahl (1957) presented above. This will be further elaborated on below. Before that, however, it is of importance to understand what power sources are. There are several studies about power that have relied upon the five sources of power suggested by French and Raven (1959) (such as Belaya and Hanf, 2009; Flynn et al., 2008; Hunt and Nevin, 1974; Maloni and Benton, 2000; Zhao et al., 2010). Maloni and Benton (2000) describe the sources as:

- Reward power - Source retains ability to mediate rewards to target.
- Coercive power - Source holds ability to mediate punishment to target.
- Expert power - Source has knowledge, expertise or skills desired by the target.
- Referent power - Target values identification with the source.
- Legitimate power - Target believes source retains natural rights to influence.

Relating back to *power basis* and *means of power* as presented by Dahl (1957), it is argued here that each of the sources of power can be categorised into one of these groups (either power basis or means of power). Expert and referent power are closely related to the basis of power,

since both can be considered as resources of one actor in a business relationship. On the other hand, reward and coercive power are more related to the means of power, as they can be seen as instruments to use in order to affect other actors. Furthermore, legitimate means that the target thinks that the source has a natural right to influence, which implies that this is a basis of power in the eyes of the target.

Some authors take resources as a starting point when power is discussed (see for example Cook, 1977; Emerson, 1962; Pfeffer and Salancik, 1978). Cook (1977) for example writes:

"The power of an organization in an exchange relation is increased as the scope of the resources (or the number of different resources) mediated by the organization increases" (p. 66)

Resources as power bases could be of various types. One example that is already discussed above is expert power. Although not mentioned explicitly as a resource in the discussion above, it can nonetheless be viewed as a resource in an inter-organisational relationship since it is something that one of the actors possesses in some way. This expert power could include valuable knowledge that is important for the inter-organisational relationship, such as an LSP having specific knowledge about how to manage goods flows for a shipper. In the context of this thesis, it could also be knowledge within environmental issues.

No matter the type of resource, the scarcity of resources is viewed as a basis of power by Cox et al. (2002). This refers to how difficult it is to find the resource somewhere else, i.e. how easily replaceable it is. One way to look at this is to view specific resources of one actor in a supply chain relationship, such as knowledge that can lead to expert power. Another way to look at it is to view the actors as such as resources and the scarcity of the actors then becomes dependent on what the market situation looks like. If there are a large number of suppliers of a certain service or product, the level of resource scarcity appears to be low, whereas if there is only one or a few suppliers, resource scarcity is high.

Another potential basis of power is a company's supply chain position. Kähkönen and Lintukangas (2010) study four different types of relationships and their results indicate that it is often the buyer that has power over the supplier. Likewise, Simpson et al. (2007) take the supply chain position as a starting point for the power balance in their study of the greening of buyer-supplier relationships. Thus, whether a company is a buyer or a supplier can potentially play a role as a power basis in a business relationship. In addition, Kähkönen and Lintukangas (2010) suggest that the closer the buying company is to the consumers, the more power it has. This is thus another aspect of supply chain position that can be a basis of power in a supply chain.

Two additional bases of power that should be mentioned are the relative size of a company in supply chain relationships and the relative size of the business deal in that relationship. With regard to the former, Kogg (2003) recognises the size of the company as an issue in her study of a small textile company in its attempts to make the supply chain greener. In a similar way, Theyel (2006) notes that large companies are more successful than small with regard to requiring environmental activities from suppliers.

As for the relative size of a business deal, Simpson et al. (2007) recognise that it is of importance for the nature of the power situation in buyer-supplier relationships; they argue that the major customer of a supplier inevitably has power over the supplier. Table 2.3 summarises the bases of power

TABLE 2.3. BASES OF POWER IN INTER-ORGANISATIONAL RELATIONSHIPS AS APPLIED IN THIS THESIS

Power bases	Description	References
Expert power	One actor has knowledge, expertise or skills desired by the other actor	French and Raven (1959)
Legitimate	One actor thinks that the other actor has a natural right to influence	French and Raven (1959)
Referent power	One actor values identification with the other actor	French and Raven (1959)
Relative size of business deal	One actor is a large part of the other actor's business	Simpson et al. (2007)
Relative size of company	Large actors often have power over smaller actors	Kogg (2003)
Resource scarcity	If the resource is difficult to find, the actor in possession of the resource has a power advantage	Cox et al. (2002)
Supply chain position	Buyers often have power over suppliers	Kähkönen and Lintukangas (2010)

The list of power bases identified above can be of use in the analysis of power balances in supply chain relationships. By understanding the relationship-specific power bases of the involved actors, it is possible to get an indication of which actor that has the power advantage and the power disadvantage. It should, however, be noted that one power basis could be of more importance in one relationship than in another. Consequently, an analysis of the power balance in a relationship based on the power bases identified should not be treated as absolute indications of power.

Further, with regard to the power balances in supply chain relationships, an additional concept is worth mentioning and that is the concept of countervailing power. Countervailing power can be seen as an attempt by supply chain actors subject to a more powerful actor to try to reduce that power in different ways (Galbraith, 1980). By attempting to use countervailing power, one supply chain actor can thus try to level the power balance in a specific supply chain relationship. It is also possible for several actors on “the weaker end” of relationships with a specific actor to work together in order to decrease the power advantage of the stronger actor.

Before closing this section on power, a brief discussion about the relativeness of power (Cox et al., 2002) is in order. The power bases described above are potential power bases that the actors in a business relationship can possess. If actor A has power over actor B because of its relative company size, this could be a basis of power in that specific relationship. In another relationship between actor A and C, actor C could instead be the larger company and thus be the one that has power over actor A due to the relative size of the company. In addition, a power basis is only an actual power basis when it helps an actor to evoke a change in another actor's behaviour, or environmental behaviour as is relevant in this thesis (see for example Hunt and Nevin, 1974; Wilkinson, 1996). A “believed” power basis that turns out not to be able to evoke a change in the target's behaviour is thus not a power basis in that specific inter-organisational relationship. It could, however, be a power basis in other supply chain relationships.

Whereas the above section has dealt with power as one perspective to take on environmental activities in supply chain relationships, the next section focuses on another perspective, namely coordination.

2.3 COORDINATION IN SUPPLY CHAIN RELATIONSHIPS

As a means to describe *how* supply chain actors can include environmental activities in their relationships with each other, this thesis takes a theoretical starting point within the field of coordination. The research area of coordination is extensive and can be found in several different fields of research (Malone and Crowston, 1994). Coordination is by many authors thought of as a means to manage dependencies between activities (see for example Malone and Crowston, 1994; Sandberg and Bildsten, 2011; Xu and Beamon, 2006). In the context of this

thesis, coordination refers to the management of dependencies between environmental activities, such as vehicle technology in inter-organisational relationships. As a means to manage the just mentioned dependencies between activities, coordination mechanisms of various types are often mentioned (Arshinder et al., 2008; Fugate et al., 2006; Glouberman and Mintzberg, 2001; Mintzberg, 1989; Xu and Beamon, 2006). Such mechanisms are believed to be able to offer some insight into how supply chain actors can include environmental activities in their relationships with each other and are therefore the focus of the remaining parts of this section.

2.3.1 COORDINATION MECHANISMS IN SUPPLY CHAIN RELATIONSHIPS

Several types of coordination mechanisms are suggested in the literature and as noted by Sandberg and Bildsten (2011), some of these mechanisms are very specific while others are on a more general level. Table 2.4 gives some examples of coordination problems and the coordination mechanisms identified in studies of other logistics researchers. As can be seen from the sample in the table, there are large variations and examples of coordination mechanisms depending on the coordination problem and the type of study. Table 2.4 also illustrates that the coordination mechanisms can be on a relatively general level (for example those in Lindholm, 2012; Sandberg and Bildsten, 2011) as well as a more specific level (such as those mentioned by Romano, 2003; Sahin and Robinson, 2002).

TABLE 2.4. COORDINATION PROBLEMS AND ACCORDING COORDINATION MECHANISMS

Logistics coordination problem	Coordination mechanisms	Author(s) (year)
Coordination to manage activity dependencies in supply chains	<ul style="list-style-type: none"> - Supply chain contracts - Information technology - Information sharing - Joint decision making 	Arshinder et al. (2008)
Coordination of logistics processes across supply networks	<ul style="list-style-type: none"> - Communication, decision, and negotiation - Social co-ordination and control - Link-pin roles/units - Common staff - Hierarchy/authority relations - Planning and control systems - Incentive systems - Selection systems - Information systems - Public support and infrastructure 	Romano (2003)
Coordination in logistics outsourcing relationships	<ul style="list-style-type: none"> - Informal coordination - Formal inter-organisational teams - Integrating roles 	Huiskonen and Pirttilä (2002)
Coordination in the interface of information sharing and physical flow in supply chains.	<ul style="list-style-type: none"> - Price coordination - Non-price coordination - Buy-back and return policy - Quantity flexibility - Allocation rules 	Sahin and Robinson (2002)
Coordination of activities in order to reduce waste in lean production	<ul style="list-style-type: none"> - Mutual adjustment - Direct supervision - Standardisation of work - Standardisation of outputs - Standardisation of skills and knowledge - Standardisation of norms 	Sandberg and Bildsten (2011) (based on Glouberman and Mintzberg, 2001)
Coordination of supply chain activities and its relation to logistics performance	<ul style="list-style-type: none"> - Communication - Information exchange - Partnering - Performance monitoring 	Stank et al. (1999)
Coordination of goods from a municipality perspective to improve urban freight transport	<ul style="list-style-type: none"> - Regulation - Information - Adjustment 	Lindholm (2012)

As Fugate et al. (2006) note, it is important to identify coordination mechanisms that fit the coordination problem at hand. The coordination problem of interest in this thesis is that of environmental activities in supply chain relationships and there is thus a need to identify coordination mechanisms suitable for this particular context. While much of the literature into coordination logistics and supply chain management is concerned with the flow of goods and/or information, environmental activities in supply chains are not necessarily connected to the actual goods flow in the same manner. Thus, there is a need for a more general set of coordination mechanisms than those suggested in much of the logistics literature with regard to coordination (see for example Arshinder et al., 2008; Romano, 2003; Stank et al., 1999).

This thesis adopts a framework that includes six coordination mechanisms suggested by Mintzberg (1989). These mechanisms have later been more thoroughly presented by Glouberman and Mintzberg (2001) and that paper is the main starting point for the six mechanisms as presented in this thesis. Further, the six mechanisms are the same ones that are found in the analysis of Sandberg and Bildsten (2011) (see Table 2.4), who have applied these mechanism in a logistics setting. The framework is according to Sandberg and Bildsten (2011) one of the most comprehensive with regard to coordination mechanisms. This is one of the reasons why it is chosen for this study – the mechanisms capture a wide variety of coordination and are here considered to be general enough to be relevant for many aspects of environmental activities in supply chain relationships. It should be noted, however, that the framework by Glouberman and Mintzberg (2001) was developed for an intra-organisational setting, whereas this thesis focuses on supply chain relationships which are thus in an inter-organisational setting. Despite this, the framework is believed to be suitable for the study of environmental activities because of 1) the comprehensiveness of the framework, and 2) the fact that Sandberg and Bildsten (2011) and to some extent also Lindholm (2012) has successfully applied the mechanisms in inter-organisational settings.

With this said, a further introduction to the framework is in order. Glouberman and Mintzberg's (2001) categorisation includes six different coordination mechanisms: *mutual adjustment*, *direct supervision* and *four different types of standardisation* (*standardisation of work*, *output*, *skills and knowledge* and *norms*). These will be presented in more detail below. Before that, however, it can be worth noticing that several of the examples of coordination mechanisms in Table 2.4 can be viewed as concrete activities that to some extent illustrate the more generic types of coordination mechanisms suggested by Glouberman and Mintzberg (2001). Some will in the discussion below therefore be categorised into the six coordination mechanisms suggested by Glouberman and Mintzberg (2001). The intention here is not, however, to categorise all of the mechanisms presented in Table 2.4 into the six mechanisms, but rather to highlight the ones that could be of interest in the coordination of environmental activities in supply chain relationships.

MUTUAL ADJUSTMENT

Mutual adjustment is, according to Glouberman and Mintzberg (2001), the most direct form of coordination and occurs when individuals or groups adapt to each other in their work process. This often includes informal communication and tends to take place in very simple or very complex situations. One simple situation as described by Glouberman and Mintzberg could be two people canoeing together, whereas a complex situation could appear in the design of an aircraft.

Relating back to Table 2.4, there are several examples of coordination mechanisms that could fall into the category of *mutual adjustment*. Examples of these are *joint decision making*, *communication*, *information sharing* (Arshinder et al., 2008; Stank et al., 1999). The need for communication and information sharing is likely to increase as the level of complexity in the situation of mutual adjustment increases. Further, *adjustments* as described by Lindholm (2012) refers to how individuals or groups of actors adapt their various activities in the context of

urban freight transport. Two types of adjustments are exemplified by Lindholm. The first one concerns adjustment to a regulation, in which case it is likely to be the non-regulators that have to adapt. Thus, this does not relate directly to *mutual* adjustment as suggested by Glouberman and Mintzberg (2001) and is more related to the coordination mechanism *direct supervision*, which will be described below. The second type of adjustment suggested by Lindholm (2012) is mutual adjustment through cooperation in order to manage urban freight transport. One example that is given in relation to this type of adjustment is when two drivers who frequently arrive at a loading zone at the same time adapt to each other and mutually make day-to-day adjustments so that their operations run smoothly. *Information* is also suggested as a coordination mechanism by Lindholm (2012), in the context of urban freight transport. Her examples of information meetings for public consultations, brainstorming meetings for various issues and freight partnerships are here suggested to fit well into the coordination mechanism *mutual adjustment*.

DIRECT SUPERVISION

In *direct supervision*, the responsibility of coordination lies with someone who does not actually perform the work, but instead gives directives to those people who do the work (Glouberman and Mintzberg, 2001). It is important to note that Glouberman and Mintzberg discuss the coordination mechanisms in an intra-organisational setting. In a supply chain context, it is likely to be more relevant to discuss directives given to supply chain actors instead of people. From the intra-organisational perspective, Glouberman and Mintzberg write that a “boss”, “supervisor” or “manager” issues the directives to the people who do the work and a “hierarchy of authority” is thus created. Again, the terms are not completely accurate for an inter-organisational setting, where the hierarchy of authority is created when one supply chain actor gives directives to another supply chain actor.

Relating back to Table 2.4, the coordination mechanism *performance monitoring*, suggested by Stank et al. (1999), appears to be closely related to direct supervision, especially judging from the term “monitoring” which to a large extent resembles supervision. *Communication*, a concrete coordination mechanism suggested by Arshinder et al. (2008) is perhaps not important in the same way for direct supervision as it is for mutual adjustment, but should still be of relevance. If the directives given to the performing actor are not clear, it will be difficult to perform the task assigned by the other supply chain actor. Thus, communication is also of relevance in relation to direct supervision. Furthermore, *supply chain contracts* (suggested by Arshinder et al., 2008) is likely to be one way for supply chain actors to specify demands they have on other supply chain actors.

One way to monitor supply chain actors could be through performance measurements. Several examples of such measurements appear in the GSCM literature. For example, CO₂ emissions are commonly mentioned when the measurement of environmental performance of logistics is discussed (see for example Aronsson and Høge-Brodin, 2006; McKinnon and Piecyk, 2009; Wolf and Seuring, 2010; Wu and Dunn, 1995). On a more general environmental logistics level, other measurements have been identified. These can be directly related to transports, such as fuel consumption (Hervani et al., 2005), air pollution and noise costs (Bickel et al., 2006), or related to a higher level of green of supply chains, ranging from revenues from green products (Hervani et al., 2005), aspects of water use (Azzone and Noci, 1998; Hervani et al., 2005) to the percentage of total energy use from renewable energy sources (Veleva et al., 2003). All of these measurements could potentially be used as a means to supervise supply chain actors.

STANDARDISATION OF WORK

The third coordination mechanism described by Glouberman and Mintzberg (2001) is *standardisation of work*. This means that coordination takes place in the design of the work and the procedures that are a part of the work are specified. This often occurs through work-study analysis according to Glouberman and Mintzberg, who also provide an example of this situation:

job instructions that can be used in the assembly work in a car factory. As described for direct supervision, there are a number of environmental measurements that can be of relevance within the field of green logistics. While it might be relatively easy to require such measurement, some of them might be difficult to actually measure. One such measurement is CO₂ emissions, which can be relatively challenging to measure, depending on the level of accuracy required (McKinnon and Piecyk, 2009; Pazirandeh, 2012). With regard to this, NTM (The Network for Transport and Environment) has developed a calculating tool – NTMCalc – with the purpose of providing a “*a common and accepted method for calculation of emissions*” (NTM, 2013). Thus, standardisation of work, or, as in this particular example, standardisation of how to measure, enables supply chain actors to measure emissions in a similar manner.

STANDARDISATION OF OUTPUTS

When *outputs* are standardised, coordination is achieved by standardisation of the results or consequences of the work (Glouberman and Mintzberg, 2001). Focus is on coordination at the interface of various activities, and Glouberman and Mintzberg give an example of a worker being instructed to produce a certain amount of products during one day. In their paper about collaboration in green supply chains, Vachon and Klassen (2008) discuss goal-setting as a means to improve environmental performance and this appears to be closely related to standardisation of outputs. Just as for *direct supervision* described above, green performance measurements can be of relevance for this coordination mechanism. That is, instead of the measurement “a certain amount of products produced in a day”, as in the example of Glouberman and Mintzberg (2001), green performance measurements can be of help in order for all supply chain actors to know which output they work towards.

STANDARDISATION OF SKILLS AND KNOWLEDGE

Standardisation of skills and knowledge means that people are trained to know exactly what to expect from each other and thereby coordinate almost automatically (Glouberman and Mintzberg, 2001). One example of this that is given by Glouberman and Mintzberg is the automatic coordination that often happens between a surgeon and an anaesthetist in an operating room.

STANDARDISATION OF NORMS

The final coordination mechanism suggested by Glouberman and Mintzberg (2001) is standardisation of norms. When activities are coordinated through this mechanism, common values and norms are ensured through socialisation with the aim to ensure that people work towards the same expectations. Glouberman and Mintzberg give two examples of when *standardisation of norms* occurs: for monks in religious orders or for workers in many Japanese corporations. Table 2.5 provides an overview of the six applied coordination mechanisms and how they are defined in this thesis.

TABLE 2.5. COORDINATION MECHANISMS OF RELEVANCE FOR THIS THESIS

Coordination mechanism	Description
Mutual adjustment	Individuals or groups adapt to each other in their work process. Involves informal communication in simple or complex situations.
Direct supervision	Directives from one supply chain actor to another who actually does the work. Direct supervision could for example be carried out through demands put in contracts.
Standardisation of work	Coordination takes place in the design of the work and procedures involved in the work are specified.
Standardisation of outputs	Coordination is achieved by standardisation of the results.
Standardisation of skills and knowledge	People are trained to know exactly what to expect from each other.
Standardisation of norms	Common values and norms ensure that people work towards the same goals and expectations.

2.3.2 APPLYING COORDINATION MECHANISMS IN SUPPLY CHAIN RELATIONSHIPS

As argued by for example Fugate et al. (2006) and Xu and Beamon (2006) different types of coordination mechanisms are suitable for different types of coordination problems. Although this could imply that there is *one* coordination mechanism most suitable for each coordination problem, this is often not the case. Instead, the same coordination mechanism can often be applied for many different coordination problems. Such coordination problems are referred to by Malone et al. (1999) as *ubiquitous*. Further, it is also possible that different mechanisms can be used to manage a particular coordination problem, and this is referred to by Malone et al. (1999) as *variability*. In this thesis, environmental activities are considered as the coordination problems in supply chain relationships. With regard to such activities, this would mean that ubiquity implies that the same coordination mechanisms can be found in the coordination of more than one type of environmental activity. Variability, on the other hand, would imply that the same environmental activity can be coordinated through more than one coordination mechanism. Figure 2.5 further illustrates the two concepts. Because of these circumstances and because of the uniqueness of each coordination problem, an appropriate classification of coordination mechanisms can be a complex and difficult task (Fugate et al., 2006). However, in accordance with Malone et al. (1999), identification of coordination problems and coordination mechanisms can give an opportunity to find new ways to coordinate a certain problem.

FIGURE 2.5. UBIQUITY AND VARIABILITY IN THE COORDINATION OF ENVIRONMENTAL ACTIVITIES

2.4 LINKING THE FRAME OF REFERENCE TO THE RESEARCH QUESTIONS

The frame of reference contributes in different ways to the four research questions developed in section 1.3. The description of the various types of supply chain relationships and the environmental activities of relevance for these aims to give a general understanding of the types of relationships studied in this thesis. Since relationships between supply chain actors as well as environmental activities are a part of all four research questions, the first part of the frame of reference relate to all of these. The section about power balances in supply chain relationships relates directly to the third research question, whereas the coordination mechanisms are described as a means to be able to analyse the fourth research question. How these different parts of the frame of reference are applied in the analysis of the research questions is described in section 3.6.

3 RESEARCH METHODOLOGY

This chapter includes the research methodology for the research conducted for this thesis. The first section describes the research process, after which the unit of analysis of the conducted study is presented. The research design is then addressed, both from the perspective of each research question and from the perspective of the research process as a whole. An overview of the literature reviews conducted is given next, followed by a description of the different data collection methods used in the research for this thesis: case studies, a homepage scan, a survey and a study of city logistics projects. Lastly, the analyses conducted in this thesis are explained and the research quality of the thesis is discussed.

3.1 THE RESEARCH PROCESS

In a perfect world, research would be as “simple” as having an area of interest, deciding upon a course of action and conducting the necessary studies, after which the findings would pop out of the empirical data and conclusions could be drawn. Even though I feel satisfied with the way the research for this thesis has been conducted, my research journey of five years has not been entirely straightforward. The following section summarises the winding road that has led to the completion of this thesis.

After finishing my master’s in Industrial Management and Engineering, I started as a PhD student as a part of the Vinnova-financed research project “Competitive Business Models to meet Future Demands on Sustainable Logistics Systems”. While the general research topic was set within the frames of the project, I did not know what the exact topic of my own research would be, nor was I sure what I found interesting in the area of environmental logistics. However, I was almost immediately involved in what is here called Study 1, which included writing a conference paper (which later became Paper II). The purpose of the paper was initially to conduct a literature review with the aim of finding papers related to measurements, the environment and logistics. The literature review conducted for the conference paper resulted in a categorisation consisting of five different dimensions of green measuring in logistics. The conference paper was the first step towards an area of interest for me and it also provided me with the necessary launch-pad for my research.

However, I did not find a distinct area of interest, although several areas for further research were discussed in Paper II. From this point on, much thought was given to the direction my research would take. One source of inspiration came from think-tanks that were organised within the above mentioned green logistics project and included participants from both LSPs and shippers. The think-tanks, as well as numerous discussions with my supervisors, led me in the direction of studying LSPs and their customers, and their interactions. LSPs and shippers could not seem to agree on which actor should take the lead in environmental development. Moreover, it was difficult to know exactly what they meant by the environmental work being discussed. It seemed to me to be important to understand the different actors’ views on environmental work, and that is when my interest in the interface between LSPs and shippers started.

This increased understanding of “the real world” led to two further studies. Study 2 focused on the types of environmental activities offered by LSPs and demanded by shippers and included in the relationships between them. Without knowledge of such issues, it would be difficult to compare the LSPs and shippers with each other, with regard to environmental activities. This comparison, which more specifically dealt with matches and mismatches between green supply and green demand on the logistics market, became Study 3, which is based on a survey. The study eventually led to Paper IV.

The survey revealed some answers, but also led to many new questions. My interest in the interface between LSPs and shippers deepened and I wanted to understand more about specific relationships between LSPs and shippers. It was important that the study should be dyadic and that I would investigate both sides of the LSP-shipper relationships. This was Study 4. My investigation of the four LSP-shipper dyads was the final empirical data collection for the licentiate thesis, which was presented in May 2011.

After the licentiate thesis, I was involved in a project financed by the Swedish Energy Agency which focused on city logistics. The first period of this project was focused on understanding the context of city logistics, an area which was completely new to me. One thing that struck me was that although much has been written within the subject and many projects have been implemented, few permanent solutions exist. As my interest in the inter-organisational aspects

of logistics continued, Study 5 (which led to Paper III) came to focus on dependencies between actors and how they could affect the city logistics projects.

While the field of city logistics was interesting, I continued to have an interest in LSP-shipper relationships. Study 4 was revisited and while the analysis of the dyads was at an early stage in the licentiate thesis, they have been analysed further in Paper V and also used as input to Paper I. The final study (Study 6) was a result of my interest in supply chain relationships as well as city logistics. A case study with a single shipper was initiated, as a means to capture many different supply chain relationships, including such relationships that could be included in a city logistics context.

Thus, six studies, all of which address interfaces between supply chain actors in some way, have been conducted during my five years as a PhD student. The chronological order is shown in Figure 3.1.

FIGURE 3.1. THE RESEARCH PROCESS

Table 3.1 depicts the six studies and their relation to the five papers and the two case reports that can be found in the appendices of this thesis. As described above, most of the studies have resulted in academic papers, which means that the results from these studies are analysed in those papers. Each X shows that the results of the study are analysed in the relevant paper. An X within brackets, which can be found for Study 1, means that the results from the study serve as input to the papers marked.

As can be seen in Table 3.1, Study 6 has not been analysed in any of the papers. Instead, Study 6 is presented as a case report and the empirical findings are analysed in this thesis. Further, the studies, papers and case reports do not exactly follow the chronological order. The reason for this is that the papers are numbered according to the time when they are of importance for the analysis in Chapter 5, whereas the studies follow the logic of when in time they were conducted.

TABLE 3.1. LINKING STUDIES TO PAPERS AND CASE REPORTS

Study no.	Description	PI	PII	PIII	PIV	PV	CRI	CRII
1	Green performance measurements		X					
2	Green activities in LSP-shipper interface	X		(X)	(X)			
3	Green supply and demand on the logistics market				X			
4	Environmental activities in LSP-shipper relationships	X				X	X	
5	Relationships between actors in a city logistics context			X				
6	Supply chain relationships with environmental focus							X

(P=Paper; CR=Case Report)

3.1.1 MY PART OF THE PAPERS AND CASE REPORTS

As can be derived from the description of the research process above, five papers and two case reports are a part of this thesis. For several of these, more than one author has been involved and there is therefore a need to clarify the contribution from each author. This is done below, where the papers and the case reports are listed.

PAPER I

Martinsen, U. and Huge-Brodin, M., 2013. Towards unearthing environmental activities in the interface between logistics service providers and shippers. Under review for publication in *Logistics Research*. An earlier version of Paper I was presented at the *Nofoma conference* in Kolding, Denmark in 2010.

Contributions in paper I: I had the main responsibility for the literature reviews and for the case study presented in the paper. The analysis and conclusions were a result of collaboration between both authors. A homepage scan was conducted by the second author, but both authors were involved in the choice of companies' homepages that were to be studied.

PAPER II

Björklund, M., Martinsen, U. and Abrahamsson, M., 2012. Performance Measurements in the Greening of Supply Chains. *Supply Chain Management: An International Journal*, Vol. 17, Issue 1, p. 29-39.

Contributions in paper II: The structured literature review in Paper II was conducted by me and I also wrote the main parts of the synthesis of the papers found. The key words used in the search derived from discussions between the three authors. Further, conclusions were also the result of discussion between all three authors. The case study presented was conducted and analysed by the first and third authors of the paper. Due to the fact that the author of this thesis was not a part of the case study, it is excluded from further discussion in this thesis.

PAPER III

Martinsen, U., Björklund, M. and Huge-Brodin, M., 2012. The Importance of Stakeholder Relationships in City Logistics Projects. The paper was presented at the *Nofoma conference* in Turku, Finland in 2012.

Contributions in paper III: I took part in the work for all sections of the paper, but with a larger contribution to some sections than others. The design of the paper was formed in collaboration among all three authors, whereas the scan of city logistics projects and the selection of projects were conducted by me. The main parts of the analysis were also conducted by me. Conclusions and literature reviews were conducted by all three authors.

PAPER IV

Martinsen, U. and Björklund, M., 2012. Matches and Gaps in the Green Logistics Market. *International Journal of Physical Distribution & Logistics Management*, Vol. 42, Issue 6, p. 562-583.

Contributions in paper IV: I took part in the work for all sections of the paper. I conducted most of the work with regard to the survey analysis, and consequently also the research approach, as well as the conclusions. The introduction and the literature review of the logistics market were a result of collaboration between the second author and myself, while the second author had the main responsibility for the literature review on gap models.

PAPER V

Martinsen, U., 2013. Coordination of Environmental Activities in Logistics Service Provider-Shipper Relationships. An earlier version of this paper was presented at the *Nofoma conference* in Gothenburg, Sweden in 2013.

Contributions in paper V: I am the sole author of Paper V.

CASE REPORT I

Martinsen, U. 2013. Environmental Work in Relationships between Logistics Service Providers and Shippers.

Contributions in Case report I: I am the sole author of Case report I.

CASE REPORT II

Martinsen, U., A Study of Environmental and other Sustainability Activities in Supply Chain Relationships at Clas Ohlson.

Contributions in Case report II: I am the sole author of Case report II.

3.2 UNIT OF ANALYSIS

It is important to define a clear unit of analysis in research, in order to know what should be studied as well as to answer the purpose of a study. In accordance with the reasoning in Chapter 1, the purpose of this thesis is to:

Describe and explain how supply chain actors, with a specific focus on logistics service providers and shippers, can include environmental activities in their relationships with each other.

Although the focus of the purpose is on LSP-shipper relationships, the general unit of analysis is the wider concept of supply chain relationships. In Figure 3.2 the unit of analysis is illustrated by a dashed line. In order to capture supply chain relationships, a dual perspective has to a large extent been applied for this research, meaning that both actors' perspectives of the interface are taken into account.

FIGURE 3.2. UNIT OF ANALYSIS

The appended papers and case reports contribute to the knowledge of supply chain relationships in different ways. Some of them focus on the interface between LSPs and shippers, which are the two supply chain actors that are of particular interest in this thesis (cf. the purpose of the thesis in section 1.3). Of these, there are basically two types; those which focus on the perspectives of LSPs and shippers but do not explicitly deal with the relationship as such (dual perspective), and those which have an explicit LSP-shipper relationship focus (dyadic). Further, some of the papers and case reports focus on supply chain relationships in a general sense, which may, but does not necessarily, mean that LSP-shipper relationships are also included. Table 3.2 illustrates the perspectives and empirical focus of the five appended papers and the two case reports.

TABLE 3.2. FOCUS OF PAPERS AND CASE REPORTS

	Unit of analysis	Perspective
Paper I	LSP-shipper market + LSP-shipper relationships	Dual and dyadic: LSPs and shippers
Paper II	Supply chain measurements	Supply chain
Paper III	Supply chain actor relationships	City logistics
Paper IV	LSP-shipper market	Dual: LSPs and shippers
Paper V	LSP-shipper relationships	Dyadic: LSPs and shippers
Case report I	LSP-shipper relationships	Dyadic: LSPs and shippers
Case report II	Supply chain relationships	One shipper

3.3 RESEARCH DESIGN

Research design refers to the plan for how to go from a research question to finding the answer to that question (Saunders et al., 2007). There are several parameters that affect the choices that need to be made for the research design. One is the research question itself (Ellram, 1996; Yin, 2009). For example, Yin (2009) suggests that for questions starting with *how* or *why*, case studies or experiments are suitable research methods, whereas questions that deal with *how much* or *how many* are better addressed through surveys or archival analysis. These ideas are coherent with the ones given by Ellram (1996), but Ellram also, more explicitly than Yin (2009), includes another aspect of the research design, namely whether the primary objective of the research is exploratory, descriptive, explanatory or predictive. These different objectives have implications for the choice of research method. Qualitative research methods, such as case studies, experiments and participant observations can, for example, be appropriate research methods to apply for all four of the objectives that Ellram (1996) mentions. Surveys or other quantitative research methods, on the other hand, are not suitable for explanatory objectives.

The research conducted for this thesis has elements of three of the objectives mentioned by Ellram (1996): exploratory, descriptive and explanatory. Looking at the purpose of this thesis, both *describe* and *explain* are explicit objectives of the research. While this is one side of the coin, the limited knowledge within the research topic of this thesis has had the effect that much of the conducted research has been exploratory in its nature. More details about this are given in relation to the specific research questions below. To recall, four research questions were developed in section 1.3. All of the questions have a main focus on relationships between LSPs and shippers, but also include supply chain relationships in general. The first four of the following sections focus on the research design for the part of the research questions that concerns LSP-shipper relationships (part *a* of the questions). These are followed by a description of the research design for the supply chain relationships in general (Part *b* of the questions).

3.3.1 RESEARCH QUESTION ONE WITH LSP-SHIPPER FOCUS

The first research question is concerned with *which environmental activities can be included in relationships between logistics service providers and shippers*. The research question focuses on the *description* of a wide spectrum of environmental activities and thus has a descriptive objective (Ellram, 1996). Literature reviews served as the starting point for answering RQ1a because of its potential to identify environmental activities in LSP-shipper relationships. However, literature turned out not to be able to provide a satisfactory description of environmental activities, mainly due to the fact that the inter-organisational perspective of LSP-shipper relationships within an environmental context has to a large extent been neglected. Because of this, there was a need to turn to empirical investigations with an *exploratory* focus (see Arbnor and Bjerke, 1997). Thus, while the objective of RQ1a is descriptive in nature, the research conducted has mainly been of an exploratory nature.

Qualitative research methods were chosen as it was believed that they had a higher probability of identifying a wide variety of environmental activities. Two different methods were used: a homepage scan and case studies. While case studies are mentioned by Ellram (1996) as suitable for descriptive objectives, homepage scans as a method are not mentioned. One assumption of this thesis is that homepage scan can be considered as a type of case study, although it focuses on detailed and intensive analysis to a much lesser extent than in-depth case studies do (Bryman and Bell, 2011). As a consequence of this reasoning, both the homepage scan (Study 2) and case studies (Studies 4 and 6) are regarded as suitable research methods with which RQ1a can be addressed.

The homepage scan made it possible to understand which environmental activities companies mention in a public description that can be read by anybody. In such a place, companies are likely to promote things they want customers and other stakeholders to know. With regard to

environmental work it is therefore possible that companies mention all the green categories that they want others to know about, and in a research perspective it is likely that a wide variety of environmental activities will be found.

Unlike homepage scan, the case studies offered insight into specific supply chain relationships and were, therefore, able to provide a narrower, but more detailed, perspective of possible environmental activities in the relationships between LSPs and shippers.

3.3.2 RESEARCH QUESTION TWO WITH LSP-SHIPPER FOCUS

The second research question aims to answer *to what extent environmental activities are included in relationships between logistics service providers and shippers*. As already mentioned, the research into environmental activities in LSP-shipper relationships is to date very limited. In order to answer RQ2a it is therefore logical to focus on empirical data. More specifically, two different research methods are used in order to address this research question: a survey and case studies. Both qualitative and quantitative data are thus used for RQ2a and, more specifically, the qualitative studies are undertaken in order to increase and deepen the understanding of quantitative results, which is in line with the reasoning of Miles and Huberman (1994). Further, as the objective of RQ2a is primarily of descriptive nature, i.e. to describe to what extent environmental activities are included in relationships between logistics service providers and shippers, both survey and case studies are suggested as suitable methods in accordance with (Ellram, 1996). Despite the objective of the research question, the research in itself is of exploratory nature due to the lack of knowledge on environmental activities in LSP-shipper relationships (see Arbnor and Bjerke, 1997).

The survey (Study 3) focuses on the description of the two different actor groups addressed in RQ2a, namely LSPs and shippers. Although not focusing on relationships as such, the survey gives a description of the situation of the two sides of the logistics market and the extent to which they offer (LSPs) or require (shippers) environmental activities. Although not focusing on specific LSP-shipper relationships, the description of the two actor groups studied is believed to contribute to the understanding of the inclusion of environmental activities in LSP-shipper relationships from each of the respective actor perspectives.

Case studies, which is the second method applied for RQ2a, offer the possibility to study relationships between LSPs and shippers in detail. On a general note, enquiries about business relationships, i.e. the focus of this thesis, are well suited for study through case studies (Johnston et al., 1999). The reason for this is, according to Johnston et al., that relationships take place within complex contexts and that researchers need to consider these contexts in order to understand the phenomenon. Two different case studies contribute to RQ2a, one of which focuses on dyadic LSP-shipper relationships (Study 4) and one which focuses on the shipper perspective of LSP-relationships (Study 6).

3.3.3 RESEARCH QUESTION THREE WITH LSP-SHIPPER FOCUS

The third research question is concerned with *how the power balance between actors can influence the extent to which environmental activities are included in relationships between logistics service providers and shippers*. According to Ellram (1996), *how* questions have an explanatory objective and this fits well with the objective of this research question.

Case studies (Studies 4 and 6) have been used as the main research method in order to answer RQ3a. This is in line with both Yin (2009) and Ellram (1996), who suggest case studies as one appropriate research method for *how* questions. Further, Johnston et al. (1999) advocate that case studies are suitable for details of business relationships. Previous research into the concept of power has to a large extent been quantitative in nature and surveys have often been the research method of choice (a few out of many examples are El-Ansary and Stern, 1972; Handley and Benton, 2012; Hunt and Nevin, 1974; Terpend and Ashenbaum, 2012). In this thesis, the

focus is on supply chain relationships. Given that power balances are relationship-specific (Dahl, 1957; French and Raven, 1959; Stannack, 1996), one assumption of this thesis is that case studies of relationships can help us understand the specific context of the relationships studies. Quantitative studies would not offer the same possibility. This reasoning is in line with the reasoning of Kähkönen and Lintukangas (2010), who use case study research in their study of supply chain relationships and power in a network context.

Despite having an explanatory objective, the studies conducted for RQ3a have to a large extent been exploratory. Very few studies have previously dealt with power in relation to environmental activities in supply chain relationships and there was thus a need for exploratory research (Arbnor and Bjerke, 1997).

3.3.4 RESEARCH QUESTION FOUR WITH LSP-SHIPPER FOCUS

The final research question addresses *how environmental activities can be coordinated in relationships between logistics service providers and shippers*. The objective of the question is to a large extent descriptive, and taking only that into account, both qualitative and quantitative research methods could be suitable (Ellram, 1996). However, the fact that the research question starts with *how* limits the research methods to being of qualitative nature (Ellram, 1996; Yin, 2009). As a result, case studies (Studies 4 and 6) have been applied as the research method for RQ4a. This is also in line with Johnston et al. (1999) who reason case study research is a suitable method for studying supply chain relationships. Similarly to the three research questions previously described, the objective of RQ4a does not entirely match the research process. Specifically, the research process for this question has to a large extent been exploratory, due to the lack of research within the field of environmental activities in LSP-shipper relationships.

3.3.5 RESEARCH QUESTIONS WITH A FOCUS ON SUPPLY CHAIN RELATIONSHIPS IN GENERAL

In addition to the research questions into LSP-shipper relationships described above, all four research questions have a part b, which concerns supply chain relationships in general. It was argued in section 1.3 that taking other relationships into account could have a potential to contribute to the understanding of LSP-shipper relationships. The aim of this section is not to discuss the research design for each one of the research questions in relation to supply chain relationships in general. Instead, the research design for the second part of each research question to a large extent coincides and is therefore described all at once. Two studies contribute to the analysis of part b of the research questions: a study of city logistics projects (Study 5) and a case study of one shipper's supply chain relationships (Study 6). Similar to the reasoning argued for by the homepage scan in section 3.3.1 above, the study of city logistics projects can be viewed as a type of case study. As argued for in the section above, case studies are suitable data collection methods for all four research questions. Given that the city logistics projects were studied in as much detail as possible (limited by the amount of documentation), the research method is believed to be able to contribute to both the descriptive and the explanatory objectives of the research question (Ellram, 1996). The same logic follows for the case study of different types of supply chain relationships.

3.3.6 AN ABDUCTIVE APPROACH

In addition to the type of research question and aim of the research, there is another parameter with implications for the research design, and that is whether the research is inductive, deductive or abductive. Deductive reasoning takes its starting point in theoretical knowledge and develops hypotheses from there before testing these hypotheses in an empirical setting (Bryman and Bell, 2011). Inductive reasoning, on the other hand, has a much clearer starting point in empirical observations, from which it turns to theoretical knowledge in order to make theoretical conclusions about the empirical findings (Bryman and Bell, 2011). Abductive reasoning combines these two approaches, allowing the researcher to travel back and forth

between the empirical and the theoretical worlds (Dubois and Gadde, 2002; Kovács and Spens, 2005). The research conducted for this thesis has to a large extent been driven by an interest in “the real world” and empirical observations have therefore been a trigger for the research. At the same time, literature has played an important role for the understanding of the empirical data, and having the possibility to go back and forth between these two worlds has been a vital part of the research design for this thesis.

Figure 3.3 illustrates one example of the abductive approach as applied in the research for this thesis. The example refers to the research process for Study 4, which is a case study of four LSP-shipper relationships and their inclusion of environmental activities. Since very limited knowledge about environmental work in LSP-shipper relationships was found in the literature, the aim of the data collection was to gather information about, for example, which environmental activities were included in the relationships and how the LSPs and shippers worked with these measures. After the gathering of the empirical data, a process began of finding patterns in the material and comparing them to various theoretical areas, mainly within the wide field of inter-organisational relationships. The goal was to find a way to help describe the inclusion of environmental activities in LSP-shipper relationships. This process, which is illustrated by the two-way arrow labelled 2 in Figure 3.3, continued for several loops. Coordination, which is one of the main constructs of this thesis, was found to be one of the theoretical perspectives that could help to understand the empirical findings of the case study.

FIGURE 3.3. AN EXAMPLE OF THE ABDUCTIVE APPROACH AS APPLIED FOR THIS THESIS

Another example of the abductive approach in the research for this thesis can be found in relation to the analysis of RQ2a. The *level of greenness* can be said to be a type of measuring tool developed specifically for RQ2a, in order to be able to evaluate how “green” LSP-shipper relationships are. The evaluation of the level of greenness is based on four criteria that have developed as a result of several of the different studies conducted for this thesis. Thus, the development of the measuring tool is enabled through several studies conducted and the review of several different research topics in the literature.

Above, some main elements of the research design have been described. The following sections go more into detail about the various research methods applied in the research for this thesis. Although not mentioned in detail in the discussion about research design above, literature studies have played an important role in different ways for all four research questions. Literature reviews are, therefore, the first research method that will be described, followed by the empirical data collection methods.

3.4 LITERATURE REVIEWS

Literature reviews are an important element of any research process, both in the formulation of research questions and in the research that follows (Punch, 2005; Tranfield et al., 2003). Indeed, this has also been proven to be true for the research process conducted for this thesis.

Two types of literature reviews have been conducted for the thesis: *systematic* and *narrative* (Bryman and Bell, 2011). While systematic reviews are replicable, scientific and transparent (Tranfield et al., 2003), narrative reviews are less focused and broader in scope (Bryman and Bell, 2011). In the research for this thesis, systematic reviews have been conducted when the aim has been to scan existent literature in order to see what has been published with regard to a specific subject. These reviews have included predefined search terms and thorough documentation of the search process and its results. The papers were reviewed in four steps, in line with the reasoning of Tranfield et al. (2003). If the title was believed to be relevant for the pre-defined research area, the abstract of the paper was studied. If the content of the abstract was also found to be of relevance, the paper was evaluated in more detail. If the paper still matched the scope of the review, it was included as a result of the systematic review. The final step was the actual analysis of the papers.

Narrative literature reviews have been applied for two reasons: 1) when a structured review did not give sufficient information or 2) to find relevant literature that could contribute to the analysis of empirical data. The latter reason is also closely linked to the abductive approach applied in this research, since the search for suitable literature often required going back and forth between the empirical data and the literature. Both types of review will be discussed below with some examples from the specific focus areas.

Table 3.3 depicts the main literature reviews conducted for this thesis and their corresponding types of review. As can be seen, several systematic, as well as narrative, literature reviews have been conducted during the course of the research. Both types of review will be discussed below with some examples from the specific focus areas.

TABLE 3.3. TYPE OF LITERATURE REVIEWS IN RELATION TO RQ'S AND PAPERS

Focus area	Type of review		Of main relevance for	Main results found in
	Systematic	Narrative		
GSCM		X	RQ1, RQ2, RQ3 and RQ4	Thesis
Environmental activities	X	X	RQ1	Paper I
Green performance measurements	X		RQ1	Paper II
The logistics market		X	RQ2	Paper IV
Power	X	X	RQ3	Thesis
Coordination	X	X	RQ4	Paper V and thesis
Relationships in city logistics		X	RQ1,3 and 4	Paper III

3.4.1 SYSTEMATIC LITERATURE REVIEWS

Four systematic literature reviews have been conducted in the research for this thesis. One was conducted in order to understand which environmental activities can be included in the interface between LSPs and shipper (see Paper I for details). In order to capture this interface, the first step was a systematic review that included pre-defined search terms to find literature about LSPs' green offers and shippers' green requirements. The review resulted in very few hits (5), leading to a poor understanding of environmental activities in LSP-shipper relationships. Even though it was possible that the search terms aimed at a narrow scope, the results gave indications that the topic was scarcely researched at the time of the review.

The systematic literature review on green performance measurements was of a somewhat different character than the one just described. The aim of this literature review was more clearly to cover a large scope of literature in order to find as much as possible within the field of green performance measurements. Search terms were thoroughly developed prior to the review. The content of the seventeen papers included in the final analysis was categorised into five categories. The synthesis of the results from this systematic literature review is a vital part of Paper II.

Systematic literature reviews were also conducted within the fields of power and coordination. While the main contribution to the frame of reference in this thesis with regard to the two

concepts comes from narrative literature reviews, the aim of the systematic reviews was to more clearly find previous studies into GSCM and power or coordination, and especially in the context of LSPs. These reviews resulted in very few, if any, papers.

3.4.2 NARRATIVE LITERATURE REVIEWS

Narrative literature reviews have been conducted for most of the focus areas as shown in Table 3.3. All the reviews build on the snowball approach, meaning that papers of relevance pointed to other papers, which then, in turn, pointed to additional papers of relevance.

While they are similar in nature, the starting point for each varies to some extent. For GSCM, for example, the starting point was literature reviews conducted by other researchers (such as Abbasi and Nilsson, 2012; Sarkis et al., 2011; Srivastava, 2007). As for the literature review into the concept of power, it has to a large extent built on the literature material for a PhD course into this area of research. It was also during this course that the idea of a possible connection between environmental activities in LSP-shipper relationships and the power balance in such relationships arose.

For the review on coordination literature, the situation was different. Firstly, coordination was not the given choice to focus on in terms of how to describe the relationships between LSPs and shippers with regard to environmental activities. Therefore, other inter-organisational areas of research were also reviewed. The abductive approach applied in this thesis allowed for this type of matching between theory and empirical data. Finally, coordination mechanisms were found to be able to contribute to the description of how LSPs and shippers can include environmental activities in their relationships with each other. The coordination literature was then approached through previous studies into coordination within the field of logistics. At this stage of the research, discussions were held with colleagues at the division of Logistics Management in order to increase the likeliness of choosing an appropriate theoretical tool to apply to the empirical data.

The narrative literature on environmental activities was a result of the scarce result from the systematic review within the same topic. The narrative literature review took its starting point in the field of green logistics. While the systematic search was focused on a company level, green logistics focuses more on general logistics activities. The general environmental activities suggested were then instead applied to the context of LSPs and shippers.

3.4.3 RESEARCH QUALITY OF THE LITERATURE REVIEWS

The systematic literature reviews have proven to be useful in the start-up process of this research as well as for complementary reviews when a focus area has been established. However, given the abductive approach of the research, systematic reviews alone would not have been sufficient in order to find appropriate constructs to apply for the empirical data. The combination of the two types of reviews is believed to have complemented each other and strengthened the quality of the research conducted.

Regarding the quality of the reviews themselves, the systematic reviews were mainly done for co-authored papers, which enabled a discussion to 1) define search terms and 2) discuss the results of the reviews. Although the author of this thesis had the main responsibility for the systematic literature reviews, this analyst triangulation (Patton, 2002) is believed to have increased the research quality of the literature reviews. Further, pre-defined search terms make it possible to replicate the systematic reviews, something which is not possible to the same extent for the narrative literature reviews.

3.5 METHODS OF DATA COLLECTION

As described above, the research for this thesis includes a number of data collection methods, all of which will be described in general terms below. More details of the methods can be found

in the appended papers and case reports. Table 3.4 gives an overview of the research methods applied for each research question. As can be seen in the table, case studies have been applied for all research questions and will therefore be the first data collection method described. Important to note is that although the homepage scan and the study of city logistics projects above have been considered as types of case studies, they are treaded as separate methods of data collection in this section.

TABLE 3.4. RESEARCH QUESTIONS AND RESEARCH METHODS

	Case studies	Survey	Homepage scan	Study of city logistics projects
RQ1	X		X	X
RQ2	X	X		
RQ3	X			X
RQ4	X			X
Found in papers	PI, PV	PIV	PI	PIII

3.5.1 THE CASE STUDIES

Two case studies have been conducted in the research for this thesis: one multiple-case study with four dyadic LSP-shipper relationships and one single-case study of the Swedish retail company Clas Ohlson. Both focus on environmental activities in supply chain relationships and contribute to the analysis of all four research questions, but whereas one case study focuses on LSP-shipper relationships specifically, the Clas Ohlson case takes a wider supply chain perspective. Further, while the first case study has a dyadic perspective and takes both LSPs’ and shippers’ views into account, the Clas Ohlson case takes a shipper perspective on supply chain relationships.

When conducting case study research, one important decision to make is whether to do a single- or a multiple case study. According to Yin (2009), this decision should be highly influenced by the aim of the research. Even though there are some circumstances when single case studies may be preferable, multiple case studies are generally recommended (Eisenhardt, 1989; Yin, 2009). The dyadic case study of LSP-shipper relationships is a multiple case study of four cases while the Clas Ohlson case is a single case study. The reason for this is that the aim of the two case studies differed. As for the LSP-shipper dyads, the objective was highly exploratory as very little was known with regard to LSPs’ and shippers’ inclusion of environmental activities in their relationships with each other. As a result, it was difficult to know how representative one single LSP-shipper dyad was. It was therefore important to be able to compare the results of several cases and potentially find direct replication (see Yin, 2009) between the cases and thus identify patterns of various types.

The second case had a different objective to the LSP-shipper cases. Whereas the relationships as such were fixed in the former case study and allowed for a comparison between them, the goal of the latter case study was to have a shipper perspective on a variety of supply chain relationships. Because of this, the shipper was fixed and the relationships were allowed to vary. The following section goes more into detail about how the cases were chosen.

CASE SELECTIONS

The companies included in the LSP-shipper dyads were chosen because of their interest in, and work with, environmental issues. This was considered important in order to be able to learn more about how LSPs and shippers can include environmental activities in their relationships with each other. The case selection follows the logic of theoretical sampling, which for this research means that the cases were chosen because of their probability to extend emergent theory (Eisenhardt and Graebner, 2007).

While the environmental interest was one important factor in the choice, another was differences in size, market focus and industry (only relevant for the shippers) of the companies included in the study. This was important because of the fact that the different contexts of the LSPs and shippers would offer a wider picture of the inclusion of environmental activities in LSP-shipper relationships. That would also mean that a potential replication of results would be more powerful than if very similar cases would have been chosen (Eisenhardt, 1989).

Two LSPs were first selected as one party in two buyer-supplier relationships each, and after that, four shippers were chosen (see Figure 3.4). With the help of the two identified LSPs, potential shipper participants were identified and asked to take part in the study. The process of finding and choosing suitable shippers took longer than expected; some shippers suggested did not show any concern for the environment on their homepages, some were too similar and some did not want to participate. Eventually, four shippers were chosen for inclusion in the study.

FIGURE 3.4. THE GENERAL IDEA OF THE CASES

The companies can be found in Table 3.5, where their differences in size, market focus and industry (for the shippers) are illustrated. The rationale behind the identification of environmental interest of the case companies is also shown.

TABLE 3.5. THE CRITERIA IN THE SELECTION OF THE DYADIC LSP-SHIPPER RELATIONSHIPS

Logistics Service Providers				
CRITERIA	Alltransport		DHL (Global forwarding, Sweden)	
Turnover (MSEK)	642		3 200	
No. of employees	95		325	
Market focus	Regional		Global	
Environmental interest	Given an award for sustainability report. Showed interest in the research planned.		Given an award for its emission simulation tool. Showed interest in the research planned.	
Shippers				
CRITERIA	Holmen Paper	Onninen	SECO Tools	Ericsson
Turnover (MSEK)	18,071	1,900	4,900	207,000
No. of employees	4,600	300	4,400	82,500
Industry	Producer of paper	Wholesaler for HVAC & electric power products	Producer of cutting tools and related products	Provider of telecommunications equipment and related services
Market focus	Mainly Europe	Sweden	Global	Global
Environmental interest	Identified by LSP. Homepage confirmed environmental interest.	Identified by LSP. Homepage confirmed environmental interest.	Identified by LSP. Homepage confirmed environmental interest.	Identified by LSP. Homepage confirmed environmental interest.

With regard to the second case study, the aim was to illustrate how environmental work could be conducted in different types of supply chain relationships, seen from the perspective of one focal shipper in a supply chain. Following the ideas of Yin (2009), a set of criteria for the case company was initially set up prior to selection. For the case company to fit the aim of the study, it was important that it was a shipper 1) for whom logistics was an important part of the

business, and 2) which had an environmental interest not only in a wide sense, but also within logistics issues. The shipper was required to have different types of relationships, both upstream and downstream in the supply chain. Clas Ohlson was identified as one of several potential shippers for this study. Initial information about the company was gathered through Clas Ohlson's web page and annual reports. The same procedure was followed for a number of other companies, but the majority were unable to fulfil all the criteria mentioned above. After the first scan of Clas Ohlson information, an initial interview was conducted with a representative from the company, in order to ensure that Clas Ohlson would be a suitable choice for illustrating environmental activities in different relationships of the supply chain. This overview of Clas Ohlson resulted in information that indicated that the company was a sound choice of case company: Clas Ohlson 1) is a trading company with suppliers in different parts of the world and stores in a number of markets; 2) works actively with logistics, which is an important part of the business model; 3) has relationships with both upstream and downstream supply chain actors, such as suppliers, LSPs and stores; and 4) has an interest in environmental issues, with a confirmed interest in environmental considerations within logistics.

DATA COLLECTION

The data collection process was similar in both case studies, which is why they are explained at the same time. Case studies can include both qualitative and quantitative data (Eisenhardt, 1989; Yin, 2009) and usually a combination of different data collection methods, such as archives, interviews, observations, questionnaires and time series, is used (Dubé and Paré, 2003; Eisenhardt, 1989). The case data collection for the two case studies in this thesis was mainly based on interviews, but additional information has been gathered from the case companies' homepages, as well as from their annual reports and sustainability reports. Three to four in-depth interviews (Yin, 2009) were conducted for each of the dyadic LSP-shipper relationships while five interviews were conducted at Clas Ohlson. Each interview lasted between 1 and 2½ hours. In the dyadic cases, the respondents were the persons actively involved in the business relationship between each LSO and shipper. In the Clas Ohlson case, the respondents were the individuals who were involved in relationships upstream or downstream in the supply chain and who were involved in environmental work in those relationships. Further, as the environmental activities were included as a main aspect of both case studies, the respondents were chosen because of their knowledge within this field. In accordance with Eisenhardt and Graebner (2007), more than one respondent with knowledge of the relationships was included in the studies when possible. The full lists of respondents can be found in the case reports in Appendix II.

The interviews, which were semi-structured, were based on an interview guide with mainly open-ended questions. The interview guides for the two case studies can be found in the appendixes of the two separate case reports (see Appendix II). All interviews were recorded and transcribed and the respondents were given the opportunity to reflect and comment on the transcriptions in order to guarantee the correct level of information.

RESEARCH QUALITY

The quality of qualitative research, which is the umbrella under which case studies fall, can be judged by four aspects of trustworthiness: credibility, transferability, dependability and confirmability (Bryman and Bell, 2011). The quality of the cases studies will be discussed in relation to these four concepts.

Credibility refers to how well the research corresponds with reality (Halldórsson and Aastrup, 2003). Respondent validation (Bryman and Bell, 2011) is an important part of this and refers to how well the researcher has captured the respondents' views of reality. Credibility has been addressed in two waves in the research for this thesis. All interviews were transcribed and the result sent to each respondent. The respondents were asked to add information with regard to any issues which were vague or difficult to understand. In the second wave, each respondent's

parts of the two case reports (see Appendix II) were sent for a final check to ensure that all information had been understood correctly. Minor changes were made by the respondents, who are thus believed to be satisfied with the accuracy of the reports.

Transferability addresses the extent to which the research results might be applicable in cases other than the ones studied (Bryman and Bell, 2011; Halldórsson and Aastrup, 2003). According to Hirschman (1986), transferability can only be assessed when the context of the additional cases is known, as shown by the following citation:

"To assess the transferability of an interpretation one must know not only the specifics of the context in which the interpretation was generated, but also the specifics of the context to which the interpretation is to be applied. /.../ The transferability of an interpretation to a second setting is thus knowable only on a post hoc basis; it cannot be assessed prior to the construction of the comparative interpretation."(p. 245)

It then becomes important for the researcher to describe the context in which the cases are found. The case reports appended in this thesis are an attempt to include a high level of relevant information about the cases, including their contexts. On a more general note, there are likely to be contexts for which the results of the case studies in this thesis are transferable, such as for several other LSP-shipper relationships. Elaboration on this subject can be found in Chapter 6 of this thesis.

Dependability refers to the extent to which the study is repeatable and the same results could be drawn by other researchers (Bryman and Bell, 2011). According to Hirschman (1986), one can never expect identical results when several people analyse the same phenomenon, since the interpretation of the empirical data is the result of a unique interaction between an investigator and the research topic. However, in an aim to increase dependability for the case studies in this thesis, a number of measures have been taken. The interview guides in the case reports in Appendix II enable others to ask the same questions again, and the list of respondents enables interviews with the same respondents. The description of how the analysis has been conducted also contributes to increased dependability (see section 3.6 for details).

Finally, *confirmability* addresses the extent to which the findings are objective and thus are not a result of the researcher's biases (Halldórsson and Aastrup, 2003). Although a wise aim, complete objectivity cannot be accomplished in case studies, because of the close interactions between the researcher and the phenomena of the study (Hirschman, 1986). Nonetheless, it is important to be able to track the steps of the research process even in qualitative research. The extent of confirmability can, according to Hirschman (1986), be assessed by outside auditors who are familiar with the research topic. In order for others to be able to follow the case study process, the rationale behind the description of the case selections given earlier in this chapter, as well as the case reports in Appendix II are two sources of information. Further, all interviews were recorded and transcribed, which makes it possible to go back to the initial empirical data. Discussions with colleagues, particularly supervisors but also others, are believed to have helped increase the level of confirmability for the case studies.

3.5.2 THE SURVEY

One survey has been a part of the research process for this thesis and it is one of the methods used in relation to RQ2a, i.e. *to what extent environmental activities are included in relationships between logistics service providers and shippers*. The survey targeted both LSPs and shippers, and this enabled a dual perspective that took both actor groups into account. The survey did not, however, target specific dyadic relationships and can therefore be said to represent the logistics market, in which one party is supply (LSPs) and the other is demand (shippers). Further, the questions focused on the inclusion of environmental activities in the supply and demand on the logistics market. This enabled a comparison of the inclusion of environmental activities between LSPs' offers and shippers' green demands. Although not focusing on supply

chain relationships as such, the description of the two studied actor groups is believed to contribute to the understanding of the inclusion of environmental activities in LSP-shipper relationships.

DATA COLLECTION AND ANALYSIS

The survey was sent out to both LSPs and shippers in order for both the supply and the demand sides of the logistics market to be covered by the study. Although part of a much larger research project, for the purpose of this thesis, five specific questions were included in the survey. One of these was targeted to all respondents, whereas the remaining four questions were two for each sample. The first question aimed to identify whether the respondent was an LSP or a shipper. The two questions for the LSPs dealt with 1) their stated offer and 2) their perception of shippers' demands, both in relation to ten environmental activities provided in the survey. The shippers were asked about 1) their stated demand and 2) their perception of supply, again in relation to the ten environmental activities. The respondents answered according to a five-point Likert scale ranging from (1) "Totally disagree" to (5) "Fully agree" in the analysis of the survey. Respondents also had the option of answering "Do not know".

The LSPs were contacted via a Swedish transport interest organisation called Transportgruppen, whereas the shippers were contacted with the help of the Swedish purchasing network called SILF (Sveriges Inköps och Logistikförbund). In total, the survey was sent to 114 potential LSP respondents and 1,612 potential shipper respondents. Due to obsolete e-mail addresses, as well as spam-filters, eight of the surveys intended for the LSPs and 537 of the surveys intended for the shippers were not received by any respondents. The efficient response rate for the questions of interest for this thesis was 8.1% in total (4.7% for the shippers and 43.4% for the LSPs).

The comparison of the supply and demand sides of the logistics market was based on mean values of the answers from the respondents. A more detailed study of the mean values was enabled by the use of confidence intervals, for which a confidence level of 95% was considered reasonable in accordance with, for example, Djurfeldt et al. (2010) and Hopkins et al. (1993). The analysis of the survey was carried out with SPSS 17.0.

RESEARCH QUALITY OF THE SURVEY

In quantitative studies, such as the survey described above, research quality is often assessed based on *validity* and *reliability* (Bryman and Bell, 2011; Saunders et al., 2007). Validity addresses the extent to which what is intended to be measured actually is measured, whereas reliability refers to the extent to which a study is replicable and will lead to the same results if conducted again (Bryman and Bell, 2011).

In order to increase validity and reliability of the study, the survey was pre-tested in accordance with the recommendations of Saunders et al. (2007). Specifically, a group consisting of both LSPs and shippers was asked to answer the survey and to report on any discovered difficulty or vagueness. The pre-test resulted in some minor adjustments of some questions and answering alternatives.

Non-response bias, which refers to the difference between answers of respondents and non-respondents (Lambert and Harrington, 1990), is of importance for the trustworthiness of survey studies. The higher the response rate, the lower the risk of non-response bias; a common way to try to reduce this risk is therefore to increase the response rate (Armstrong and Overton, 1977; Lambert and Harrington, 1990). In an attempt to do this for the survey conducted for this thesis, a reminder was sent out to all potential respondents. A comparison between early and late respondents was conducted after the data collection had come to an end. This is one way to check for non-response bias, and similar responses would then decrease the risk of non-response bias (Armstrong and Overton, 1977; Kanuk and Berenson, 1975). T-tests of the four survey questions showed no significant differences between early and late responses when a

significance level of 0.05 was used, thus indicating that no major differences between the two respondent groups exist.

The data analysis was mainly based on a comparison of mean values between the answers received from LSPs and shippers. In order to understand the validity of the differences found between the answers of the two actor groups, confidence intervals were used. These confidence intervals provided information about whether the intervals for green-activity mismatches overlapped. If the confidence intervals overlapped, that decreased the robustness of the mismatch and therefore had implications for the conclusions that could be drawn.

Regarding the appended papers, the survey is included in Paper IV which is a co-written paper. Although the author of this thesis had the main responsibility for the analysis of the survey results, the fact that another researcher was involved enabled analyst triangulation (Patton, 2002), which is believed to have increased the reliability of the study.

3.5.3 THE HOMEPAGE SCAN

One of the two data collection methods that rely on secondary data in this thesis is a homepage scan. The homepage scan contributes to this thesis in that it helps to answer RQ1a, i.e. *which environmental activities can be included in relationships between logistics service providers and shippers*. Regarding the appended papers, the homepage scan is a part of Paper I, in which the focus is on environmental activities of LSPs' offers and shippers' demands. The method was used as an attempt to find additional offers from LSPs and requirements from shippers that could expand the findings from literature. The scope of the homepage scan can therefore be said to be quite broad, whereas it does not go into the different companies in great detail.

DATA COLLECTION AND ANALYSIS

The selection of companies whose homepages were suitable for study can be compared to the selection of case companies in case study research. Patton (2002) states that:

"the logic and power purposeful sampling lie in selecting information-rich cases" (p. 230).

The most important aim of the homepage scan was to possibly widen the scope of the green offering that had resulted from the general literature review. Therefore, it was necessary to choose companies which were to some extent recognised for their environmental work. Guided by lists such as Global 100, Global 500 Carbon Disclosure Project and DJSI Supersector Leaders, seven LSPs and nine shippers were selected for the homepage scan. This strategy for selecting companies can be compared to what Patton (2002) calls *intensity sampling*, in which the cases intensely demonstrate the area of interest. In total, 16 companies (7 LSPs and 9 shippers) were chosen for this study; see Table 3.6. The shipper companies are all international companies with considerable activities in Sweden.

TABLE 3.6. COMPANIES STUDIED IN THE HOMEPAGE SCAN

LSPs	Shippers
TNT	H&M
DHL	Atlas Copco
Green Cargo	SCA
Posten	Unilever
Bring	Volvo
SAS Cargo	ICA
	Siemens
	IKEA
	StoraEnso

Each of the companies' official homepages was visited in order to study the environmental activities mentioned in relation to LSPs' offers and shippers' requirements. The investigation included all the contents of the homepages, including all accessible material such as sustainability reports and press releases, as this information can be considered to be an imprint of what a logistics company is willing to state officially.

RESEARCH QUALITY OF THE HOMEPAGE SCAN

As suggested in section 3.3.1, in which the rationale behind the choice of research methods was described, the homepage scan can to some extent be compared to case study research. Because of this, the research quality can be assessed in relation to the criteria suggested by Bryman and Bell (2011) for qualitative studies (see the research quality discussion for the case studies in Section 3.5.1).

It is relevant to discuss two of these criteria in relation to the homepage scan. One is the issue of *dependability*, meaning if the study is repeatable (Bryman and Bell, 2011). In relation to the homepage scan, it would be possible for others to scan the same homepages as done in the research for this thesis. However, the content of the homepages is likely to change at regular intervals because of, for example, increasing environmental demands from stakeholders such as customers (Wolf and Seuring, 2010). Thus, an attempt at replication of the homepage scan is likely to result in a somewhat different result than the ones found in this thesis. This is, on the other hand, likely to be a general problem for the analysis of homepages, and in order to avoid it, the research method should be avoided altogether. It is, however, believed that the method was a good way to contribute to a wide variety of environmental activities and therefore had a high level of contribution to RQ1a.

When the homepage scan was conducted, the main responsibility for it lay with the second author of Paper I (and thus not the author of this thesis), although the research approach was determined during mutual discussions. Moreover, the findings from the homepage scan were analysed by both authors involved in Paper I. This analyst triangulation (Patton, 2002) is believed to have increased the *confirmability* of the homepage scan, which means that it has increased the level of objectivity.

3.5.4 THE STUDY OF CITY LOGISTICS PROJECTS

The study of city logistics projects is the second research method that relies on secondary data in this thesis. The study of city logistics projects was conducted for the purpose of learning more about relationships between actors in such projects and how the power balance in various relationships affected the projects. The focus of the method is on relationships between actors within a city logistics context, and is thus not limited to LSP-shipper relationships. Regarding the research questions, the method provides input to RQ1b, which focuses on environmental activities as such, RQ3b, which focuses on power balances between supply chain actors, and RQ4b, which focuses on coordination of environmental activities, all in the context of supply chain relationships in general. In relation to the appended papers, the study of city logistics was conducted for the purposes of Paper III, which focuses on the context of city logistics.

DATA COLLECTION AND ANALYSIS

In order to learn more about relationships in a city logistics context, there was a need to find some empirical data that could contribute to the matter. The method of looking into previously conducted city logistics relationships was chosen as one way to find information about these relationships. A prerequisite for this was that projects had been documented in some way, so that it would be possible for others to find information about them. There are a number of projects that present documentation of city logistics project in some form, including CIVITAS, BESTUFS, START and CITYLOG. The projects that fall under the CIVITAS umbrella were studied because of the large number of projects presented on the web page (CIVITAS, 2012). This gave a wide range of projects to study, which was believed to increase the likelihood of finding relevant

project descriptions. This method of finding empirical data to study is closely related to convenience sampling (Bryman and Bell, 2011), although Bryman and Bell discuss it in relation to quantitative research. Convenience sampling means that the sample is available merely because of its access accessibility.

Once this decision had been made, the main difficulty lay in finding documented city logistics projects that included information about relationships between different actors. The selection of city logistics projects, which to some extent coincides with the analysis of them, was divided into three steps. First, the 676 city logistics projects documented on the CIVITAS web page were scanned to identify those which dealt with freight transport in some way. This resulted in 62 projects which were then taken into the second step of the study, in which the focus was relationships between actors. Much of the documentation on the city logistics projects was very poor in content, with the result that only eighteen of the projects were found to include any mention of relationships between actors and thus qualify for inclusion in the final step of the study. In this step, an attempt was made to find additional information to that presented on the CIVITAS web page. The extent to which the projects were further documented varied, but additional information could be found for most of the chosen projects. The documentation found for each project was then scanned for information concerning relationships between actors, in order to find information that could contribute to the analysis of how dependencies and power balances in these relationships influenced the projects. In the end, three cases with the richest information were chosen for the final analysis.

RESEARCH QUALITY FOR THE STUDY OF CITY LOGISTICS PROJECTS

As with the homepage scan, the study of city logistics projects can be considered as a type of case study and can as a result be assessed according to the same criteria as case studies.

The fact that the selection of projects was based on convenience sampling (Bryman and Bell, 2011) might be a problem since it makes generalisation, or *transferability*, of findings impossible. On the other hand, the technique might be valuable if the idea is to conduct a pilot study of some sort, in order to know if the research is on the right track. The idea that dependencies and power might influence city logistics projects was indeed *an idea*, and the study of city logistics projects was a first way to understand more about this matter. The selection of cases did not presume to cover all existing city logistics projects and it is likely that relationships of interest might be described in other projects. Nonetheless, the convenience sampling provided a starting point for the research within the area of power, dependencies and city logistics projects and is, in hindsight, also as also considered a suitable research method, given the stated objective of the study.

The convenience sampling also has implications for the *dependability* of the study. Since the selection of city logistics projects is based on documented and accessible information, the possibility to replicate the study increases. Unlike the homepages, for which it was argued in section 3.5.3 that information could change over time, the documentation of the city logistics projects is likely to remain in the same way as they were found in this study. However, there is a possibility that more projects have been added to the CIVITAS database, since the CIVITAS project is still running.

Paper III, in which the study of city logistics projects is presented in more detail, is a co-authored paper. This enabled analyst triangulation (Patton, 2002), which is considered to have increased the *confirmability* of the cases. More specifically, although the author of this thesis had the main responsibility for the analysis of the documented city logistics projects, all three authors of the paper participated in the analysis of the three projects that were analysed first (out of the eighteen included in the final round of analysis). The main benefit of the analyst triangulation was that it enabled a discussion of dependencies and power in relation to the projects, and increased the probability that all relevant information was identified and interpreted in an objective way.

3.6 ANALYSIS OF RESEARCH QUESTIONS

The purpose of this thesis is addressed through four research questions, each of which is analysed separately in Chapter 5. The analyses are based on those appended papers and case reports that can contribute to the answer to that research question. Further details about the analyses are described in the next sections. Due to the focus on LSP-shipper relationships of the research questions (part *a* of the questions), the analyses related to these are described first. The analysis of supply chain relationship in general (part *b* of the questions) is described at the end of this section.

3.6.1 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPS AND SHIPPERS

The first research question deals with which environmental activities can be included in LSP-shipper relationships. Starting with the former (analysed in section 5.1), the logic of the analysis follows the logic of Paper I, which is closely related to this RQ1a. The analysis of environmental activities takes its starting point in a systematic as well as a narrative literature review. The results from the review are then compared to the results from a homepage scan and the two case studies included in this thesis. The comparison aims to find both similarities and discrepancies between the data sets in order to gain a fuller understanding of different types of environmental activities possible to include in LSP-shipper relationships.

Based on the identified environmental activities and the empirical context in which they are found, a classification of environmental activities is offered. The classification is closely linked to the one found in Paper I, albeit while the classification in Paper I only takes the case study of LSP-shipper relationships into account, the classification in this thesis is complemented with findings from the Clas Ohlson case study. The suggested categories of environmental activities are then discussed based on their characteristics. For this part of the analysis, Paper II, which focuses on green performance measurements, provides useful input. To the extent that they are applicable, the environmental activities are therefore further analysed based on the five dimensions addressed in Paper II, namely the *stakeholder perspective*, the *purpose of measuring*, *managerial levels of measuring*, *measuring across the supply chain* and *combination of measurements*.

The concept of environmental activities is an important aspect of this thesis and is a common theme throughout the thesis. The three remaining research questions are to varying degrees all dependent on these activities. However, before moving on to describing the analysis of the remaining questions, one thing about the environmental activities needs to be clarified. The list of environmental activities has developed during the course of the research conducted. As a consequence, the environmental activities identified in Paper I do not always coincide with the environmental activities analysed for each research question. With that said, the analysis of RQ2a will be addressed.

3.6.2 THE EXTENT OF ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPS AND SHIPPERS

The second research question focuses on the extent to which environmental activities are included in relationships between LSPs and shippers. The analysis is based on the results of the survey and the two case studies conducted for this thesis. More specifically, the survey, which takes a market perspective of LSPs and shippers, and the cases, which take a relationship perspective of the same are analysed separately and then compared. The analysis of the survey is very closely linked to the results presented in Paper IV, in which a gap analysis enables a comparison on of supply and demand of environmental activities on the logistics market. Supply and demand are more specifically analysed through a comparison of mean values from the answers of LSPs and shippers with regard to environmental activities (see Paper IV for details). These environmental activities coincide with some, but not all, of the activities identified for RQ1a. The reason for this is that the survey took its starting point in the literature, whereas

RQ1a, as described above, also includes analysis of empirical data. The gap analysis offers insight into to what extent supply and demand on the logistics market match in relation to environmental activities.

The next step in the analysis of RQ2a is focused on the two case studies of interest in this thesis. In order to address the extent to which environmental activities are included in the LSP-shipper relationships, the level of greenness of the relationships is evaluated. One way to address the level of greenness would be to merely measure the number of environmental activities in each of the relationships. However, during the course of the research for this thesis, other aspects of the relationships have been identified as important with regard to the level of greenness. Through an iterative process based on results from several parts of the research for this thesis, four evaluation criteria appear to describe the level of greenness for LSP-shipper relationships:

- Number of environmental activities in relationship
- Match or gap between perceptions of supply and demand of environmental activities in relationship
- Type of environmental activities (simple/complex) in relationship
- Environmental ambition of actors with regard to environmental activities in relationship

The rationale behind each of the criteria is further described in section 5.3.2. As a final step of the analysis of RQ2a, the market perspective and the relationship perspective are compared and similarities and differences are discussed. The findings are discussed in relation to previous research that can help to further analyse the results.

3.6.3 THE INFLUENCE OF POWER BALANCES ON ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

The third research question focuses on how the power balance between actors can influence the extent to which environmental activities are included in relationships between LSPs and shippers. The research question sets out to find potential causalities between power and environmental activities in LSP-relationships, which corresponds to what Yin (2009) calls explanation building. In order to understand how the power balance in such relationships affects the inclusion of environmental activities in them, there is a need to understand the nature of power balances in the relationships. In the frame of reference, a tool for analysis of power balances was developed. Through identification of the power bases of each actor in a supply chain relationship, it is suggested that indications of the power balance in a supply chain relationship can be evaluated. In the first part of the analysis of RQ3a, the four LSP-shipper relationships as well as Clas Ohlson's LSP-relationships are analysed according to a pattern matching approach (Yin, 2009). This means that the empirical data and the power bases identified in the literature are compared and when one of the power bases is found for a specific LSP-shipper relationship, it is suggested that this power basis is part of that specific relationship. Because of this approach, it is possible that not all power bases identified in the frame of reference are identified in the empirical data.

As a next step, the power balances are evaluated based on the results of the analysis of the power bases in each relationship. The number of power bases for each company in a supply chain relationship is *one* indication of the power balance and a way to visualise the cases, but it is also possible that some bases of power are more important than others. Thus, the power balances in the analysed LSP-shipper relationships are evaluated based on the total picture that they give. The suggested power balances then provide input to two different types of analyses. The first of these addresses a potential correlation between the level of greenness (identified as a result of RQ2a) and the power balances in the LSP-shipper relationships. For this analysis, the findings of RQ2a are compared to the proposed power balances in the relationships, and patterns between the various relationships are evaluated. The final step of the analysis of RQ3a

is focused on the separate power bases found in the cases, in order to understand if any patterns emerge from the data that are of relevance for the inclusion of environmental activities in LSP-shipper relationships.

3.6.4 COORDINATION OF ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

The final research question addresses how environmental activities can be coordinated in LSP-shipper relationships. The analysis of RQ4a to a large extent follows the logic of the analysis presented in Paper V, which specifically deals with coordination of environmental activities in LSP-shipper relationships. The analysis takes its theoretical starting point in the six coordination mechanisms discussed in the frame of reference, namely *mutual adjustment*, *supervision*, *standardisation of work*, *standardisation of output*, *standardisation of skills and knowledge* and *standardisation of norms*. The empirical basis for the analysis is the two case studies conducted for this thesis. Using a pattern matching approach (Yin, 2009), the environmental activities in each of the cases are compared to the six coordination mechanisms in order to see whether – and in that case which – they are in play in the specific situations. This analysis is conducted for the four LSP-shipper dyads in Paper V, but is complemented in this thesis with the results from the Clas Ohlson case. When the environmental activities have been matched with coordination mechanism, two types of analyses are conducted. One takes its starting point in the six coordination mechanisms in order to see to what extent they are ubiquitous and thus are applicable to different types of environmental activities (Malone et al., 1999). The other analysis addresses variability (Malone et al., 1999) in coordination of environmental activities and therefore takes its starting point in the environmental activities, in order to understand if the different coordination mechanisms can be used for several of them. The results of these analyses are discussed in relation to previous research that can further help to understand the results.

3.6.5 ANALYSING SUPPLY CHAIN RELATIONSHIPS IN GENERAL

In addition to the research questions into LSP-shipper relationships described above, all four research questions have a part *b*, which concerns supply chain relationships in general. It was argued in section 1.3 that taking other relationships into account could have a potential to contribute to the understanding of LSP-shipper relationships. The aim of this section is not to discuss the research design for each of the research questions in relation to supply chain relationships in general. Instead, the research design for the second part of each research question to a large extent coincides and is therefore described all at once. Two studies contribute to the analysis of part *b* of the research questions: a study of city logistics projects (Study 5) and a case study of one shipper's supply chain relationships (Study 6). Similar to the reasoning argued for by the homepage scan in section 3.3.1 above, the study of city logistics projects can be viewed as a type of case study. As argued for in the section above, case studies are suitable data collection methods for all four research questions. Given that the city logistics projects were studied in as much detail as possible (limited by the amount of documentation), the research method is believed to be able to contribute to both the descriptive and the explanatory objectives of the research question (Ellram, 1996). The same logic follows for the case study of different types of supply chain relationships.

3.7 RESEARCH QUALITY

Several factors that have affected the quality of the research for this thesis have already been mentioned above in relation to the applied research methods (see the final section for each of the data collection methods presented in 3.5). Further, different criteria for the qualitative (credibility, transferability, dependability and confirmability) and quantitative (reliability and validity) studies have been assessed in accordance with, for example, Bryman and Bell (2011). This section takes a step back from specific research methods and discusses instead the research quality of the combined research for this thesis. One commonly mentioned way to

increase the quality of a study is triangulation (see for example Gummesson, 1991; Merriam, 1994; Patton, 2002; Tarrow, 2004). According to Saunders et al. (2007), triangulation means:

“the use of two or more independent sources of data or data collection methods within one study in order to help ensure that the data are telling you what you think they are telling you” (p. 614).

Although triangulation has already been mentioned in relation to some of the specific research methods above, this more holistic view of the research process enables further discussion of the concept. More specifically, there are a number of different types of triangulation that have undoubtedly helped to increase the research for this thesis.

Methods triangulation refers to the use of multiple methods to study one single problem (Patton, 2002). The purpose of this thesis has, as described previously, been addressed through a number of research methods. The combination of these different methods is believed to have contributed to a higher research quality than the methods would have done separately. One example of this is the combination of qualitative and quantitative data, which King et al. (2004) argue is a strength in research. For this specific thesis, this can be exemplified with the findings of the survey leading to the case studies of the dyadic LSP-shipper relationships, which in turn has increased the understanding of the survey results.

Analyst triangulation is, for example, achieved when several different researchers are included in one study (Patton, 2002). The strength of this type of triangulation is that it allows for a comparison between different views and it thus decreases the risk of researcher bias (Patton, 2002). As mentioned in section 3.4, four of five of the appended papers have been co-authored which has thus provided the opportunity to discuss corresponding and conflicting arguments. One example is Paper III, in which the identification of relevant city logistics cases was conducted in a discussion among the three authors. The fact that the analysis of dependencies in the projects also was conducted by all three authors increased the likeliness that all relevant dependencies were identified.

Theory triangulation refers to the use of different theoretical perspectives on the same empirical material (Patton, 2002). As described in section 3.6, two main theoretical research areas are applied in the analysis of environmental activities in supply chain relationships, namely power and coordination. These two areas separately give two different perspectives in relation to the research topic of this thesis. While the separate analyses offer valuable insight into how supply chain actors can include environmental activities in their relationships with each other, a combination of the perspectives offers a possibility of additional analysis which can lead to an extension of the findings.

4 APPENDED PAPERS AND REPORTS

Five papers and two case reports are appended in this thesis. They are all relevant for the subsequent analysis of LSP-shipper relationships. This chapter aims to give an overview of the papers and case reports in terms of content and how they fit into the analysis of LSP-shipper relationships. Basic information for the papers in terms of background, purpose and research approach is provided, as well as an overview of the findings for each of the papers. For this latter part, the main focus is on such findings as are of relevance for the analysis in Chapter 5. The order of the papers is based on which part of the analysis they are relevant for. A brief presentation of the cases in the case reports is also given and includes the aim of the studies as well as an overview of the companies studied.

4.1 PAPER I: TOWARDS UNEARTHING ENVIRONMENTAL ACTIVITIES IN THE INTERFACE BETWEEN LOGISTICS SERVICE PROVIDERS AND SHIPPERS

In relation to the research questions of this thesis, Paper I mainly contributes to RQ1a, which deals with which environmental activities can be included in relationships between LSPs and shippers. The results from the paper also provide input to the remaining three research questions, since they are all to some extent linked to the identified environmental activities.

4.1.1 PURPOSE AND OUTLINE OF PAPER

Paper I takes its starting point in the logistics market and, more specifically, in environmental activities as offered by LSPs or required by shippers on this market. The paper also opens up for the possibility that there is a difference between the general offerings and requirements and the actual exchange of environmental activities between LSPs and shippers. The purpose of the paper is therefore *to describe how green logistics activities are offered and required on the logistics market, and how the green logistics exchange that becomes part of a business deal can relate to the scope of activities.*

The paper is based on two literature reviews (one systematic and one narrative) as well as empirical data from a homepage scan and four cases of LSP-shipper dyads. The results from each of these data collection methods are presented separately, after which an analysis of the aggregated results is conducted.

4.1.2 MAIN CONTRIBUTIONS FROM PAPER

Based on the results from the literature reviews, the homepage scan and the case study, a wide spectrum of environmental activities are identified in Paper I. A classification of the identified activities is suggested based on their role in the business between LSPs and shippers, and more specifically:

- 1. those that can be expressed as offerings or requirements prior to business deal;
- 2. those that can be applied as precondition for the contract; and
- 3. those that can be included in the on-going relationship between LSPs and shippers.

FIGURE 4.1. CLASSIFICATION OF ENVIRONMENTAL ACTIVITIES IN PAPER I

The environmental activities identified in Paper I provide a basic understanding of which environmental activities can be included in LSP-shipper relationships. The activities thus serve as a starting point for the analysis of environmental activities and are of relevance for the analysis of all three research questions.

4.2 PAPER II: PERFORMANCE MEASUREMENTS IN THE GREENING OF SUPPLY CHAINS

In this thesis, Paper II is mainly related to RQ1 and its focus of environmental activities in supply chain relationships. The paper offers insight into the measurement aspect of the various environmental activities identified and helps to characterise them in different ways. Further, Paper II also relates to RQ4, in which coordination of environmental activities is analysed. Specifically, the measurements discussed in Paper II are closely related to two of the coordination mechanisms, namely *direct supervision* and *standardisation of output*.

4.2.1 PURPOSE AND OUTLINE OF PAPER

Based on an argumentation for the importance of green performance measurements and the lack of a synthesis of the present state of this research field, the aim of Paper II is:

1. to make a synthesis of what has been published on green measuring in supply chain management and thereby assess the state of the art in the field;
2. to analyse strengths and shortcomings in prior research within the field based on an identification of dimensions important to consider when measuring environmental performance in supply chain management; and
3. to provide a practical example showing that it is possible to succeed with environmental performance measurement in supply chain management by applying the dimensions identified.

In a systematic literature review, literature regarding logistics management and performance measurement is coupled with theories regarding environmental logistics and green supply chain management. A major part of the paper focuses on the findings from this literature review and the results are categorised and discussed in relation to a five-dimensional framework. A second major part of the paper includes a case study based on four actors in a reverse supply chain, in order to illustrate the framework.

4.2.2 MAIN CONTRIBUTIONS FROM PAPER

The analysis of the papers found in the literature review takes its starting point in a framework with five dimensions, as shown in Table 4.1. A lack of research with regard to studies into green performance measurements is identified in the paper, based on the literature review conducted.

In addition to the results presented in the framework above, Paper II also provides an understanding of the various types of measurements that can be of interest within GSCM. The most frequently mentioned measurements found in the literature review were air emissions (mostly CO₂), energy use, recycling, fuel use and water use. Further, a case study illustrates a supply chain in which all the identified shortcomings from literature are transformed into a successful example of measuring green performance. As mentioned in section 3.1.1, this case study is not subject to further attention in this thesis.

TABLE 4.1. RESULTS OF LITERATURE REVIEW IN PAPER II

Framework dimension	Findings from the literature review
Stakeholder perspective	There is a lack in consideration of the interest of different stakeholders. Even though the pressure from external stakeholders is described as one important reason for organisations to take environmental action, few, if any, examples describe how the results from the measuring are communicated back to these parties, other than the fact that they publish external reports.
The purpose of measuring	The articles that present examples of measurements seldom describe the purpose of the measuring. As a result, a large number of different measurements are presented and the measurement systems become unnecessarily complex.
Managerial levels of measuring	Previous research advocates integration of green performance measurements over several managerial levels, i.e. strategic, tactical and operational. However, examples of such integration are scarce in the identified literature.
Measuring across the supply chain	Several of the articles studied discuss the importance of integrated measurement systems across the different actors and companies in the supply chain. However, the articles studied take a focal company perspective regarding in whose interest the measuring is undertaken.
Combination of measurements	Several of the papers highlight the importance of connecting the environmental measurements to other areas of measurement, such as linking environmental performance to financial performance. However, few of the articles describe these links when presenting measurements.

4.3 PAPER III: THE IMPORTANCE OF STAKEHOLDER RELATIONSHIPS IN CITY LOGISTICS PROJECTS

Like Paper II, Paper III does not deal explicitly with relationships between LSPs and shippers. Instead, it focuses on relationships between actors (called stakeholders in the paper) in city logistics projects. Such relationships can, but does not have to, include LSPs. By taking the perspective of relationships between actors in a city logistics context, the paper mainly contributes to the part of the purpose that is directed towards supply chain relationships in general. Specifically, Paper III contributes to RQ1b, RQ3b and RQ4b.

4.3.1 PURPOSE AND OUTLINE OF PAPER

The starting point in Paper III is the relationships between various actors involved in city logistics projects. The paper takes the perspective of dependencies between such actors and argues that this is a crucial aspect in relation to the projects. More specifically, the purpose of the paper is to explore city logistics projects based on actors' (called stakeholders in the paper) cooperative relationships in order to suggest how the nature of dependence between the actors can affect the project.

The frame of reference includes two sections: one on relationships between actors in a city logistics context and one on dependencies in inter-organisational relationships. Regarding the research approach, a wide range of documented city logistics projects is narrowed down in an iterative process, and three projects where relationships are described are analysed supported by the frame of reference. A cross-case analysis compares the findings and identified patterns in the cases discussed further.

4.3.2 MAIN CONTRIBUTIONS FROM PAPER

The analysis of the three projects identified in the cities of Toulouse, Burgos and Bologna shows, amongst other things, the following:

- Local authorities are often dependent on the willingness of other actors to participate in the city logistics projects.
- Despite the previously mentioned findings, there is often a lack of descriptions of forms for cooperation between, as well as within, actor groups in the reviewed projects.

- It is suggested that the involvement of actors in city logistics projects is of greater importance in the design phase than in the implementation phase.

4.4 PAPER IV: MATCHES AND GAPS IN THE GREEN LOGISTICS MARKET

In relation to the research questions, Paper IV contributes first and foremost to RQ2a, which addresses the extent to which environmental activities are included in supply chain relationships.

4.4.1 PURPOSE AND OUTLINE OF PAPER

This paper takes its starting point in the interface between the LSP and shippers. More specifically, it is concerned with the environmental offers from LSPs and the environmental demands from shippers, and how they match on the logistics market. The purpose of the paper is to develop and apply a tool for the identification of matches and gaps in the interface between the environmental demands of the shippers and the corresponding offers from the LSPs.

In the first part of the paper, literature about the LSP-shipper interface is reviewed, with a focus on environmental offers and environmental demands. Literature on gap models is also discussed and together these two reviews lead to a proposed gap model for green logistics. The second part of the paper includes a survey study of LSPs and shippers on the Swedish logistics market. The survey results are analysed in accordance with the developed gap model and this is followed by a discussion of the findings.

4.4.2 FINDINGS

Figure 4.2 shows the gap model developed in Paper IV. It includes a number of environmental activities (labelled green categories in the paper) that can be considered as parts of environmental offers or demands in LSP-shipper interfaces. The environmental activities are to a large extent based on the findings of an earlier version of Paper I.

FIGURE 4.2. THE GREEN LOGISTICS GAP MODEL IN PAPER IV

As illustrated in the gap model, five potential gaps are addressed. For each gap, mean values are compared between the relevant questions shown in Figure 4.2. As an example, Table 4.2 depicts the results for Gap 1. As can be seen, the LSPs' stated offers are found to have higher mean values for all environmental activities than do the shippers' stated demands. The remaining four gaps are presented in a similar manner, along with a discussion about the reasons for the matches and gaps.

TABLE 4.2. MEAN VALUES REPRESENTING GAP 1

	LSPs' stated offer (A)	Shippers' stated demand (B)	Gap 1
Fuel	3.79	3.50	0.29
Environmentally classified vehicles	4.12	3.86	0.26
Emission data	4.13	3.30	0.83
Energy data	4.03	3.06	0.97
Combination of transport modes	3.89	2.86	1.03
Transport planning	4.13	3.03	1.10
Logistics system design	4.14	3.08	1.06
Environmental management systems	3.88	3.50	0.38
Eco driving	3.75	3.23	0.52
Choice of partners	3.77	3.05	0.72

Note: 1 – totally disagree → 5 – fully agree

4.5 PAPER V: COORDINATION OF ENVIRONMENTAL ACTIVITIES IN LOGISTICS SERVICE PROVIDER-SHIPPER RELATIONSHIPS

As Paper V addresses coordination of environmental activities, it is of considerable importance for the analysis of RQ4, which deals with this topic. In addition, the paper provides input to the analysis of the level of greenness in the cases, which is conducted in relation to RQ2a.

4.5.1 PURPOSE AND OUTLINE OF PAPER

Paper V takes its starting point in environmental activities in LSP-shipper relationships. Further, it takes a coordination perspective on these activities and its purpose is to suggest how environmental activities can be coordinated in LSP-shipper relationships.

The frame of reference focuses on coordination, and, more specifically, coordination mechanisms that can be applied in the relationships between LSPs and shippers. With guidance from the literature, as well as characteristics of environmental activities, the frame of reference results in six coordination mechanisms for further study in the context of environmental activities in LSP-shipper relationships. Four cases of LSP-shipper dyads are analysed based on the mechanisms. Specifically, it is suggested that the identified environmental activities are coordinated through one or more of the six coordination mechanisms. The results are compared in a cross-case analysis and this leads to two main discussions: one that takes its starting point in the type of coordination mechanism and one that takes its starting point in the type of environmental activity.

4.5.2 MAIN CONTRIBUTIONS FROM PAPER V

The main result of Paper V is depicted in Table 4.3. The analysis in the paper provides more extensive information as to why it is suggested the various environmental activities are coordinated as shown in the table. However, in this summary it is sufficient to note that the paper identifies a number of coordination mechanisms applicable for different types of environmental activities in LSP-shipper relationships. Moreover, it is suggested that some environmental activities that can be undertaken in LSP-shipper relationships can be coordinated through different types of coordination mechanisms.

TABLE 4.3. ENVIRONMENTAL WORK AND CORRESPONDING COORDINATION MECHANISMS

ENVIRONMENTAL ACTIVITIES	COORDINATION MECHANISMS					
	Mutual adjustment	Supervision	Standardisation of work	Standardisation of output	Standardisation of skills and knowledge	Standardisation of norms
Change in pick-up system			B3			
Clean shipping project		B4				
Continuous communication regarding environmental work						B4
Dyadic collaboration between two individuals	B3				B3	B3
Eco-driving project			B4			
Emission reports		B3, B4	B4	B3, B4		
Ensure that environmental work is conducted		A1				
Environmental factors as part of all communication			B4			
Environmental person at LSP					B3	
Environmental project		B4				
High fill-rates		A1		A1		
ISO 14001		A2				
LSP tries to influence pattern of transport-use			B4			
Milk-round project			B4			
Type of vehicles		A2				

A1=Alltransport-Holmen; A2=Alltransport-Onninen; B3=DHL-SECO Tools; B4=DHL-Ericsson

4.6 CASE REPORT I – ENVIRONMENTAL WORK IN RELATIONSHIPS BETWEEN LOGISTICS SERVICE PROVIDERS AND SHIPPERS

Case report I includes an exploratory case study with the aim of increasing the understanding of how LSPs and shippers can include environmental activities in their relationships with each other. Four dyadic cases of LSPs and shippers are studied, as depicted in Figure 4.3. At the top of the figure are the two LSPs included in the study: *Alltransport*, a regional and relatively small company, and *DHL*, a relatively large company active on a global market. Two customers for each of the LSPs are included in the study. The shippers in the two Alltransport relationships are Holmen, a Sweden-based forest industry group that manufactures printing paper, paperboard and sawn timber, and Onninen, a Finland based wholesaler of lighting, electricity, gas, industrial, refrigeration & air conditioning, telecommunications, sewage and plumbing. The shippers included in the DHL relationships are SECO Tools, a Sweden-based provider of cutting tools for various industries all over the world, and Ericsson, a Sweden-based provider of telecommunication networks and services, also all over the world.

FIGURE 4.3. THE CASES INCLUDED IN CASE REPORT I

Case report I is divided into two main sections: one with a focus on the individual companies and one with a focus on the four dyadic relationships. In the first section, each company is presented both in general terms and with environmental considerations in mind. In the second

section, which focuses on the relationships, the dyads are described both in a general manner and with a specific focus on the environmental work undertaken.

The four dyadic LSP-shipper relationships provide input to all four research questions.

4.7 CASE REPORT II – A STUDY OF ENVIRONMENTAL AND OTHER SUSTAINABLE ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS AT CLAS OHLSON

Case report II describes a single case study which looks at the Swedish retail company Clas Ohlson. The aim of the case study is to illustrate how environmental work can be conducted in different types of supply chain relationships, seen from the perspective of one focal shipper in a supply chain. These relationships include both upstream and downstream parts of the supply chain and shippers as well as of service providers (see Figure 4.4).

As the case study focuses on the perspective of one shipper, the case report describes Clas Ohlson’s views of its supply chain relationships and the inclusion of environmental activities. In addition to addressing environmental activities in the relationships, the report includes CSR-related activities for which the relationships with suppliers are described.

The case report is divided into different sections according to Clas Ohlson’s supply chain. As a result, the chapters focus on *suppliers*, *inbound logistics*, *the distribution centre*, *outbound logistics* and *stores*. In addition, the final section is about *the transport management function*, which includes both inbound and outbound logistics and focuses mainly on future thoughts for transport management at Clas Ohlson.

As in case report I, the Clas Ohlson case provides input to all four research questions.

FIGURE 4.4. RELATIONSHIPS IN CLAS OHLSON'S SUPPLY CHAIN

5 ANALYSIS

This chapter seeks to find answers to the four research questions developed in Chapter 1. The research questions are addressed one by one, each starting with a focus on relationships between LSPs and shippers, after which the focus widens to include supply chain relationships in general. As this is a compilation thesis, the research questions all include to some extent the results from one or more of the appended papers and case reports. However, some new analyses are conducted in this chapter. In particular, the analyses of RQ1 build to a large extent on the findings from the appended papers, whereas RQ2 and RQ4 are a mix of findings from appended papers and new analyses. RQ3 includes a larger number of additional analyses than the others. The final section of the paper includes, in the context of LSP-shipper relationships, the analysis of all four research questions combined.

5.1 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

This first section of the analysis addresses RQ1a, which is formulated as: *Which environmental activities can be included in relationships between logistics service providers and shippers.* Paper I serves as the main source of input for the subsequent analysis, due to its focus on different types of environmental activities in the interface between LSPs and shippers. Case Report I is included in the analysis of Paper I, whereas Case Report II provides additional input to the analysis of RQ1a. Further, Paper II deals specifically with environmental performance measurements, which will be discussed in relation to the environmental activities identified.

5.1.1 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

In Paper I, a number of environmental activities were identified as being of interest for the LSP-shipper interface. Based on two literature reviews, ten environmental activities of relevance for the LSP-shipper interface were identified. Table 5.1 shows these activities, and provides explanations of what they mean as well as examples of literature which deal with the activities (for references, see Paper I).

TABLE 5.1. ENVIRONMENTAL ACTIVITIES DERIVED FROM LITERATURE

Environmental activity	Examples
Mode choice and intermodal transportation	Switching from one mode to another or combining transport modes.
Logistics system design	Affects the number and length of links in a supply chain, which in turn affects environmental impact
Transport management	Increasing fill-rates or decreasing empty running
Vehicle technology	Changing vehicle design, such as engine and exhaust systems
Behavioural aspects	Actions taken by the driver to increase energy efficiency
Alternative fuels	Affects the amount of CO ₂ emissions per unit of energy consumed by the vehicle.
Environmental managements systems	ISO 14001 or EMAS are examples of systems often required by purchasing companies
Choice of partners	Who to partner with and how to manage the relationships can affects the environmental impact
Emission data	Measuring environmental impact through emissions, often specifically CO ₂
Efficient buildings	Energy consumption of LSPs' buildings, such as terminals and warehouses

The findings of a scan of homepages of both LSPs and shippers, as well as a case study of LSP-shipper relationships (Case report I) were compared with the ten environmental activities suggested. The Clas Ohlson case can provide further input to this comparison. More specifically, the Clas Ohlson case (Case report II in Appendix II) provides four examples of activities that constitute, or have constituted, a part of the relationships between Clas Ohlson and LSPs. Firstly, Clas Ohlson has a minimum requirement regarding the LSPs' *trucks in terms of environmental standard*. This specific environmental activity deals with the technology of the vehicle used by the LSPs and thus falls into the more general activity *vehicle technologies*. Further, Clas Ohlson also requires the LSPs to provide them with *emission data*, which corresponds to one of the general environmental activities. The other two environmental activities identified include one where Clas Ohlson and several LSPs had *brainstorming meetings* in order to generate some new environmental solutions into their relationships, and one where Clas Ohlson was a *representative on one LSP's environmental board*. It is interesting to note that these two environmental activities are examples of past activities and are not conducted at present. However, both environmental activities are interesting, since they do not fall under any of the suggested general environmental activities and are therefore considered as additional environmental activities.

The empirical results from the homepages and cases confirm the relevance of the ten general environmental activities in the interface between LSPs and shippers. Further, they offer a more specific understanding of the majority of the ten activities. For the general environmental activity *transport management*, for example, more specific environmental activities such as *high fill-rates*, *change in pick-up system* and a *milk-round project* were found. The empirical data also provides a number of additional environmental activities that were not found in the literature review.

Previous research has, to a limited extent, addressed the potential environmental activities that can be included in LSP-shipper relationships. A number of researchers, such as Colicchia et al. (2013), Weijers et al. (2012) and Lieb and Lieb (2010), have, however, addressed environmental activities from an LSP perspective. In their papers, the environmental activities discussed are strongly related to the activities discussed in general green logistics literature (that is to say, without the LSP focus). Thus, they correspond well with the first ten environmental activities suggested here. The research conducted for this thesis does, however, differ somewhat from the previous studies. Firstly, as RQ1a is exploratory in nature and has a specific aim of identifying a wide spectrum of environmental activities, it results in a wider variety of environmental activities than in the studies previously mentioned. This is believed to be one reason why many of the additional environmental activities suggested here are not included in the other studies.

Further, it is suggested that the dual perspective taken with regard to the environmental activities in the research for this thesis is able to capture a wider variety of activities. In particular, the inter-organisational perspective of environmental activities in LSP-shipper relationships has been acknowledged by Colicchia et al. (2013). More specifically, their classification of environmental activities is based on whether they are intra- or inter-organisational, but still takes the LSP perspective. Given the dual perspective that is taken with regard to environmental activities in LSP-shipper relationships, this research indicates it is possible to offer another classification of the activities that takes this duality into account.

5.1.2 A CLASSIFICATION OF ENVIRONMENTAL ACTIVITIES

Whereas some environmental activities are of importance from a promotional point of view, others are more important from a business deal perspective. With its starting point in the dual perspective of LSP-shipper relationships, the suggested classification takes the following three categories into account:

1. those that can be expressed as offerings or requirements prior to a business deal;
2. those that can be applied as a precondition for the contract; and
3. those that can be included in the on-going relationship between LSPs and shippers, meaning that they are each other's supplier and customer

Figure 5.1 illustrates these categories and the environmental activities identified as relevant for each of them. The environmental activities identified in the Clas Ohlson case are included in the figure. Almost all the identified environmental activities are included in category 1. The reason for this is that this category highlights the potential environmental activities that may be a part of the offering or requirements with regard to green logistics services. While the environmental activities in category 1 can be said to be general in nature, the activities become more specific in category 2 and 3. For details about the activities in category 1, the reader is referred to Paper I. These two other categories will be discussed separately in the following sections.

FIGURE 5.1. CLASSIFICATION OF ENVIRONMENTAL ACTIVITIES IN LSP-SHIPPER RELATIONSHIPS

CATEGORY 2

Most of the environmental activities found for category 2 are relatively easy to communicate, which could be one reason why they are mentioned as preconditions for a business deal between LSPs and shippers. This could also be related to the possibility of measuring the outcome and it could further be argued that all activities placed in category 2 (and several in category 1) are a type of measurement that is possible for the shippers to measure in order to see if the LSPs “deliver”. The Clas Ohlson case can be said to illustrate this with regard to *vehicle technologies*, since the company has checked the types of vehicles that deliver the goods to the stores, in order to see if they were of EUR3 class or higher as stipulated in the agreements. In most cases, the LSPs used appropriate vehicles, which were often, but not always, of a higher environmental class than EUR3. The controls are mostly carried out in order to show the LSPs that Clas Ohlson does indeed follow up on the demands they make.

The reasoning above is related to the findings of Paper II, in which it was suggested that the purpose of measuring was unclear in the identified papers. This appeared to lead to a situation in which a large number of measurements are presented, and the measurement systems therefore become unnecessary complex. However, it is suggested here that the environmental activities in category 2 are relatively simple to measure. Drawing the conclusions from Paper II, does that, then, mean that the purpose of the measuring is clear? Not necessarily. The Clas Ohlson case, for example, illustrates the difficulty in finding suitable requirements for LSPs. In the last procurement process, the LSPs:

“/.../ were not allowed to have trucks of lower environmental classification than EUR3. And look at the situation now – EUR3 is nothing to be particularly proud of.”

(Peter Bergestål, transport manager, Clas Ohlson)

The empirical results thus indicate that in some situations, the shippers try to find suitable environmental activities for their requirements, but the purpose of measuring, or the actual goal of including environmental activities, might not be entirely clear. Another situation appears to arise when the environmental activities are required in order to show stakeholders that *something* is being done to reduce the environmental impact. On the one hand, the purpose of

measuring is clear in such a situation, but on the other hand, one can perhaps question whether the environmental activities are in fact conducted in order to reduce the environmental impact. Yet another situation is found in the Alltransport-Holmen relationship, in which *transport management* is required by the shipper for financial reasons. Thus, although this environmental activity can lead to decreased environmental impact, the main focus of the activity is on financial purposes. This is in line with Oglethorpe and Heron (2010) who suggest that increased economic transport efficiency often goes hand in hand with environmental activities.

Although it would appear that the environmental activities in category 2 are easy to communicate, two exceptions can be identified. Firstly, *transport management* appears somewhat more complex than the others, but, as noted above, this activity can be included in LSPs' operations for financial and efficiency reasons. Secondly, *emission data* might be easy to communicate as such, but could be made relatively complex depending on the accuracy of the measurement. This relates well to category 3 of the classification suggested above.

CATEGORY 3

The environmental activities found in category 3, which thus appear to be a part of on-going LSP-shipper relationships, are somewhat different in character to those in category 2. Firstly, they are relationship-specific, which means that each of the activities is developed for the specific relationship in which they are included. Compared to category 2, in which the environmental activities are relatively general, the inclusion in category 3 thus means that they are taken one step further and are adapted to the specific setting of an LSP-shipper relationship. One example is the *emission data*, which can easily be a precondition set by shippers (category 2), but if it is included in category 3, more specific work is required as to how the emissions are measured and reported. In addition, there appears to be another type of environmental activity that is even more tied to the on-going relationship than the others in category 3. These are the brainstorming meetings and participation on the environmental board that sometimes take place in specific relationships. These are very much tied to specific relationships and, unlike all the other environmental activities, do not, therefore, appear to be part of category 1.

Secondly, the environmental activities in category 3 are, in general, more complex than those in category 2, as is supported by the discussion about *emission data* above. It thus appears that the complexity increases when the same environmental activity is included in category 3 as well as in category 2. Another example of a complex environmental activity is *logistics system design*, which is a complex activity that is likely to have great potential if planned jointly between LSPs and shippers. In relation to the environmental activities in category 2, which it was suggested were relatively easy to measure, the increased complexity of the environmental activities in category 3 further appears to make measuring more complex. One aspect of the increased complexity is the managerial levels involved. In Paper II it is suggested that there is a lack of integration of environmental measurements between the strategic, tactical and operational levels of a company. For several of the environmental activities in category 3 it appears that higher managerial levels are involved than for category 2. For example, decisions regarding changes in logistics system design for environmental reasons are likely to be taken on a strategic level (Aronsson and Hüge-Brodin, 2006). Such a decision would have implications for the lower managerial levels when the environmental impact is to be measured. However, in line with the reasoning in Paper II, one can perhaps question whether it is the measurements in themselves that are strategic, tactical or operational, or if the *purpose* of measuring and how the results are used determines to which managerial level the measurements belong.

On a final note, the findings of Paper II pointed to several researchers who highlight the need for integrated measurement systems across the supply chain (Hervani et al., 2005; Markley and Davis, 2007; Veleva et al., 2003). One question that arises in relation to this is whether there is a need for more integrated measurements in the specific context of LSP-shipper relationships. The empirical results in this thesis indicate that the shipper often decides which measurements are relevant in a specific LSP-shipper relationship (compare to category 2), which perhaps

decreases the need for integrated measurement systems. The shipper is able, through its chosen measurements, to compare an LSP's performance from one year to another, as well as to compare different LSPs without such integrated measurements. However, if shippers measure according to different measurement systems, this could become a problem for LSPs, who then have to adapt to several such systems. This, in turn, could lead to a decrease in the quality of measuring since LSPs might not have the resources to adapt to all types of measurement systems. Thus, from the perspective of several LSP-shipper relationships, both actors could benefit from integrated measurement systems.

5.2 ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS IN GENERAL

This section focuses on RQ1b, which deals with environmental activities in supply chain relationships in general. Both the Clas Ohlson case and Paper III, which focuses on the context of city logistics, play a major role in this second part.

Regarding relationships between customers and their physical goods suppliers (as opposed to suppliers of services such as logistics), environmental activities have already been studied to some extent by for example Zhu and Sarkis (2004) and Hu and Hsu (2010) within the field of GSCM. Such activities were presented in the frame of reference and can for example include cooperation with customers for environmental objectives or environmental management systems for suppliers. In the Clas Ohlson case studied for this thesis, the environmental activities included in the relationships with suppliers are a part of the larger concept of the code of conduct, which, briefly, is a tool that defines what a customer expects of suppliers with regard to social responsibility (see for example Amaeshi et al., 2008; Frostenson et al., 2012). All Clas Ohlson suppliers have to sign the code of conduct in order to be able to deliver products to the company. Signing the code of conduct means that the suppliers agree to meet the requirements stipulated in the code. Environmental requirements constitute one of six chapters in Clas Ohlson's code of conduct. Within the environmental chapter, requirements state that suppliers need to follow the laws of the country in which they operate. Further, the code of conduct states that as a minimum requirement, suppliers should handle hazardous substances and waste in a safe way.

Even though the Clas Ohlson case provides limited results with regard to specific environmental activities with its shippers, the wider approach applied by the company with the code of conduct offers interesting input to the analysis of LSP-shipper relationships. Specifically, in relation to environmental (and/or social) activities in supply chain relationships, the findings of the Clas Ohlson case indicate that this specific shipper is more structured and consistent with regard to demands made on suppliers of physical goods than of LSPs. The empirical data indicate that the environmental activities demanded by Clas Ohlson in their relationships with shippers are a result of the work of a limited number of individuals, of whom only one (the environment coordinator) have had environmental focus as a part of the work description. The demands included in the code of conduct, on the other hand, appear to be backed up by a complete CSR organisation, which indicates that more resources are dedicated to demands made on physical goods suppliers. In the specific case of Clas Ohlson, a new transport management function has put more focus on environmental activities in the company's relationships with LSPs. By learning from the CSR organisation, there could be a potential for Clas Ohlson, as well as other shippers that find themselves in a similar situation, to apply learnings from the structured work with the code of conduct to the work with environmental activities in relationships with LSPs. Details about what can be learned, and how, are beyond the scope of this thesis and are therefore proposed as a potential avenue for future research in order to understand more about environmental activities in LSP-shipper relationships.

Another type of supply chain relationships is those included in a city logistics context. In this context, Paper III to some extent provides input regarding the types of environmental activities in such relationships. While the aim of this discussion is not to list all the environmental

activities possible in a city logistics context, the empirical results from Paper III indicate one interesting topic for further discussion in relation to environmental activities in LSP-shipper relationships. This has to do with the purpose of measuring, which is identified in Paper II as an important, albeit sometimes forgotten, aspect of measuring. As was argued in section 5.1.1, for some of the environmental activities included in the relationships between LSPs and shippers, and especially those in category 2 of the classification, the purpose of measuring is not directly linked to a decrease in environmental impact. Specifically, some environmental activities are included because shippers wish to show that they act with regard to the environment. City logistics projects often go further than that since they have a clear aim to decrease the impact of freight transports on urban areas (Benjelloun et al., 2010). It is thus important from a city's perspective that the projects actually result in improvements. This in turn has an impact on the types of environmental activities initiated in a city logistics context. In the examples found in Paper III, the environmental activities range from freight delivery plans, to collaboration between the authorities and a postal company, to a van-sharing system for small LSPs.

With regard to LSP-shipper relationships, it is perhaps sufficient for some shippers to merely show that they are doing *something* for the environment, while for others it is important that the environmental activities actually lead to decreased environmental impact. By formulating clearer purposes of measuring it could be argued that it would be easier to find the suitable environmental activities for each specific relationship.

5.3 THE EXTENT OF ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPS AND SHIPPERS

Although RQ2a focuses on *relationships* in the same way as the main theme of this thesis, it is argued here that a general knowledge of the interface between LSPs and shippers with regard to environmental activities is also of interest. This section, therefore, starts with a discussion about the green logistics market, in which environmental activities are offered by LSPs and demanded by shippers (see Paper IV for details). The market perspective is, as described in Chapter 3, studied through a survey. It is important to note that the environmental activities in the survey do not entirely coincide with all the environmental activities identified in RQ1a (see 3.6.2 for more details). After the focus on the market perspective, LSP-shipper relationships are analysed in order to learn more about to what extent environmental activities are included in them. This analysis is made through an assessment of the level of greenness of the relationships. Finally, a comparison between the two perspectives is made.

5.3.1 THE EXTENT OF ENVIRONMENTAL ACTIVITIES ON THE LOGISTICS MARKET

The matches and gaps with regard to environmental activities on the green logistics market are assessed based on the gap model shown in Figure 5.2. The model allows a comparison of the two groups of actors on the logistics market: LSPs and shippers. Further, the model enables the inclusion of the view of both actors of their green offer (LSPs) or green demand (shippers), as well as their perception of the other actor group's offers and demands. As can be seen in Figure 5.2, five possible gaps are identified as being of interest in a comparison between the supply and demand side of the green logistics market if we are to learn more about the extent to which environmental activities are taken into account in the interface between LSPs and shippers. The gaps are discussed below in a general sense, but for specific information about matches and gaps for each of the environmental activities, the reader is referred to Paper IV.

FIGURE 5.2. THE FIVE GAPS

Starting with Gap 1, which concerns the difference between LSPs’ stated offers and shippers’ green demands, LSPs’ stated offers are found to have higher mean values for all environmental activities than do the shippers’ stated demands. Such a situation, where supply exceeds demand, is referred to by Lings and Brooks (1998) as a positive gap. While “positive” can be a good thing, it can also be argued that there is a possibility that service quality is too high, as suggested by Large and König (2009), implying that LSPs could use make better use of resources elsewhere.

The findings for Gap 2 suggest that LSPs are aware of their own “overachievement”, as the results of the comparison of LSPs’ stated offer versus their perception of shippers’ demand indicates an even larger gap than in Gap 1. Thus, if the LSPs’ service quality is too high with regard to environmental activities, they do appear to be aware of the situation. Further, previous research by Wolf and Seuring (2010), who suggest that LSPs are ahead of their customers with regard to environmental activities, is to some extent confirmed by the results from Gap 1 and Gap 2. However, a closer look at Gap 3 reveals that shippers do not share the same perception of green supply as LSPs. More specifically, shippers perceive the extent of offered environmental activities as lower than the LSPs do. Thus, whether the suggestion by Wolf and Seuring (2010) is true or not, the shippers do not appear to perceive LSPs to be ahead of them in terms of environmental activities. Could this mean that the LSPs offer more than the shippers are aware of? Or could it mean that LSPs and the shippers have different views and different levels of maturity with regard to environmental activities?

Whereas Gap 3 illustrates the differences in perception of supply, Gap 4 addresses both actor groups’ views of demand. The results indicate that the shippers’ demands exceed the LSPs’ perception of the demands. This is the only gap where the shippers have higher mean values than the LSPs, and it is thus the only negative gap (Lings and Brooks, 1998) of the five. However, compared to Gap 3 this is a relatively small gap.

The final gap, Gap 5, shows the shippers’ views on both green supply and green demand. The results point to a relatively good match between supply and demand when both are seen from a shipper perspective. This could indicate that shippers are pleased with the offers from the LSPs since their demands are met. Further, the relatively large gaps found in Gap 1 and Gap 2 do not seem to be noticed by the shippers.

The results from the gap analysis in Paper IV are descriptive in nature and leave some unanswered questions regarding why the identified gaps occur. One possible explanation for some of them could lie in the differences in supply and demand between the market perspective and the relationship perspective, as implied by the classification of environmental activities (see Figure 5.1). The next section will therefore focus on LSP-shipper relationships and more specifically on *the level of greenness* in the cases studied, as one way to illustrate the extent to

which environmental activities are taken into account in relationships between LSPs and shippers.

5.3.2 LEVEL OF GREENNESS IN THE RELATIONSHIPS BETWEEN LSPS AND SHIPPERS

In the analysis of the level of greenness in the LSP-shipper relationships, four different parameters are taken into account. The first is the *number of environmental activities* found in the relationship between the actors involved. If one case is found to have a low number of environmental activities in the relationship and another has a higher number of activities, this indicates that the second case is greener than the first. The second parameter is closely linked to the discussion about the five gaps above and compares *the LSP's and the shipper's perception of environmental activities* included in the relationship. A *match* between the two actors' perception would increase the level of greenness in the relationship. The third parameter is linked to the *types of environmental activities* in the relationships and, more specifically, if they are simple or complex. This is directly linked to the results of RQ1a discussed in section 5.1, for which the simplicity and complexity of various environmental activities were discussed in relation to the classification of activities.

While the three parameters mentioned, which are closely linked to environmental activities as such, give some indication of the level of greenness in the cases, they do not give the whole picture. More specifically, the environmental activities illustrate the present state of a relationship to some extent, but do not take future goals into consideration. While some relationships may include a low level of environmental activities, they might work towards an increase of environmental focus in the relationships. It is suggested that this development is another important aspect of the level of greenness, and a final parameter is therefore the *environmental ambition* in the relationships. The level of greenness is, in this thesis, thus evaluated based on:

- number of environmental activities
- match or gap between perceptions of supply and demand in the relationship
- type of environmental activities (simple/complex) in the relationship
- environmental ambition of actors in the relationship

Paper V presents useful information for the analysis of environmental activities in the cases. In this paper, the environmental activities included in the relationships between the four LSP-shipper dyads were identified. The environmental activities included in the Clas Ohlson case with regard to LSP relationships were identified in section 5.1. Table 5.2 summarises the activities found in Paper V and, in addition, includes the environmental activities found in the Clas Ohlson case. It might be of relevance to know that the empirical material presented in relation to the following analysis is a sample from the richer case reports presented in Appendix II. The aim in this section is to briefly illustrate the cases, but for a more complete understanding of them the reader is referred to Appendix II as well as to Papers I and V. With Table 5.2 as the starting point, the level of greenness in the relationships in each of the cases will be commented on in turn.

TABLE 5.2. ENVIRONMENTAL ACTIVITIES IN THE FIVE CASES

ENVIRONMENTAL ACTIVITIES	Alltransport - Holmen	Alltransport - Onninen	DHL - SECO Tools	DHL - Ericsson	Clas Ohlson - LSPs
Brainstorm meetings between shipper and LSP(s)					X
Change in pick-up system			X		
Clean shipping project				X	
Continuous communication about environmental work				X	
Dyadic collaboration between two individuals			X		
Eco-driving project				X	
Emission reports			X	X	X
Environmental factors as part of all communication				X	
Environmental person at LSP			X		
Environmental project				X	
High fill-rates	X				
ISO 14001		X			
LSP tries to influence pattern of transport use				X	
Milk-round project				X	
Shipper on LSP's environmental board					X
Type of vehicles		X			X

THE ALLTRANSPORT-HOLMEN RELATIONSHIP

In the dyadic relationship between Alltransport and Holmen, *high fill-rates* is the only suggested environmental activity that is a part of the relationship. The case findings also indicate that the LSP and the shipper do not both perceive this as an environmental activity; this is merely the perception of the LSP. Nonetheless, the results of Paper I suggest that since high fill-rates are a part of the on-going relationship, it becomes more complex than had it just been a precondition for the business deal between the two actors.

Alltransport is an LSP with an environmental focus and has won an award for its sustainability report. The empirical data indicates that their environmental ambition for the relationship with Holmen is higher than the shipper's ambitions for the same. The following citation gives a clear view of Alltransport's perception of the shipper's environmental demand:

"I perceive that [Holmen's environmental demand] is non-existent."

(Mattias Bodin, business area manager, Alltransport)

THE ALLTRANSPORT-ONNINEN RELATIONSHIP

Two environmental activities are suggested as being a part of the relationship between Alltransport and Onninen: *ISO 14001* and *type of vehicles*. In contrast with Alltransport's relationship with Holmen, the LSP does not perceive any environmental activities in the relationship with Onninen. Instead, it is the shipper that views *ISO 14001* and *type of vehicles* as environmental activities in the relationship between themselves and Alltransport. Further, both environmental activities mentioned are suggested in Paper I as being a precondition for the business deal, which in turn suggests that they are of relatively simple character.

The fact that Alltransport does not mention any environmental activity does not necessarily mean that it does not have environmental ambitions for the relationship; it merely suggests the LSP's view of the relationship's current state. However, both Alltransport and Onninen predict that the environmental demands from Onninen will increase in the future, which suggests a somewhat higher environmental ambition than in the Alltransport-Holmen relationship. This, and the fact that there are two environmental activities in the relationship between Alltransport-Onninen (compared to one in the relationship between Alltransport and Holmen),

indicate that the level of greenness is marginally higher in this relationship than in the one described above.

THE DHL-SECO TOOLS RELATIONSHIP

The empirical results suggest that there are four environmental activities in the relationship between DHL and SECO Tools: *change in pick-up system*, *dyadic collaboration between two individuals*, *emission reports* and *environmental competence at LSP*. Because they are all relationship specific, it is suggested that all the activities belong to category 3 of the classification provided in Paper I. As a consequence, these environmental activities are relatively complex.

Further, the two actors appear to be in agreement to a much larger extent with regard to environmental activities in the relationship than the actors in the two Alltransport relationships. One reason for this is likely to be that one of the identified environmental activities is *dyadic collaboration between two individuals*, which ensures that both actors are involved in the environmental activities. The *change in pick-up system* at a distribution centre in Brussels is, in fact, a direct result of this collaboration. There are also two planned changes to the design of the logistics system in the DHL-SECO Tools relationship, but since they had not been performed at the time of the case study they are not regarded as actual environmental activities in this analysis. However, the plans for environmental improvement indicate that there is an environmental ambition in the relationship. Further, the empirical results indicate that this environmental ambition includes both companies in the relationship, as illustrated by the following citation:

"...since we know that they [SECO Tools] are open for such [environmental] argumentation, of course it helps our communication and our business relationship if we can prove ourselves to be inventive and help them reach their environmental targets."

(Lennart Wilén, customer relationships manager, DHL)

Compared to the two Alltransport relationships, it is suggested that the level of greenness is higher in the DHL-SECO Tools relationship. The reason for this can be found in all four of the parameters evaluated.

THE DHL-ERICSSON RELATIONSHIP

As can be seen in Table 5.2, eight environmental activities are proposed for inclusion in the relationship between DHL and Ericsson. Ericsson requires DHL to use only ships that are a part of the so-called *clean shipping* project, in which shipping companies can report their environmental impact. Further, DHL is required to conduct an *environmental project* each year, and the *eco-driving project* and the *milk-round project* are the direct results of this. The remaining environmental activities in this relationship are *continuous communication regarding environmental work*, *emission reports*, *environmental factors as part of all communication* and that the *LSP tries to influence patterns of transport use*. More details of these environmental activities can be found in section 5.7. For now, it is sufficient to note that the DHL-Ericsson relationship has the highest number of environmental activities included in the relationship of all the dyads compared. In addition, the perception of the environmental activities in the interaction on the part of both actors appears to correlate rather well. This indicates that DHL and Ericsson communicate well with regard to environmental work in the relationship. Further, many of the environmental activities are relationship-specific and, as suggested in section 5.1.1, this also means that they are relatively complex. The empirical results also indicate that both actors have a relatively high environmental ambition for the relationship. From DHL's perspective, it is believed that the two actors have achieved a great deal with regard to environmental work, and the LSP appears to be eager to continue this work:

“This is what is fun about this – there is enormous potential; there are no limits.”

(Juan Barrena, inbound & domestic development manager, DHL)

A comparison between the DHL-Ericsson relationship and the three previously analysed dyads suggests that the relationship between DHL and Ericsson is the greenest of the four. Compared to the DHL-SECO Tools case, the DHL-Ericsson case can be said to be on the same level with regard to the environmental ambition, but ahead with regard to environmental activities.

CLAS OHLSON’S RELATIONSHIPS WITH LSPS

As previously described in section 5.1, the empirical results suggest that two environmental activities are currently part of the relationships between Clas Ohlson and the LSPs the company uses: *vehicle technologies* and *emission data*. Both of these activities are treated as preconditions for the business deals with LSPs and therefore appear to be of relatively simple character.

Since the Clas Ohlson case merely reveals one side of the LSP-shipper relationship, it is not fruitful to compare the shipper’s opinion to the LSPs’ in the case. However, four environmental activities are found and Clas Ohlson’s relationships with LSPs therefore appear to be greener than the two Alltransport relationships. Environmental ambition in the relationships between Clas Ohlson and its LSPs is relatively high from Clas Ohlson’s perspective. One reason for this is that a new transport management function has recently been introduced, an assignment which includes a 30% reduction of CO₂ emissions by 2020. There are several projects in the pipeline for Clas Ohlson and some of its LSPs which aim to reduce the volume of goods transported by road and instead transport them by rail. The environmental ambition from the LSPs’ perspective can only be speculated on, since the case study only included Clas Ohlson. Clas Ohlson’s perception, however, is that the LSPs have not approached Clas Ohlson with any suggestions for environmental improvement, which could potentially indicate a low level of environmental ambition for this particular relationship.

Although the environmental ambition is relatively high, as stated by Clas Ohlson, the number of current environmental activities is relatively low and the activities themselves are relatively simple. It is suggested that while this results in the level of greenness being lower than for the two DHL cases, Clas Ohlson and its LSP-relationships have a higher level of greenness than the two Alltransport cases.

SUMMARY OF THE LEVEL OF GREENNESS

To summarise, the relationship between DHL and Ericsson appears to have the highest level of greenness out of the five studied cases in this thesis. Figure 5.3 illustrates the relative position of the cases along a “greenness-continuum”. Note that it is not the exact position of the relationships that are of importance, but rather the relative position when the cases are compared.

FIGURE 5.3. LEVEL OF GREENNESS IN THE LSP-SHIPPER RELATIONSHIPS

5.3.3 THE MARKET PERSPECTIVE VERSUS THE RELATIONSHIP PERSPECTIVE

The results from the relationship perspective of the LSP-shipper interface give a somewhat different view than the market perspective. While gaps were found for the latter, the relationships appear to match relatively well with regard to environmental activities offered and required. One reason for this could be that the LSPs' stated offering (as shown by the survey) is directed towards present as well as potential customers and has to fit a large variety of shippers. In relation to this, previous research suggests that the absence of environmental requirements from shippers might hinder LSPs' environmental work (Björklund, 2011; Isaksson, 2012). The findings here appear to support their result, in that LSPs with a broad environmental offer (for example Alltransport, see above) can have a relatively low level of greenness in their relationships with shippers. Thus, although the potential environmental activities of an LSP might be high, the relationship perspective illustrates that the shipper could inhibit the inclusion of such activities.

Further, the comparison of the survey and the cases propose that, in effect, all mismatches in both the survey and in the cases are positive (Lings and Brooks, 1998), suggesting that the LSPs could be ahead of their customers with regard to the green categories. Interestingly, the opposite situation, where a shipper demands more in terms of environmental activities than the shippers offer, was not found in any of the cases. Thus, the LSPs appear to be able to offer what the shippers demand. This result confirms the findings of Wolf and Seuring (2010), who also suggest that green supply from LSPs appears to exceed green demand from shippers. On a similar note, Colicchia et al. (2012) find that LSPs sometimes perceive a lack of commitment from customers, which is supported by the result of the survey, with its wide scope of shippers included. The results also appear to be coherent with the situation for the more general supply and demand, meaning without the environmental aspect taken into account. Indeed, Murphy and Poist (2000) find that LSPs offer more general services than the shippers are interested in, which also leads to a positive gap in the general service context.

The discussion above implies that in order to fulfil the demands of *one* environmentally conscious shipper, the LSPs could potentially offer the environmental activities to *all* its customers. If the LSP is willing to fulfil the environmental demands, this would mean that the service quality would actually need to be too high compared to the average shipper's demands. Large and König (2009) argue that this leads to a waste of resources that could be used better elsewhere. However, one could question whether it is possible to offer all environmental activities to all shippers. More specifically, while some environmental activities are the result of a specific relationship and might be included in a general offering, others might only be of relevance for the specific relationship. One example of the latter is the brainstorming meetings identified in the Clas Ohlson case. Although this environmental activity could have an impact on the specific relationship, it is not as likely to be a part of the general offering (see also section 5.1.1).

Despite the situation described above, there appears to be some frustration in the DHL-Ericsson case, as well as in the Clas Ohlson case, over why the LSPs do not suggest environmental improvements without the shippers asking for it. This is not the same as an LSP not being able to supply the shipper with what it demands. Instead it appears to imply that the LSPs do not take their own initiatives in the relationships studied. In the Clas Ohlson case for example, no LSP has approached Clas Ohlson with an environmental improvement suggestion, a fact which Clas Ohlson finds frustrating:

"This is exactly the reason why we have our meetings every three months."

(Peter Bergestål, transport manager, Clas Ohlson)

There thus appear to be contradicting results when the market perspective is viewed against a relationship perspective of the LSPs and shippers. The situation implies that LSPs in general

take a passive role in the greening of LSP-shipper relationships. The passiveness of LSPs has also been identified in other contexts (see for example Andersson et al., 2007) and is thus coherent with previous research into LSPs. One possible reason for the passiveness of the LSPs could be the power balances in the relationships. More specifically, a potential power advantage on the part of shippers could inhibit the LSPs' probability of initiating additional environmental activities in their relationships with shippers. This potential link will be discussed further in the following section.

5.4 THE EXTENT OF ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS IN GENERAL

While the preceding section specifically focused on LSP-shipper relationships, this section deals with RQ2b, in which supply chain relationships in general are in focus. However, the extent to which environmental activities are included in such relationships is not entirely easy to address directly based on the empirical material in this thesis. However, if a wider scope of activities is included, such as those addressed by a code of conduct in the Clas Ohlson case, the findings are of interest for discussion. In order for this discussion to make sense, some details of Clas Ohlson's CSR work is in order (for a more extensive description of this work, please see Case report II in Appendix II). The code of conduct is the same for, and must be followed by, all Clas Ohlson suppliers. Further, Clas Ohlson evaluates the suppliers based on the six chapters in the code of conduct. The CSR team visits the suppliers and grades them for each of the areas in the code. The suppliers then receive a colour code. The same procedure is followed for the Asian suppliers and all direct imports made in Asia. If Clas Ohlson sees the need to evaluate European suppliers as well, a third party conducts the evaluation. As a result of the evaluation and grading of suppliers, the empirical data indicates that Clas Ohlson knows the extent to which each supplier complies with the code.

If the procedure regarding the code of conduct for physical goods suppliers is compared to that of environmental activities of the LSP, there are considerable differences. For one, the demands from the shipper are very clearly stated in the code of conduct. Non-compliance with the code is not tolerated and if the supplier does not improve, it will cease to be a supplier for Clas Ohlson. Based on the findings from the Clas Ohlson case, the same clear limits do not appear to exist for LSPs with regard to environmental activities. Although Clas Ohlson does evaluate the LSPs based on environmental criteria prior to the business deal, only a limited and seemingly random evaluation of the compliance of demands appears to be conducted during the relationships. This is similar to the findings of Björklund and Forslund (2013b), who note that retailers do not evaluate LSPs' compliance in terms of environmental activities included in the contract.

In relation to this, it is of relevance to note that the physical goods suppliers are evaluated by Clas Ohlson's dedicated CSR team in Shanghai, whereas the LSPs are evaluated by a limited number of individuals who are involved in the procurement process of logistics services. This is likely to be one of the reasons for the large differences between the two types of supply chain relationships. Another possible reason could be related to the purpose of measuring which is identified in Paper II, as well as by for example Björklund and Forslund (2013a), as important for environmental performance measurements. One could perhaps wonder if there are different purposes of measuring with regard to compliance with environmental and/or social requirements in relationships between LSPs and shipper from those between shippers and physical goods suppliers. Schiebel and Pöchtrager (2003) for example list a number of reasons why CSR is conducted by companies and one of these include minimising risks that could be the result of misconduct in the supply chain. For example, misconduct such as child labour could possibly damage a company's reputation. A shipper's reputation does not, on the other hand, appear to be at risk to the same extent if LSPs fail to comply with environmental requirements. Reasons for this are beyond the scope of this thesis, but could be an interesting area to focus on in future research.

It can be questioned whether shippers should aim to evaluate LSPs based on environmental activities in the same way as they evaluate physical-goods supplier based on compliance with the code of conduct. However, if a shipper wants to work towards a decrease in environmental impact from logistics through its relationship with LSPs, it could be beneficial to learn from the evaluation conducted with regard to the code of conduct. In order to enable better evaluation of LSPs, one possible way would be to let all LSPs be evaluated by the environmental department, as opposed to the CSR organisation for the code of conduct. This would require more resources to be devoted by the shipper company, but also enable better evaluation of LSPs. The suggestion is likely to be one of many possible suggestions for how to improve the evaluation of LSPs and further research is needed in order to gain an increased understanding of this as well as other possibilities.

The above discussion is to a large extent focused on *evaluation* of suppliers, whether they are suppliers of physical goods or of logistics services. This perspective is one that can be taken in order to green logistics through relationships with suppliers. Compared to the analysis of environmental activities in 5.1, the environmental (or social) activities included in the code of conduct would most likely belong to category 2. To some extent they would also belong to category 3, but only because they are evaluated during the on-going relationships. This is in contrast to most of the environmental activities identified for category 3 for LSP-shipper relationships, which are relationship-specific and addressed in a more pro-active way in the on-going relationships. Based on this, and depending on the ambition of the CSR work of the shipper, it could be suggested that the CSR activities in relationships between shippers and their physical goods suppliers can be extended and other types identified if inspired by the environmental activities in category 3 in Figure 5.1.

5.5 THE INFLUENCE OF POWER BALANCES ON ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

This section aims to answer the first part of third research question of this thesis, which addresses *how the power balance between actors can influence the extent to which environmental activities are included in relationships between logistics service providers and shippers*. Since this research question addresses relationships between LSPs and shippers, there is a need to understand the power balance in such relationships. As described in section 3.6, the power balances are evaluated based on an analysis of power bases in the relationships covered by the two case studies. The four LSP-shipper dyads are analysed first, followed by Clas Ohlson's relationships with LSPs. After that, the power balances in the LSP-shipper relationships are discussed in relation to environmental activities in them.

5.5.1 POWER BALANCES IN THE LSP-SHIPPER RELATIONSHIPS

This section focuses on the power balance in the relationships between LSPs and shippers found in the two case studies conducted for this thesis. The results of the subsequent analysis give a relatively unanimous picture of the power balances in LSP-shipper relationships: *the shipper has the power advantage in its relationships with LSPs in the cases studied*. The following sections go through the analysis behind this conclusion and illustrate why the results point in this direction. The first paragraph(s) of each sub-section aims to give a general picture of the power balance for each case, whereas the remaining parts of the sub-sections deal with the power bases of the separate companies in each case. The analysis of power bases then leads to a suggested power balance.

THE ALLTRANSPORT-HOLMEN RELATIONSHIP

Holmen has been a customer of Alltransport for so many years that no one at either company seems to know the exact length of the relationship. Deals are renewed at regular intervals, and although the number of tons that Alltransport transports varies, the company has always had some business with Holmen. The duration of the contracts between Alltransport and Holmen is

usually two to three years, and varies according to Holmen’s situation. If Holmen knows major changes are being planned within their company, they do not want to sign deals with Alltransport that are longer than two years. Alltransport, on the other hand, endeavours to make the contracts last as long as possible.

The above paragraph helps to illustrate the power balance in the Alltransport-Holmen case. Although they have done business together for many years, Holmen controls the length of contracts and keeps them short. At the same time, Alltransport would gladly sign longer contracts, but are, to a large extent, in the hands of the shipper. In order to understand the situation better, the power bases in this relationship will be analysed (see Figure 5.4. for an overview).

FIGURE 5.4. POWER BASES IN THE ALLTRANSPORT-HOLMEN RELATIONSHIP

In the Alltransport-Holmen relationship, Holmen represents 20% of Alltransport’s turnover. In comparison, Alltransport represents about 5% of transport costs for Holmen. Holmen Paper’s logistics director believes that Holmen is the stronger actor since they are a major part of Alltransport’s business.

“If they [Alltransport] didn’t have Holmen, then they wouldn’t be able to have as many vehicles as they have. We, on the other hand, would find someone else.”

(Bo Wibrén, logistics director, Holmen)

Although Alltransport’s business does not rely completely on Holmen being a customer, the *relative size of the business deal* does appear to be one basis of power in favour of Holmen. In addition, the citation above indicates that Holmen could replace Alltransport as a service provider. Even though Holmen appears to be satisfied with the Alltransport relationship and a change of LSP seems unlikely due to their long relationship, the fact that *“there are a lot of trucks”*, as the logistics director puts it, provides Holmen with a power advantage. More specifically, the *resource scarcity* of LSPs able to perform the same tasks as Alltransport appears to be low.

Holmen uses many different LSPs, and because Holmen does not usually work with the largest players, many of them are very small. In the current situation in Sweden, DHL, Schenker and other companies of that size are too large to provide the service needed in combination with reasonable costs. In line with the reasoning of Simpson et al. (2007), one possible conclusion that can be drawn from this situation is that *the relative size* of Holmen compared to the LSPs is another basis of power that Holmen possesses.

An additional power basis can be identified for Holmen in this specific relationship, and that is the *supply chain position*. Holmen is the buying company in this specific relationship and there is no evidence in the case material to contradict what has been suggested by Kähkönen and Lintukangas (2010), namely that the buyer has power over the supplier.

In terms of environmental work in the relationship, Alltransport claims to have competence within this area. This is, however, not something that is recognised by Holmen Paper. In addition, Holmen does not believe that the small LSP that Holmen works with has either the

knowledge or the capacity to make, for example, emission calculations. Thus, *the potential expert power* that Alltransport possesses is not recognised by Holmen Paper, which eliminates it as a power basis in this relationship.

To conclude, the empirical data do not point to any power bases for Alltransport in their relationship with Holmen. Since Holmen, on the other hand, appears to have a number of power bases in the relationship, the shipper appears to have the power advantage in this case.

THE ALLTRANSPORT-ONNINEN RELATIONSHIP

The Alltransport-Onninen relationship differs slightly from the Alltransport-Holmen relationship, at least according to Alltransport, which is the common actor in the two cases. Regarding the power balance, Alltransport's business area manager puts it like this:

"In the end it is the customer that has the advantage since they own the goods, but this [Onninen relationship] has worked a little differently than with Holmen. Holmen is a little old-fashioned, if that's the right word. You meet the purchasing director once a year and you have a meeting where you go through the contract. Onninen is a bit more modern. We meet on a regular basis; sales personnel and transport leaders and their operative personnel meet and we've brought our drivers to some meetings to talk about ideas and how we can improve and the importance of doing things properly. So in my view, Onninen has a more modern set-up."

(Mattias Bodin, business area manager, Alltransport)

According to Alltransport's business area manager, the two companies are jointly responsible for the success of their relationship:

"So, I think that our power [over Onninen] is pretty high, in spite of everything."

(Mattias Bodin, business area manager, Alltransport)

Even though one of the Onninen representatives is convinced that Onninen has the power, the power situation in this case appears to be a little different to the Alltransport-Holmen case. The next step is to understand the power bases of Alltransport and/or Onninen in order to see if they can illustrate these differences. Figure 5.5 gives an overview of this analysis.

FIGURE 5.5. POWER BASES IN THE ALLTRANSPORT-ONNINEN RELATIONSHIP

Onninen represents about 3% of Alltransport's turnover, which makes them an average customer for the company, or *"a good medium-sized customer"* as the business area manager for Alltransport puts it. As for Onninen, Alltransport represents around 4.5% of total transport costs. Thus, the relative size of business deal is not very large for either of the two companies. *The supply chain position*, on the other hand, appears to be one basis of power in the relationship. Onninen is the customer in the relationship, a factor which is often a basis of power in business relationships (Kähkönen and Lintukangas, 2010). This is also confirmed by Onninen:

"After all, we are the ones who are in charge of whether or not we want them [Alltransport] to transport [goods]; they are not the ones who decide if they want to transport our goods."

(Johan Grönkvist, transport coordinator, Onninen)

Closely related to this is also the *level of resource scarcity* of the services that Alltransport conducts for Onninen. According to the case material, Onninen can change transport supplier if Alltransport does not do a good job, which implies that Onninen has other options. Thus, the *level of resource scarcity* of LSPs is *low* in this specific relationship.

The relationship between Alltransport and Onninen is, to a large extent, based on personal connections. Alltransport's salesperson and Onninen's transport manager knew each other before the deal between the two companies was made, and the salesperson at Alltransport says:

"We have a very good relationship since I already knew John [Lind, at Onninen] from the transport business. ... We have a business-like relationship, but a good one."

(Tommy Gustafsson, sales person, Alltransport)

The transport manager has made it clear that the salesperson is the person he wants as his contact person in Onninen's relationship with Alltransport and that he has confidence in his competence:

"I know that Tommy Gustafsson [the salesperson] will fix this [Onninen's transport needs and problems that arise]."

(John Lind, transport manager, Onninen)

The salesperson at Alltransport is thus an important element of the relationship for Onninen. It is therefore suggested that he is an important resource that is desired by Onninen, and this is potentially a basis of *expert power* for Alltransport.

To conclude, the power balance appears to be in favour of Onninen, due to the supply chain position and the fact that there are several LSPs who could provide logistics services for Onninen. However, Alltransport has an important resource in the sales person, who is highly valued by the shipper.

THE DHL – SECO TOOLS RELATIONSHIP

In the relationship between DHL and SECO Tools, the power balance is rather difficult to pin down. The respondents' own views on the power situation give an unclear picture, since both actors to some extent see the other actor as the more powerful. However, there seems to be a good relationship between the two companies and power does not appear to be of significant importance. This is illustrated by the following citation from SECO Tools' global transport solutions manager:

"I might be naive in a Swedish way, but I would say that there is a good balance of power. Now we touch on things like personal chemistry, deep respect for people who have worked professionally with things for many years. There is maybe not always respect between SECO Tools AB and DHL Global Forwarding Sweden AB or DHL Express Sweden AB, but on a personal level I would have to say that there is a very good balance."

(Bengt Brammefors, global transport solutions manager, SECO Tools)

The suggested balance of power is further confirmed by the way in which the contracts are dealt with in the relationship. DHL and SECO Tools have continuous contracts, where no end-date is set and where price adjustments are negotiated once a year. If either DHL or SECO Tools are dissatisfied, there are varying terms of notice depending on the specific situation.

In order to understand more about the nature of the power situation in the DHL-SECO Tools case, an analysis of the power bases in the relationship is in order (see Figure 5.6 for an overview). SECO Tools is an important customer for DHL, and is sometimes the fourth or fifth largest customer for DHL Global Forwarding (DGF). DHL transports in total around 30% of SECO Tools' volumes, through both DHL Global Forwarding and DHL Express. The situation implies that the companies are of mutual importance and neither holds power based on the relative size of the business deal.

FIGURE 5.6. POWER BASES IN THE DHL-SECO TOOLS RELATIONSHIP

As in the previous cases, the *supply chain position* appears to be a basis of power in the relationship. DHL's customer relationship manager (CRM) is, for example, convinced that SECO Tools is the more powerful actor in the relationship and simply says:

"The customer is always right."

(Lennart Wilén, customer relationship manager, DHL)

On the other hand, SECO Tools' global transport solutions manager believes that DHL has more power because of their size:

"if you look at it strictly in business terms, we are small fry for DHL since a local office for them might well be as large as we [SECO Tools] are globally."

(Bengt Brammefors, global transport solutions manager, SECO Tools)

Thus, DHL (the whole company, not just DGF) appears to have a power advantage because of their *relative size* in the relationship. On the other hand, SECO Tools has a power advantage because they can change LSPs if they are not pleased with DHL, as implied by the following citation:

"If DHL does not have the best balance between price, lead time and accuracy and can show environmental data that is correct, well, then they won't get the deal."

(Bengt Brammefors, global transport solutions manager, SECO Tools)

Since SECO Tools has the option, and the possibility, to switch service providers, it appears as though *resource scarcity* of LSPs is relatively low, just as in the previous two cases. In this case, this appears to provide a power basis for SECO Tools and a power disadvantage for DHL.

Yet another possible power basis in the DHL-SECO Tools relationship is that of the environmental manager at DHL. For SECO Tools, many of the DHL services performed are not standard products. For this reason, the environmental manager at DHL has had to work hard to provide SECO Tools with the data they require. The global transport solutions manager believes that DHL has an advantage because of the work that the environmental manager conducts:

"The specific supplier, no matter who, that has Linda [Bergsten] as their environmental manager, has an advantage over the others. I have never met a person more devoted to environmental issues."

(Bengt Brammefors, global transport solutions manager, SECO Tools)

The citation above implies that SECO Tools regards the environmental competence of the environmental manager at DHL as an important element of the environmental work in the relationship. The environmental competence can therefore be said to be a basis of power for DHL; and, more specifically, she gives DHL *expert power*.

To summarise, both actors could be said to be in possession of power bases in this specific relationship. In the case of DHL, this is due to their *relative size* and their *environmental competence*, whereas SECO Tools has an advantage because of their *supply chain position*. In addition, both companies are important for each other in terms of the *relative sizes of the business deals*, which implies that they are interdependent (Cox et al., 2002). The power balance therefore appears to be relatively equal in this particular relationship, even though there is a slight tilt towards a power advantage for SECO Tools, given that they have the possibility to change LSP.

THE DHL-ERICSSON RELATIONSHIP

Just as in the Alltransport-Holmen case, the contracts can help to illustrate the power balance in the DHL-Ericsson relationship. On a global level, contracts between Ericsson and DHL do not have an expiry date. These so-called sales agreements enable regional and local Ericsson divisions to negotiate more detailed agreements that suit the local conditions. The local contracts in Sweden have a duration period of one year and constitute an extension to the global sales agreement. From the perspective of DHL, this is unfortunate; since DHL and Ericsson continuously work with improvements in the relationship, the negotiations disturb and interfere with that work. The following quote illustrates this situation:

“That [negotiations] is not where focus should be right now.”

(Juan Barrena, inbound & domestic development manager, DHL)

DHL’s share of Ericsson’s transportation can change during negotiations. The inbound & domestic development manager says that DHL has lost shares with regard to Ericsson’s export flows, whereas inbound flow shares keep growing.

Based on the information above, it appears as though Ericsson is the stronger actor in this particular relationship, as the company sets the rules for contract periods and decides how much of their logistics services to buy from DHL. An analysis of the power bases in the relationship follows here (see Figure 5.7 for an overview), in order to understand more about the nature of power in this relationship.

FIGURE 5.7. POWER BASES IN THE DHL-ERICSSON RELATIONSHIP

DHL handles around 20% of the inbound flows at Ericsson, which corresponds to MSEK 150. Ericsson is a major customer of DHL and is also the most expansive within DHL Global Forwarding (DGF). DGF does not merely provide sea and air freight, but also has control tower operations, which mean that they function as support for the logistics department at Ericsson. DHL is also one of five transporters that take care of Ericsson’s outbound flows. Thus, Ericsson is an important customer for DHL with regard to relative size of business deal, and the same appears to be true for DHL’s share of Ericsson’s logistics operations.

One basis of power for Ericsson is potentially the *size of the company*; although DHL is a large company, Ericsson is even larger. Compared with the Swedish part of DHL Global Forwarding, Ericsson has a turnover which is about 60 times higher (MSEK 207,000 compared to MSEK 3,200). Moreover, *resource scarcity* of logistics services is likely to be *low* in this case, just as in the other three cases. The fact that Ericsson uses five different LSPs for their outbound logistics implies that there are other actors that could take care of logistics operations if Ericsson decided to switch from DHL.

Finally, the environmental manager at DHL is a potential basis of power for DHL, just as she appeared to be in the DHL-SECO Tools case. However, the case material in the DHL-Ericsson relationship does not imply that the environmental manager is an important part of the environmental work conducted in the relationship and she is therefore not considered to provide a power basis for DHL in this specific relationship.

To summarise, only Ericsson is found to have power bases in this particular relationship, which gives the shipper the power advantage. DHL does, however, appear to have some countervailing power due to the fact that the two companies appear to be interdependent (Cox et al., 2002) because of the relative importance of the business deal for both companies.

CLAS OHLSON'S RELATIONSHIPS WITH LSPs

The Clas Ohlson case is somewhat different from the dyads analysed above. Instead of specific relationships from a dyadic perspective, it illustrates one shipper's view of several LSP relationships. That also means that there is potentially more than one type of power situation in the various relationships that Clas Ohlson has with LSPs. From Clas Ohlson's perspective, however, they have power over the various LSPs:

"Well, I can demand anything I want from them [the LSPs] in a procurement process. I can tell them: 'I want every millilitre of the fuel you use to be biofuels of some sort.' But the line must be drawn somewhere, because the higher the demands I make, the more expensive it will be. But they would definitely do it."

(Peter Bergestål, transport manager, Clas Ohlson)

This said, the power bases in the various LSP-relationships are of interest, in order to understand what the perceived power advantage consists of (see Figure 5.8 for an overview). First of all, the citation above indicates that the *supply chain position* is one basis of power for Clas Ohlson – their position in the supply chain as a buying company effectively gives them the freedom to demand whatever they want.

FIGURE 5.8. POWER BASES IN CLAS OHLSON'S RELATIONSHIPS WITH LSPs

During a procurement process, a number of LSPs are considered as potential suppliers of inbound logistics services for Clas Ohlson. The most recent procurement process regarding sea freight involved around eight LSPs, although more could have been included:

"Naturally there are even more, but we have to limit the selection somehow in order to make a decision."

(Maria Ax, manager, Import Department, Clas Ohlson)

The situation is similar for the other modes of transport and geographical locations - many LSPs are interested in becoming a logistics provider for Clas Ohlson. Usually, however, only a limited number of LSPs are able to handle large portions of Clas Ohlson's goods flow. Clas Ohlson essentially finds the right type of logistics solution for them on the logistics market. It appears that this has never resulted in a compromise where Clas Ohlson has had to give up some requirements in order to find a logistics provider.

The fact that many LSPs are interested in becoming a service provider for Clas Ohlson implies that one of Clas Ohlson's power bases in relation to LSPs is *referent power*, meaning that the LSPs see a value in being connected to Clas Ohlson (French and Raven, 1959). In addition, the fact that Clas Ohlson usually has more than one LSP who can deliver the service they require implies that they can find other LSPs if necessary, and thus that the *resource scarcity* is low with regard to LSPs.

In some relationships, Clas Ohlson is a large customer of the LSPs they work with, and thereby possesses power in terms of *relative size of the business deal*. This would enable Clas Ohlson to influence suppliers so that they improve environmentally:

"I actually think we have a possibility to influence quite a bit. We are starting to become such a big player now and we have large volumes as well, which makes us an interesting customer, first of all. So from that perspective I absolutely believe that we have a possibility to influence."

(Maria Ax, manager, Import Department, Clas Ohlson)

In the reasoning above, several power bases in favour of Clas Ohlson have been identified. It is also possible to identify power bases that favour the LSPs in their relation to Clas Ohlson. One example of this can be found in Clas Ohlson's relationships with their present LSPs, in which the same LSPs have been hired for both inbound and outbound logistics for a long time (with a few exceptions). The transport manager states that the current LSPs have an advantage over competitors since they already know what Clas Ohlson needs. He explains:

"If they [the prices] are about the same, it is probably very easy to choose the current [provider] - you know what you're getting."

(Peter Bergestål, transport manager, Clas Ohlson)

The manager of the import department shares the same view:

"The reason for this [the long relationships] is that we are very pleased with their work. The service has simply been very good and with regard to prices...the differences are marginal. So it has really been a question of reliability, in a manner of speaking."

(Maria Ax, manager, Import Department, Clas Ohlson)

In terms of power basis, the LSPs appear to have *expert power* in this situation based on their extensive knowledge about Clas Ohlson's logistical needs.

To summarise, the analysis above points to a power advantage for Clas Ohlson with regard to the shipper's power balance in relationships with LSPs. It should be noted that the analysis only takes the shipper's perspective and there is a possibility that an additional perspective from the LSP would suggest another result. With this said, it is interesting to note that the analysis above indicates that Clas Ohlson in general views its LSP relationships in the same way. More specifically, the company does not appear to distinguish between different LSPs when factors such as "ability to affect LSPs" are discussed. Because of this, only one type of power balance is suggested in relation to Clas Ohlson and its relationships with LSPs.

SUMMARY OF THE POWER BALANCES IN THE CASES

The power balances in all the relationships studied for the purpose of this thesis appear to be in favour of the shippers. Further, it is suggested that all the shippers are in possession of at least one power basis because of their supply chain position. Regarding the LSPs, some are found to have no power bases in the specific relationships analysed, whereas those who appear to be in possession of power bases in the relationships could be said to have expert power of some sort and/or have a relatively large company in comparison with the shipper.

Even though the power balance in most cases analysed above appears to be in favour of the shipper, the nature of the power situation in the relationship varies among the five cases. The following section aims to analyse how the power balance in LSP-shipper relationships can influence the inclusion of environmental activities in these relationships

5.5.2 THE ROLE OF POWER BALANCES FOR ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPs AND SHIPPERS

In section 5.3.2, the five empirical cases were discussed in relation to their level of greenness, which was evaluated based on four parameters. It was found that for some relationships there was a strong correlation between the involved LSP and shipper regarding environmental ambition. This appeared to be the case for the relationship between DHL and SECO Tools as well as for that between DHL and Ericsson. Other relationships were instead found to illustrate divergent views of environmental ambition, as was the case for both Alltransport and Holmen, and Alltransport and Onninen. In both these cases, the empirical results pointed to a higher environmental ambition for the LSP than for the shippers. Despite this ambition on the part of the LSP, the number of environmental activities was relatively low in these relationships. This indicates that the environmental content in the relationship is highly influenced by the shipper. Even in the two relationships where the results suggest corresponding environmental ambition, the shippers exert the main influence over the environmental content.

The Clas Ohlson case further illustrates this link between the shippers' environmental ambition and the environmental content of the relationship. The Clas Ohlson case depicts several LSP relationships, as opposed to the four dyadic LSP-shipper cases. The level of greenness (see section 5.3.2) appears to be similar in most, if not all, Clas Ohlson's LSP-shipper relationships. In the dyadic cases, on the other hand, there are some differences in terms of environmental activities in the different relationships for the same LSP. While this finding is based on Clas Ohlson's perception of environmental activities in its relationships with LSPs, it still indicates that it is the shippers who decide upon the environmental activities in these relationships. One possible reason for the suggested link between environmental ambition of the shipper and the environmental activities in an LSP-shipper relationship is the power dynamics of such relationships. The empirical results point to a general situation where shippers are the ones with the most power in their relationships with LSPs. It is therefore suggested that in an LSP-shipper relationship with a power advantage for the shipper, the shipper's environmental ambitions for logistics sets the agenda for the environmental activities in that relationship.

5.5.3 POWER BASES AS A MEANS TOWARDS A HIGHER LEVEL OF GREENNESS

In terms of power bases identified in the five cases, the empirical data provide deeper insight into two of them in relation to environmental activities in LSP-shipper relationships. More specifically, expert power and resource scarcity are identified as being relevant for further discussion in the following sections.

EXPERT POWER AND LEVEL OF GREENNESS

When environmental competence is recognised by the shipper as a positive aspect of an LSP-shipper relationship, this could give the LSP a power basis. This was suggested to be the case in the DHL-SECO Tools relationship in the analysis above. In the DHL-Ericsson relationship, on the

other hand, the environmental manager at DHL is the same person, but the expert power is not perceived as power by the shipper, which in turn makes it a “non-power-basis” (Hunt and Nevin, 1974). The environmental competence that the environmental manager possesses can thus be used to some extent by LSPs as countervailing power in LSP-shipper relationships. The power balance in the relationships does, however, appear to affect the extent to which this countervailing power basis is actually countervailing. Another parameter that is likely to affect the potential for environmental competence as expert power is the environmental ambition of the shipper. Without any such environmental ambition, the results indicate that it is unlikely that the shipper regards environmental competence as a countervailing basis of power.

In the wider context of sustainable supply chains, Touboul et al. (2012) suggest that the power balance between supply chain actors needs to be re-evaluated when sustainability is added to the general relationship. The findings with regards to expert power somewhat contradict this view, in that it appears as though it is *only if* the shipper has a relatively high environmental (or sustainable) ambition that there is a need for re-assessment of the balance of power in the relationship. However, given such an ambition from the shipper, the research in this thesis supports the findings of Touboul et al. (2012) in that expert power might be one way to alter the power balance in LSP-shipper relationships.

RESOURCE SCARCITY AND THE LEVEL OF GREENNESS

The power basis of resource scarcity stands out as a non-issue in the LSP-shipper relationships discussed above. In all cases it appears as though the shippers will find other LSPs should they want or need to. Even though the four dyad cases illustrate this, the situation is even clearer in the Clas Ohlson case. There it is evident that there are many LSPs who can offer the services that Clas Ohlson needs, even though the shipper at the time of the case study appears to be pleased with the currently hired LSPs. The high level of competition is commonly described as one key characteristic of the supply side of the logistics market (see for example Lieb and Butner, 2007; Liu et al., 2010), this is not a surprising finding from this research.

The cases do, however, illustrate the current state of the LSP-shipper relationships that they represent. This could mean that even though resource scarcity is not an issue for shippers today, it might be in the future. First, it can be important to clarify that resource scarcity as analysed thus far in this thesis refers to LSPs as such, which means that if there is a large number of LSPs on the market, then resource scarcity is low. As put forward in the frame of reference, resource scarcity could also mean specific resources that an actor possesses. No such resource scarcity has been identified in the LSP-shipper relationships analysed in this thesis. This could be because of the fact that the LSPs studied provide rather general logistics services and that the shippers' goods do not require any special solutions. It might, however, be possible that resources that can in some way be included as or in environmental activities could become a vital resource for LSPs to use as countervailing power in the future. In comparison with the study of Touboul et al. (2012), the resources in terms of knowledge of the suppliers (not LSPs) are mentioned as important from the buying companies' perspective, confirming the potential countervailing power suggested here.

5.6 THE INFLUENCE OF POWER BALANCES ON ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS IN GENERAL

In this section, RQ3b is addressed. To recall, it focuses on how the power balance between actors can influence the extent to which environmental activities are included in supply chain relationships in general. Based on the empirical data of this thesis, there are several results that are of interest for further discussion. Starting with the Clas Ohlson case, it reveals an interesting connection between the power balance between the shipper and physical goods suppliers on the one hand, and Clas Ohlson's relationships with LSPs on the other. In some cases, such as when Clas Ohlson buys products from very large companies, the suppliers might say “If you

want to buy from us, we will handle the delivery". Another alternative is that these large companies offer to transport the products via their contract of affreightment, since they have negotiated lower prices from LSPs. In these cases Clas Ohlson is a small company relative to the physical goods suppliers. Implicitly, this hinders Clas Ohlson's involvement in the transports and thus the company's ability to affect environmental content of the LSP-relationship. Then again, Clas Ohlson does not explicitly have a relationship with these LSPs, since the physical goods suppliers are the ones that have relationships with the LSPs. Clas Ohlson would, however, like all products to be transported through their own contract of affreightments, in order to have more control over the LSPs that are used. The example illustrates how power balances in supply chain relationships in general can influence the extent to which environmental activities can be included in LSP-shipper relationships. In relation to this example from Clas Ohlson, it can be of interest to note that when analysing LSP-shipper relationships, Bask (2001) identifies a triad that consists of a three actors: a buyer, a seller and an LSP. According to Bask (2001), the LSP can have a relationship with both the buyer and the seller, but more commonly only has a relationship with one of these actors. Although beyond the scope of this thesis, an avenue for future research could be to widen the scope of actors that might have an impact on environmental activities in LSP-shipper relationships.

In relation to power balances between supply chain actors, the findings of Paper III are also of interest. In the paper, dependencies between actors are analysed in the context of city logistics projects. In accordance with Emerson (1962), one actor's dependence on a second actor in a relationship is equal to the second actor's power over the first. Thus, dependencies between supply chain actors are very closely linked to the power balance in those relationships and, therefore, also closely related to the analysis in the preceding section. One of the major findings of Paper III suggests that in city logistics projects, the authorities, which are often the project initiators, are dependent on the willingness of one or more actors to participate. One example of this was found in the city of Toulouse, where one project aimed at implementing a new freight delivery regulation. There had been one previous attempt at a city logistics project, namely an urban distribution centre, but due to resistance from small LSPs the project was abandoned.

In relation to the discussion about LSPs in the preceding sections about power, it is particularly interesting that it was a number of small LSPs who opposed the first freight delivery plan in the example above. In the types of LSP-shipper relationships analysed above, the LSPs appeared to have a power disadvantage and, therefore, have difficulties in influencing the inclusion of environmental activities in the relationships. Here, on the other hand, we see a situation in which LSPs – and small LSPs at that – appear to be able to influence to a large extent. Similarly to the findings of Kogg (2003), the results indicate that small companies can indeed influence larger supply chain actors. However, while the paper by Kogg (2003) focuses on a single shipper that manages to influence its supply chain despite its assumed power disadvantage, the example of the LSPs in Toulouse includes several LSPs. Following this, it could be questioned whether the freight delivery plan would have been a failure if only one small LSP had been against it. Further, it could also be questioned if the situation would be different if one large LSP could have achieved the same results as the group of small LSPs. In accordance with the logic of Galbraith (1980), it is possible for several actors to work together in order to gain countervailing power. It is suggested here that in the specific context of city logistics, small LSPs can have a power advantage over the authorities as long as they act as a unified group. This situation differs from LSP-shipper relationships, in which there are more clearly two actors in the relationship and it is perhaps not possible to the same extent to form groups of LSPs to gain countervailing power.

It is also of interest to address another example discussed in Paper III in this thesis. The example, which is also from the city of Toulouse, includes the postal company Chronopost, which wanted to present itself as an environmentally aware company through a change in its

delivery operations. At the same time, the city of Toulouse wanted to show the benefits of more environmentally friendly deliveries in the city centre to other LSPs. The city dedicated premises in the city centre to Chronopost's operations. These were used as micro terminals by Chronopost, who made the deliveries from there using three electrical vehicles, one CNG vehicle and two electrically self-propelled vehicles that were steered by a walking delivery person.

The example illustrates another situation in which the local authorities are dependent on another actor in order to include environmental activities in city logistics projects. This situation is, however, somewhat different from the one described above in which the group of small LSPs opposed a freight delivery plan. One difference lies in the fact that in this latter example, the local authorities found a way to build a more balanced power relationship, through offering resources that are attractive (in this case making premises available). This can be compared to the use of countervailing power, as suggested by Galbraith (1980). Thus, by offering attractive resources, local authorities may be able to promote more environmental activities at the same time as business opportunities for LSPs increase. As a result of this, LSPs can actually benefit from the relationships with the local authorities. However, the extent to which there is communication between the two types of actors in a city logistics context can be questioned, and the results of Lindholm (2012) point, in fact, to a lack of both knowledge and communication from the local authorities' perspective. As the Chronopost example is only one example of a situation where local authorities and LSPs can truly benefit from each other in a city logistics context, an avenue for future research could be to investigate other ways in which similar or alternative synergy effects could be achieved. Such a study would preferably also include not only the beneficial solutions, but also an understanding of how the actors might actually reach these solutions. In line with the research of Lindholm (2012), one possible way to investigate this could be through various coordination mechanisms (called mechanisms by Lindholm). The next section focuses on coordination mechanisms in play for environmental activities in LSP-shipper relationships, after which such mechanisms will be discussed in the context of general supply chain relationships.

5.7 COORDINATION OF ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPS AND SHIPPERS

This section aims to answer the first part of the fourth research question of this thesis, which is concerned with how environmental activities can be coordinated in LSP-shipper relationships. An analysis of the coordination of environmental activities in the four LSP-shipper relationships (Case report I in Appendix II) was conducted in Paper V. The results from that paper serve as the major empirical input for the subsequent analysis. The environmental activities suggested for coordination in Paper V largely follow the environmental activities identified in Paper I for the LSP-shipper relationships. It might, however, be of interest to know that they do not match completely, since Paper I and Paper V have somewhat different perspectives and Paper V takes a more explicit relationship view. Further, the Clas Ohlson case provides a complementary picture of how environmental activities can be coordinated in LSP-shipper relationships when RQ4a is addressed.

Table 5.3 below shows the various environmental activities in the LSP-shipper relationships of the cases and the according coordination mechanisms. In order to facilitate the following analysis, the table has been adjusted from Paper V in two ways: firstly, the specific environmental activities in each case have been categorised following the general environmental activities presented in section 5.1 (as well as Paper I); secondly, the environmental activities found in Clas Ohlson's LSP-relationships are included in the table and will be presented in further detail in the analysis below.

The analysis takes its starting point in the environmental activities identified in the LSP-shipper relationships in the cases. The activities are then matched with Glouberman and Mintzberg's (2001) coordination mechanisms (*mutual adjustment, supervision, standardisation of work*

standardisation of output, standardisation of skills and knowledge and standardisation of norms) in order to see if they are in play in the specific situations and if so, which of them is or are in play. In Table 5.3, the environmental activities from the Clas Ohlson case are linked to certain coordination mechanisms. More details as to why the different activities are linked to the coordination mechanisms can be found in the analysis below.

TABLE 5.3. COORDINATION MECHANISMS FOR ENVIRONMENTAL ACTIVITIES IN EACH OF THE CASES

ENVIRONMENTAL ACTIVITIES	COORDINATION MECHANISMS					
	Mutual adjustment	Direct supervision	Standardisation of work	Standardisation of outputs	Standardisation of skills and knowledge	Standardisation of norms
Vehicle technologies						
• Type of vehicles		AT-O CO				
• Clean shipping project		DHL-E				
Transport management						
• Change in pick-up system			DHL-ST			
• High fill-rates		AT-H		AT-H		
• Decrease of trucks run empty		AT-H				
• Milk-round project			DHL-E			
Behavioural aspects						
• Eco-driving project			DHL-E			
• LSP tries to influence pattern of transport use			DHL-E			
• Environmental factors as part of all communication			DHL-E			
Environmental management systems						
• ISO 14001		AT-O				
Emission reports						
• Emission reports		CO DHL-E DHL-ST	DHL-E	DHL-E DHL-ST		
Other						
• Continuous communication about environmental work						DHL-E
• Environmental competence at LSP					DHL-ST	
• Environmental project		DHL-E				
Environmental meetings						
• Dyadic collaboration between two individuals	DHL-ST				DHL-ST	DHL-ST
• Shipper on LSP's environmental board						CO
• Brainstorm meetings between shipper and LSP(s)	CO					

Abbreviations: AT: Alltransport; H: Holmen; O: Onninen; ST: SECO Tools; E: Ericsson; CO: Clas Ohlson

As can be seen in Table 5.3, it appears that all six of Glouberman and Mintzberg's (2001) suggested coordination mechanisms are applied for the coordination of environmental activities in the studied LSP-shipper relationships. Moreover, it was possible to classify all the suggested environmental activities into one or more of the six categories. This has implications for how environmental activities can be managed in LSP-shipper relationships in at least two ways: firstly, taking a starting point in the type of coordination mechanism can help understand how they can be applied for different types of environmental activities; secondly, taking a starting point in the different types of environmental activities can help increase the understanding of how they can be coordinated (see Figure 2.5). The next two sections (5.7.1 and 5.7.2) focus on the first of these issues, whereas the following two sections (5.7.3 and 5.7.4) focus on the latter issue.

5.7.1 ANALYSIS BASED ON TYPE OF COORDINATION MECHANISM

The first part of the analysis addresses the ubiquity (Malone et al., 1999) of the coordination mechanisms in the LSP-shipper relationships that the cases include. Ubiquity refers to the fact that the same coordination mechanisms can be found in the coordination of more than one type of environmental activity (see Figure 5.9). As can be seen in Table 5.3, all of Mintzberg’s (1989) coordination mechanisms can be found for more than one type of environmental activity. Each of the mechanisms will be discussed in turn below and the section ends with a concluding discussion on the coordination mechanisms.

FIGURE 5.9. UBIQUITY OF COORDINATION MECHANISMS

MUTUAL ADJUSTMENT

To recall, mutual adjustment refers to when individuals or groups of people adapt to each other in their work progress. Despite the notion that mutual adjustment is the most direct form of coordination (Glouberman and Mintzberg, 2001), a limited number of environmental activities coordinated through this mechanism are found in the cases (see Table 5.4). In Paper V, the one example found illustrates when people in both companies of one specific LSP-shipper relationship communicate extensively with regard to a variety of environmental activities, such as changes in distribution.

TABLE 5.4. ENVIRONMENTAL ACTIVITIES COORDINATED THROUGH MUTUAL ADJUSTMENT

Coordination mechanism: Mutual adjustment	
Environmental activity	Case(s)
Dyadic collaboration between two individuals	DHL-SECO Tools
Brainstorm meetings between shipper and LSP(s)	Clas Ohlson

The Clas Ohlson case provides another example where mutual adjustment appears to be in play. In 2008, Clas Ohlson took the initiative to hold brainstorming meetings with their transport providers during the current contract period:

“We brought all of our transport providers at the time to us and we had brainstorm meetings, more or less, in which we left no stone unturned in our efforts to find environmental improvements, or financial and environmental improvements.”

(Per Hedberg, environment coordinator, Clas Ohlson)

One of the suggestions that came up during these brainstorming meetings was to increase the volume of goods that went by train from Europe to Insjön. At the time, some of the goods transported from Europe were already being transported by train, but Clas Ohlson and Schenker, who was (and still is) the transport provider for European goods flows, saw potential for transporting additional goods by train. For various reasons, no additional activities were conducted after these brainstorm meetings, but they show similarities with the dyadic collaboration in the DHL-SECO Tools case. In both situations, LSPs and shippers jointly try to come up with solutions in an attempt to decrease their environmental impact.

Further, both examples of mutual adjustment found in the cases illustrate the directness and the informality of the coordination that is attributed the mechanism of mutual adjustment by Glouberman and Mintzberg (2001): people communicate with each other openly and apparently without bias in order to find solutions. Further, according to Glouberman and Mintzberg (2001), mutual adjustment occurs between individuals or groups of people. The results indicate that mutual adjustment with regard to environmental activities in the LSP-shipper relationships studied tends to happen between individuals. The example from the DHL-SECO Tools case is a clear example of this, where the coordination mechanism is found between two specific individuals. In the Clas Ohlson case, however, although more people are involved, it is still individual persons who adapt to each other.

Moreover, mutual adjustment often takes place in either very simple or very complex situations (Glouberman and Mintzberg, 2001). The situations in which mutual adjustment is found to take place in the cases studied appear to be rather complex; the people who adapt to each other do so when they try to come up with new ideas for environmental activities in the specific LSP-shipper relationships.

While mutual adjustment is considered to be a direct form of coordination (Glouberman and Mintzberg, 2001), it has been found for a low number of environmental activities in the cases. The results indicate that this coordination mechanism holds large potential for the development of environmental activities. More specifically, mutual adjustment appears to be a way of “thinking outside the box” and generating environmental activities that would not have been identified without this coordination mechanism.

DIRECT SUPERVISION

When direct supervision is in play, someone has given directives to another person or group of people who, in turn, perform the work. Unlike mutual adjustment, direct supervision was found in paper V for several different types of environmental activities, as shown in Table 5.5. The Clas Ohlson case confirms two of the environmental activities that appear to have been coordinated by *supervision* in that Clas Ohlson places demands on LSPs in the negotiation process. These demands include what *type of engines* the LSP's trucks should use, which is related to *type of vehicles* as labelled in Paper V, and that the LSPs should be able to *report their emissions*, similar to two of the LSP-shipper dyads.

As expressed by Glouberman and Mintzberg (2001), direct supervision means that the responsibility for coordination lies with someone who does not actually perform the work, but instead gives directives to other actors. While all the environmental activities that appear to be coordinated through this mechanism fit into this description, the type of work that is delegated differs somewhat between the activities in that it is either performed by the LSP prior to the actual business deal, or conducted during the on-going relationship.

TABLE 5.5. ENVIRONMENTAL ACTIVITIES COORDINATED THROUGH DIRECT SUPERVISION

Coordination mechanism: Direct supervision	
Environmental activity	Case(s)
Clean shipping project	DHL-Ericsson
Emission reports	DHL-SECO Tools DHL-Ericsson Clas Ohlson
Environmental project	DHL-Ericsson
High fill-rates	Alltransport-Holmen
ISO 14001	Alltransport-Onninen
Type of vehicles	Alltransport-Onninen Clas Ohlson

One example is *environmental management systems*, such as ISO 14001. This type of direct supervision does not in fact mean that the shipper gives the LSP directives *during* their

relationship but rather *before* the relationship can start. ISO 14001 is thus an example of coordination through direct supervision where the actual work by the LSP is conducted prior to the relationship. The environmental activity *type of vehicles* illustrates a similar situation if the shipper demands, prior to the relationship, that the LSP has a specific type of vehicles. If the LSP already has the requested type of vehicle, then the shipper is satisfied and the LSP does not need to do anything extra. If not, however, the LSP has the option of acquiring the right type of vehicles for this specific relationship, which would most likely mean that the vehicles need to be in place when the actual relationship starts. Hence, the direct supervision would appear to result in work by the LSP mainly prior to the relationship.

High fill-rates, on the other hand, is one example of an environmental activity that needs to be fulfilled during the relationship between an LSP and a shipper, as it is linked to the flow of goods in the on-going relationship. The *Clean Shipping Project*, *emissions report* and *environmental project* are also environmental activities that need to be conducted by the LSPs during the actual relationships with shippers.

In the frame of reference, *communication*, suggested by Arshinder et al. (2008), appeared to be a more concrete example of a coordination mechanism than the more generic mechanism of *direct supervision*. As anticipated in the frame of reference, all the environmental activities coordinated through *direct supervision* are easy to communicate. This would be in line with, for example, Wolf and Seuring (2010), who suggest that “*compliance with some very basic requirements seems to be mostly a ‘hygienic’ factor or minimum requirement*” (p. 52). Indeed, most of the environmental activities found to be coordinated through *direct supervision* would fit well into this description.

However, two of the environmental activities are somewhat different with regard to this. One is the environmental project that is a requirement from the shipper in the DHL-Ericsson case. While the *environmental project* as such is, like the others, easy to communicate, it leads to other, more relationship-specific environmental projects. This is thus an example where the coordination mechanism *direct supervision* can be used as a means to encourage other environmental activities in an LSP-shipper relationship. The other environmental activity that deserves to be mentioned is the *emission reports*. Although the requirement for such reports is easy to communicate as such, the two DHL cases indicate that there are difficulties in how these reports should be conducted and what they should contain. In these two cases, the *emission reports* have led to additional types of coordination, as can be seen in Table 5.3. Further discussion about this is given in section 5.7.3.

Interestingly, direct supervision appears to be one-sided in the LSP-shipper relationships, in that it is the shippers who place demands on the LSPs and not the other way around. Potentially, this could be an effect of the power advantage shippers possess, as discussed in section 5.5. This is in line with the reasoning of Glouberman and Mintzberg (2001), who from an intra-organisational perspective suggest that direct supervision is issued by people with a high level of authority. In a similar manner, the power advantage held by shippers in inter-organisational LSP-shipper relationships are here suggested to lead to the possibility for shippers to issue direct supervision.

Further, the empirical results indicate that from a shipper perspective, direct supervision is a coordination mechanism that appears to be relatively easy to use in order to include environmental activities in the relationships with LSPs. This can have both positive and negative effects. On the one hand, an easy-to-use coordination mechanism can help to simplify the process of including environmental activities in the relationships between LSP and shippers. On the other hand, it is possible to question the actual outcome of some of the environmental activities that are initiated through direct supervision, in line with the citation of Wolf and Seuring (2010) above. The Clas Ohlson case illustrates this point; while the company is aware

that their demand for EUR3 engines is relatively low, they can communicate to stakeholders that they place environmental requirements on LSPs.

STANDARDISATION OF WORK

Standardisation of work is another of the coordination mechanisms that was found for a number of environmental activities in the analysis of the separate cases and which thus illustrates ubiquity (Malone et al., 1999). As Table 5.6 depicts, several environmental activities appear to be coordinated through standardisation of work. Interestingly, with the exception of one environmental activity coordinated through *standardisation of work*, all the activities are conducted in the DHL-Ericsson relationship.

TABLE 5.6. ENVIRONMENTAL ACTIVITIES COORDINATED THROUGH STANDARDISATION OF WORK

Coordination mechanism: Standardisation of work	
Environmental activity	Case(s)
Change in pick-up system	DHL-SECO Tools
Eco-driving project	DHL-Ericsson
Emission reports	DHL-Ericsson
Environmental factors as part of all communication	DHL-Ericsson
LSP tries to influence pattern of transport use	DHL-Ericsson
Milk-round project	DHL-Ericsson

According to Glouberman and Mintzberg (2001), *standardisation of work* involves specified procedures for the work to be done and refers to the assembly procedure in a car factory, where all the steps are likely to be predefined. Looking at the environmental activities coordinated through *standardisation of work*, the procedures they involve are specified to various levels. The *milk-round project* is one example where procedures are specified in detail, as described in the following citation from the DHL-Ericsson relationship where they have:

"implemented a system where a truck arrives at 10 a.m. If there is nothing on the loading platform, the truck leaves at 10.30 a.m., period. There is no time to wait [for goods to arrive], because it comes back again at 2 p.m. and leaves at 2.30 p.m. So, it goes in loops like that."

(Linda Bergsten, environmental manager, DHL)

The *eco-driving project* conducted in the DHL-Ericsson relationship is another example where the procedures are specified in detail, as the point of eco-driving is that the trucks are driven in a specific, efficient manner. The *emission reports* in the DHL-Ericsson relationship are also standardised and follow a specific format, and are reported each month to the shipper.

The procedures involved in the environmental activity *environmental factors as part of all communication* is not specified in as much detail as for the example above. More specifically, Ericsson has encouraged their employees to ask for the environmental dimension, as well as cost and lead time, when they deal with DHL. Simultaneously, Ericsson has tried to persuade DHL to include environmental impact in every such report automatically, even though the shipper might not have asked for it. As the situation described implies, the wish to make the environmental factor a part of all communication has merely started and there do not yet appear to be clear specified procedures for this activity. However, this is an activity that could have the potential to become a standardised procedure that must be followed in most of the communication between DHL and Ericsson.

Finally, one environmental activity that appears to be coordinated through standardisation of work is where the DHL tries to *influence the patterns of transport use* of Ericsson. More specifically, much of the environmental work for DHL is focused on making Ericsson understand that it is not necessary to use, as they do in one case, seventeen different transporters in a delivery from A to B. Although this activity appears to be coordinated through *standardisation of*

work, it does not appear to involve any standardised procedures. The activity could instead be seen as an attempt to standardise the behaviour of the shipper with regard to transport use, so that fewer transports are needed.

Several of the identified environmental activities coordinated through *standardisation of work* appear to be related to traditional logistics activities, such as *transport management*, but with an environmental twist. Many of the activities are thus considered to be advantageous from a financial perspective as well, in line with Oglethorpe and Heron (2010) who find that there is often no conflict between financial and environmental benefits in these cases.

Further, several of the activities have the potential to actually decrease environmental impact, as opposed to, for example, some of the environmental activities coordinated through *direct supervision* which appear to be little more than order-qualifiers that were not addressed further in the relationships.

STANDARDISATION OF OUTPUTS

As shown in Table 5.7, *standardisation of output* was found as a coordination mechanism for two environmental activities. To recall, this coordination mechanism is achieved by standardisation of the results or consequences of the work (Glouberman and Mintzberg, 2001). *Emission reports* were used as a way to standardise the type of environmental indicator (CO₂) of interest in the DHL-SECO Tools and the DHL-Ericsson relationships. As already noted in section 2.3, CO₂ emissions are a common way to measure environmental performance in logistics (see for example Paper II and Wolf and Seuring, 2010). *High fill-rates* were mentioned in the Alltransport-Holmen case, in part as a way to lower environmental impact (LSP’s view). This environmental activity is, however, closely related to traditional logistics activities, and this is also how it is perceived by Holmen.

Further, Glouberman and Mintzberg’s (2001) example of coordination through standardisation of output referred to a specified quantity of a product that was to be produced by one individual during one day. The two environmental activities that appear to be coordinated through standardisation of output do have similarities with this example, but are still somewhat different. They are similar in that they, just as a specific quantity of products, represent a measurement to work towards. However, a precise quantity of products is a more precise target to reach for than, for example, *high fill-rates*, as in the Alltransport-Holmen relationship. Even less precise is the target of CO₂ emissions in the two DHL-shipper relationships, where the case material indicates that the green performance measurement of importance in the relationships is CO₂ emissions, although the case material does not reveal any specific targets for these emissions. Thus, since no specific target is set for the CO₂ emissions, it could be difficult to work towards a common goal, or to evaluate based on this. Given that previous research has identified the importance of environmental goal-setting in inter-organisational relationships (Vachon and Klassen, 2008), it is somewhat surprising that more precise goals are not set in the LSP-shipper relationships.

TABLE 5.7. ENVIRONMENTAL ACTIVITIES COORDINATED THROUGH STANDARDISATION OF OUTPUTS

Coordination mechanism: Standardisation of outputs	
Environmental activity	Case(s)
Emission reports	DHL-SECO Tools DHL-Ericsson
High fill-rates	Alltransport-Holmen

STANDARDISATION OF SKILLS AND KNOWLEDGE

The environmental activities that are found to be coordinated through *standardisation of skills and knowledge* are, for natural reasons, related to people. Two examples are found (Table 5.8): one that is linked to one specific person - the environmental manager at DHL - and one that is

linked to the two people who have close collaboration in which environmental factors are included (the DHL-SECO Tools relationship).

TABLE 5.8. ENVIRONMENTAL ACTIVITIES COORDINATED THROUGH STANDARDISATION OF SKILLS AND KNOWLEDGE

Coordination mechanism: Standardisation of skills and knowledge	
Environmental activity	Case(s)
Dyadic collaboration between two individuals	DHL-SECO Tools
Environmental person at LSP	DHL-SECO Tools

According to Glouberman and Mintzberg (2001), standardisation of skills and knowledge means that people are trained to know exactly what to expect from each other and thereby coordinate almost automatically. A suggested analogy was the manner in which a surgeon and an anaesthetist automatically adapt to each other during an operation. One of the environmental activities could almost be said to resemble the situation in the operating room: the dyadic collaboration between the Customer Relationship Manager (CRM) at DHL and the global transport solutions manager at SECO Tools. These two individuals have a good dialogue about environmental work and know what to expect from each other in these situations. One limitation of the dyadic collaboration is that it is focused on two specific people. This could be the case in the operating room as well, but a more likely scenario is that the surgeon, for example, could also work successfully with other anaesthetists, since they have all learned how to work in an operating room.

The other environmental activity that appears to be coordinated through standardisation of skills and knowledge – *environmental competence at LSP* – is a little different from the dyadic collaboration. More specifically, with regard to the environmental manager in the DHL-SECO Tools, more people can benefit from knowing her skills and thereby knowing who to turn to with questions regarding environmental issues.

STANDARDISATION OF NORMS

Finally, standardisation of norms was found as a coordination mechanism for two related types of environmental activities in Paper V (see Table 5.9). In the DHL-SECO Tools case, the specific collaboration between two individuals leads to the standardisation of norms in that specific relationship, whereas the environmental activity in the DHL-Ericsson relationship aims to spread the information about environmental work to different shipper sites.

TABLE 5.9. ENVIRONMENTAL ACTIVITIES COORDINATED THROUGH STANDARDISATION OF NORMS

Coordination mechanism: Standardisation of norms	
Environmental activity	Case(s)
Continuous communication about environmental work	DHL-Ericsson
Dyadic collaboration between two individuals	DHL-SECO Tools
Shipper on LSP's environmental board	Clas Ohlson

The Clas Ohlson case provides another example of an environmental activity for which standardisation of norms is potentially in play: one representative from Clas Ohlson was a member of an *environmental board of one of the LSPs* that they worked with for several years. The board was formed on the transport provider's initiative and included around five other customers of the LSP. Participation on the board was considered a good way to hear about trends and developments within environmental logistics, such as clean shipping, acidification and which projects Geodis-Wilson should support with their environmental fund. Although some ideas were brought back to Insjön, no projects reached the implementation stage at Clas Ohlson.

To recall, *standardisation of norms* occurs through socialisation, which in turn creates common norms and values so that people work toward the same expectations (Glouberman and Mintzberg, 2001). Both the examples of this coordination mechanism given in the frame of reference (monks in religious orders or workers in Japanese corporations) refer to groups of

people. The environmental activities that are found in this thesis to be coordinated through *standardisation of norms* do not all fit into the same description. The two collaborating individuals in the DHL-SECO Tools case appear to have created norms of some kind and thereby have certain environmental expectations that they work towards. The empirical data indicates that the relationship between the Customer Relationship Manager (CRM) at DHL and the global transport solutions manager at SECO Tools is a very important element of the relationship between DHL and SECO Tools (on a company level), especially in terms of environmental focus. Therefore, the norms that these two people create together could potentially also affect the other people involved in the DHL-SECO Tools relationship. The environmental activity found in the Clas Ohlson case also has limitations as it does not necessarily mean that groups of people in the specific relationships share the same norms. However, offering the shippers the opportunity to sit on the environmental board, makes it more likely that the LSP and the shipper will share the same values with regard to environmental work. However, even though the board might have led to a *standardisation of norms* between the participating person from Clas Ohlson and Geodis-Wilson, the information does not appear to have made an impact at Clas Ohlson as such, given that no environmental activities took place as a result of the board.

The environmental activity that is closest to the examples given by Glouberman and Mintzberg (2001) is the one found in the DHL-Ericsson case. In that relationship, many enquiries of general information from different shipper divisions come to the LSP, and normally the LSP gets back to the shipper division and reports cost and lead-time for the changes. Internally, Ericsson has encouraged their employees to ask for the environmental dimension, as well as cost and lead time, when they deal with DHL. Simultaneously, Ericsson has tried to persuade DHL to include environmental impact in every such report automatically, even though the shipper might not have asked for it. This environmental activity appears to have been initiated for the very purpose of ensuring common norms for environmental work, so that employees at Ericsson will be influenced to consider environmental impact more than has previously been done.

Even though the environmental activity found in the DHL-Ericsson relationship appears to be the one that is most similar to the situation of standardisation of norms as suggested by Glouberman and Mintzberg (2001), it is suggested here that the other two environmental activities may also contribute to the standardisation of norms in the specific relationships.

In a case where the shipper only has one person engaged in environmental issues, as appears to have been the case some years ago at Clas Ohlson, there is perhaps not even a need for more people at the shipper to learn about the environmental discussion from the environmental board. That, however, also sets limits for the environmental work in the relationship between the LSP and the shipper, since one person only can do so much. An interesting question that arises here is whether the norms to be standardised in order for a more successful environmental LSP-shipper relationship are in fact norms in the actual relationship (for example between two individuals in the Geodis-Wilson-Clas Ohlson relationship) or norms that need to reach further into the two companies and affect more people than just one in each company. Linked to this is the matter of intra- versus inter-organisational environmental activities. As a result of their study, Colicchia et al. (2013) note that intra-organisational environmental activities of LSPs often are positively related to inter-organisational ones. This is also supported by Andersson et al. (2007), who find the same relation but in a context where environmental improvements are not the focus. Thus, intra-organisational norms with regard to environmental beliefs might be a prerequisite for standardising norms on an LSP-shipper relationship level. This is an area that will not be elaborated on further in this thesis, but might be an avenue for further research.

5.7.2 DIFFERENT ROLES FOR DIFFERENT COORDINATION MECHANISMS

The above analysis suggests some differences in the types of coordination mechanism that are interesting to discuss further. Judging by name, there are four mechanisms that refer to

standardisation while two of them do not. The results indicate that the two latter mechanisms, i.e. *mutual adjustment* and *direct supervision*, are coordination mechanisms that can be *chosen* to be applied in relationships between LSPs and shippers. The choice to use, for example, direct supervision then leads to environmental activities of different types, according to the cases.

Contrary to the above situation, the four coordination mechanisms that refer to *standardisation* of some sort instead appear to be a result of the environmental activity. Among the activities included in transport management, for example, two have in common the fact that they are coordinated through standardisation of work, i.e. it is hoped that conducting the activities in the standardised way will have less environmental impact than before these activities were conducted.

The most prominent examples of initiatives of environmental activities from LSPs would appear to be a result of either the *environmental project*, which is a result of *direct supervision*, or *mutual adjustment*. Both of these situations deserve further attention. The *environmental project* is a way for a shipper to ensure that an LSP conducts some type of environmental activity for their specific relationship. In its simplest form, the demand for an *environmental project* is coordinated through *direct supervision*, but the project could then lead to other types of environmental activities initiated by the LSP. The identified environmental activities that have arisen as a result of the *environmental project* appear to be closely connected to the logistics skills of the LSP, which suggests that this type of direct supervision leads to a better use of LSPs' competence than appears to be usual in LSP-shipper relationships. Indeed, Makukha and Gray (2004) find that shippers are often reluctant to believe in LSPs' capabilities. Introducing an *environmental project* as a part of the contract could therefore be a first step towards taking advantage of the knowledge that LSPs have within efficient logistics solutions.

Mutual adjustment appears, in this case, to be another way to include LSPs' knowledge of environmental logistics into the relationships between LSPs and shipper. It thus appears that shippers can take a starting point in this coordination mechanism and attempt to apply it in its relationships with LSPs. The empirical evidence from the cases in this thesis indicates that this could be done through different types of meetings between several people, or collaboration between a limited number of people in a specific LSP-shipper relationship. The purpose of both of these types of interaction between LSPs and shippers is simply to generate ideas for environmental activities in the relationship.

Further, compared to the environmental project described above, *mutual adjustment* could potentially be an even more powerful way of generating new environmental activities in the relationships between LSPs and shippers. The reason for this is that while the environmental project is assigned to the LSPs, *mutual adjustment* means that both LSPs and shippers work together to come up with solutions. This provides opportunities to address issues that the LSP otherwise has little control over, such as the location of warehouses (see for example Wolf and Seuring, 2010). Although not implemented at the time of the empirical data collection, the DHL-SECO Tools case illustrates two examples of when *mutual adjustment* can lead to a plan for changes in the design of the logistics system. It is suggested here that this would have been a less likely outcome if the LSP had been focused on an environmental project demanded by the shipper.

A comparison between direct supervision and mutual adjustment suggests that the former is relatively easy to initiate and, according to the empirical results, requires little involvement on the part of the shippers. Mutual adjustment, on the other hand, requires the involvement of both actors. In relation to this, the findings of Fabbe-Costes et al. (2009) are of interest. In the context of supply chain integration (SCI), they suggest two ways in which an LSP can be perceived by the shipper, namely as "*a pro-active SCI facilitator, or merely a tool to be used by others, i.e. a more passive adaptive role*" (p. 84). The decision of whether to apply direct supervision or mutual adjustment appears to be related to such a shipper view, meaning that 1) it is the

shipper who decides which coordination mechanism to use and 2) the shipper's perception of the LSP could potentially affect the decision. The limited examples of mutual adjustment found in the research for this thesis might be related to the findings of Makukha and Gray (2004), who find that shippers often regard LSPs as providers of resources rather than facilitators.

5.7.3 ANALYSIS BASED ON TYPE OF ENVIRONMENTAL ACTIVITY

This part of the analysis addresses the variability of coordination mechanisms in relation to environmental activities (see Figure 5.10). This means that the analysis takes its starting point in the various environmental activities in order to see if they can be coordinated through more than one mechanism.

FIGURE 5.10. VARIABILITY OF COORDIANTION MECHANISMS

As can be seen in Table 5.3, the empirical results suggest that some of the environmental activities can be coordinated through more than one coordination mechanism (i.e. variability according to Malone et al., 1999). The analysis of environmental activities provided by Paper I provides useful input to this analysis. An extract from Table 5.3 is provided in Table 5.10 below and depicts the environmental activities that appear to be coordinated through more than one coordination mechanism.

TABLE 5.10. ENVIRONMENTAL ACTIVITIES IDENTIFIED TO BE COORDINATED THROUGH MORE THAN ONE MECHANISM

ENVIRONMENTAL ACTIVITIES	COORDINATION MECHANISMS					
	Mutual adjustment	Direct supervision	Standardisation of work	Standardisation of outputs	Standardisation of skills and knowledge	Standardisation of norms
Transport management						
• Change in pick-up system			DHL-ST			
• High fill-rates		AT-H		AT-H		
• Decrease of trucks run empty		AT-H				
• Milk-round project			DHL-E			
Environmental meetings						
• Dyadic collaboration between two individuals	DHL-ST				DHL-ST	DHL-ST
• Shipper on LSP's environmental board						CO
• Brainstorm meetings between shipper and LSP(s)	CO					
Other						
• Emission reports		CO DHL-E DHL-ST	DHL-E	DHL-E DHL-ST		

Abbreviations: AT: Alltransport; H: Holmen; O: Onninen; ST: SECO Tools; E: Ericsson; CO: Clas Ohlson

TRANSPORT MANAGEMENT

The empirical results indicate that the general environmental activity transport management can be coordinated through several coordination mechanisms. Notably, it could be said that in general, the environmental activities within transport management are first initiated through one coordination mechanism and then executed through another. *Direct supervision* appears to be the initiating coordination mechanism, either directly or through the *environmental project* (not included in Table 5.10 because it appears to be another environmental activity). In the execution phase, the environmental activities within transport management are then coordinated through either *standardisation of output* or *standardisation of work*. This latter phase is considered to be the more interesting for further discussion. Because of the two different stages of the coordination of transport management, one can question whether this actually refers to variability in the same sense that Malone et al. (1999) have in mind, which means having a variety of coordination mechanisms to choose from for one environmental activity. That is, while the choice of *standardisation of output* or *standardisation of work* offer two different ways in which to coordinate similar environmental activities, the *direct supervision* merely initiates the activity.

ENVIRONMENTAL MEETINGS

The environmental meetings are very different in character from transport management discussed above. Unlike transport management, they appear to be initiated through *mutual adjustment*. They then appear to have a potential to *lead to standardisation of skills and knowledge* as well as *standardisation of norms* in accordance with the empirical data. The discussion here is very closely linked to the discussion about mutual adjustment in 5.7.2 and will not be elaborated on further here.

EMISSION REPORTS

Finally, the empirical results suggest that emission reports can be coordinated in several ways. A common factor for three of the cases is that emission reports are coordinated through *direct supervision*, as one way for the actors in the relationship to know that emissions are measured in some way. It appears in the cases that the performance measurement of interest in the relationships is CO₂ emissions, which corresponds to the findings in previous research (see McKinnon, 2010; Wolf and Seuring, 2010). Moreover, it appears as though *direct supervision* of emissions can lead to a specification of an environmental *output* that the relationship can work towards. On the other hand, it could be a specification of output that leads to the output needing to be monitored and thus resulting in additional coordination through direct supervision to make sure the output is monitored.

Just as the majority of the other activities that appear to be coordinated through *direct supervision*, emission reports as such are easy to communicate in an LSP-shipper relationship. Emissions are, however, not entirely easy to measure (McKinnon and Piecyk, 2009). By merely coordinating through *direct supervision*, it could be argued that the shippers simply receive a “tick in the box” because they have measured emissions in some way. By also coordinating through *standardisation of output*, it can be argued that the emission reports are taken to the next level, so that there is a goal with that environmental work in an LSP-relationship. In relation to this, one of the cases (the DHL-Ericsson relationship) is also found to coordinate emission reports through *standardisation of work*, in that they require that standardised reports follow a specific format. Even though Clas Ohlson was only found to have coordinated emission reports through *direct supervision*, the company has in fact tried to take emission reports one step further. During the last procurement process, the transport manager collaborated with the environment coordinator with regard to the environmental demands they should place on potential transport providers. They wanted to demand more specific environmental data from the providers, but as has already been mentioned, this is difficult:

".../we tried to improve the quality of the environmental reports, or the environmental data. /.../ We are in a situation where the environmental data is based on broad generalisations. /.../ So we have tried to see if it is possible to include that as a demand in a procurement process – that the transport provider should show data which is more or less specific for Clas Ohlson, to the extent that that is possible.

(Per Hedberg, environment coordinator, Clas Ohlson)

The Clas Ohlson case illustrates the complexity that shippers may encounter when they want to measure the environmental impact from their transports. The citation above indicates that Clas Ohlson wants to go further than merely coordinating *emission reports* through *direct supervision*, but that they do not know how to go about it. The DHL-SECO Tools relationship exemplifies a situation where the LSP helps the shipper to understand what is of relevance to measure. Previously, SECO Tools was interested in the exact fill-rate of a plane on one specific day and exactly how much their portion of the freight weighed. Now they focus more on an average fill-rate that seems to be accurate enough over time:

"It will never be completely accurate. I think that was an extremely important lesson learnt when we sat down with Linda [Bergsten, environmental manager at DHL] for a whole day. She actually helped us analyse our own material, and I think that is done well."

(Bengt Brammefors, global transport solution manager, SECO Tools)

Emission reports as an environmental activity can thus be coordinated in several ways. The Clas Ohlson case points to the difficulty in measuring emissions, as the company has thought about demanding Clas Ohlson-specific data but has chosen not to because of the uncertainty of the numbers.

5.7.4 ENVIRONMENTAL ACTIVITIES COORDINATED IN A VARIETY OF WAYS

The above discussion highlights that some environmental activities can be coordinated in a number of ways. A question that arises is whether it is better to coordinate one environmental activity in any particular way. A complete answer to that question would require an evaluation of environmental performance and is beyond the scope of this thesis. However, in relation to the question, it is possible to identify three different categories from the findings discussed above:

- 1) Environmental activities for which the coordination mechanism(s) can be chosen by the shipper and for which a small number of mechanisms is sufficient for the success of the activities. This would appear to be the situation for transport management, for which all identified environmental activities have a target to reduce the need for transports in different, but similar, ways. These environmental activities appear to have to be initiated through direct supervision, either directly or through an environmental project. Whether it is then decided that they will be coordinated through standardisation of work or standardisation of outcome does not appear to be of major significance. Rather, what is important is that some coordination mechanism is chosen so that transport management is conducted.
- 2) Environmental activities for which the coordination mechanism(s) can be chosen by the shipper and for which additional coordination mechanisms improve the environmental work in the relationship. According to the empirical findings, emissions data is one such example. While direct supervision appears to be the first step towards including this activity, additional coordination mechanisms increase the focus of emissions in the LSP-shipper relationship. While transport management in category 1 appears to be the focus of the LSP (see for example Colicchia et al., 2013), the environmental activities in category 2 appear to have an impact on the relationship between an LSP and a shipper.

- 3) The environmental activities for which coordination mechanisms appear to be a result of the activity. Based on the results of the empirical data, *environmental meetings* appear to be such an environmental activity. Although the initiation of the meetings might be a result of *mutual adjustment* (see also 5.7.2), *standardisation of skills and knowledge* as well as *standardisation of norms* would appear to be a result of them. For this type of activity, the direct environmental impact might be zero, while it has the potential to result in other types of environmental activities which, in turn, have a potential to reduce environmental impact.

The presented types of environmental activities in relation to coordination mechanisms end this section on coordination of environmental activities in LSP-shipper relationships. The next step of the analysis is to discuss coordination of environmental activities in supply chain relationships in general.

5.8 COORDINATION OF ENVIRONMENTAL ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS IN GENERAL

This section addresses RQ4b, which is concerned with how environmental activities can be coordinated in supply chain relationships in general. In the context of city logistics, some findings with regard to coordination mechanisms deserve further discussion. This makes it necessary to go back to two examples of failed city logistics projects presented in Paper III. One of these has already been described in section 5.6, where a group of small LSPs opposed an urban distribution centre proposed by the local authorities in Toulouse. The idea of the distribution centre was abandoned as a result of the resistance. In the city of Burgos, an attempt was made to solve problems of noise, congestion and pollution. A large number of different actors opposed the plan to such an extent that it also had to be abandoned. Given that the actors in the examples were clearly against the project plans made by the local authorities, it could be argued that *direct supervision* was the coordination mechanism used by local authorities in order to initiate the projects. However, as opposed to the situation in LSP-shipper relationships, direct supervision does not appear to be an effective mechanism to use in a city logistics context. One reason for this could be the possibility of countervailing power of groups of actors (Galbraith, 1980), unlike in the dyadic relationships for LSPs and shippers (see also section 5.6).

The results in Paper III instead indicate that *mutual adjustment* is a coordination mechanism that has greater potential in a city logistics context. Both in Toulouse and in Burgos, new city logistics projects were planned in collaboration between local authorities and a number of different actors. For example, in Toulouse the new suggestion included a freight regulation plan with smaller, cleaner vehicles. The plan was presented to different freight operators, who accepted the new plan on condition that the shopkeepers could also accept it. The shopkeepers, in turn, accepted the new regulation, even though slight constraints were imposed by it. The details of the new regulation were drawn up by city representatives, shopkeepers and freight operators, which was considered to be an enabler for the implementation of the new delivery regulation. Other city logistics projects were initiated in Burgos, but planned in a similar manner. The documentation of the projects (see CIVITAS CARAVEL, 2009) in Burgos even stated:

"There can be no doubt that success is chiefly attributable to the positive participation of all stakeholders" (p. 20)

The examples above suggest that authorities have trouble applying *direct supervision* with regard to freight transport in cities. One reason for this can be found in the findings of Lindholm (2012), who suggests that local authorities seldom have competence within the field of freight transports. Because of this, the authorities become dependent on the participation of actors for input. As a result, the examples indicate that coordination through *mutual adjustment* is vital in city logistics projects that focus on freight transport (see also Lindholm, 2012).

Further, the findings from Paper III further strengthen the idea put forward in section 5.7 of *mutual adjustment* as an “idea-generating” coordination mechanism for environmental activities. The use of *mutual adjustment* as a coordination mechanism in a city logistics context may be more complex than, for example, the authorities deciding on a course of action, but at the same time, *mutual adjustment* appears to increase the probability of a successful result. A similar result is suggested by Lindholm (2012), who advocates the inclusion of a large number of stakeholders in the initial stages of city logistics projects, in order for suitable solutions to be found.

The Clas Ohlson case can provide some additional input to the analysis with regard to coordination in supply chain relationships in general. The use of the code of conduct, in which environmental activities are included to some degree, appears to be coordinated to a large extent through *direct supervision*. Specifically, all suppliers are required to comply with Clas Ohlson’s code of conduct and the company audits its suppliers as stipulated in the code of conduct. For each of the six chapters in the code, the suppliers are evaluated according to a grading system, where different failings have different gradings. Clas Ohlson’s work with the code of conduct appears to correspond to what Amaeshi et al. (2008) and Frostenson et al. (2012) link to the concept. As put forward in section 5.2, this structured way of working could also be used in LSP-shipper relationships and the use of direct supervision could be developed if inspired by the way of working with codes of conduct. On the other hand, it could be an interesting avenue for future research to investigate whether the benefits of mutual adjustment, which in this thesis are found for LSP-shipper relationships as well as for relationships in a city logistics context, could also be found in work related to environmental and/or social activities in relationships between physical goods suppliers.

On that note, the analysis of the four research questions has come to an end. While the results for each question contribute to the understanding of how supply chain actors can include environmental activities with each other, additional understanding can be reached when combining the results. The final section of Chapter 5 focuses on such an aggregated analysis.

5.9 INCLUSION OF ENVIRONMENTAL ACTIVITIES IN LSP-SHIPPER RELATIONSHIPS: A RESULT OF THE FOUR RESEARCH QUESTIONS COMBINED

The results from the separate analyses of the four research questions above provide valuable input to the understanding of how supply chain actors, and specifically LSPs and shippers, can include environmental activities in their relationships with each other. In relation to LSP-shipper relationships specifically, a combined analysis of the results presented so far offers additional insights into the matter.

In section 5.5.2 it was proposed that there is a connection between a shipper’s environmental ambitions and the level of environmental activities in its relationships with LSPs. While this can shed some light on how a power advantage, apparently on the part of the shipper in LSP-shipper relationships, can influence the inclusion of environmental activities in relationships between LSPs and shippers, the empirical results indicate that there are a variety of situations where environmental ambition is highly influential. Building on that, a matrix can be developed. The matrix, which is shown in Figure 5.11, depicts the level of environmental ambition for both the LSP (horizontal axis) and the shipper (vertical axis). Such a categorisation can be divided into four general categories in which LSPs and shippers can find themselves. The empirical results (the cases are placed in the matrix in Figure 5.11) indicate that there are different ways in which to coordinate environmental activities in LSP-shipper relationships depending on the combined evaluation of the environmental ambitions of an LSP and a shipper for a specific relationship. Each of the four categories depicted in Figure 5.11 will be discussed in the following sections. As has already been mentioned, one starting point in the discussion is the results from the analysis of the power balance in LSP-shipper relationships (section 5.5.1), in which one important finding is that shippers generally have a power advantage over LSPs in their relationships with

each other. Another starting point is the results from section 5.7.2, where it was suggested that *direct supervision* and *mutual adjustment* are the two coordination mechanisms out of the six mechanisms studied that can be used as an active choice by one of the actors in LSP-shipper relationships. The analysis below thus focuses on these two coordination mechanisms.

FIGURE 5.11. CATEGORISATION OF LSP-SHIPPER RELATIONSHIPS INCLUDING CASES STUDIED

CATEGORY 1 – GOING GREY

The category in the lower left-hand corner of the matrix depicts a situation where neither the LSP nor the shipper has environmental ambitions in a specific relationship. This situation, unfortunately, offers little hope for any environmental activities in the relationship between an LSP and a shipper. Looking back at the discussion about environmental ambition in section 5.3.2, none of the researched cases appeared to fit into this category. Since the cases were selected based on the perception that they would include environmental activities, this is not a surprising result.

LSPs and shippers who find themselves in the lower left-hand corner of the matrix are not interested in including environmental activities in their relationship with each other. Because of this, it is difficult to discuss coordination in relation to the power balance in such relationships. In order for the actors in relationships that belong to this category to work towards becoming greener, pressure to do so must be applied by external stakeholders, such as legislators or customers. While there are likely to be relationships of this type that need attention in order to green logistics, they are not the primary focus of this thesis.

CATEGORY 2 – FORCE TO BE GREEN

The second category of the matrix illustrates a situation where the environmental ambition of the shipper is high, whereas it is lower for the LSP. Due to the suggested power advantage of shippers in LSP-shipper, the shippers are likely to have a greater possibility to influence the inclusion of environmental activities in the relationships between LSPs and shippers in such situations. The Clas Ohlson case would appear to be situated in this category, based on the previous analysis of environmental ambition.

In a situation such as the one in category 2, *direct supervision* appears as a useful coordination mechanism to apply for environmental activities in the relationships between LSPs and shippers. In section 5.7.2, it was noted that for all the environmental activities coordinated through *direct supervision*, it was the shipper who demanded the environmental activity from the LSP. No examples were found where the LSP placed demands on shippers and therefore applied *direct supervision* towards shippers. When Glouberman and Mintzberg (2001) describe *direct supervision*, they mention a hierarchy of authority, indicating that one actor is more powerful than another and can thus demand certain things from an actor of lower rank. Due to

the suggested power advantage for shippers in LSP-shipper relationships, the empirical results confirm this description of when *direct supervision* can be used.

Because of the low level of environmental ambition from the LSP in a situation illustrated by this second category, and because of the power advantage of the shipper, *direct supervision* appears to be one way to include environmental activities in LSP-shipper relationships. Because of their power advantage, shippers also have the possibility to change from an LSP with low environmental ambition to another LSP with higher environmental ambition. Naturally, such a possibility is related to the availability of LSPs, but for general logistics solutions this is not seen as a problem (see also section 5.5.3).

Without shippers' possibility to influence LSPs' environmental work in the relationships between LSPs and shippers, relationships within category 2 would be less likely to include environmental activities in their relationships. This is thus one situation in which the environmental content in LSP-shipper relationships benefits from the power advantage of shippers. Further, the risk of shippers switching LSPs could also result in increased environmental awareness of LSPs.

CATEGORY 3 – GOING GREEN

The third category in the matrix in Figure 5.11 represents a situation where both the LSP and the shipper have a high environmental ambition for their specific relationship. The empirical result indicates that both *direct supervision* and *mutual adjustment* are potential coordination mechanisms to use in relationships of this type.

Based on the previous analysis of the level of greenness in the cases studied, the DHL-SECO Tools relationship and the DHL-Ericsson relationship would appear to belong to this category. Both the cases situated in this category indicate that the shippers would have liked the LSPs to come up with more suggestions for environmental activities than they have done so far. Given that the shippers are the more powerful actors in the relationships, it is perhaps not surprising that this has not happened to such a large extent so far. Shippers need to be aware that their power advantage may inhibit environmental initiatives from the LSPs. If they truly want LSPs to come up with additional suggestions for environmental activities, they need to find a way to manage this situation. One possibility that has proved fruitful in the DHL-Ericsson case is the environmental project that Ericsson demands of DHL each year. Although this environmental activity is coordinated through direct supervision, it has led to several environmental activities in the relationship.

On the other hand, it could also be possible for shippers to take a step back from the power position they are in and do something about it. Mutual adjustment was earlier identified as a coordination mechanism with considerable potential for the generation of new environmental activities in a relationship. However, *mutual adjustment* appears to be related to situations where power in the LSP-shipper relationships is relatively balanced. Does that mean that mutual adjustment is not possible in a relationship where the shipper has a large power advantage? The empirical results give little guidance in this matter, but one possibility appears to be that shippers are so used to their power advantage that they to a large extent apply *direct supervision* and as a result miss out on the possibilities that come with *mutual adjustment*. By understanding their power advantage and the effects it has on the coordination of environmental activities, shippers could thus include *mutual adjustment* in their relationships with LSPs.

CATEGORY 4 – MANIPULATE TO BE GREEN

The fourth category represented by the matrix illustrates a situation in which the LSP has a relatively high environmental ambition for a specific relationship whereas the shipper's environmental ambition for the same is low. As has already been elaborated on, the findings suggest that the shippers set the agenda for the environmental activities in an LSP-shipper

relationship. This was based on the notion that shippers appear to have the power advantage over LSP in LSP-shipper relationships. Consequently, the LSP with a high environmental ambition finds itself in a difficult position, in that it is difficult to influence the shipper in terms of environmental activities.

Two of the researched cases can be said to belong to category 4: Alltransport and Holmen, and Alltransport and Onninen. In these cases, Alltransport has a relatively high environmental ambition for the relationships with the shippers, whereas the shippers' ambition is relatively low. These two cases represent the two cases with the lowest number of environmental activities in the relationships between the LSPs and the shippers. Moreover, the findings suggest that these environmental activities are initiated by the shippers through *direct supervision* by the shipper. Thus, even though the LSP has the higher environmental ambition, it is the shipper with the lower ambition that decides the environmental activities in the relationship. Given this imbalance in ambition, this should mean that there is large potential for additional environmental activities if only the LSP could somehow influence the shipper. Is that possible, given the power advantage of the shipper? Kogg (2003) offers hope in this matter when she writes:

"greening the supply chain is not the prerogative of the big and powerful" (p. 55)

What can then be done by the LSP in order to include more environmental activities in its relationship with a more powerful shipper? The findings presented in this thesis point to a number of ways in which an LSP could influence the inclusion of environmental activities in its relationships with shippers: coordination through *mutual adjustment*, through for example initiating an environmental board that the shipper can participate in or through using *expert power* as countervailing towards shippers. However, without environmental ambition on the part of the shipper, it might be difficult for the LSPs to introduce such initiatives. Despite this, there might be an opportunity for an LSP to initiate *mutual adjustment* with regard to environmental activities if, for example, other services in the relationship are already coordinated through this mechanism.

The relationship between Alltransport and Holmen gives indications for another way in which to address environmental activities. As described previously, the one environmental activity included in the relationship between these two actors is *high fill-rates*. This activity is considered by Alltransport to be an environmental activity, whereas Holmen requires it for financial reasons. Within logistics, environmental activities are often believed to go hand in hand with financial benefits (Oglethorpe and Heron, 2010), and if the LSPs promote this to shippers they might be able to influence them towards greener interaction. In fact, in Paper II it is noted that there is often a need to combine financial and environmental measurements (Azzone and Noci, 1998; Hervani et al., 2005). This type of link appears to be of specific interest in LSP-shipper relationships located in category 4 of the matrix. Although the DHL-Ericsson case does not fit into this fourth category, a quotation from that case is an appropriate way to end this discussion regarding financial versus environmental benefits:

"Money talks and the environment doesn't."

(Juan Barrera, inbound & domestic development manager at Ericsson)

6 CONCLUSIONS AND DISCUSSION

This final chapter sets out to present the conclusions of the research conducted for this thesis as well as to discuss the results in different ways. To recall, the purpose of the thesis is to describe and explain how supply chain actors, with a specific focus on logistics service providers and shippers, can include environmental activities in their relationships with each other. The first section of this chapter addresses the LSP-shipper relationships of the purpose, whereas the subsequent section focuses on supply chain relationships in general. The findings are then related to previous research, after which managerial implications are proposed. A discussion follows and, lastly, suggestions for further research are given.

6.1 TOWARDS GREENER SUPPLY CHAINS: INCLUSION OF ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LOGISTICS SERVICE PROVIDER AND SHIPPERS

This thesis has identified a number of factors important in LSP-shipper relationships if they are to decrease the environmental impact of logistics. To begin with, the shippers almost exclusively have the power advantage in their relationships with shippers and this has implications for the inclusion of environmental activities in these relationships. The environmental activities in the relationships are also affected by the environmental ambition of the actors involved. Combined, these findings are suggested to have implications for the coordination of environmental activities in LSP-shipper relationships. More specifically, this thesis offers a categorisation of different types of LSP-shipper relationships and the involved actors' environmental ambition. The categorisation, in turn, has implications for the possibility in each type of relationship to work towards greener logistics. Figure 6.1 below illustrates the four types of situations in which LSP and shippers can find themselves with regard to environmental ambition, whereas the power advantage of the shipper is an underlying assumption of the matrix illustrated. Depending on which of the boxes of the matrix an LSP-shipper relationship finds itself in, there are different ways to try to increase the inclusion of environmental activities in that specific relationship. More specifically, the four categories lead to different types of conditions for the coordination of environmental activities in LSP-shipper relationships:

- 1. *No environmental ambition found.* Pressure from external stakeholders is needed in order to initiate inclusion of environmental activities.
- 2. *Shipper's environmental ambition is high, whereas the LSP's is low.* This situation implies that the shipper is the actor that needs to take the environmental initiatives in order to increase the level of greenness in the relationship. Direct supervision – that is to say, when one actor tells the other what to do - is likely to be the most efficient way to coordinate environmental activities in the relationship.
- 3. *Both the LSP and the shipper have a high environmental ambition.* In this situation, the shipper, as well the LSP, has a potential to influence the level of greenness in the relationship. Both direct supervision and mutual adjustment are possible coordination mechanisms. Large potential lies in mutual adjustment, but shippers need to be aware of their power advantage in order for this coordination mechanism to be applied.
- 4. *The LSP has a high environmental ambition whereas the shipper's environmental ambition is low.* The power balance in the relationship inhibits the inclusion of environmental activities. One way to move past this barrier could be for LSPs to highlight the financial benefits of environmental activities. Another is for LSPs to use *expert power* as a means to decrease the power advantage for shippers and thereby increase the ability to be able to include environmental activities in the relationship.

FIGURE 6.1. CATEGORISATION OF LSP-SHIPPER RELATIONSHIPS BASED ON ENVIRONMENTAL AMBITION

The categorisation above builds on the results from the first part (part *a*) of the four different research questions addressed in this thesis. In addition to providing input to the matrix suggested above, each of the research questions has separately proven to offer valuable insight into LSP-shipper relationships. The following section aims to highlight the most important findings of these separate enquiries. Section 6.1.1 combines the findings of RQ1a and RQ2a, section 6.1.2 focuses on the results of RQ3a and 6.1.3 presents the conclusions that can be drawn from RQ4a.

6.1.1 ENVIRONMENTAL ACTIVITIES IN RELATIONSHIPS BETWEEN LSPS AND SHIPPERS

The first research question of this thesis addresses environmental activities that can be included in LSP-shipper relationships. By means of an analysis of both logistics literature and empirical data, a classification of environmental activities that can be included in relationships between LSPs and shippers has been developed. As Figure 6.2 shows, the classification comprises three categories. The first of these includes the potential environmental activities that can be a part of the offering or requirements with regard to green logistics services. These activities are not related to the actual relationships between LSPs and shippers, but rather illustrate a list of what companies can include from a promotional point of view. The environmental activities found in category 2 are related more to the actual relationships and can be applied as a precondition for the contract in potential LSP-shipper relationships. Most of the activities found in category 2 are also present in category 1, but have become more specific as they move closer to the actual relationships between LSPs and shippers. Finally, the activities suggested as belonging to category 3 consist of relationship-specific environmental activities that have further increased in complexity compared to categories 1 and 2.

FIGURE 6.2. A CLASSIFICATION OF ENVIRONMENTAL ACTIVITIES FOR LSP-SHIPPER RELATIONSHIPS

The extent of inclusion of environmental activities in LSP-shipper relationships is also addressed in this thesis (RQ2a). With regard to this, two different perspectives have been taken: a market perspective and a relationship perspective. The market perspective, in which perceptions of offerings of shippers and requirements of shippers are compared, suggests that LSPs offer more in terms of environmental activities than the shippers require. While the results

indicate that the LSPs are aware of this situation, the shippers are seemingly unaware. Further, the requirements of shippers appear to be met according to the market perspective.

The relationship perspective gives further insight to the matter. Firstly, while gaps were found in the market perspective, LSP-shipper relationships appear to match relatively well with regard to offered and required environmental activities. Given that the market perspective indicates that LSPs offer more than the shippers want, it is suggested that shippers inhibit an increased extent of included environmental activities in LSP-shipper relationships. Secondly, the relationship perspective support the findings from the market perspective that suggests that LSPs are able to fulfil the requirements set by shippers and that shippers' requirement thus are met. This research does, however, point to a passiveness among LSPs in their relationships with shippers, who in turn would like the LSPs to be more proactive. These findings are somewhat paradoxical: while the LSPs are able to fulfil all requirements from shippers and the shippers are seemingly pleased with this, the shippers are at the same time frustrated about the passiveness of the LSPs. One of the reasons behind this might be found in the categorisation of LSP-shipper relationships presented in section 6.1. Specifically, the matrix (Figure 6.1) highlights that there can be differences between relationships in terms of environmental ambition, and this will most likely affect how the two actors involved perceive the environmental activities in the relationships.

6.1.2 THE POWER ADVANTAGE OF SHIPPERS

The third research question of this thesis specifically focused on how power balances in LSP-shipper relationships can influence the extent to which environmental activities are included in such relationships. Based on the analysis conducted, it is suggested that in an LSP-shipper relationship in which the shipper has a power advantage, the shipper's environmental ambitions for logistics sets the agenda for the environmental activities in that relationship.

As for the specific power bases, *expert power* in terms of environmental competence stands out as one power basis that LSPs are in control of and it can be used by LSPs as countervailing power to some extent in LSP-shipper relationships. The power balance in the relationships does, however, appear to affect the extent to which this countervailing power basis actually is countervailing. Another parameter that is likely to affect the potential for environmental competence as expert power is the environmental ambition of the shipper. Without any such environmental ambition, the results indicate that it is unlikely that the shipper regards environmental competence as a countervailing basis of power. This situation is likely to appear in category 3 of the matrix (Figure 6.1) presented in section 6.1, where both the LSP and the shipper have a high environmental ambition.

6.1.3 COORDINATION FOR DECREASED ENVIRONMENTAL IMPACT

In this thesis, six coordination mechanisms, namely *mutual adjustment*, *direct supervision*, *standardisation of work*, *standardisation of output*, *standardisation of skills and knowledge* and *standardisation of norms* have been analysed in the context of LSP-shipper relationships. The results indicate that two of these mechanisms, direct supervision and mutual adjustment, can be chosen in order to include environmental activities in LSP-shipper relationships. The four types of standardisation instead often come as a result of these two mechanisms.

Further, direct supervision is found to be one-sided, meaning that it is initiated from one actor in the LSP-shipper dyad, namely the shipper. Furthermore, this coordination mechanism is suggested as an easy way for shippers to include environmental activities in their interaction with shippers. Sometimes it is, however, possible to question whether these activities are conducted in order to decrease environmental impact or if they are just done in order to get a "check!". Yet, one specific example is found where direct supervision leads to additional environmental activities, and that is an environmental project that a shipper requires each year from an LSP.

With regard to mutual adjustment, where LSPs and shippers adapt to each other with regard to environmental activities, it is suggested that this holds large potential for the development of environmental activities. More specifically, mutual adjustment appears to be a way of “thinking outside of the box” and generating environmental activities that would not have been identified without this coordination mechanism. One major strength with this coordination mechanism appears to be that both actors in an LSP-shipper relationship are involved, which leads to an inclusion of knowledge and perspectives from two sides of the dyad. In relation to the categorisation of LSP-shipper relationships in section 6.1, mutual adjustment is suggested as having the most potential in relationships where both actors have a high environmental ambition (category 3).

6.2 LEARNING FROM SUPPLY CHAIN RELATIONSHIPS IN GENERAL

Even though relationships between LSPs and shippers have been the main focus of this thesis, other types of relationships between supply chain actors have also been studied. More specifically, such relationships include those between shippers and suppliers of physical goods (as opposed to services such as logistics) as well as between actors in a city logistics context. In relation to each research question, supply chain relationships in general have been analysed in order to see if they can contribute to an increased understanding of the inclusion of environmental activities in LSP-shipper relationships. The following points highlight the most important findings of this analysis:

With regard to the first research question, which is concerned with environmental activities in supply chain relationships, two main things were found. Firstly, shippers’ work with tools such as a code of conduct towards suppliers of physical goods appears to be more structured than the inclusion of environmental activities in LSP-shipper relationships. It is therefore suggested that shippers that have their own CSR organisation might learn from it and apply their learnings to the inclusion of environmental activities in relationships with LSPs. Further, looking at a city logistic context, the results suggest that the purpose of measuring is clearer in city logistics projects than for environmental activities in LSP-shipper relationships. As some of the latter can be included without specific focus on a decrease of environmental impact, it is argued that by formulating clearer purposes of measuring, it could be easier to find the suitable environmental activities for each specific relationship.

Regarding the second research question, which concerns the extent to which environmental activities are included in supply chain relationships, the code of conduct can again be of interest in relation to LSP-shipper relationships. More specifically, suppliers of physical goods are checked for compliance by a CSR organisation and shippers appear to be aware of the extent of compliance for each supplier. Further, non-compliance is not tolerated. The same degree of control does not appear to exist in LSP-shipper relationships. While it could be questioned to what extent similar controls would be meaningful for shippers to conduct on LSPs, learning from the way of working with the code of conduct, or other types of tools used to evaluate suppliers of physical goods, could have a positive effect on the inclusion of environmental activities in LSP-shipper relationships.

In terms of the research question about power balances in supply chain relationships, LSPs are suggested to be at a power disadvantage in relationships with shippers (see section 6.1.2). In a city logistics context, LSPs appear to have a greater possibility to affect their power situation, mainly due to the fact that authorities appear to be dependent on LSPs’ willingness to participate in city logistics projects. While one large LSP potentially can have a power advantage over authorities, small LSPs can gain countervailing power by forming unified groups. This differs from LSP-shipper relationships, in which there are more clearly two actors in the relationship and it is perhaps not possible to the same extent to form groups of LSPs to gain countervailing power.

Finally, in relation to the research question that is concerned with coordination of environmental activities, the results from the analysis of relationships between actors in a city logistics context further strengthens the finding of *mutual adjustment* as an “idea-generating” coordination mechanism.

These first sections summarise the findings of the research of this thesis. In the subsequent section, the findings are related to the existing body of literature within relevant areas of research.

6.3 RELATING FINDINGS TO PREVIOUS RESEARCH

The research in this thesis relates to several different research fields. Firstly, it adds to the field of GSCM, which has previously taken LSPs into account to a very limited extent. Further, even though GSCM to a large extent takes an inter-organisational perspective, there still appears to be relatively limited research into details of supply chain relationships and how they affect the greening of supply chains (exceptions being for example Simpson et al., 2007; Theyel, 2001). While including a relationship perspective, these studies often concern relationships between buyers and physical goods suppliers. The research into LSP-shipper relationships in this thesis contributes to the understanding of relationships in the greening of supply chains, with a specific focus on relationships between LSPs and shippers.

In this thesis, two main theoretical points of departure have been taken in relation to the LSP-shipper relationships. Following the fact that LSP-shipper relationships have been scarcely researched within the field of GSCM, it is suggested that both the perspective of power balances in relationships and coordination offer a novel view of such relationships. As for coordination mechanisms studied, they give an increased understanding to environmental activities in LSP-shipper relationships as such, as well as an increased understanding of how supply chain actors can include such activities in their relationships with each other.

With regard to the concept of power, this has previously not been given much attention within the context of greening supply chains in a general sense. While some authors (such as Kogg, 2003; Min and Galle, 2001; Simpson et al., 2007) briefly mention power as a factor to account for in relationships between buyers and physical goods suppliers, very few – if any – go into detail about how power balances in LSP-shipper relationships affect the greening of supply chains. It is proposed here that the findings with regard to the power balances in LSP-shipper relationships can help increase the understanding of other supply chain relationship’s potential in the greening of supply chains.

Whereas GSCM can be said to evolve around inter-organisational perspectives of the greening of supply chains, a related field of research is that of green logistics, which amongst other things has a focus on the strategies of individual companies for decreasing their environmental impact from logistics. Previous research has included LSPs, but studied mainly from the perspective of greening LSPs’ own operations (for example Isaksson, 2012; Lieb and Lieb, 2010; Maack, 2012; Perotti et al., 2012). Environmental activities are, for example, discussed to some extent in previous studies (Colicchia et al., 2013; see Weijers et al., 2012). The research in this thesis contributes to the understanding of such activities by adding the dual perspective and by suggesting when in a business process between LSPs and shippers various activities play various roles. The dual perspective taken in this thesis also adds to the green logistics literature by illustrating that LSPs find themselves in a context that largely influences their inclusion of environmental activities.

Another field of research that the results in this thesis relate to is that of coordination between supply chain actors. One major assumption of the research for this thesis is related to the six coordination mechanisms that have been analysed in relation to supply chain relationships. The original framework by Glouberman and Mintzberg (2001) was developed for an intra-organisational setting, while this thesis is concerned with an inter-organisational setting. The

choice of the framework for the analysis was chosen despite this notion, mainly because of its suggested comprehensiveness. The choice was supported by the research of Sandberg and Bildsten (2011) and Lindholm (2012), who also to some extent apply the same, or similar mechanisms in an inter-organisational setting. In this thesis the six mechanisms have proven to be useful, as well as suitable, for the analysis of coordination of environmental activities in LSP-shipper relationships in particular, which further strengthens the framework's applicability in an inter-organisational context. One of the mechanisms deserves specific attention in this respect and that is *direct supervision*. In an intra-organisational setting, Glouberman and Mintzberg (2001) suggest direct supervision is dependent on a hierarchy of authority. While this might not be the case in supply chain relationships, the identified power advantage of some supply chain actors can be used in a similar manner as authority within one single organisation.

While the research conducted in this thesis is suggested to have implications for some different areas of research, it also has implications for practitioners. The following section highlights the most important of these.

6.4 IMPLICATIONS FOR PRACTICE

The results of the research presented in this thesis have several implications for practice. One of the major findings of this research is the categorisation of LSP-shipper relationships into the four categories based on the environmental ambition of the actors in an LSP-shipper relationship. It is important to note that the categorisation, in turn, relies on the assumption that shippers have a power advantage over LSPs in their relationships with each other. The implications for practice presented here are based on the developed categorisation of LSP-shipper relationships (Figure 6.1), but implications are given with a starting point in the two types of actors involved in LSP-shipper relationships.

IMPLICATIONS FOR LSPs

LSPs with a high environmental ambition might find it difficult to promote environmental activities in their relationships with shippers, especially if the shippers have a low environmental ambition. Two primary ways for LSPs to influence shippers toward greener logistics are identified in this thesis:

- Initiate mutual adjustment with regard to environmental activities in relation to other services in the relationship that are already coordinated through this mechanism.
- Promote the financial benefits of environmental activities in order to influence the shipper's environmental ambition.

IMPLICATIONS FOR SHIPPERS

Due to their assumed power advantage, shippers have a greater possibility to influence the inclusion of environmental activities in their relationships with shippers. Depending on the environmental ambition of the LSP in a specific relationship, a shipper with a high environmental ambition can, according to the results, use different means to try to influence the LSP:

- If the LSP has a low environmental ambition, the shipper can, due to its power advantage, dictate the environmental activities in the relationship. In the event that the LSP does not want or is not able to do as the shipper wishes, the shipper can turn to other LSPs with higher environmental ambition.
- If the LSP also has a high environmental ambition, the shipper needs to be aware that its power advantage may inhibit environmental initiatives from the LSP. While it is still possible for the shipper to dictate the environmental activities in the relationship, mutual adjustment between the two actors may have higher potential in terms of environmental improvements.

IMPLICATIONS FOR OTHER SUPPLY CHAIN ACTORS

Although LSPs and shippers have been the supply chain actors in focus in the research for this thesis, there are practical implications for other actors as well. For one, actors such as legislators and customers need to understand that they *can*, and perhaps *have a responsibility to*, influence LSPs and shippers to become greener. One type of relationship between LSPs and shippers identified in this research is one where neither the LSP, nor the shipper, have any environmental ambitions for the relationship. None of these actors will take a step towards environmental activities in the relationship unless external supply chain actors give them reasons for why they should.

6.5 DISCUSSION

This section addresses a number of different topics that can be of interest to discuss in relation to the research presented in this thesis. The first of these is the theoretical perspectives taken in the thesis.

6.5.1 THE RESULTS – TRANSFERABLE TO OTHER CONTEXTS?

In section 3.5.1, case studies were briefly discussed with regard to transferability. To recall, transferability refers to the extent to which a research result is applicable in cases other than the ones studied (Halldórsson and Aastrup, 2003). Even though it is suggested by Hirschman (1986) that it is not possible to assess transferability before the new context is known, a discussion about to which contexts the results could be transferable is in order. Firstly, the research in this thesis is mainly focused on a Swedish context (with the exception of the study of city logistics projects) and the case studies represent companies active on the Swedish market. Related to this, one might wonder whether it would be possible that the findings of the research conducted in this thesis could be applicable in other countries as well. Sweden is generally seen as an environmentally conscious country (see for example Environmental Leader, 2013) and the results could therefore be claimed to be applicable only in such a context. However, even though one of the criteria for the selection of case companies was that they should have an environmental interest, some companies proved to be relatively uninterested in environmental activities in their LSP-shipper relationships. The lower-left corner of the previously suggested matrix in fact includes such companies where very little or no environmental ambition is found. Thus, it is here suggested that the developed categorisation (see Figure 6.1) could very well be of relevance to LSP-shipper relationships in logistics markets with both a high and low level of environmental ambition.

Further, the types of companies studied in the cases could have an impact on the transferability of findings of this thesis. As mentioned in section 3.5.1, companies were selected based on environmental interest as well as differences in size, market focus and industry (for the shippers). As for the shippers, they all represent relatively large companies. Given that the size of company has been one of the power bases analysed in the LSP-shipper relationships in this thesis, smaller shippers could potentially have less power over LSPs than the companies studied. That could, for example, mean that the developed matrix of environmental ambitions in LSP-shipper relationships not is as applicable to such small shipper companies. In the context of this it is worth mentioning that Kogg (2003) found that a small shipper was able to influence the upstream part of its supply chain, and this possibility opens up for a potential use of the matrix despite a lower power advantage.

Further, the LSPs in the relationships studied in this thesis are relatively large companies that coordinate logistics services. There are smaller companies active on the logistics market, such as pure transport operators, that because of their size and limited resources might have lower environmental ambitions than the larger LSPs. The findings of this research might not have been the same if such small LSPs had been studied. That does not, however, mean that the results are not applicable to such companies. More specifically, the power advantage for shippers, which is a condition for the categorisation of LSP-shipper relationships developed in

this research, is likely to apply to these small LSPs to an even larger extent than to larger LSPs. However, the extent to which such LSPs would find themselves in the boxes where LSPs' environmental ambition is high could be questioned, and thereby also the applicability of the matrix.

Lastly, this thesis has focused on the field of green supply chain management. A closely related field is that of sustainable supply chain management (Kronborg Jensen, 2013). According to Carter and Jennings (2002), the experience from one area within social responsibility, of which environmental activities can be said to be a part, can often be applied to other areas within this field. Taking this into consideration, it would appear that the results in this thesis could possibly be applicable to the field of SSCM as well. However, further research is needed in order to understand these synergy effects further.

6.5.2 COORDINATION AND POWER – SIMILAR BUT DIFFERENT?

The two different theoretical perspectives applied in this thesis deserve some further attention. While each is applied separately for one research question, it can be argued that coordination and power do overlap to some extent. One example of this is the suggested relatedness between a supply chain actor's possibility to use direct supervision and its power position in a supply chain relationship. In a similar manner, the possibility to apply mutual adjustment appears to be related to a more balanced power situation in supply chain relationships. Thus, there are some connections between the two concepts. However, it is argued here that the inclusion of merely one of the perspectives would not have given the same findings as the ones suggested in this thesis. For one, the categorisation that has been developed in terms of environmental ambition in LSP-shipper relationships is a result of all four research questions and thus includes both theoretical perspectives discussed here. Instead of being problematic, the combination of the two theoretical lenses has contributed to results that would not have been possible without this theory triangulation.

6.5.3 THE LSP - ALWAYS AT A POWER DISADVANTAGE?

The results in this thesis point to a general picture where shippers have the power advantage over LSPs. However, there could also be situations in which an LSP has the power advantage over a shipper. This could for example be the case if the LSP offers a unique service that is difficult to find elsewhere. The LSPs studied in this thesis are of general character and do not offer that type of services. Another possible situation where the LSP could have a power advantage could be when the shipper represents only a very small part of the LSP's business. In such a case it could be vital for the shippers to have the goods delivered, whereas the LSP has other customers who are much more important for the business. In such a case, it is likely that the LSP sets the agenda for environmental activities in the relationship.

In the case of this thesis, the shippers' goods did not require any special solutions from the LSPs. As a result, resource scarcity was appeared not to be an issue for shippers in their search for LSPs. As the findings of this thesis are a result of the empirical data studied, the transferability of the findings might be affected by this particular circumstance. That is, the conclusions are based on situations in which resource scarcity was found not to be an issue and might therefore not be transferable to situations in which LSPs are a scarce resource. Further research is needed in order to understand how resource scarcity in this context could influence the inclusion of environmental activities in LSP-shipper relationships.

6.5.4 DUAL APPROACH – BENEFICIAL OR PROBLEMATIC?

This thesis has taken a dual approach to LSP-shipper relationships and most studies conducted for the thesis relate include perceptions of both LSPs and shippers (see Table 3.2). Previous research into supply chain relationships has to a large extent focused on one side of the relationships, which leads, among other things, to differing perceptions not being discovered (Golobic, 2007). The dyadic perspective taken of the four LSP-shipper relationships in one of the

case studies did indeed offer insight into the differing views of the actors in each relationship. The categorisation of LSP-shipper relationships (Figure 6.1) that is one of the main findings of this thesis is based on the different environmental ambition of LSPs and shippers. Without a dyadic perspective and empirical studies into both actors in the dyads, this parameter would not have been identified.

Based on the argumentation above, one can wonder why research into supply chain relationships often focuses on one side of the relationship, as noted by Golobic (2007). As the research for this thesis has included two case studies, of which one is dyadic and one focuses on the perspective of one shipper, it is possible to compare these two studies. Such a comparison leads to one apparent reason for taking the perspective of one side of supply chain relationships: it is less complex and will therefore most likely require less time and effort compared to a study of both sides. The extra effort might, however, lead to findings that would not have been revealed without it, as is the case for the research for this thesis.

6.5.5 ENVIRONMENTAL ACTIVITIES – AT WHAT COSTS?

One interesting question with regard to the environmental activities discussed in this thesis is whether environmental activities cost too much. This is of interest especially for relationships that find themselves in category 4 of the suggested matrix (Figure 6.1), which means that the LSP's environmental ambition is high, whereas the shipper's is low. It is suggested that LSPs in such situations can attempt to manipulate shippers to include environmental activities by highlighting the financial benefits of such activities. This reasoning would not apply if environmental activities increase costs for shippers.

During the case studies conducted in the research for this thesis, the financial aspects of environmental activities in LSP-shipper relationships have not been explicitly studied. The topic has, however, been mentioned by several respondents, who all appeared to share the same perception of the matter: shippers do not want to pay extra for environmental activities. Despite this, the results in this thesis suggest that several environmental activities are conducted, albeit to various extent, in the relationships studied. This indicates that those environmental activities actually identified in the studied LSP-shipper relationships are beneficial from an environmental as well as a financial perspective. Even though there are likely to be environmental activities that increase costs, the results in this thesis suggest that much can be done in terms of environmental activities without negative financial effects.

6.5.6 GREENING SUPPLY CHAINS – WHO IS RESPONSIBLE?

The results in this thesis indicate that LSPs are able to fulfil shippers' environmental requirements at the same time as shippers with high environmental ambition appear to want LSPs to be more proactive. It is also suggested that shippers are the actors with the power advantage in their relationships with LSPs and that this situation can inhibit LSPs' to take environmental action in LSP-shipper relationships (see category 3 and 4 of the matrix in Figure 6.1). Further, without an environmental ambition from the shippers, the results indicate that there is a low likelihood of inclusion of environmental activities in their relationships with LSPs. These results could be interpreted in a way that would mean that shippers are the ones who are responsible for including environmental activities in relationships between LSPs and shippers. Without their willingness to do so, the LSPs are left to do what they can on their own. As argued for in this thesis, such intra-organisational environmental activities do not, however, have the same potential to decrease the environmental impact from logistics and transports. Thus, shippers are one supply chain actor that needs to realise their role in the greening of logistics and engage with LSPs in order to work towards greener supply chains. If shippers increasingly accept this responsibility, LSPs need to be prepared for an increase in environmental requirements from shippers. The results in this thesis do, in fact, indicate that they already are ahead of shippers in terms of offering more than what shippers demand, and this could indicate that LSPs are preparing for an increased demand of environmental activities.

Are LSPs and shippers the only ones that need to act? In relation to this question, a comparison between environmental activities in LSP-shipper relationships and environmental and/or social activities in relationships between shippers and physical goods suppliers could be of interest. The results in this thesis indicate that CSR-work have come further in terms of being structured and consistent with regard to demands made on suppliers of physical goods than of LSPs. While a shipper's reputation can be damaged if physical goods suppliers fail to comply with for example the code of conduct, the same shipper's reputation does not appear to be at risk to the same extent if LSPs fail to comply with environmental requirements. As the reputation of a company is at least to some extent decided by its present and potential customers, this stakeholder group also has a responsibility to put pressure on shippers to act. Lastly, as the first category of the developed matrix illustrates (see Figure 6.1), some types of LSP-shipper relationships are likely to engage in environmental activities only if pressured from outside stakeholders, including customers as discussed above, but also from legislators. Authorities thus also need to accept some responsibility if supply chains are to be greener through LSP-shipper relationships.

6.6 SUGGESTIONS FOR FURTHER RESEARCH

In Chapter 5 of this thesis, several suggestions for future research were put forward in relation to the analysis of supply chain relationships in general, i.e. part *b* of the research questions. This section instead focuses on avenues for further research with regard to LSP-shipper relationships.

With regard to the cases selected for the research in this thesis, they were chosen because of a belief that they were "green". Even though each company was checked for environmental interests before they were included in the study, it turned out that the level of greenness differed to a large extent between the different cases. In fact, some of the LSP-shipper relationships have been suggested as having a low level of greenness. With regard to the environmental activities identified in this thesis, and in particular the classification of the activities, these are to a large extent a result of the cases chosen. Selection of both the LSPs and, in particular, shippers with higher environmental ambitions for the relationships, could have led to identification of additional environmental activities. This, in turn, could have led to additional findings with regard to the coordination of various environmental activities. Research into other cases could therefore be one direction for further research as a means to increase the understanding of the inclusion of environmental activities in LSP-shipper relationships. It should, however, be noted that without the LSP-shipper relationships that were found to have a low level of greenness, the differences in environmental ambitions would not have been identified and it would not have been possible to develop the matrix that builds on this concept.

Further, the "level of greenness" has in this thesis been developed as a type of measuring tool in order to evaluate how "green" LSP-shipper relationships are. This relates to the findings of Paper II, in which it was found that previous research to a large extent has focused on environmental measurements in the interest of single supply chain actors. The measurement tool developed in this thesis includes both LSPs and shippers and could be a first step towards an actual measuring tool for LSP-shipper relationships in particular, but perhaps also for supply chain relationships in general. More research is needed in order to refine this measurement or develop others that could contribute to the measuring of environmental aspects across several supply chains actors. In such research, it would, in accordance with the findings of Paper II as well as those of Björklund and Forslund (2013a), be important to keep in mind the purpose of the measuring tool.

It has been proposed in this thesis that the shipper's environmental ambition sets the agenda for the environmental activities included in LSP-shipper relationships. As noted in Chapter 1, research into LSPs' environmental work has increased considerably during recent years (see for

example Colicchia et al., 2013; Evangelista et al., 2013; Isaksson and Høge-Brodin, 2013; Perotti et al., 2012). While research solely from an LSP perspective is valuable in order to understand LSPs' potential with regard to decreasing environmental impact from logistics, one can rather crassly wonder what the benefits of this research are if the shippers are the ones who make all the decisions with regard to environmental activities in their relationships with LSPs. The question then arises of how to increase the inclusion of environmental activities in LSP-shipper relationships if the shippers have a low environmental ambition. The results of the research in this thesis point to a need for further research into the inter-organisational aspects of environmental activities in research into LSPs' environmental work. One starting point for such research could be the categorisation of LSP-shipper relationships suggested in this research. The conclusions in this thesis do not include if and how LSP-shipper relationships could move from one box to another. This would, however, be an interesting avenue for future research and could lead to more normative recommendations than given in this thesis.

Some further attention to the categorisation of LSP-shipper relationships is in order. The developed matrix can be seen as a first step towards an understanding of the inclusion of environmental activities in LSP-shipper relationships. However, it might be possible to develop the matrix further and for each category find subcategories that could further help understand the issue at hand. As already suggested in section 5.9 for the fourth category of the matrix, one example could be the characteristics of the LSP-shipper relationship in general. Mutual adjustment for general logistics services might make it easier to facilitate mutual adjustment for environmental activities as well. While this is merely one example, there could also be others, and this is suggested as another avenue for further research.

While there is still much to do in order for supply chains to reach their full potential in terms of becoming "green", one piece of the puzzle at a time will hopefully contribute so that one day the puzzle will be complete. I hope that I with this thesis have contributed with one of these pieces of the puzzle and that the results can make the road towards greener supply chains a little clearer.

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Appendix I – Papers

The articles associated with this thesis have been removed for copyright reasons. For more details about these see:

<http://urn.kb.se/resolve?urn=urn:nbn:se:liu:diva-102564>

APPENDIX II – CASE REPORTS

CASE REPORT I

ENVIRONMENTAL WORK IN RELATIONSHIPS BETWEEN LOGISTICS SERVICE PROVIDERS AND SHIPPERS

DEPARTMENT OF MANAGEMENT AND ENGINEERING
LOGISTICS DIVISION
LIU-IEI-RR--13/00190--SE

CASE REPORT:

ENVIRONMENTAL WORK IN
RELATIONSHIPS BETWEEN LOGISTICS
SERVICE PROVIDERS AND SHIPPERS

UNI MARTINSEN

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1 ABOUT THIS REPORT

This report comprises a description of a case study which includes four dyadic relationships between logistics service providers (LSPs) and shippers. The case study has been conducted during the Vinnova-financed research project “Competitive Business Models to meet Future Demands on Sustainable Logistics Systems” and focus in the report is on environmental (or green) work in relationships between LSPs and shippers. More specifically, the purpose of the report is to increase the understanding of such work in relationships between LSPs and shippers. Before the cases are described, the process of selecting the cases as well as collecting the data will be elaborated on.

1.1 SELECTING CASES

Figure 1 illustrates the general idea behind the four cases. The companies were chosen because it was believed that they were interested in and worked with environmental issues. Two LSPs were first selected as one part in two buyer-supplier relationships each, and after that, four shippers were chosen. The LSPs were selected based on theoretical sampling, in accordance with Eisenhardt and Graebner (2007) and they were chosen for two different reasons. First, they were chosen because of the above mentioned environmental criterion, which increases the likeliness that they contribute to theoretical insight within the field of environmental logistics. Secondly, the two LSPs were chosen because of their differences in size and market focus, and these differences were believed to offer contrary results that could shed light on why matches and mismatches appear.

Figure 1. The general idea of the cases

The LSP that is labelled LSP X in Figure 1 is an LSP called Alltransport i Östergötland AB (Alltransport). The reason for this was that the company was interested in environmental issues and was thought of as an example of good-practice. They were for example given an award for their sustainability report in 2008 (Svensk Åkeritidning, 2008). Alltransport is a regional and relatively small company active on the logistics market in Norrköping and its surroundings. The second LSP was selected for both heterogeneous and homogenous reasons Patton (2002). The LSP, DHL, is considerably larger than Alltransport and active on a global market, which makes the two cases heterogeneous. It is also a company that recognises the environmental impacts that their activities cause and tries to make up for these impacts in different ways. DHL has for example won an IT-award in the category “the sustainable project of the year” for its emission simulation tool. Thus, the environmental criterion is fulfilled by both LSPs, although the two companies differ in turnover and market focus. As with Alltransport, an additional reason for the choice of DHL was access, since the environmental manager cooperates with the department in which I work.

When the decision was made about which LSPs to study, a list of criteria was set up for the selection of the shippers and included both homogenous and heterogeneous criteria. With the help of the quality and environmental manager at Alltransport and the environmental manager at DHL, potential shipper participants were identified and asked to take part in the study. The process of finding and choosing suitable shippers took longer than expected; some suggested shippers did not show any environmental concerns on their homepages, some were too similar and some did not want to participate. Eventually, four companies were chosen. Alltransport's two customers were Holmen Paper AB and Onninen, while the two customers selected for DHL were SECO Tools AB and Ericsson. All four companies' homepages were checked to make sure that some attention to environmental issues was given there. The following four cases are thus a part of the research for this thesis:

- Alltransport-Holmen
- Alltransport-Onninen
- DHL-SECO Tools
- DHL-Ericsson

Table 1 shows some key facts about the four cases and illustrates similarities and difference between the companies.

Table 1. General facts about the selected case companies

	Size (LSP/shipper)	Industry	Type of business	Market (LSP/Shipper)
Alltransport-Holmen	Small/Medium-Large	Paper	Producer	Regional/Europe
Alltransport-Onninen	Small/Small	HVAC & electric power products	Wholesaler	Regional/Sweden
DHL-SECO Tools	Large/Medium	Cutting tools	Producer	Global/Global
DHL-Ericsson	Large/Large	Telecom	Producer	Global/Global

1.2 DATA COLLECTION

The case data collection was mainly based on interviews, but additional information were gathered from the case companies' web pages, as well as from their annual reports and sustainability reports. Three to four in-depth interviews (Yin, 2009) were conducted for each of the cases (see Table 2), each one lasting between one and two hours. The respondents where the persons involved in the business relationship and for each case three or four interviews were conducted. The interviews, which were semi-structured, were for reliability reasons (Yin, 2009) based on an interview guide with mostly open-ended questions (see Appendix I). The questions concerned aspects of internal environmental work, relationship-specific environmental activities as well as more general relationship characteristics. The interpretation of what environmental work could include was entirely the respondents'. All interviews were recorded and transcribed and the respondents were given the opportunity to reflect and comment on the transcriptions in order to guarantee correct level of information and strengthen construct validity (Yin, 2009).

Table 2. List of respondents

Company	Name of Responent	Position at Company	Date of Interview
Alltransport	Mattias Bodin	Buisness Area Manager	18 November 2010
Alltransport	Tommy Gustafsson	Salesperson	7 December 2010
DHL	Lennart Wilén	Customer Relationship Manager (CRM) and Business Development Manager	21 January 2011
DHL	Linda Bergsten	Environmental Manager	2 February 2011
DHL	Juan Barrena	Inbound and Domestic Development Manager	28 February 2011
Holmen	Bo Wibrén	Logistics Director	15 November 2010
Onninen	John Lind	Transport Manager	20 January 2011
Onninen	Johan Grönkvist	Transport Coordinator	20 January 2011
SECO Tools	Bengt Brammefors	Manager of Global Transport Solutions	4 January 2011
Ericsson	Maria Hasselrot	Works in Inbound Distribution Development and as Environmental Advisor Distribution Logistics	28 February 2011

1.3 OUTLINE OF CASE REPORT

This case report has two main sections. The first of these includes company presentations of the six companies that are included in the four LSP-shipper dyads studied. The section starts with a presentation of the two LSPs, after which the four shippers are described. The second section of the case report includes a description of each LSP-shipper relationship. In this section, each case is first described based on general information about the relationship between the two companies. Next, a presentation of the environmental focus for that specific case is presented.

2 COMPANY PRESENTATIONS

This chapter introduces the companies that are part of the four buyer-supplier relationship cases studied in this thesis. Each such relationship consists of two companies. In total, six companies are involved in the cases, of which two are LSPs and four are shippers. The LSPs thus belong to two cases each. In order not to have to repeat general company information for the LSPs in the case descriptions, this chapter will provide company information for all six case companies. A general overview of each participating company will be given as well as a description of the general environmental work within the company.

The information in this chapter has mainly been obtained from interviews with company representatives (see Appendix 1); information from other sources is clearly marked in the text.

2.1 THE LOGISTICS SERVICE PROVIDERS

This chapter presents the two LSPs. A brief general description of Alltransport is followed by information about the company's environmental work. This is then followed by corresponding sections about DHL. Table 3 shows general information about the two LSPs.

Table 3. General information about the LSPs

	Alltransport	DHL Global Forwarding, Sweden
Turnover (MSEK)	642	3 200
No. of employees	95	325
Market focus	Regional	Global

2.1.1 ALLTRANSPORT

Alltransport is a logistics service provider (LSP) that was founded in 1937. The company's head office is located in Norrköping, which is in the Östergötland region of Sweden. Alltransport is a private corporation in which the stocks are owned by the drivers and their companies. Basically, every vehicle is equal to one stock share. On a practical level, this means that Alltransport's owners are also their suppliers. In total, 143 haulers and construction equipment companies comprise the ownership of Alltransport. In 2009, Alltransport had a turnover of 642 million SEK and 95 people were employed at the company. (Alltransport, 2009)

Alltransport is divided into three business areas: "Fjärr och Distribution", "Bygg och Anläggning" and "Tank och Miljö" (Alltransport, 2009). The business area of "Fjärr och Distribution", or *Long-distance and Distribution*, is responsible for long-distance transports and distribution of goods. They can offer transports throughout Sweden, but the focus is Östergötland and surrounding areas. "Bygg och Anläggning" mainly leases out contract vehicles and contract machines, whereas "Tank och Miljö" focuses on the transportation of waste and recycling material from companies, households and retrieval plants in the southern parts of Sweden. For the case descriptions that include Alltransport, focus will be on the business area *Long-distance and Distribution*, which means that "Alltransport" equals *Long-distance and Distribution* unless otherwise noted.

Alltransport is mainly a regional company that competes in Norrköping and the surrounding areas. In fact, this is something that is an important aspect of the company's strategy. The business area manager says:

"Our strategy is that we want to be the strongest alternative on our local market. That's the main thing."

ALLTRANSPORT AND THE ENVIRONMENT

With regard to the environment, Alltransport tries to work with environmental issues and the business area manager says:

"Generally within the company we try to profile ourselves as working a lot with these [environmental] issues."

The awareness of environmental issues is considered to be high at Alltransport, since it is an area that the whole company is working with and one that Alltransport tries to profile themselves with. Alltransport is certified according to the environmental certification ISO 14 001. With regard to specific competences, the quality and environmental manager is perhaps the most important person as she is responsible for the environmental work at Alltransport. In order to increase the environmental competence of the employees, an internal training day is held once a year within the field of quality and environment. With respect to this, the business area manager states:

"We go through our sustainability report, what types of work we do, how that affects different things and how individuals' way of working affects the things that are important in the sustainability report."

2.1.2 DHL

Deutsche Post DHL is a mail and logistics service provider, founded in 1969 in San Francisco. Today, the company has its main office in Germany. DHL is divided into four divisions; Deutsche Post Mail, DHL Express, DHL Global Forwarding, Freight and DHL Supply Chain. Deutsche Post Mail delivers mail items to households in Germany and to customers worldwide. DHL Express offers express deliveries. DHL Global Forwarding, Freight has two different focuses. DHL Global Forwarding focuses on air and ocean freight, while DHL Freight offers road freight operations. DHL Supply Chain works with warehousing and 3PL operations. Deutsche Post DHL is present in 220 countries around the world. In total, the company has around 400 000 employees and had a turnover of 401 900 MSEK in 2009. (DHL, 2011)

This case report will focus on the Swedish division of DHL Global Forwarding (DGF), and the term DHL will thus be equated with this division. In those cases where it is necessary to distinguish between DHL and DGF, the term DGF will also be applied. DGF has around 30 000 employees worldwide and about 325 of these work in the Swedish DGF division. With regard to the overall strategy of DHL in its entirety, the customer relationship manager says:

"It [our strategy] is to be one of the leading, or perhaps the leading transport company on a global level. And we have to be able to do that in an ethically correct way. And profitable, of course."

When DGF approaches potential customers, they try to emphasise price, availability, lead time and on-time deliveries. However, when the environmental manager is asked what she thinks that customers value the most when they buy from DGF, she immediately responds:

"Price"

DHL AND THE ENVIRONMENT

At DHL, there are environmental managers on a global level as well as on domestic levels. Within DHL Global Forwarding in Sweden, one environmental manager is responsible for environmental issues.

DHL started to work more resolutely with environmental issues four or five years ago. One example of this is that in 2007 DHL set a global target to cut CO₂ emissions by 30% by the year 2020. As a complement to the 30% goal mentioned above, DHL set a goal to cut CO₂ emissions by 10% by 2012 for their own vehicles and planes, which mostly belong to DHL Express and DHL Freight (trucks). The environmental manager says that DGF’s own operations – business trips, company cars and electricity for the offices – cause 0.5% of the total environmental impact if the transports DGF perform for customers are taken into account. Thus, instead of trying to cut emissions for their own direct operations, DGF tries to involve customers and subcontractors in the environmental work. The Swedish environmental manager says:

“We have to decrease our emissions, and the only way we can do that is to involve our customers since we on a Swedish level have difficulties to involve our subcontractors since that is regulated from our German head office.”

The environmental manager claims that a large part of the environmental work is to inform customers and try to get them interested in working towards environmental improvements together with DHL. She says:

“What we try to do is to provide customers with information and hope that they are interested...”

2.2 THE SHIPPERS

In this chapter, the four shippers will be presented. A brief general description of each shipper is followed by general information about each company’s environmental work. Holmen Paper is presented first, followed by Onninen, SECO Tools and Ericsson. Table 4 shows some general information about the four shippers.

Table 4. General information about the shippers

	Holmen Paper	Onninen	SECO Tools	Ericsson
Turnover MSEK	18 071	1 900 (Sw)	4 900	207 000
No. of employees	4 600	300 (Sw)	4 400	82 500
Industry	Producer of paper	Wholesaler for HVAC & electric power products	Producer of cutting tools and related products	Provider of telecommunications equipment and related services
Market focus	Mainly Europe	Sweden	Global	Global
Relationship with	Alltransport	Alltransport	DHL	DHL

2.2.1 HOLMEN

Holmen is a Swedish forest industry group founded in the 17th century. The head office is in Stockholm. In 2009 about 4 500 people were employed by Holmen and the turnover was 18 billion SEK. The company has two main types of business areas: Product oriented and Raw-material oriented. Product oriented business areas include Holmen Paper, Iggesund Paperboard and Holmen Timber. Holmen Paper produces printing paper of various types, while Iggesund

Paperboard manufactures paper board for consumer packaging and graphic applications and Holmen Timber produces sawn timber. The raw-material oriented business areas include Holmen Skog, which has responsibility for Holmen's forest assets, and Holmen Energi, which is responsible for hydro power assets and the development of energy operations. Holmen has six production sites, of which four are located in Sweden (Norrköping, Iggesund, Strömsbruk and Hallstavik), one in the UK and one in Spain. The main market for Holmen is Europe, where 90% of its products are sold. (Holmen, 2009)

The focus of this report is Holmen Paper and will therefore be more thoroughly described in the following. Holmen Paper has its head office in Norrköping in Sweden and around 60 people are employed there. Three of the six production sites mentioned above belong to Holmen Paper; Braviken, which has 700 employees, Hallsta, which also has 700 employees, and one in Madrid where 500 people are employed.

Holmen Paper's strategy is to be a leading manufacturer of high quality printing paper. The company is moving away from newsprint and towards more exclusive paper qualities. The high quality paper is more expensive for the customer to buy, and is also more expensive for Holmen to produce. Today, Holmen Paper has 10% of the European newsprint market, whereas the company has 30-40% of the European market of higher quality papers. All the "pink paper", used in the newspaper *Dagens Industri* for example, comes from Holmen.

Logistics is important for Holmen Paper, partially because of rules for Holmen Paper with regard to deliveries to customers. The customer often set an exact time for the order to arrive and if the truck is not there on time, it may have to wait many hours before being allowed to unload the goods. Holmen Paper's logistics director says:

"It is important that the product goes from the factory to the customer within the specified time limits and that it happens in such a way that when it arrives at the customer it is damage free."

On average, 14% of the sales price consists of transport costs, but that number differs according to the circumstances. For some customers, a problem is the distance between them and Sweden where Holmen Paper is mainly located. In order to be able to compete with other closer players on the market, Holmen needs to have warehouses in Europe to lower the lead times.

HOLMEN AND THE ENVIRONMENT

There is an environmental department at the Holmen Head Office in Stockholm that is responsible for environmental issues for Holmen as a whole. The environmental staffs at the different factories are responsible for their specific sites. There is no department or person responsible for environmental issues in logistics. The logistics director describes some of the environmental work conducted in the area of logistics within Holmen in the following way:

"Every second year we do a follow-up on how much we have emitted; sulphur, Nox, carbon dioxide and so forth, where we basically take all destinations into account."

He adds:

"From there it is not very easy to know what to do about it [the situation] but at least you get awareness about where we are."

The follow-up gives Holmen an idea of how well or badly they are performing. The estimations are based on calculations made by Holmen. Building the model took a lot of time, but since the industry is fairly conservative, the model does not require many changes from year to year.

According to the logistics director, there are LSPs that have a good idea about their emissions and would be able to give Holmen an approximate percentage for the contribution of their emissions. However, Holmen uses many different LSPs and many of them are very small and the logistics director does not think that they have the knowledge or the capacity to do these calculations. In addition, Holmen does usually not work with the largest players – they are too large. The logistics director says that as the situation is in Sweden, DHL and Schenker and companies of that size are too large to give the service needed in combination with reasonable costs.

The environmental competence within Holmen is high for those persons that have dedicated environmental positions in the company, but otherwise is not very high. Holmen has the ISO 14 001 environmental certification. Environmental training is not common within Holmen, but the logistics director thinks that it might appear in the factories, where there also are dedicated persons that work with environmental issues.

Driving forces for the environmental work within Holmen mainly come from two different sources. One is the customers, who think that Holmen should be at least as environmentally friendly and proactive as competitors. In fact, companies in the industry largely follow competitors with regard to environmental work. Indeed, Holmen basically follows industry standards, meaning that if Holmen or a competitor in some way “goes greener”, the rest will follow. The other driving force is the environmental personnel at the factories. When the logistics director comments on the environmental work and the driving forces, he says:

“I believe that...it may sound defensive, like we don't do anything. The problem is that you can really do a lot but you have to see that it gives something back. Some customers appreciate it, they ask for it, but sometimes it feels as though it is almost trendy to ask.”

The customers have different environmental demands and if Holmen are not able to fulfil these immediately, they do what is necessary to be able to deliver. But then, after Holmen has added that specific competence or other request, then the customer seems to forget about it. The logistics director says:

“It is just like they have been to a conference and heard that this is what they should ask.”

2.2.2 ONNINEN

Onninen was founded in 1913 in Finland, where the parent company is still located today. The company offers a wide variety of products and services to contractors, industry, public organizations and technical product retailers. There are basically two different business areas within Onninen; heating and sanitation and electric power. With regard to the heating and sanitation, Onninen competes for third place in the industry with roughly 15% of the market share. Onninen's present goal is therefore to be the best “number three”. With regard to electric power, Onninen is by far the biggest player in the industry with about 50% of the market share. Since it started in 1913, Onninen has been a family-owned company that has developed into a

corporation with operations in Finland, Sweden, Norway, Russia, Estonia, Latvia, Lithuania and Kazakhstan. In 2009, the corporate group as a whole had a turnover of approximately 1 340 million Euro ($\approx$ 11 700 MSEK) and had 3 000 employees. The focus of this case description, however, will focus on Onninen AB in Sweden (hereafter called Onninen) unless otherwise stated. Onninen's main office is in Solna, while the distribution centre is located in Örebro. The company has eighteen sites in total in Sweden. The In 2009, Onninen AB in Sweden employed 317 people and had a turnover of 1 830 MSEK. (Onninen, 2009)

Onninen's costs for transportation of goods are about 4% of total costs. When the transport coordinator talks about the importance of logistics, he distinguishes between the heating and sanitation segment and the electric power segment. Logistics is important for both of them, but more important for the customers within the electric power segment. He says:

"In reality, the customers [within heating and sanitation products] want very, very much service, but a lot of service costs a lot of money and in most cases they are not prepared to pay for it."

For these heating and sanitation customers, the transport coordinator guesses that the customers value the right price to 60% and various logistics parameters to 40%. He says:

"If we don't have functioning logistics operations, the customers won't buy from us, no matter how low our prices are."

For electric power products, price is less important than for heating and sanitation products. Logistics is, however, more important for this other products segment. The customers in this segment value suppliers that manage the difficulties that arise when products are to be delivered to different sites. The customers are large; the duration of contracts is long and as long as logistics operations are managed well, price is not an important issue. Sanitation and heating customers often purchase from 2-3 different wholesalers and alternate between those that performs the best or has the lowest price.

ONNINEN AND THE ENVIRONMENT

Onninen is located on a water catchment, which means that there are strict environmental regulations for the company's operations. For example, it is not possible to have asphalt everywhere outside the central warehouse, since the water has to be able to stream away.

With regard to environmental efforts at Onninen, the transport manager mentions that he attended a general environmental course when he started working at the company, but he does not know if that is something every employee does or if it is just those in leading positions. The transport manager also says that the environmental standard of the company cars follows environmental policies, even though they do not live up to the toughest environmental requirements that would allow them to be classified as "clean vehicles". The transport coordinator also emphasises that Onninen has waste management. For him, however, one of the things that is important in the environmental work is to keep the need for transports as low as possible, and he believes that he has a role to play in Onninen's environmental work:

"The environmental work that I do is to decrease the amount of transports, in order to get rid of as many unnecessary transports as possible."

However, in the transport coordinator's work, he considers costs 90% of the time and the environment only 10%. Still, he says, decreased costs are believed to go hand in hand with lowered environmental impact.

With regard to environmental competence within Onninen, the environmental manager seems to have the most competence. The transport coordinator says:

"We have one [person] here that is good at environmental issues – our environmental and quality manager – but I can't say that we have a very high [environmental] competence; no, I don't think so."

Within Onninen it is not believed that environmental work will improve competitive advantage. The transport manager says:

"In the end, I don't think that customers will pay extra because we drive 'clean vehicles' that would cost a lot more. I don't think so, even though they would profile themselves as if they would [pay extra]."

2.2.3 SECO TOOLS

Although the company's history goes back to the 17th century, the actual company called SECO Tools was founded in 1974 (SECO Tools, 2009). SECO Tools' main products are so-called inserts – small hard metal plates – for milling cutters or holders, depending on the application. In order to reach all potential markets, SECO Tools also produce milling cutter bodies, drill bodies and holders for turning. The small inserts are the most important product if volume in sales is considered, even though the other products also generate money. Around 60 million inserts produced by SECO Tools are sold every year.

SECO Tools' head office is in Fagersta, where production also takes place. Additional production sites are located in Arboga, Norrköping, Ludvika and Norberg. Currently, SECO Tools has two distribution centres; one in Belgium and one in Singapore. In addition, SECO Tools has affiliates in 42 countries, some of which have production units and some of which are pure sales companies. The company has a turnover of 4 889 MSEK and employs 4 400 people (SECO Tools, 2009).

The strategy of SECO Tools is to be a premium brand within its market segments. This means that they do not mainly compete on low prices but, instead, they offer detailed knowledge about the products they sell and how they can be used. The following citation from the manager of global transport solutions describes the strategy:

"The strategy is to be one of the three to four actors on the market that has a complete, high-quality program, no matter what type of processing that you want to do, we should in 85-90% of the cases have a standard product to offer and in the rest we develop special solutions for that customer."

Environmental concern is a part of SECO Tools' strategy. The manager of global transport solutions mentions the code of conduct which sets rules for how company employees should and should not act.

"It is a part of being 'the good company'."

Even if quality is important for SECO Tools, competitors also offer high quality products to their customers. Therefore an important competitive weapon is on-time deliveries. In Western Europe and the Nordic region, deliveries at the required time have always been important. The ambition of the Nordic sales office SECO Nordic is that all orders that come in before 5 p.m. should be at the customers' sites before 9 a.m. the following morning. Today SECO Tools has a service level of around 90%. Consequently, the global transport solutions manager states that logistics is very important for SECO Tools.

"I myself am a part of the logistics organisation and naturally answer that we need it to survive. I also think that is the honest answer, not only in order to praise my own role..."

SECO TOOLS AND THE ENVIRONMENT

On a corporate group level at SECO Tools, environmental issues are taken very seriously and the environmental consciousness is high. On a more individual level, consciousness naturally varies. According to the manager of global transport solutions:

"In that way, I can brag a little about my employer; environmental work as a whole, including work environment, is taken very seriously."

SECO Tools has a department that is responsible for quality, environment and work environment, and that department is located in Fagersta at the main office. The people that work there act as support and internal auditors for the different subsidiaries. They also give SECO personnel updates on the management system, including the environmental aspects of that system. Otherwise, there is not specific environmental training for the personnel, unless it is explicitly asked for.

The process of selecting LSPs from global transports' perspective includes three main criteria. First, the LSPs need to offer a high enough service level. They also need to have realistic prices, and third, they must be able to show that they have organised their work in a way that considers environmental issues. The first step is to have an environmental management system, which does not necessarily have to be ISO 14 001. The environmental requirements have sometimes caused problems, for example in countries where LSPs not always can live up to the required standards.

SECO Tools has to report their environmental impact and present how they systematically work in order to decrease, or at least maintain today's levels of, environmental impact. The manager of global transport solutions explains:

"The ambition is that we want to produce more and sell more, but no necessarily damage the environment more."

There are several driving forces for the environmental work. First, it is important to be considered a "good company". The manager of global transport solutions says:

"I do not think we can act powerfully on an international market without having the safety of this [environmental work]. We want to be able to step up and say 'We take responsibility'."

There are also financial incentives for the environmental work, because environmental concern also generates more business, according to the manager of global transport solutions. He says:

"If a company works internationally with environmental improvements, that [work] will increase market shares."

2.2.4 ERICSSON

Ericsson, which was founded in 1876, is a provider of telecommunication equipment, related services and multimedia solutions. In Ericsson's annual report from 2009, one can read: *"Our vision is to be the prime driver in an all-communicating world. This means a world where everyone can use voice, data, images and video to share ideas and information, wherever and whenever they want."* (p. 1). Over 40% of all mobile traffic goes through Ericsson equipment.

Ericsson is active in 175 countries, of which the United States and China are two of the largest markets. In 2010, Ericsson had a turnover of 207 billion SEK and employed 90 300 people. The company divides its business areas into five different segments; Networks, Multimedia, Global services, Sony Ericsson and ST-Ericsson. The first three of these are pure Ericsson segments, whereas the two latter are joint-ventures. Segment Networks is the largest of the three pure Ericsson segments and develops and delivers mobile and fixed infrastructure equipment and related software. Segment Multimedia develops and delivers software-based solutions for real-time & on-demand TV, consumer & business applications and Business Support Systems (BSS) for telecom operators. Finally, the Global services segment provides managed services, consulting, systems integration, customer support and network rollout. This segment is the second largest of the three segments. (Ericsson, 2009)

The remaining parts of this company description will focus on logistics within Ericsson, and more specifically distribution logistics, unless otherwise stated. The global strategy for the logistics division is to ensure that distribution and warehousing in the supply chain works. Centrally, about 80 people work with distribution logistics. Logistics and transports are very important to Ericsson, since they constitute an important part of the whole supply chain. However, the environmental advisor at Distribution Logistics does not know exactly how much of Ericsson's costs that derives from transport.

On a more general Ericsson level, transports are implicitly of importance. More specifically, one of the company's ideas is that people should not necessarily have to travel in order to communicate, since the products and services that Ericsson provides have a potential to lower the need for physical meetings between people. The environmental advisor at Distribution Logistics says:

"The sector that we belong to believes that it shouldn't be necessary to take that flight."

With regard to environmental work, Ericsson makes a Life Cycle Analysis (LCA) for all its products, and transports are one part of the LCA. The environmental advisor's work here involves the reporting of emissions from freight transports, and she therefore collects emissions reports from the logistics service providers. She states that it is too bad that there are no standards for how to measure and report CO₂ emissions and that this is a problem when emissions data is to be collected from the logistics service providers. However, since emissions

are reported every year, the environmental advisor at Distribution Logistics points out that it is at least possible to see changes and improvements compared to previous years.

As a step towards developing a standard for measuring CO₂ emissions from transports, Ericsson has been actively involved in NTM.

ERICSSON AND THE ENVIRONMENT

Ericsson basically wants to be a part of creating a more sustainable world. The company wants to empower both individuals and companies to actually do something about the problems that the world faces. There are a number of people within Ericsson that work with environmental issues, such as those that are dedicated to environmental design and the development of products. This means that they are working to make the products less environmentally harmful.

There are a number of people who work with environmental issues on a corporate level at Ericsson. In addition, there are a number of people at different places in the organisation that working with environmental issues; for example, every region has an environmental advisor who has general environmental responsibility for that region.

Ericsson is aware that they are a part of environmental problem. the environmental advisor at Distribution Logistics says:

"We know that we definitely have a part in environmental effects, since transports are a large part of environmental effects."

This knowledge is also a driving force for environmental work at Ericsson – they want to contribute to improving the situation. Another driving force is that they see a connection between environmental work and cost savings:

"The right cost and the right carbon footprint go hand in hand."

The environmental advisor at Distribution Logistics is required to give quarterly reports on transport emissions to the corporate level.

Ericsson also measures the quantity of goods that are sent via so-called surface transports (road, rail and ocean) and air. Ericsson sends a lot of goods by plane, but as a part of their environmental work they are trying to decrease the percentage of air freight.

The environmental advisor's responsibility is to inform the organisation about environmental issues within the field of transports. On a corporate level, sustainability director Matilda Gustafsson is responsible for environmental issues within Ericsson, and environmental issues is one part of the sustainability work at Ericsson. Matilda Gustafsson's superior is the vice president for sustainability and corporate responsibility issues.

Environmental work within Ericsson is driven by different people within the organisation and in part from the corporate level.

3 CASE DESCRIPTIONS

In this chapter, each case is first described based on general information about the relationship between the two companies in each buyer-supplier relationship. Next, a presentation of the environmental work in that specific case is presented.

3.1 THE ALLTRANSPORT-HOLMEN RELATIONSHIP

Holmen Paper is Alltransport's largest customer and represents 20% of Alltransport's turnover. Of those 20%, about 35% are inbound transports to Holmen's factories and 65% outbound transports from Holmen's factories. The remaining parts of this case description will focus on outbound transports, for which the logistics director at Holmen Paper is responsible. For Holmen Paper, in its turn, Alltransport represent about 5% of transport costs. Even though 5% may seem like a small figure, Alltransport is the largest transporter of products from Braviken to destinations within Sweden.

Holmen has been a customer to Alltransport for so many years that no one at the two companies seems to know the exact length of the relationship. Deals are renewed at regular intervals, and although the number of tons that Alltransport transports varies, the company has during the relationship always had some business with Holmen. The duration of the contracts between Alltransport and Holmen is usually two to three years. The duration of the contracts vary according to Holmen's situation. If Holmen knows of big changes planned within their company, they do not want to sign deals with Alltransport that are longer than two years. Alltransport on the other hand, tries to make the contracts last as long as possible.

There are basically two situations when the people interviewed at Alltransport and Holmen Paper are in contact with each. One is when negotiations for new contracts are made and once a year when price adjustments are discussed. In the case of Alltransport, the business area manager is the person who has the overall responsibility for the deal with Holmen, while the salesperson often is the person involved when adjustments, for example new destinations, are made during the contract period. The other situation that requires contact between Alltransport and Holmen is when trouble arises. For example, if the unloading at one of Holmen's customers is not working as it should, then Holmen Paper's logistics director is contacted by the customer. This, however, is something that rarely occurs. The logistics director says:

"But, I mean, if it [the relationship] works, then that is how it is. And basically it always does."

In addition to these two reasons for communication, other people within Alltransport and Holmen are in contact with each other as well. One example is the transport leaders, who are in contact with the unloading section at Holmen's site. That this communication is working as well is also important for the Alltransport-Holmen relationship.

Both Alltransport and Holmen are clear about the fact that there is trust in the relationship between the two companies. Alltransport's salesperson explains:

"Even if we have merely shaken hands on some issues, we still know that it [the handshake] is valid."

Alltransport's business area manager believes that Holmen trusts Alltransport because of the fact that Alltransport are allowed to do other things than just take care of transports. Trucks are sometimes loaded inside of Holmen's area when Holmen's working hours are over. More specifically, Holmen themselves have times scheduled for the loading of trucks each day, but in addition to these times, Alltransport's personnel do this job in the evenings. Furthermore, Alltransport also takes care of the unloading at some of Holmen's customers' sites. The logistics director at Holmen Paper even states that Alltransport is Holmen's *"face towards the customers"* and this has led to a strong connection between Holmen and Alltransport.

With regard to the power relationship between Alltransport and Holmen, both companies believe that Holmen is the more powerful. Even though Holmen Paper's logistics director initially says that the two power relations between the companies are equal, he admits that Holmen is the stronger since they are a big part of Alltransport's business and that Alltransport could be replaced if necessary, since *"there are a lot of trucks"*. He says:

"If they [Alltransport] didn't have Holmen, then they wouldn't be able to have as many vehicles as they have. We, on the other hand, would find someone else."

Alltransport is also aware of the fact that Holmen could switch logistics service provider if they found it necessary, and that such a situation gives Holmen power. Still, Alltransport's salesperson says that Alltransport has kept a high level of service towards Holmen, and he thinks it is unlikely that the company will change suppliers. Moreover, the business area manager claims that Holmen and Alltransport often reach mutual solutions. Additionally, he thinks that Alltransport exercises some power since they are either capable or not capable of doing what the customer asks of them:

"We have a possibility to say no, of course - if there are circumstances that we can't accept or prices that we can't accept. But often we find mutual solutions."

Holmen Paper's logistics director concludes that even though Alltransport are more dependent on Holmen than Holmen on Alltransport, this is not something that Holmen takes advantage of. He also adds that Alltransport's size is of importance to Holmen, because the company is neither too big nor too small. If demand for transportation increases unexpectedly – for example because of news that in turn leads to an increase in demand for newspapers – and a truck must transport paper to a customer at 12 am, then Holmen can call a driver at Alltransport and ask him to do that. According to the logistics director, DHL would for example not be able to do this, since that company is too big to be so fast. He explains:

"So this is where they [Alltransport] have their niche. They help out. That's their strength. So they can't grow too much. If they grow, it is important that they keep the personal touch."

The relationship between Alltransport and Holmen is based on the function that is bought, that is, the transports. Holmen's logistics director says that although it is always nice to recognise the person sitting opposite you when you are negotiating, it is still the function that is bought. Alltransport's salesperson agrees that the contact between Holmen and Alltransport is mostly professional, but adds that it is to some extent built on more personal relationships. Alltransport's salesperson says:

"We have gotten to know each other very well over the passing years. We negotiate, we call each other about new changes once in a while and we meet at customer activities too, so we know each other well."

3.1.1 ENVIRONMENTAL WORK IN THE RELATIONSHIP

Environmental work is an issue in the relationship with Holmen, according to both the business area manager and the salesperson at Alltransport because of the desire to have high load rates and the need to minimise trucks running empty. This work is made easier since Alltransport takes care of both some inbound and some outbound transports for Holmen and both "sides" (inbound and outbound) were present at the same time during the previous negotiation. The business area manager at Alltransport says:

"We try to match the two deals that we have with Holmen, so that the outgoing volumes match the incoming. We match those flows, so that trucks that load paper from Norrköping to Stockholm or Västerås or some other place, for them we transport recycled paper back to the factory. So we try to match that as much as we can, so that it becomes almost a closed circle."

Alltransport's salesperson gives some more information about how they are working towards high fill-rates and states that Holmen themselves keep track of how much to load until a truck is fully loaded. He says:

"We hardly ever have half-filled trucks [for Holmen]; we make use of the loading possibilities to 100%, at least with regard to weight limits."

However, according to the salesperson, Holmen never speaks about the fill-rates in environmental terms; the measures to reach high fill-rates are for financial reasons. Other than high fill-rates, the environment is not taken into account in the Alltransport-Holmen relationship, according to Alltransport's salesperson. The logistics director at Holmen Paper states even more clearly that environmental issues do not exist in the relationship between Holmen and Alltransport. When asked if environmental issues are a matter of consideration in any way in the relationship with Alltransport, Holmen Paper's logistics director says:

"No, they actually aren't. We haven't really asked those questions. /.../ We have just focused on the product arriving at the right time and so on."

Both Alltransport and Holmen Paper are clear about the fact that Holmen Paper does not have any environmental demands at all and environmental agreements are never part of the contracts between the two actors. The business area manager at Alltransport even puts it like this:

"I perceive that [Holmen's environmental demand] as non-existent."

Likewise, Holmen's logistics director states that Holmen Paper does not have any specific environmental demands on logistics service providers in general, and says:

"When we negotiate transport deals, we have come pretty far with regard to secure loading requirements...But we don't have demands that they [the LSPs] should have a specific engine."

Thus, environmental work is not a reason for why Holmen is a customer of Alltransport. Service is the most important aspect, but if different LSPs can offer the same high service level, then environmental work could potentially be a factor that affects the choice of LSP for Holmen. Moreover, Holmen is not willing to pay for environmental work.

As a consequence, the environmental work that Alltransport does in the relationship with Holmen is at Alltransport's own initiative, since there is no demand from Holmen. If a truck is on its way back to Norrköping from somewhere in Sweden, Alltransport tries to fill it up with recycled paper for the factory in Braviken. This benefits the customer in the end, since Alltransport gets an efficient transport flow and costs are decreased.

With regard to green focus within Alltransport, the salesperson at Alltransport thinks that Holmen thus is aware that Alltransport conducts environmental work. He says:

"I think they somehow know us so well and they receive documents about our environmental work, and somehow that is enough for them."

Holmen Paper, on the other hand, has no awareness of what Alltransport's environmental offering consists. According to the logistics director, Alltransport has never really tried to clarify the details of their environmental work, and Holmen has not asked for a clarification either. According to the logistics director, the situation in Sweden is different from other European countries, in the sense that Sweden has come further with regard to environmental issues. He says:

"...Sweden, at least, here – at least we perceive, and hope and believe – has come so far with regard to engines, that we shouldn't really have to be concerned here. But that's more of a feeling that we have."

This reasoning also applies to Alltransport. The logistics director says:

"...we think that they [Alltransport] have 'good things' and that they work with these things themselves. We read in their magazine which we get now and then and see that they have different projects. So I am certain that they don't just sit and do nothing."

Holmen Paper's logistics director thinks that it is vital that if environmental issues were to be discussed with an LSP, it must be done in the negotiation phase. He does not believe that it is of interest later in the process – at that point in time things have to go fast and everyone is busy.

According to Alltransport, the most environmentally driving company in the relationship is Alltransport. The salesperson believes that this has to do with the nature of the companies; Alltransport is a logistics service provider and it is more natural for such companies to be environmentally aware. When the business area manager explains why he thinks Alltransport is the most environmentally driving company in the relationship, he says:

"We at least try to inform them about our way of working and our way of thinking, and every year when our sustainability report has been published we have gone through it together with them so that they get to see it. So I think that they are aware of our [environmental] work. I hope..."

The logistics director at Holmen, on the other hand, does not see a clear driver of environmental work in the relationship between Alltransport and Holmen. He thinks that the question is difficult to answer, but concludes:

"We are not proactive and that goes for the other party [Alltransport] as well."

3.2 THE ALLTRANSPORT-ONNINEN RELATIONSHIP

Onninen represent about 3% of Alltransport's turnover, which makes them an average customer for the company, or *"a good medium-sized customer"* as the business area manager for Alltransport puts it. As for Onninen, Alltransport represent around 4.5% of total transport costs. All Onninen's goods that are to be delivered in Östergötland are transported by Alltransport. The logistics service provider is involved in deliveries of almost the whole range of heating and sanitation products and in the smaller deliveries of the electric power products offered by Onninen. Every evening, Alltransport sends a truck and trailer to Onninen's central warehouse. The goods are driven to Alltransport's terminal in Norrköping, where they are handled and sorted and then distributed the next morning in the distribution vehicles.

Onninen has been a customer of Alltransport since February 1st 2010, and the first contract is for three years. Onninen's transport manager says the following about the period of the contracts:

"I know who they [Alltransport] are and what type of quality they can deliver. At the same time, price is important as well; I get a lower price if I sign a three-year contract as opposed to a one-year contract. So I make money and they also benefit because of the security of three years so that they can develop. I could just as well sign a five-year contract. There is a clause, so if they mess up, then the contract is broken."

The transport manager has known the company Alltransport, and naturally some of the people there, for seven years and worked with them in his previous job as a transport salesperson. At that time, Alltransport and the transport manager's transports were coordinated at times, whereas the transport manager is now "at the other side of the table" and buys transports from Alltransport. This means that he is tougher in his relationship with them now and he also knows how to deal with them since he has been on the other side. He also thinks that his history as a salesperson is an advantage in his new role. He says:

"Since I have sold transports, I know how a [transport] sales person works. So that's fun."

With regard to daily activities, the transport leaders are the people who manage the relationship between Alltransport and Onninen. The employees interviewed at Alltransport and Onninen are in contact with each other approximately once or twice a week and they meet physically every two months. Alltransport's business area manager is very seldom in contact with Onninen, since the salesperson is the person who is responsible for the contract with Onninen. The two companies are generally have contact for three different reasons, other than the negotiation process; problems, new circumstances or invoice issues. Onninen's transport manager also adds:

"There are also occasions when we just call to talk in general. But that's something I do with all our suppliers."

Alltransport and Onninen have a trustful relationship, according to both involved companies. Representatives from both companies mention that the trust is built on the employees at the other company. Onninen's transport manager specifically mentions Alltransport's salesperson, with whom the transport manager is most often in contact. The transport manager has made it clear that the salesperson is the person he wants as his contact person and he was also the person the transport manager knew from his last job. The transport manager says:

"I know that Tommy Gustafsson [the salesperson] will fix this [Onninen's transport needs and problems that arise]."

The business area manager bases the presence of trust on a background story where Onninen had trouble with a logistics service provider that was responsible for the company's transports. That had led to a broken contract and a switch of logistics service provider to another provider. When Alltransport also wanted a deal with Onninen, convincing Onninen's personnel was difficult and during this time the transport manager was not very popular within Onninen. Alltransport's business area manager says:

"So when we came into the picture and wanted to take care of some transports, we had a tough job in convincing the personnel within their [Onninen's] organisation. Since John [Lind, the transport manager], who is responsible [for transports] within Onninen, has worked with Alltransport previously, he knew what we could achieve. But we had a tough job convincing the personnel within Onninen."

Alltransport's salesperson also says that Alltransport had to prove that they were able to live up to Onninen's demands and there were many meetings before the deal was closed. He says:

"Then there is the issue of convincing their [Onninen's] customers as well. In order for us to be a supplier, we had to manage the time restrictions in Östergötland. So we have had to rearrange much of our traffic in order for us to manage that. But this is a competitive advantage for Onninen as well; they can tell their customers that we arrive a certain time – much earlier than competitors – and that way they can sell more and we can sell more transports."

In addition, the relationship between Alltransport and Onninen was tested at an early stage since the start of the contract coincided with the chaos caused by heavy snow in Östergötland in 2010. That meant that Alltransport's trucks were often very late. The transport manager says:

"The transition [from the previous LSP] to Alltransport has not been without hitches. The first month was chaotic - there were the snowstorm in January and February - so they weren't off to the best start."

During this time, Alltransport and Onninen had daily communication in order to try to solve the problems. Although there were problems, the relationship between the two actors was strengthened during this time. After that, whatever problems that have arisen have been solved and solved quickly, and this has enabled a high degree of trust between Alltransport and Onninen.

Some adjustments have been made since the first year of the deal between the two companies because of things that have worked well and things that have worked less well. Alltransport's business area manager says:

"But it feels like we've sorted things out and that they have a high confidence in us today."

Onninen are also happy about the arrangement and are pleased with the work that Alltransport performs. The transport coordinator also says:

"Alltransport has been very responsive, come up with changes on their own and that is something we like – that I don't have to tell them what to do all the time and that they can come up with their own ideas."

With regard to their power relationship, Alltransport and Onninen, Onninen seems to be the most powerful in the relationship. However, Onninen's transport manager has not thought about power in the relationship and is convinced that it does not really matter. He reluctantly says that Onninen probably has more power, since they can switch transport supplier if Alltransport does not do a good job. He wants Alltransport to do their job well and power is not an issue. He says:

"I expect that they do what they are supposed to – those things we've agreed on – and that they develop during our collaboration and find better and smarter solutions and that we don't stand still and instead achieve continuous improvements."

Onninen's transport coordinator is more certain that Onninen has the power in the relationship between Alltransport and Onninen, because Onninen is the customer:

"After all, we are the ones who are in charge of whether or not we want them [Alltransport] to transport [goods]; they are not the ones who decide if they want to transport our goods."

Alltransport agrees and partially puts the power situation down to the fact that Onninen puts such high demands on Alltransport with regard to punctuality. The salesperson says:

"We have to adjust to their demands quite a lot."

Alltransport's business area manager compares the Alltransport-Onninen relationship with the Alltransport-Holmen Paper relationship (presented in Chapter 3.1). He thinks the relationships work a little differently and says:

"In the end it is the customer that has the advantage since they own the goods, but this [Onninen relationship] has worked a little differently than with Holmen. Holmen is a little old-fashioned, if that's the right word. You meet the purchasing director once a year and you have a meeting where you go through the contract. Onninen is a bit more modern. We meet on a regular basis; sales personnel and transport leaders and their operative personnel meet and we've brought our drivers to some meetings to talk about ideas and how we can improve and the

importance of doing things properly. So in my view, Onninen has a more modern set-up."

The two companies are jointly responsible for the success of their relationship according to Alltransport's business area manager. He concludes:

"So, I think that our power [over Onninen] is pretty high, in spite of everything."

The relationship between Alltransport and Onninen is to a large extent based on personal connections, even though the transport coordinator only contacts Alltransport on a professional basis and has no personal contacts within the company. Alltransport's salesperson and Onninen's transport manager knew each other before the deal between the two companies was made. The salesperson says:

"We have a very good relationship since I already knew John [Lind, at Onninen] from the transport business. ... We have a business-like relationship, but a good one."

In addition, the transport manager previously had contacts within Alltransport. Alltransport's business area manager adds that many people within Alltransport have now also developed a personal relationship with the transport coordinator at Onninen and says:

"So it's based on a little more than just business relations. And that is something that we like."

Alltransport and Onninen basically agree that Onninen has the power over Alltransport, even though the transport manager at Onninen does not think that power is an issue that has any effect on the relationship.

3.2.1 ENVIRONMENTAL WORK IN THE RELATIONSHIP

During the negotiations between Alltransport and Onninen, environmental issues were not mentioned and according to Alltransport, the focus was on-time deliveries and price. Onninen's transport manager says:

"Unfortunately we didn't think about environmental things when we made the deal with Alltransport, although I know that they work with environmental issues. But that has not been the critical detail in this case."

Alltransport has tried to show what they are doing within the environmental field, but that was not what closed the deal with Onninen. The business area manager says:

"Nothing that I have been a part of in the relationship with Onninen has been about that [environmental requirements]."

According to Onninen's transport coordinator, however, one of Onninen's requirements was that Alltransport should have environmentally high-quality vehicles. He adds:

"Other than that, it [the environmental work] is that we should work towards decreased amounts of transports and plan transports in an as smart way as possible for both parties."

From Onninen's perspective, a decreased in the number of vehicles and smarter planning are viewed as mostly cost saving measures. Onninen's customers do not want more than one vehicle delivering goods and at the same time, and according to Onninen it is not financially possible for Alltransport not to consolidate goods. Consequently, the environmental side of this work is merely seen as a bonus and is not explicitly discussed in the relationship between Alltransport and Onninen.

Both the transport manager and transport coordinator at Onninen know that Alltransport works with environmental issues and the transport manager says that if he had been a hauler, he would have driven efficiently in order not to use too much fuel for example, which would keep costs down. Driving efficiently would also benefit the environment, which is something he believes holds for many cost saving strategies for logistics service providers. The transport coordinator looked at the documentation of Alltransport's environmental offering during the negotiation process over a year ago, but he does not remember enough today to explain the offering. The transport manager also knows that Alltransport has new vehicles and that they constantly update their fleet. He says that when you are on the road:

"You see many trucks that belong to Alltransport, and they look new."

Environmental issues are not discussed when Onninen's transport manager and Alltransport's salesperson talk about different matters, but the transport manager knows about Alltransport's environmental work from their webpage and he knows that they have an environmental management system. He says:

"They are certified according to ISO within the environmental field as well [as quality], and then you know that they've done work in order to get this quality marking. You can't cheat your way to that, so there you get information that shows that they think about environmental issues and work towards them [environmental improvements]."

With regard to Alltransport's green offering, Onninen's transport manager says:

"It is difficult to pin down what they [Alltransport] offer as far as environmental categories are concerned, besides the fact that they are [environmentally] certified. It's not as if they offer me two different suggestions – one 'dirty' truck and one environmental truck. I don't get those kinds of offerings from them. They have never given me two different options."

The environmental certification is important for Onninen and all suppliers need to have some environmental management system. The transport manager explains more about the green offering:

"I only notice that they are [environmentally] certified. I would probably not have chosen Alltransport if they weren't certified."

On the other hand, Alltransport's business area manager says:

"I get the feeling that they don't consider that [environmental demand] a prioritized issue."

Onninen has never had any green demands that Alltransport could not fulfil, but on the other hand, they have never required anything other than the environmental management system. Onninen's transport manager gives an example of Stockholm, which has strict environmental regulations and where it is not allowed to use any old truck – the truck has to live up to some environmental standard. The logistics service provider that takes care of Onninen's deliveries there has to follow strict environmental regulations. But since there are no similar environmental regulations in Norrköping, Alltransport does not need to fulfil the same requirements.

Alltransport is the most environmentally driving company in the relationship. One reason for this according to both Alltransport and Onninen is that Alltransport wants to send as few trucks as possible, with as high loading rates as possible. The transport manager says:

"They [Alltransport] are the ones who have to drive in the most economical way in order to make more money."

Another reason why Alltransport can be considered to be the party with the environmental interests is that Onninen has simply not demanded any environmental work yet. Alltransport's salesperson says:

"I do not know their environmental work, but since they have not required environmental work from the beginning, I still think that we are driving more [with regard to environmental issues]."

Both Alltransport and Onninen predict that the environmental demands from Onninen will increase in the future.

3.3 THE DHL-SECO TOOLS RELATIONSHIP

SECO Tools is an important customer for DHL, and is sometimes the fourth and sometimes the fifth largest customer for DHL Global Forwarding (DGF). DHL transports in total about 30% of SECO Tools' volumes, including both DHL Global Forwarding and DHL Express. DGF often transports large volumes to distribution centres around the world, where DHL Express, or in some cases, regional actors, take over and distribute the separate parcels. According to the customer relationship manager (CRM) at DHL, SECO Tools mostly transports goods by air, but they use road and sea whenever possible.

According to the CRM at DHL, SECO Tools has been a DGF customer since 2003. They have continuous contracts, where no end-date is set and where price adjustments are negotiated once a year. If either DHL or SECO Tools are dissatisfied, there are varying terms of notice depending on the specific situation.

With regard to the contact between DHL and SECO Tools, it is the CRM who is the global co-ordinator for SECO Tools. The manager of global transport solutions at SECO Tools and the CRM at DHL have known each other professionally for many years. The CRM says:

"Since five years back I have been their [SECO Tools] way into DHL, and they have decided that they want me no matter which division it is."

Besides communication with the CRM, the global transport solutions manager keeps in contact with DHL through global or regional managers within DHL Global Forwarding or DHL Express. He says:

"We are large enough [for DHL] to have special key account managers assigned to us for each region."

DHL and SECO Tools have a trustful relationship, according to representatives from both companies. For DHL, the CRM bases his opinion of trust on the fact that the two companies can speak openly about different solutions without having to hide things from each other. DHL's environmental manager agrees and says that since she is not in a commercial position within DHL, she can tell things to SECO Tools that a sales person perhaps would not want to say. She would not do that without there being a feeling of trust in the relationship.

The manager of global transport solutions gives one main reason for the relationship of trust between DHL and SECO Tools which is that he believes that SECO Tools are really too small to have a key account manager. He thinks that the other companies that are assigned such key account managers have turnovers ten times greater than SECO Tools' turnover. However, according to the global transport solutions manager SECO Tools has complex transport specifications. At the same time, DHL are able to offer a large variety of services, from large deliveries like granting a charter of a plane or ship to small, time critical transports like single parcels by taxi. The global transport solutions manager concludes:

"They [DHL] have given us trust through assigning us specific contact people."

The CRM at DHL is a good example of such a person and SECO Tools' global transport solutions manager says:

"I have worked in the [transport] industry and created my own network, so some of the companies that SECO Tools works with today with regard to transport solutions would not have become a supplier if it wasn't for me, since I use old communication channels and sometimes of very informal character."

With regard to power, DHL's CRM is convinced that SECO Tools is the most powerful actor in the relationship. He says:

"The customer is always right."

SECO Tools global transport solutions manager is of another opinion. First, he says that that there is a good balance in the power between SECO Tools and DHL. He says:

"I might be naive in a Swedish way, but I would say that there is a good balance of power. Now we touch on things like personal chemistry, deep respect for people who have worked professionally with things for many years. There is maybe not always respect between SECO Tools AB and DHL Global Forwarding Sweden AB or DHL Express Sweden AB, but on a personal level I would have to say that there is a very good balance."

He does, however, add some more information about his view of the relationship:

"However, if you look at it strictly in business terms, we are small fry for DHL since a local office for them might well be as large as we [SECO Tools] are globally."

Despite the fact that the global transport solutions manager perceives that DHL has most of the power, he is not concerned since the relationship works well on a personal and business level. The CRM at DHL seems to agree:

"SECO Tools is a so-called wise customer. They know that you can't demand a Rolls Royce if you pay for a Fiat. In that way it is fairly simple to have a dialogue with SECO Tools and they are prepared to pay for high quality."

Moreover, SECO Tools compares DHL's offerings with other LSP's offering and SECO Tools' global transport solutions manager claims that the company does have some power there:

"If DHL does not have the best balance between price, lead time and accuracy and can show environmental data that is correct, well, then they won't get the deal. Now, that was at least a bit cocky."

Both the CRM and the global transport solutions manager think that personal relations are important in the relationship. For example, the CRM is convinced that DHL and SECO Tools do more business together because of the personal connection between himself and the global transport solutions manager. These two company representatives did not know each other before the collaboration between DHL and SECO Tools started, but the confidence in the relationship was built early when they started working together. The CRM at DHL says:

"After our first meeting we decided that I would never go to Bengt [Brammefors, at SECO Tools] and sell something; he would tell me if he needed anything."

For SECO Tools part, the business deal itself is dealt with on a central level, but as soon as the contract is signed a lot of more people are involved than the global transport solutions manager. He believes that a business relationship is really built on communication between individuals and says:

"If you get a little bit philosophical, then you see that it is not companies that are in contact with each other – it is human beings."

DHL's CRM adds, however, that it is the business relations between the two companies that provide the basis for the collaboration.

3.3.1 ENVIRONMENTAL WORK IN THE RELATIONSHIP

Environmental concern is relevant in the relationship between DHL and SECO Tools, and the two companies communicate well with regard to environmental issues. According to the CRM, DHL does not have the same substantial environmental discussion with all customers. He says:

"With regard to environmental work, we have a very good dialog with SECO Tools in particular."

For SECO Tools' part, environmental work is one of the criteria that the company needs to consider when suppliers are chosen. More specifically, suppliers are measured on the quality of the technical solution, lead time, price and environmental data. If all other things are equal,

environmental considerations are taken into account in the choice of supplier. The global transport solutions manager gives an example:

"I think I can claim that the company that can show that it works actively with environmental issues and actually, over time, has better measurements and can explain those numbers and stand for them – even if it is 5% more expensive, that is the ones that get that deal, as opposed to one that is really cheap but where we feel that there is no serious environmental evaluation."

SECO Tools' customers value 1) the product 2) on-time deliveries and 3) price, and in that particular order. The CRM at DHL says:

"That's a bit unusual, that the price comes after the logistics parameter."

The fact that on-time deliveries are an important factor sets boundaries for the environmental work. More specifically, even though SECO Tools is interested in environmental issues, the company needs to live up to customers' demands. The CRM says:

"If you wonder how customers think about logistics, it is clear that SECO Tools is very interested in environmental issues, but at the same time, they have to give their customers as good a service as possible from a competitive point of view."

The CRM at DHL thinks that the tight time schedule that customers demand is one of the largest problems for environmental work in general for LSPs. If SECO Tools' customers could order their goods 24 hours earlier than is done today, it would open up new possibilities for the transport planning. The CRM says:

"If it would be possible to increase the awareness of environmental issues – not at SECO Tools, but at SECO Tools' customers – then you would get a large environmental effect."

According to the CRM at DHL, there are basically three main projects that DHL and SECO Tools have performed, or are working on, together in terms of environmental work; decrease the amount of pick-up trucks at the DC in Brussels, open a new DC in China and open a national DC in Sweden. Details about these three projects are described below. In addition to these, SECO Tools has stopped the using air freight to their site in India, and they have made changes in their planning which enables some large deliveries to be transported by ship.

A few years ago, the CRM at DHL and the global transport solutions manager at SECO Tools made a trip to Brussels where SECO Tools' distribution centre (DC) is located. The aim of the trip was to see if they could lower the number of trucks that picked up goods from the DC. At that time, fifteen trucks collected goods each day. The two company representatives tried to calculate at what time the goods had to be picked up in order to arrive at the customers on time. They did these calculations for the whole flow from the DC. This work enabled a decrease in trucks from fifteen to eight. The CRM at DHL says:

"We did pretty well. We managed to get down to eight [trucks]... The icing on the cake was when we managed to get DHL Express and Global Forwarding to collect with the same vehicle."

Because of changes in the structure in Brussels, the use of the same vehicle is no longer possible.

The second project includes changes in SECO Tools' distribution, and more specifically the start of a DC in China, since SECO Tools discovered that 40-50% of all goods that are sent to the Asian DC in Singapore end in China. The plan now is to send this 40-50% directly to Shanghai and thereby eliminate the extra distance between Singapore and Shanghai. DHL has assisted SECO Tools in this work and has helped them to think about certain issues. In addition, DHL's environmental manager has calculated the environmental effects such a change in the distribution would result in.

The final environmental project in the DHL-SECO Tools relationship includes yet another change in the distribution system. Today, goods that are produced in Sweden are transported to the DC in Brussels and goods that later are sold in the Nordic region are transported back north to the customers. SECO Tools is now considering opening a national distribution centre that could support customers in the Nordic region, the Baltic States and parts of Russia. If this was done for those goods, the return journey between Sweden and Belgium would be eliminated. The CRM at DHL says:

"And this is purely an environmental idea."

DHL's environmental manager helped SECO Tools with environmental calculations for this possible change in their distribution. In fact, SECO Tools is one of the few customers that have wanted help to calculate more advanced environmental data. However, the environmental manager is not sure if it is a genuine environmental agenda from SECO Tools' side, or if the global transport solutions manager may have got directives from higher up in the hierarchy. Still, she says:

"Approximately 140 customers want environmental reports, so it's not unique, but these [SECO Tools] seemed to want to do more."

Even though environmental issues are discussed in the relationship between DHL and SECO Tools, money is also a central factor in the discussion. The CRM at DHL says:

"There is a common denominator in all of these three cases, and naturally that is that...if you reduce the amount of pick-up trucks by half, then you don't just reduce the environmental impact; you also reduce costs."

DHL manages well in the "green competition", according to SECO Tools' global transport solutions manager. He says that for standard transactions, DHL can use their system, press a button and out comes the environmental report. For SECO Tools, many of the DHL services performed are not standard products. Therefore the environmental manager at DHL has had to work hard to provide SECO Tools with the data they require. The global transport solutions manager believes that DHL has an advantage because of the work that the environmental manager conducts. He says:

"The specific supplier, no matter who, that has Linda [Bergsten] as their environmental manager, has an advantage over the others. I have never met a person more devoted to environmental issues."

As mentioned in the description of environmental work within DHL, the company works with a GoGreen concept, where customers can pay an extra fee and become a part of the decision about what that extra money should be used for. The CRM at DHL says that SECO Tools has not yet bought the GoGreen concept. However, he says:

"...and I think it attracts the type of environmentally aware customers that SECO Tools is a good example of."

He believes that SECO Tools will buy the GoGreen program if they find somewhere useful to invest the extra money. He gives an example of the portable water purification equipment that DHL works with and that could be something that SECO Tools can support in the future. On the other hand, SECO Tools has actively chosen not to buy DHL's Go Green concept. This is because SECO Tools thinks that the measures taken should be more directly related to the transports linked to their products. The global transport solutions manager explains:

"What we in that case want to pay for should have a more clear connection to the commitment in itself"

Thus, SECO Tools does not want to buy the GoGreen program. However, SECO Tools has other green demands, and the global transport solutions manager is clear about what these are:

"What we need is basic [environmental] data, which should be of high enough quality and we should understand how it was calculated."

The environmental data that SECO Tools requires is CO₂ emissions, partially because CO₂ emissions are the specific indicator for which an international standard has started to be developed. They have planned to add other indicators as well in the future, but as the global transport solutions manager says:

"We have to start somewhere."

DHL's environmental manager has partially helped the global transport solutions manager and his co-worker within global transport solutions to understand what type of data to require, in the sense that SECO Tools previously were interested in the exact fill-rate of a plane one specific day and exactly how much their portion of the freight weighed. Now they focus more on an average fill-rate that seems to be accurate enough over time. The global transport solutions manager says:

"It will never be completely accurate. I think that was an extremely important lesson learnt when we sat down with Linda [Bergsten, environmental manager at DHL] for a whole day. She actually helped us analyse our own material, and I think that is well done."

SECO Tools' global transport solutions manager also states that there are regional differences between the green offerings from different DHLs, which make the demand for uniform environmental data more difficult. He says:

"The offering does not look the same, even within [DHL] Express, here [Sweden], in Belgium, in Singapore and for USA flows."

The CRM at DHL believes that DHL are able to fulfil all environmental demands that SECO Tools have, as long as they are realistic about the fact that a transport needs to take place. DHL's environmental manager agrees and says:

"Yes, I think so – they haven't actually requested that much. They merely want to find some ways to lower the emissions – and we have done that – and we offer [environmental] reports. They are not interested in any green products and carbon offsets, but they are interested in a financial and environmental profit."

According to SECO Tools' global transport solutions manager, DHL has understood that environmental issues are important. He says:

"It is so modern, that those who offer a so-called green alternative in certain markets will gain market shares."

In a way, both SECO Tools and DHL encourage the work with environmental issues in the relationship between them. On the one hand, the global transport solutions manager says that since they do not have "a Linda [Bergsten, environmental manager at DHL]", they cannot compete with being the driver of environmental work.

"I cannot say that we [SECO Tools] have a person that is so devoted."

In addition, DHL believes that they are the party that pushes for environmental work since they come up with environmental suggestions with which they then approach SECO Tools.

On the other hand, both SECO Tools and DHL seem to agree that SECO Tools to some extent is the driver of the environmental work, since the company has a green demand and asks questions that show that they are environmentally concerned.

In a way, both companies can be said to be driving forces with regard to environmental issues. The CRM at DHL thinks that both of their commitments go hand in hand and says:

"...since we know that they [SECO Tools] are open for such [environmental] argumentation, of course it helps our communication and our business relationship if we can prove ourselves to be inventive and help them reach their environmental targets."

3.4 THE DHL-ERICSSON RELATIONSHIP

DHL takes care of about 20% of the inbound flows at Ericsson, which corresponds to 150 million SEK. Ericsson is a major customer of DHL and is also the most expansive within DHL Global Forwarding (DGF). DGF does not merely provide sea and air freight, but also has control tower operations which mean that they function as support for the logistics department at Ericsson. DHL is also one of five transporters that take care of Ericsson's outbound flows. Ericsson has been a customer of DHL for a long time.

On a global level, the contracts between Ericsson and DHL do not have an expiry date. These so-called sales agreements enable regional and local Ericsson divisions to negotiate more detailed agreements that suit the local conditions. The local contracts in Sweden have a duration period of one year and constitute an extension to the global sales agreement. The inbound & domestic development manager at DHL thinks it is too bad that the contract periods are so short, since

DHL and Ericsson continuously work with improvements in the relationship it is sometimes disturbing that negotiations have to interfere with that work. He says:

"That [negotiations] is not where focus should be right now."

During negotiations, DHL's share of Ericsson's transportation can change. The inbound & domestic development manager says that DHL has lost shares with regard to Ericsson's export flows, whereas inbound flow shares keep growing.

DHL has a meeting at every Ericsson site in Sweden once a month. The meetings are run by the environmental advisor at Ericsson Distribution Logistics and she helps to collect the necessary information before each meeting. At these meetings, all flows are discussed and questions that arise are answered. Market tendencies are discussed as well as organisational changes and KPIs (Key Performance Indicators) and why they might have changed. The inbound & domestic development manager says:

"In this communication we have a very natural way of talking to each other about current problems, what has happened since the month before and what is going to happen in the near future."

DHL is also in contact with some of Ericsson's suppliers and discusses how the transport bookings should be handled. The environmental advisor at Distribution Logistics has contact with DHL when they provide emission reports and when Ericsson wants goods moved.

The relationship between DHL and Ericsson is perceived to be a trustful one, according to both companies. The inbound & domestic development manager bases this on the notion that the two companies work together to find solutions and he says:

"They [Ericsson] trust us, to a hundred percent."

Another reason to why the relationship is regarded as one of trust is that the two companies communicate well and they know how to deal with things if something goes wrong. The two companies have got to know each other well. The environmental advisor at Distribution Logistics at Ericsson says:

"We've made a journey together."

Moreover, the inbound & domestic development manager at DHL thinks that to achieve a high level of trust between DHL and customers, requires a lot of work; the companies need to see each other regularly, communication needs to be good and DHL needs to give the customer conditions to succeed in its work. He thinks that Ericsson values the fact that DHL puts the customer first and analyses customer needs to find suitable solutions, and he elaborates:

"They have a high trust in us. They know that if we make mistakes, we take responsibility for them. And if they make mistakes, we can talk to them as well. It's a give-and-take situation."

With regard to power, DHL's environmental manager is convinced that Ericsson holds the power over DHL in the relationship, while the inbound & domestic development manager at DHL and the environmental advisor at Ericsson Distribution Logistics have not considered

power as an issue in the relationship. The inbound & domestic development manager considers the two companies as equals and adds:

"If I come into Ericsson's different sites, I feel at home."

Ericsson Distribution Logistics environmental advisor's view of power in the relationship is that the collaboration is built upon a strong relationship and that power is not an important issue. Service is trickier to buy than products, because it is not as easy to define what it is that you want. However, she admits that even though the environmental advisor says that Ericsson demands certain lead-times and service levels:

"We have certain requirements regarding the service we buy, but I don't think that's power; I think that is a part of the relationship that we buy."

DHL's inbound & domestic development manager has the same view and emphasises that improvements need to be achieved together with the customer, and therefore a good relationship is important and one partner's power over another can disturb the work in the relationship. He says:

"They know that we have switched on a light and that we need to walk together and we will get a lot of aha-experiences /.../. We do this together."

To some extent, personal relationships are important to the DHL-Ericsson relationship. The environmental advisor at Distribution Logistics and DHL's environmental manager have both been a part of a network – Arlanda logistiknätverk – and they got to know each other there. The inbound & domestic development manager believes that personal relationships between partners are important:

"You represent a company, but you come closer to a person. At the same time you need to be professional because you know that this relationship exists because of a job."

He says that the personal relationships do not matter in negotiations for example, but that trust is to a large extent built on the personal relationships and it is these that enable collaborations between the companies. From Ericsson's point of view, the relationship with DHL is regarded as strictly professional.

3.4.1 ENVIRONMENTAL WORK IN THE RELATIONSHIP

Initially, the environmental aspects of the Ericsson-DHL relationship were about emission reports. Since there is no standard as to how these emissions should be measured, there was a discussion about how it should be done. Ericsson now requires that DHL reports environmental data every month, following a specific format that Ericsson has decided.

Another part of Ericsson's environmental work is that they want to shift from air transports to sea transports. 37% of Ericsson's goods are transported by planes, which corresponds to 93% of their CO₂ emissions. DHL's environmental manager says:

"Perhaps they haven't managed to shift that much [to sea], yet. But, they're working on it."

Moreover, Ericsson wants all five logistics service providers (or distribution service providers as they are called at Ericsson) to conduct an environmental project every year. The project should be something that is beneficial to both Ericsson and the involved logistics service provider. In 2009, DHL and Ericsson had a project that concerned eco-driving on the route between Gävle and Arlanda and that project resulted in less fuel consumption (the Gävle site is now closed). In 2010, DHL was in charge of one environmental project in which a milk round was initiated. Prior to the change, different sites were responsible for sending their goods to the central warehouse, which meant that each site used several transporters which, in turn added up to many transports to the site that ordered the goods and central warehouse had to deal with many transporters.

The milk round means that trucks go from one production site to the next to pick up goods. The trucks follow a time schedule, like buses do, and employees at the sites know when the trucks are scheduled to arrive. DHL's environmental manager explains:

"...we've taken over all of their [Ericsson's] flows that have gone between the factories and implemented a system where a truck arrives at 10 a.m. If there is nothing on the loading platform, the truck leaves at 10.30 a.m., period. There is no time to wait [for goods to arrive], because it comes back again at 2 p.m. and leaves at 2.30 p.m. So, it goes in loops like that. /.../ Like a bus, simply, in order to be able to plan and fill these trucks."

The subcontractors that are responsible for the transports in the milk round have installed computers in their trucks and "are in full control", as the environmental manager at DHL says. The project has resulted in high fill-rates and low emissions per tonne-km. DHL has recently started to provide Ericsson with environmental reports on these changes. The inbound & domestic development manager believes that these reports are more useful than the general reports about emissions and goods transported, since they in a clearly show the effects that a scheduled loop has on costs and the environment. Indeed, the project has also resulted in cost savings. DHL has persuaded Ericsson to send documents with trucks that already go between the different sites, instead of sending the documents with a separate courier.

In the relationship in which the inbound & domestic development manager is involved between DHL and Ericsson, a lot of the environmental work is concerned with making Ericsson understand that it is not necessary to use as they do in one case, seventeen different transporters in a delivery from A to B. He says:

"There is no one that can defend such behaviour – and they [Ericsson] don't. But, as I said, so many [people] are involved. Way too many people."

An interesting development in the milk-round project is that in Borås, the first biogas truck in Sweden will be a part of the scheduled delivery system. It is going to be tested locally, in order to see how much potential there is to expand its use, since there is still the problem that biogas driven vehicles cannot travel far without being refuelled.

There are still improvements to be made in the system implemented, for example get the sites to report the size of goods that they want delivered and standardise the way they book transports. The inbound & domestic development manager says:

"We see a lot of potential. And that is what we do – we win a deal, but we want to keep it and grow together with the customers."

According to DHL's inbound & domestic development manager, the project was not "forced" on DHL from Ericsson; instead it was driven by DHL employees.

The inbound & domestic development manager says that DHL and Ericsson have achieved a lot with regard to environmental work and continues:

"This is what is fun about this – there is enormous potential; there are no limits."

The environmental advisor at Ericsson's Distribution Logistics says that when she and her colleagues are involved in the planning of the transportation of goods, most conditions are already set earlier in the supply chain. Therefore different transport options are limited when the environmental advisor gets involved. Because of that, information about environmental issues in logistics needs to be shared with other parts of the supply chain. The environmental advisor at Distribution Logistics says:

"A huge part of our job is to inform earlier parts of the supply chain about transport's [environmental] impact."

Traditionally, there has been a focus on cost and lead times when Ericsson has worked with logistics service providers. Recently, however, Ericsson has tried to integrate the environmental dimension to part of their communication with DHL. In the Ericsson-DHL relationship, many enquiries from different Ericsson divisions come to DHL, and normally DHL gets back to the Ericsson division and reports cost and lead-time for the changes. Internally, Ericsson has now tried to get their employees to ask for the environmental dimension, as well as cost and lead time, when they deal with DHL. Simultaneously, Ericsson has tried to get DHL to automatically include environmental impact in every such report, even though Ericsson might not necessarily have asked for it. It is hoped that the inclusion of the environmental dimension will influence employees to consider environmental impact more than has previously been done.

Although Ericsson is considered interested in improvement of environmental issues, DHL is aware of that their customer is not prepared to pay extra for environmental services. In the work with Ericsson, both costs and environmental considerations are of interest for DHL. The inbound & domestic development manager says:

"It's a difficult combination. The customer has to save money. The management here [at DHL] has to see that is good business, and if I can include environmental consideration, then I'm satisfied."

The reality, he says, is that:

"Money talks and the environment doesn't."

When regard to DHL's environmental offering, the environmental advisor at Distribution Logistics says that DHL offers different modes of transport. Moreover, she knows that they offer climate offset programs, but say that Ericsson does not buy such services.. She adds:

"I still think that they work actively with their environmental work within DHL."

With regard to green supply and demand in the relationship, the environmental advisor thinks that logistics service providers must take the lead in the environmental challenge, since they are the ones who impact the environment. Ericsson's core business is the products, and not transports, while the logistics service providers are experts on transportation. She does not think that logistics service providers in general are driving forces in environmental work. She says:

"Sometimes I feel like we are pushing them."

She also says:

"I don't think that the suppliers show what they can do [in terms of environmental work]; instead, Ericsson presents something and then they react."

Both companies seem to agree that DHL can fulfil all Ericsson's green demands. DHL's environmental manager says:

"Yes, we can. What they have required are environmental reports and that we do an environmental project each year, plus that we have to use shipping companies that are included in the Clean Shipping Project. And we can match that. What they haven't done, is to demand that we should control their transports more, and that's something we would be able to do to a larger extent."

The Clean Shipping Project provides an index in which shipping companies can report their environmental impact. Ericsson thus wants DHL buy shipping services from companies that are a part of the Clean Shipping database.

The environmental advisor at Distribution Logistics at Ericsson also thinks that DHL are capable of offering all environmental work that DHL ask of them. However, she adds:

"Those [environmental] things we've said that we want, they have done. But there might be other things possible that we don't know about."

DHL's inbound & domestic development manager does not think that it is strange that DHL are able to fulfil Ericsson's green demand, according to him since he believes that DHL is leading the environmental work in the relationship. He says:

"Currently, it's we [who drive environmental work], without a doubt. It's we who present everything to them. And they are interested..."

The environmental manager agrees with this to some extent, but adds that globally, Ericsson is the actor that drives the environmental work in the relationship. Locally, however, she believes that DHL is a driver of this work.

DHL's view is that Ericsson's environmental demand will increase in the future and that inbound managers at the different sites will focus more on environmental issues when they become more accustomed to the new way of thinking. The good results from the domestic project described above are also likely to have helped Ericsson understand the potential of environmental work and they might therefore want similar projects in the future.

The inbound & domestic development manager at DHL states that it is the relationship that has to encourage the environmental work. DHL knows about transports and can provide ideas in that area, but they need to work together with the customer in order to achieve as much as possible in the “green relationship”. He adds that the customer has to be involved in this work and says that the environmental advisor at Distribution Logistics and her inbound manager at every Ericsson site has to be involved in the different concepts, both with regard to costs and to environmental gains.

When DHL started working with inbound operations at Ericsson, no environmental demand existed and focus was merely on costs. Now, some Ericsson sites want to know the level of CO₂ emissions caused by their transports, in order to become more aware of the situation.

The inbound & domestic development manager at DHL has held a lot of presentations at Ericsson’s different sites about the project and the improvements that have been accomplished. At some sites, this has generated a lot of interest and the management there has taken the presentation further and wants to know more. The inbound & domestic development manager thinks that the sites’ managements are important elements in the continued work to improve inbound operations. He also thinks that the inbound division at DHL would benefit if they had an environmental specialist that could discuss green issues with the different sites at a higher level than what the inbound staff now is capable of.

However, the environmental advisor at Distribution Logistics thinks that DHL is the driving force with regard to environmental work in the relationship between Ericsson and DHL.

“It should be DHL – it [transport] is their core business.”

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APPENDIX I: INTERVIEW GUIDE

QUESTIONS TO THE LOGISTICS SERVICE PROVIDERS

The respondent

- What is your position at the company?
- How long have you been working at the company?
- Who do you report to?
- Who reports to you?

The company in general

- What is the strategy of the company/relevant division?

The company with regard to environmental issues

- How are environmental issues taken into account at the company?
- What environmental competences exist in the company?
- What are the driving forces for the environmental work?
- Who is responsible for environmental issues?
- Who is the environmental work driven by at the company?

The relationship with a specific shipper

- How much of your transports are represented by the shipper?
- How and when do you interact with the shipper?
- How long has the shipper been a customer to the company?
- What are the characteristics of your relationship?

The environmental relationship with a specific shipper

- What are the environmental aspects of your relationship with the shipper?
- What is your perception of the shipper's green demands?
- What can your company offer in regards to what the shipper demands?
- Which actor is the driver of the environmental work in the relationship?

QUESTIONS TO THE SHIPPERS

The respondent

- What is your position at the company?
- How long have you been working at the company?
- Who do you report to?
- Who reports to you?

The company in general

- What is the strategy of the company/relevant division?
- What role does logistics have for the company?

The company with regard to environmental issues

- How are environmental issues taken into account at the company?
- What environmental competences are found in the company?
- What are the driving forces for the environmental work?
- Who is responsible for environmental issues?
- Who is the environmental work driven by at the company?

The relationship with a specific LSP

- How large portion of your transport needs is represented by the LSP?
- How and when do you interact with the shipper?
- How long has the company been a customer to the LSP?
- What are the characteristics of your relationship?

The environmental relationship with a specific LSP

- What are the environmental aspects of your relationship with the LSP?
- What is your perception of the LSP's green offering?
- What does the company demand in regards to what the LSP offers?
- Which actor is the driver of the environmental work in the relationship?

CASE REPORT II

A STUDY OF ENVIRONMENTAL AND OTHER SUSTAINABILITY ACTIVITIES IN SUPPLY CHAIN RELATIONSHIPS AT
CLAS OHLSON

DEPARTMENT OF MANAGEMENT AND ENGINEERING
LOGISTICS DIVISION
LIU-IEI-RR--13/00191--SE

CASE REPORT:

A STUDY OF ENVIRONMENTAL AND OTHER
SUSTAINABLE ACTIVITIES IN SUPPLY CHAIN
RELATIONSHIPS AT CLAS OHLSON

UNI MARTINSEN

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1 ABOUT THIS REPORT

This report is the result of a case study conducted at the Swedish retail company Clas Ohlson. The study has been conducted as one step in the PhD process of the author of this report and is financed by the Swedish Energy Agency (Energimyndigheten). In this first chapter, some background information to the case study is given: the aim of the study, the rationale behind choosing Clas Ohlson as the case company and data collection methods. Finally, the structure of the remaining parts of the report is presented.

1.1 AIM OF STUDY

The aim of this case study is to illustrate how environmental work can be conducted in different types of supply chain relationships, seen from the perspective of one focal shipper in a supply chain. The relationships include both upstream (such as suppliers and inbound logistics service providers) and downstream (such as outbound logistics service providers and stores in a city logistics context) parts of the supply chain. As these examples illustrate, the supply chain relationships can include shippers as well as logistics service providers (LSPs).

1.2 CHOOSING THE CASE COMPANY

The aim of the study was a major factor in the choice of case sample. Following the ideas of Yin (2009), a set of criteria for the case company was established prior to selection. For the case company to fit the aim of the study, it was important that it was a shipper 1) for whom logistics was an important part of the business, and 2) which had an environmental interest not only in a wide sense, but also within logistics issues. The shipper was required to have different types of relationships, both upstream and downstream in the supply chain. It was also essential to find a company that undertook distribution into city centres, in order to cover potential input from a city logistics perspective. City logistics is an area that has gained increasing attention during recent years, both in academia and in practice. One reason for wanting to include this perspective was to enable a comparison between the environmental work in relationships in a city logistics context and other supply chain relationships.

With help from a representative of a large LSP in Sweden (Stefan Källberg at PostNord), Clas Ohlson was identified as one of several potential shippers for this study. Initial information about the company was gathered through Clas Ohlson's web-page and annual reports. The same procedure was followed for a number of other companies, but the majority were unable to fulfil all the criteria mentioned above. After the first scan of Clas Ohlson information, an initial interview was conducted with a representative from the company (the transport manager), in order to ensure that Clas Ohlson would be a suitable choice for illustrating environmental activities in different relationships of the supply chain. This overview of Clas Ohlson resulted in information that indicated that the company was a sound choice of case company: Clas Ohlson 1) is a trading company with suppliers in different parts of the world and stores in a number of markets; 2) works actively with logistics, and logistics is an important part of the business model; 3) has relationships with both upstream and downstream supply chain actors, such as suppliers, LSPs and stores; and 4) has an interest in environmental issues, with a confirmed interest in environmental considerations within logistics.

1.3 DATA COLLECTION

Once the case company had been selected, the data collection could begin. The main data collection method was semi-structured interviews. The transport manager, Peter Bergestål, who

was also the contact person for this case, was initially asked to help identify appropriate people to interview. Additional conversations took place with several people at Clas Ohlson, in order to narrow down the field of relevant people. The most important criterion for the choice was that they should be involved in some way in the relationship with some other supply chain actors. The relationships that were to be covered were Clas Ohlson and its suppliers, its inbound logistics service providers, its outbound logistics service providers and its stores.

Semi-structured interviews, each lasting between 1 and 2½ hours, were conducted with five respondents (see Table 1.1). During one interview on January 29th 2013, two respondents were interviewed at the same time, while the other respondents were interviewed separately. The interviews were based on an interview guide (see Appendix I) and were recorded and transcribed. All the respondents were then asked to review the written material to check for errors, add or remove information and clarify information where necessary. After this first approval by the respondents, the interview material was translated and compiled into this report. The material, including the citations, has been translated by the author of this report. All respondents were given the opportunity to check the translated version of their specific parts of the reports for approval and they were specifically asked to approve the inclusion of their citations in the report.

TABLE 1.1. THE RESPONDENTS

Names of Respondents	Position at Company	Date of Interview
Eva Berg	Category Manager Home Department	29-01-2013
Henrik Alfredsson	Manager Technology & Quality - Purchase	29-01-2013
Maria Ax	Manager Import Department	05-12-2012
Per Hedberg	Environment Coordinator	05-12-2012
Peter Bergestål	Transport Manager	07-11-2012 (initial interview) 05-12-2012

This final report has been read by both the transport manager, Peter Bergestål, and Clas Ohlson’s supply chain director, Magnus Höjman. After some adjustments the report was approved by both of them.

1.4 STRUCTURE OF CASE REPORT

The structure of this report has been chosen because the case study aims to illustrate how environmental work can be conducted in different types of supply chain relationships. The Clas Ohlson supply chain was chosen as the main structure of the report in order to clearly distinguish between different parts of the supply chain (see Figure 1.1). That also means that the data material has been categorised into the different parts that comprise the supply chain, i.e. suppliers, inbound logistics, distribution centre, outbound logistics and stores. It should be noted that Clas Ohlson as depicted in the figure refers to Clas Ohlson in Insjön, which here implies both the central warehouse and functions such as purchasing and transport management that are handled from the head office.

It is of interest to note that Clas Ohlson also has a goods flow resulting from its mail-order business, but since this is a very limited part of the business it is not included in this study. In addition, the focus has been on the forward supply chain, which is why return flows have also been excluded.

The final chapter of the report does not fit into the supply chain logic. The chapter is entitled “The transport management function” and focuses mainly on future thoughts for transport management at Clas Ohlson. The reason for this is that the inbound and outbound logistics functions were previously handled by two people; they are now managed by one transport manager.

FIGURE 1.1. RELATIONSHIPS IN CLAS OHLSON’S BASIC SUPPLY CHAIN

The case data is a result of the interviews and additional data collection described above. Based on this data, the case report aims to give a *description* of Clas Ohlson and its supply chain relationships with regard to environmental activities. As shown in Table 1.1, the empirical data that is described in the subsequent chapters was mainly gathered during the end of 2012 and beginning of 2013. The description of the case company given in this report is thus focused on that specific period of time.

2 COMPANY INFORMATION

In this chapter, basic information with regard to Clas Ohlson is presented. Most of the information comes from Clas Ohlson's annual report (Clas Ohlson, 2013a) as well as their web page (www.clasohlson.se).

Clas Ohlson is a retail company which aims to make it easy for people to solve their everyday practical problems. The product range is divided into five categories: hardware, home, multimedia, electrical and leisure.

The company was founded in Insjön, Dalarna in 1918 by a man named Clas Ohlson. The company started as a mail-order company and this was also the main part of the business until the 1980s. Soon after the company was founded, a store was opened in Insjön as a complement to the mail-order business. That would be the only Clas Ohlson store until 1989, when a second store was opened in Stockholm. After that, the company has continued to open stores and now has 157 stores in four different countries: Sweden, Norway, Finland and the UK. In the fiscal year of 2011/2012, Clas Ohlson had a turnover of SEK 6,260 million and opened eighteen new stores. Table 2.1 illustrates the growth of the company and the operating margin.

TABLE 2.1. OPERATING INCOME, OPERATING MARGIN AND NUMBER OF NEW STORES

	2012/2013	2011/2012	2010/2011	2009/2010
Operating income (MSEK)	5,519	6,260	5,828	5,556
Operating margin	6.6	9.0	8.7	10.6
No. of new stores	17	18	19	14

Insjön is still an important part of the company; both the head office and the central warehouse are located here. Figure 2.1 shows its location, which is about 250 kilometres north-west of Stockholm. Clas Ohlson also has a purchasing and CSR (Corporate Social Responsibility) organisation located in China.

FIGURE 2.1. CLAS OHLSON'S HOMETOWN INSJÖN

In Sweden, Clas Ohlson is a fairly large player, and larger than its Swedish competitors, which include Biltema, Julia and Rusta. Globally, however, the company is small, as illustrated in the comparison with regard to the goods flow from Asia:

"When Wal-Mart places its orders, they fill a whole ship, whereas we can fill two containers if we really go for it."

(Peter Bergestål, transport manager)

2.1 ENVIRONMENTAL OBJECTIVES

With regard to environmental work at Clas Ohlson, the following can be read in Clas Ohlson's annual report:

"We work actively to achieve our environmental objectives, and continuously improving the company's environmental performance is a priority.

(Clas Ohlson, 2013a, p. 40)

More specifically, Clas Ohlson has an environmental policy that states that:

"The environmental perspective must underpin all important decisions, in order to create long-term value for our customers, employees, shareholders and society at large. This entails a lifecycle perspective that spans the entire chain, from choice of suppliers, manufacturing methods and transport modes to product materials, use, energy consumption and waste management."

(Clas Ohlson, 2013a, p. 40)

Environmental and sustainability activities in Clas Ohlson's different supply chain relationships will be described in the relevant sections.

3 SUPPLIERS

This chapter includes a presentation of Clas Ohlson's suppliers and various aspects of their relationships with them (see Figure 3.1). The main source of the information is Eva Berg, who is manager of the purchasing team for the product category Home, and Henrik Alfredsson, who is the manager of the division Technology and Quality. Their information is complemented by information from Clas Ohlson's annual report.

FIGURE 3.1. FOCUS OF CHAPTER 3

3.1 OVERVIEW OF SUPPLIERS

The purchasing department at Clas Ohlson is a natural starting point when describing the relationships with suppliers. It is divided into five product categories: *hardware*, *home*, *multimedia*, *electrical* and *leisure*. There are a number of purchasers assigned to each of the five product categories and there are also groups that work across all five categories. Technology and Quality and Packaging and Design are examples of such groups. Although the technicians within Technology and Quality are experts within a specific category, the group runs through the whole purchasing department.

There is also a CSR team in China that supports the purchasing department in Insjön. This team consists of about ten people and includes a manager, team leader and auditors. The CSR team was established in 2008. A large part of their work consists of verifying, assessing and monitoring compliance with Clas Ohlson's code of conduct, with a focus on Asian suppliers (Clas Ohlson, 2013a).

There are also quality controllers (QCs) who support the purchasing department in Insjön. These work at various suppliers in Asia and check each delivery that Clas Ohlson is due to receive. More specifically, they make sure that the deliveries include the items ordered and that they are of the right material and do not contain any dangerous substances.

Clas Ohlson has approximately 700 suppliers, of which most are located in Sweden. Many are also located in Asia and particularly in China, and some in the rest of Europe (see Figure 3.2). In the annual report (Clas Ohlson, 2013a), Clas Ohlson separates between countries of purchase (Figure 3.2) and countries of origin. The latter shows that 67% of purchased products originate from Asia, 10% from Sweden, 20% from the rest of Europe and 2% from other countries. In the remaining parts of this case report, the country of purchase is of main interest since this is where Clas Ohlson has its scontacts with suppliers. It can, however, be of interest to know that most of Clas Ohlson's products originate from Asia but are sold through trading houses or agents in for example Sweden.

The size of the suppliers varies and there are examples of both very small and very large suppliers:

“They can be gigantic, where our production stands for a non-existent part of their business – 0.5 per cent. Then we have suppliers that are smaller, but that we think are valuable and that we might have had long relations with and that we want to help develop. So it’s a wide spectrum.”

(Eva Berg, category manager, Home Department)

FIGURE 3.2. COUNTRIES OF PURCHASE

3.2 FINDING SUPPLIERS

For Clas Ohlson, a number of different types of situations are taken into account when choosing suppliers. In those cases where Clas Ohlson wants to buy goods from a known brand, that specific brand is chosen as a supplier. When Clas Ohlson wants to buy products from a supplier in China, however, the situation is a little different. The Shanghai office first conducts a scan of the Asian market to check for potential suppliers. Among other things, they check the history of a supplier, their turnover, how they work with code of conduct related issues and the type of customers that they have. The Shanghai office provides the purchasing department in Insjön with documentation regarding these matters. Clas Ohlson also works with agents who help the company to find suppliers in the same manner as the Shanghai office does. The decision regarding the range of product within the categories (*hardware, home, multimedia, electrical or leisure*) is made by the team within each category.

Sometimes the purchasers in Insjön are contacted by potential suppliers. If these are located in Asia, the suppliers are referred to the Shanghai office. If they are located in Europe or Sweden, the purchasers in Insjön deal with the inquiries.

Suppliers usually operate within a certain niche and thus focus on a specific product category. Despite this, there are many different suppliers to choose from for most products, and many suppliers compete within the same niche.

Clas Ohlson aims to have long-term relationships with their suppliers. The challenge thus lies in finding suppliers who perform well in the long run and with whom Clas Ohlson can collaborate and further develop.

"We have a goal not to have products or suppliers that just come and go. We do not want such [short] business relationships, and our ambition is to choose the suppliers that we believe have potential for the future."

(Eva Berg, category manager, Home Department)

Without these long-term relationships, it would be difficult to work with questions such as CSR, environmental issues, safety at the various production sites and product development.

Clas Ohlson tries to limit the number of suppliers from whom they buy only one product. This is in line with the idea of long-term relationships with suppliers: Clas Ohlson wants to spread their risks so that suppliers do not leave Clas Ohlson when there are problems with that one product. The category manager, home department, elaborates:

"Both sides become quite vulnerable when we only deal with one product, for which the lifespan might end. It is not exactly fair to that supplier. If they are interested [in widening the range of products], however, then we might try to move some products to them. If there is no interest, then that one product will be switched to some other supplier with whom we already have a business relationship for similar kinds of products. So we don't want to be in that position."

(Eva Berg, category manager, Home Department)

There are, however, some situations where the products are very specific and where there are suppliers who are highly specialised and skilled with regard to one type of product. In such cases, Clas Ohlson looks at the advantages and disadvantages and might decide to choose that one specialised supplier.

3.2.1 CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL DEMANDS

Given that there is more than one supplier to choose from, Clas Ohlson has several parameters to consider when making their choice. These include quality, price, design, knowledge and acceptance and signing of the code of conduct. Price is no more important than any of the other factors; rather, several parameters are considered simultaneously. One thing that can differ between suppliers in China, for example, is whether they work with product development. It is important for Clas Ohlson that suppliers have designers or R&D teams who work with this type of development, to show that they are dedicated to their products. Thus, this is one parameter that could affect Clas Ohlson's selection of suppliers.

Moreover, it is important for Clas Ohlson to find suppliers they can trust. This is especially important if problems might arise with regard to a certain product. Such situations require extra handling and for Clas Ohlson it is important to know that the suppliers will take responsibility when required.

The demands that Clas Ohlson places on their suppliers today are closely linked to the code of conduct. Clas Ohlson's code of conduct is a document consisting of six chapters:

- Legal requirements
- Working environment
- Working conditions
- Environment
- Application and monitoring

- Anti-corruption

The content in the code of conduct is adapted to the laws of the respective country. All Clas Ohlson suppliers have to sign the code of conduct in order to be able to deliver products to the company. Signing the code of conduct means that the suppliers agree to meet the requirements stipulated in the code.

Clas Ohlson evaluates the suppliers based on the six chapters in the code of conduct. The CSR team visits the suppliers and grades them for each of the areas in the code. The suppliers then receive a colour code. The same procedure is followed for the Asian suppliers and all direct imports made in Asia. If Clas Ohlson sees the need to evaluate European suppliers as well, a third party conducts the evaluation.

The CSR team has a schedule that shows which suppliers they are going to visit and which need to be revisited. During the fiscal year of 2011/2012, 600 audits were conducted by the CSR team (Clas Ohlson, 2013a).

The environmental demands made on suppliers by Clas Ohlson are closely linked to the code of conduct, in which one chapter focuses on such issues. This chapter states (see also Appendix II):

“Clas Ohlson is actively working to continually reduce its direct and indirect environmental impact.

Suppliers are expected to work in line with Clas Ohlson’s environmental policy. Suppliers shall therefore be well informed about and comply with requirements in accordance with national legislation, regulations and industry standards. This involves being aware of and monitoring their environmental impact, and constantly working to improve environmental performance in their operations.

As a minimum requirement, suppliers shall handle hazardous substances and waste in a safe way. Requirements restricting hazardous substances in those markets where Clas Ohlson sells its products, as well as any additional requirements made by Clas Ohlson, shall be met.”

There are additional environmental issues that are discussed with suppliers, such as energy efficiency and water use. These are not actual requirements, but they are nonetheless often discussed with suppliers. Large manufacturers, who also often have large customers, have already made good progress with regard to these environmental issues. They have documentation of their consumption of different types of energy and they have targets that they work towards, such as specific goals to reduce emissions during the next five years.

Clas Ohlson does not, however, have a specific team to work with environmental issues in Asia and the CSR team understands the code of conduct-related demands. In order for Clas Ohlson to place higher environmental demands on suppliers, the category manager of the home department believes that there is a need for a specialised “environmental team”, and continues:

“Our ambition is to get that far, but we’re not there yet.”

(Eva Berg, category manager, home department)

With regard to products as such, there are also some demands that Clas Ohlson places on suppliers. As a starting-point, there are a number of directives from the European Union which

must be fulfilled before products can be sold on the European market. These need to be signed by the suppliers with whom Clas Ohlson works. In addition to these directives, Clas Ohlson has a number of demands that concern substances they do not want to find in their products. Many of these concern products that are related to skin contact, children and textiles. As a first step, the suppliers thus approve and sign the demands made by Clas Ohlson.

With regard to quality control of products, suppliers can be subjected to varying degrees of control depending on which type of suppliers Clas Ohlson uses; this control is a consequence of risk assessment. Clas Ohlson often sends personnel from the Quality Control organisation to suppliers' production plants to check various important aspects of the products. The level of quality control varies depending on, among other things, the size of the supplier, its trustworthiness and how well it has performed in the past. If a supplier is new to Clas Ohlson, a large number of inspections are made during the first deliveries at the beginning of the relationship, until Clas Ohlson has ascertained that the supplier is doing what it has set out to do. For a supplier who has been in a relationship with Clas Ohlson for some time and has performed well in the past, the level of control is lowered. It would be a difficult task for Clas Ohlson to check all products to the same degree:

"We have difficulties in controlling everything given the large range of products that we carry, and the large number of suppliers. That's just the way it is. So we have to work with risk assessment."

(Henrik Alfredsson, manager technology and quality – purchase)

3.3 DURING THE RELATIONSHIPS

Contact with suppliers is managed in a number of ways. The Shanghai office manages things such as sample tests, quality control (QC) and CSR for all the products assigned to Shanghai. Some suppliers are found by agents and thus "belong to" those agents rather than the Shanghai office. In these cases, the agents often have a number of suppliers assigned to them and manage the communication with these suppliers. For such suppliers, the purchasers in Insjön are in direct contact with the agents and no office is involved. However, the CSR team in Shanghai works in the same manner with all suppliers, regardless of whether they are categorised under the Shanghai office or under an agent.

"With regard to CSR, it is exactly the same. It is the same support that comes from the same function in Shanghai, so we check the agents' suppliers just as much as those that come under the Shanghai office. So there is no difference there. It is the order follow-up that differs."

(Eva Berg, category manager, Home Department)

A more detailed description of the CSR work during the relationships follows in the sub-section "CSR and environmental work" below.

Some suppliers are more important than others for Clas Ohlson, such as those who supply a unique product. The purchasing department (just as the CSR organisation) also grades the suppliers in Asia, according to how important they are to the company. There are three different levels: very important, important and less important. A supplier with a unique product would typically be rated a very important supplier. Clas Ohlson generally wants suppliers to belong to the higher levels, as illustrated by the following quote:

"We would like most suppliers to be important and very important."

(Eva Berg, category manager, home department)

Today, about 80-85% of the supplier base in China belongs to one of these two gradings and only a small portion are regarded as less important. The grading can have an impact on how Clas Ohlson works with the suppliers.

"Of course we work differently with them [very important or important suppliers] than with the ones that are less important. That is quite natural. We don't find ourselves in the situation where we have ranked one supplier as less important but would like it to become very important. That's a very big step and there is a reason why a supplier becomes less important."

(Eva Berg, category manager, home department)

The suppliers' interest in Clas Ohlson also plays an important role. Clas Ohlson has chosen to communicate with the suppliers important to them so that they are aware of this. They do not want to be in a situation where the supplier is ranked as very important to Clas Ohlson, at the same time as Clas Ohlson is of very low interest for the supplier.

"It would be a pretty sad story if we have ranked one supplier as very important, but when we meet with him he is completely uninterested in our plans or what we want /.../. That's a difficult situation, even though we would like to deepen the relationship. We are not in such situations very often."

(Eva Berg, category manager, home department)

3.3.1 CSR AND ENVIRONMENTAL WORK

As previously mentioned, Clas Ohlson aims to have long-term relationships with suppliers as far as possible and it is rare that suppliers need to be replaced. In the event that suppliers fail to comply with the code of conduct, this is taken seriously within Clas Ohlson. If the supplier does not improve, it will cease to be a supplier for the company. However, this only happens a few times each year. In addition, Clas Ohlson is aware which suppliers might have problems with the code of conduct, so they do not just "pop-up" from out of nowhere.

Clas Ohlson always tries to help suppliers who have trouble within a particular area, for example the code of conduct. They try to determine what type of support the supplier needs and to provide the necessary help. This might be a specific training course, which Clas Ohlson can offer if they have the expertise; if not, other organisations with the right expertise might be involved.

"Our ambition is always to help, not bring down."

(Eva Berg, category manager, home department)

When suppliers sign the code of conduct, they also need to inform their major sub-contractors about the code. It is, however, difficult for Clas Ohlson to follow up all suppliers' suppliers. Nonetheless, they have conducted random sample audits of some of these sub-contractors. There is an ambition within the company to monitor these in the same way as the suppliers, but this work has not progressed as far as the work with suppliers.

"It is really difficult to check if they [sub-contractors] do that [follow the code of conduct]. We have to secure our main production – we must be completely sure that it [the code of conduct] is followed. "

(Eva Berg, category manager, home department)

With regard to product control, Clas Ohlson conducts some such controls before the production starts at the suppliers' sites. This is done for some critical materials or components in order to make sure that the suppliers do not produce goods that then turn out to be flawed. This is thus an example of another type of control of the second tier suppliers – a control of whether they have delivered what they should.

All Clas Ohlson suppliers are required to follow the code of conduct and Clas Ohlson has not embarked on a relationship with any supplier who cannot comply with the code.

"The things that are in our code cannot be changed or disregarded"

(Eva Berg, category manager, home department)

Moreover, the code of conduct is the same for, and must be followed by, all Clas Ohlson suppliers. The suppliers can, however, be given different pre-conditions when they start to work with Clas Ohlson. Some suppliers are very large, whereas Clas Ohlson is a small customer for them. In such cases the suppliers usually already work with other large customers, who also have codes of conduct that must be followed. When all the companies involved are serious players, the codes are often very similar and must, of course, comply with national laws, international conventions etc. Other suppliers are very small and may have more difficulty complying with the code of conduct. Compliance might require them to invest money and take measures they would not otherwise have taken, such as move emergency exits. However, for the CSR team in Shanghai, just as much effort can be needed for a large supplier as for a small:

"It depends on the attitude and whether there is a management team at the production plant that accepts CSR. If there is, then it is fairly easy, but if there isn't, then it will be difficult. And that can be both a large and a small supplier – that varies a lot. But our requirements are the same, no matter the size."

(Eva Berg, category manager, home department)

Clas Ohlson audits their suppliers as stipulated in the code of conduct. As mentioned above, there are six chapters in the code. For each chapter, the suppliers are evaluated according to a grading system, where different failings have different gradings. Child labour, for example, is prohibited and Clas Ohlson will not work with a supplier that uses child labour. In the event of such a situation arising, Clas Ohlson tries to help the family as well as the supplier in order to rectify the problem.

There are four different gradings on the scale. Green means that the supplier is satisfactory. Yellow is also satisfactory, although there are some areas in which the supplier can improve. The next step is orange, which implies a risk and that Clas Ohlson should try to help the supplier improve. Serious efforts should be made to help suppliers that are graded with orange. If the supplier goes from orange to red, Clas Ohlson is not allowed to work with them until improvements have been made. Clas Ohlson's ordering system ensures that it is not possible to order products from suppliers with a red grading.

Most suppliers are graded as yellow (Clas Ohlson, 2013a). Within this spectrum there is an additional rating system: “good” means that the suppliers are on their way to becoming green, “medium” means that they are stable and “poor” simply means that they are in the lower parts of the yellow spectrum. Thus, the yellow area is quite large and Clas Ohlson has good knowledge of the suppliers’ ratings.

“We have very good control of this. And the supplier also knows its ranking, so it’s not as if they sit and reflect: ‘I wonder what it [the ranking] will be this time?’, because they know that ‘there are seven failings that I have to correct, that means that I have this ranking at Clas Ohlson, and I must fix the problems within a certain period of time’. The time period for the improvements is decided together with the supplier, because they themselves have to get back to us with their correction active plan that says ‘I promise to be ready by October 1st.’”

(Eva Berg, category manager, home department)

With regard to specific environmental work, there are no actual requirements other than those stated in the code of conduct. Because of this, it is difficult to follow up on suppliers environmental initiatives. Clas Ohlson does, however, encourage suppliers’ own initiatives.

Regarding environmental work, the substances in the various products are an issue. The legislation regarding such substances is being continuously tightened and the demands from customers have increased, notably during the last two years. Clas Ohlson tries to strike a balance between how much they should try to find out about the products and what is administratively possible.

4 INBOUND LOGISTICS

This chapter is focused on Clas Ohlson’s relationships with LSPs involved in the inbound flow of goods (see Figure 4.1). Before describing the relationships, a brief overview of Clas Ohlson’s current inbound flow of goods is given. Information about inbound logistics comes mainly from the manager of the Import Department, Maria Ax, who until recently was responsible for the transport contracts for inbound transportation. In addition, both Peter Bergestål, transport manager and Per Hedberg, environment coordinator, as well as, to a lesser extent, Eva Berg, category manager for Home Department and Henrik Alfredsson, manager of Technology and Quality, have contributed to the content of this chapter.

FIGURE 4.1. RELATIONSHIPS WITH LSPs IN THE INBOUND FLOW

4.1 OVERVIEW OF INBOUND LOGISTICS

Until recently, the procurement process for the inbound transportation flow was handled by the Import Department, and more specifically by its manager. The Import Department is, therefore, a natural starting point for the description of the inbound flow.

The Import Department has close collaborations with the purchasing department, the distribution centre (in particular the goods reception) and the purchasing firm in Shanghai (since they handle all import documentation needed for customs, and payments to the Asian suppliers).

Clas Ohlson’s suppliers were described in Chapter 3 of this report. In order to describe Clas Ohlson’s relationships with LSPs, who are responsible for ensuring that the goods arrive at Insjön, it is necessary to consider the location of the suppliers, since Clas Ohlson hires several LSPs who take care of different geographical areas and different modes of transport. Table 4.1 gives an overview of the LSPs responsible for the various goods flows to Insjön. More details are given in the subsequent sections.

TABLE 4.1. INBOUND LOGISTICS SERVICE PROVIDERS

Logistics service provider	Distance	Mode of transport
Geodis-Wilson	From Asia	Sea, rail
DHL	From Asia	Air Express
Panalpina	From Asia	Air
Damco	From Israel, Spain, Portugal	Sea
Schenker	From Europe, Sweden, Norway	Rail
UPS	From Europe	Road, Air Express

Clas Ohlson's relationships with external LSPs involved in the inbound flow vary (Figure 4.1 illustrates this). Clas Ohlson would like all products to be transported under their own contract of affreightments, in order to have more control over the LSPs used. However, certain terms of delivery determine which actor is responsible for which transportation in the goods flow. Clas Ohlson follows the international terms of delivery "Incoterms®2010". The Asian suppliers, for example, are responsible for the transportation of goods from their sites to the harbour. These delivery terms are also applied for all other sea freight that Clas Ohlson is involved in. The terms of delivery are negotiated in the procurement process with "regular suppliers" (i.e. not LSPs) and thus fall under the work of the purchasing department.

In other cases, products are purchased from companies much larger than Clas Ohlson, and in those situations Clas Ohlson often has to follow the transport wishes of those suppliers. More information about this will follow below.

4.1.1 GOODS FLOW FROM ASIA

A large flow of goods to Clas Ohlson (about 37% of product volumes) comes from Asia. This flow of goods is handled by Geodis-Wilson, who is responsible for transportation of goods from the harbours in Asia to the central warehouse in Insjön. Geodis-Wilson is a forwarding agent who, in turn, uses a number of different shipping companies. Geodis-Wilson ensures that the goods are booked on a ship. Most ships arriving from Asia then stop at one of the major European ports where the goods are reloaded onto smaller ships and transported to Gothenburg's harbour. All goods that arrive at Gothenburg are then transported by train to a terminal in Insjön. Geodis-Wilson is responsible for the contract with the train operator and can therefore be said to deliver door-to-door service for Clas Ohlson's goods from Asia.

Transportation of goods from Asia to Insjön takes 30-45 days by sea and rail as described above. However, when Clas Ohlson needs the goods more urgently they are transported by air (see Box 1 for an example of such a situation). Clas Ohlson wants to reduce the use of air transports, but since it is a solution for urgent matters, it is difficult to predict the need from year to year. In general, however, Clas Ohlson has good knowledge of the items they sell and only a limited number of items in the range of products are changed each year.

"We have historic sales figures, we know exactly what it looked like for this item and so forth, so we can be pretty certain when we place an order. But things like this [the need for express deliveries] can happen in these particular cases when they are new items and we don't know anything about the market's response to a certain item."

(Peter Bergestål, transport manager)

About 1% of Asian goods are transported by air, where there are two options to choose from: Panalpina or DHL. The transport manager describes Panalpina as "a slow plane"; the transport time varies between six and eight days, and large volumes are sent with this LSP. In more urgent cases, such as samples that need to be checked in Insjön, transportation is handled by DHL Express. The purchasing department sometimes plays a role with regard to air transports, since they decide whether the product is an important one that needs to be delivered quickly and thus go by air instead of by sea. This might, for example, be the case when production has been delayed, the orders have been placed late, or actual sales have exceeded the sales prognosis.

Since a while back, Clas Ohlson has had a strong focus on lighting products in their stores. In the autumn of 2012 they introduced a new type of articulated LED lamp that they had not previously sold. When new products are introduced in the stores, it is always difficult to know how much to order from suppliers since there are no historic sales figures. The product was transported by ship and after being delivered to the DC in Insjön it was distributed to the stores. Orders had already been placed for more products from the suppliers, based on the expected sales rate. This particular lamp proved to be very popular and suddenly there were no lamps in the stores or in the DC. At the time, one consignment was in China, ready to be sent (by ship). A decision was then made to have the consignment sent to Sweden by plane, in order for it to arrive more quickly. This was an important business decision for Clas Ohlson, because if the lamp were not available in stores, the customers would go to competitors to try to find it.

BOX 1. ILLUSTRATION OF THE NECESSITY OF AIR TRANSPORT

The Asian suppliers are responsible for the cost of the transports until the goods are delivered to Geodis-Wilson in an Asian harbour. From there, Clas Ohlson takes over the transport costs. Geodis-Wilson also offers to take the goods from the suppliers to the harbour. In those cases the supplier can book a transport with Geodis-Wilson and the logistics provider then often sends a container that the supplier can load. Thus, the suppliers know that Clas Ohlson uses Geodis-Wilson and can choose to send their goods at a reduced price. However, the suppliers are free to use whichever logistics company they want and the procedure can vary:

"It depends: the Chinese are businessmen, so of course they look around. They might get a lower price from someone else."

(Maria Ax, manager, Import Department)

4.1.2 GOODS FLOW FROM EUROPE

As described in Chapter 3, a large portion of goods (about 62%) is purchased from Europe and from Sweden in particular. The Swedish and most of the European goods are transported by truck to Insjön. However, shipments from Italy which weigh over 20 tons (which corresponds to about 70%) are transported by train from Italy to Hallsberg. From there, the goods are transported by truck to Insjön. Goods from Norway are categorised as a special group of goods since Norway is not a member of the European Union. The goods from Norway are delivered by truck to the central warehouse. The truck deliveries from Sweden, Norway and Europe are handled by Schenker.

As with the Asian goods, goods are on occasion transported to Sweden from Europe by plane. However, Clas Ohlson is trying to reduce the portion of goods transported by plane, and uses air transports only rarely.

Clas Ohlson also buys goods from Spain, Portugal and Israel; these goods are transported by ship by Damco, a subsidiary of Maersk. In addition, express deliveries in Europe are handled by the logistics service provider UPS.

In some cases, such as when Clas Ohlson buys products from very large companies, the suppliers might say "If you want to buy from us, we will handle the delivery". In those cases, Clas Ohlson is a relatively small actor and cannot do much about this situation. Another alternative is that these large companies offer to transport the products via their contract of affreightment, since they have negotiated lower prices from LSPs.

Prior to his current position as transport manager, Peter Bergestål was manager of the distribution centre. Based on his experience from that position, he says that the suppliers who handle their own transports are not always easy to deal with. These deliveries can arrive at the goods reception at any time, whether or not the staff at the DC is ready for them. If the transport manager had a choice, he would prefer it if Clas Ohlson controlled all of the inbound transports to the DC.

4.2 FINDING LOGISTICS SERVICE PROVIDERS

When Clas Ohlson initiates a procurement process, the first step is to send out a request for proposal (RFP) that includes a number of questions to be answered by the potential LSP. There are a number of factors that are taken into account before the final decision about which LSP to choose is made: these are costs, service, stability of the company, environmental factors and added value. The costs normally vary only slightly between the different LSPs, in particular with regard to sea freight:

"We look both at the service they offer and naturally also the costs. As for the costs, they seldom differ that much between the different [LSPs], especially with regard to sea freight, so we are more focused on the added value. What's important is that we get our goods at the right time and that the service is good."

(Maria Ax, manager, Import Department)

Environmental factors are included in the RFP and Clas Ohlson checks that the LSPs have an environmental policy that complies with their own. However, during the latest procurement processes, environmental factors have not been a deal breaker in the choice of LSPs, although this is expected to change in the future:

"Environmental issues will become more important in the near future than they are today. It will become an important issue – that you really show what you do in your environmental work."

(Maria Ax, manager, Import Department)

Most of the LSPs currently responsible for the inbound flow have been used for a long period of time. Around 2002, there was a change in the LSPs for the inbound flow from Europe and Sweden, but Schenker has since had this responsibility. Regarding sea freight, Geodis-Wilson has been the trusted LSP for an even longer period of time than Schenker.

"The reason for this [the long relationships] is that we are very pleased with their work. The service has simply been very good and with regard to prices...the differences are marginal. So it has really been a question of reliability, in a manner of speaking."

(Maria Ax, manager, Import Department)

There is, however, one other reason why Clas Ohlson has stuck with the same logistics providers for a long time: the company has been growing rapidly for several years and there have not been enough resources to deal with big changes in the goods flow. The manager of the Import Department elaborates:

"We have felt that 'Well, we should perhaps wait a bit before we make any drastic changes with regard to this [transports], because it takes some effort to sit down and look into this and that is also one reason for why we've now realised that we need a function to handle this."

(Maria Ax, manager, Import Department)

There have, however, been some changes in logistics service providers in recent years. Four years ago, Clas Ohlson changed their LSPs for air transports from Asia. Prior to that, Geodis-Wilson had been the contracted LSP for these and Clas Ohlson was pleased with the service they provided. However:

"...Panalpina offered an alternative that was a little exciting /.../. They had something called Rail Air, which means that the goods are transported by train across the border into China and then flown for the rest of the distance. /.../ It is a little faster than the sea alternative, but naturally slower than the air alternative."

(Maria Ax, manager, Import Department)

It would take two and a half to three weeks for the goods to travel from Asia to Insjön. The Rail Air alternative has never been used by Clas Ohlson, for a number of reasons. One is that when the purchasing department wants something quickly, they want it ASAP, which means that the pure air alternative is chosen. In addition, it turned out that the suppliers needed different licences depending on the province they belonged to, which made the Rail Air alternative more complicated. Clas Ohlson has, however, identified benefits with Rail Air:

"...environmentally speaking, it [Rail Air alternative] would naturally be better from an environmental point of view than flying the whole distance."

(Maria Ax, manager, Import Department)

During a procurement process, a number of LSPs are considered as potential suppliers of inbound logistics services for Clas Ohlson. The most recent procurement process regarding sea freight involved around eight LSPs, although more could have been included:

"Naturally there are even more, but we have to limit the selection somehow in order to make a decision."

(Maria Ax, manager, Import Department)

The situation is similar for the other modes of transport and geographical locations - many LSPs are interested in becoming a logistics provider for Clas Ohlson. Usually, however, only a limited number of LSPs are able to handle large portions of Clas Ohlson's goods flow. Clas Ohlson essentially finds the right type of logistics solution for them on the logistics market. It appears that this has never resulted in a compromise where Clas Ohlson has had to give up some requirements in order to find a logistics provider.

To date, Clas Ohlson has chosen to group flows of goods into, for example, European and Swedish goods, so that one LSP is responsible for each geographical area. This does not, however, have to be the case and Clas Ohlson has also been interested in finding more specialised LSPs, such as those who are experts on deliveries from one specific country. Nonetheless, Clas Ohlson has so far assigned the larger flows to the LSPs, rather than having one LSP for each country:

"I think that we see advantages with having one [LSP for each flow of goods]. /.../ With regard to fill-rate and things like that - that you really fill the trucks - well, both from financial, environmental and other perspectives I believe it makes sense to have as few actors as possible."

(Maria Ax, manager, Import Department)

There have also been discussions regarding possible advantages arising from inbound and outbound logistics being handled by the same LSP. The manager of the Import Department explains:

"We have trucks that come here, we empty the trucks here and then they leave empty, instead of taking advantage of this and filling them with something before they leave from here."

(Maria Ax, manager, Import Department)

This would make sense from an environmental perspective, but there are many practical issues that need to be resolved in order for this to work.

During her time at Clas Ohlson, the manager of the Import Department has been in charge of two procurement processes for the inbound flow. Both these processes have resulted in more or less the same LSPs as the previous contract period. In the end, the deal breaker is usually that one LSP is able to take overall responsibility, even though others with more specific flows may have seemed interesting.

"We know pretty well who they [the LSPs] are, the ones that can handle our types of flows. And they know who we are. When they contact us, they are often fully aware what our flows look like and if they have the possibility to offer us a solution."

(Maria Ax, manager, Import Department)

4.2.1 ENVIRONMENTAL DEMANDS

Environmental demands have to some extent been included in the last two procurement processes for the inbound flow. The guidelines for that work came from the environmental coordinator, unlike today, when they are communicated by the person responsible for the contract. In the latest process in 2010, Clas Ohlson expressed the following goal:

"We work actively to reduce our environmental impact and according to our environmental management program we should decrease our transports' energy consumption and emissions and pollution per ton-kilometre to keep pace with social and technology developments."

The environmental demands made on LSPs have to a large extent followed NTM's¹ guide for evaluation of suppliers. A copy of the document can be found in Appendix III of this report. This meant that the LSPs should include a description of their environmental policy and future goals in their offer to Clas Ohlson. The following sentence was included in the material sent out to the LSPs from Clas Ohlson:

"In connection with evaluation of your offer, we will also focus on how we can collaborate in order to match our environmental goals."

With regard to the inbound flow, no LSP has made proposals in terms of environmental improvements. Moreover, as far as the manager of the Import Department knows, no LSPs have improved their environmental work as a result of Clas Ohlson's demands. Instead, many of the LSPs have improved because they already had that plan, regardless of Clas Ohlson.

¹ NTM (The Network for Transport and Environment) is a non profit organisation, initiated in 1993 and aiming at establishing a common base of values on how to calculate the environmental performance for various modes of transport. (<http://www.ntmcalc.se/index.html>)

If Clas Ohlson had had more prominent environmental demands than the LSPs, the manager of the Import Department believes it would be possible to influence the suppliers so that they improve environmentally:

"I actually think we have a possibility to influence quite a bit. We are starting to become such a big player now and we have large volumes as well, which makes us an interesting customer, first of all. So from that perspective I absolutely believe that we have a possibility to influence."

(Maria Ax, manager, Import Department)

In this context, Geodis-Wilson is given as an example. Clas Ohlson is a large customer of Geodis-Wilson, perhaps even the LSP's largest, and it would therefore be possible for Clas Ohlson to influence the LSP's environmental focus. This might also be the case for LSPs with whom Clas Ohlson does not currently have contracts, since if Clas Ohlson focuses on environmental issues, potential LSPs might also try to improve their environmental work. According to the manager of the Import Department, this could also be the case for LSPs for whom Clas Ohlson is not necessarily the largest customer. Regarding this, the manager of the Import Department concludes:

"The best thing would be if all customers did that, give the question top priority, because then it would of course be easier to influence."

(Maria Ax, manager Import Department)

4.3 DURING THE RELATIONSHIPS

Clas Ohlson works more closely together with the LSPs who take care of the sea freight from Asia than with the other LSPs. There are a number of reasons for this. One is that sea freight places higher demands on the control and planning of the flow of goods. Moreover, the customs regulations must be followed, which makes the process more complicated. For most of the other inbound transportation, it is the suppliers who book the transports (albeit through Clas Ohlson's transport contracts) and the import department is not involved with this flow in the same way as with the Asian shipments. Another reason for the close contact with the sea freight operators is that it is the most sensitive part of the goods flow.

"We are actually dependent on them [transports in general] working and I think that the sea freight is the most vulnerable area. If we have trouble there, this can result in huge problems because of the long lead times and so forth. With trucks, on the other hand, it feels like it is always possible to find alternatives if something was to go wrong with our own provider - we could easily find someone else."

(Maria Ax, manager, Import Department)

Clas Ohlson has daily communication with the sea freight operator in order to know when the goods will arrive. Other than that, communication between Clas Ohlson and the LSPs is mainly based on so-called production meetings. This applies to both Geodis-Wilson, who covers the sea freight from Asia, and the other LSPs. These meetings may include a range of topics, such as handling of goods, environmental issues and new logistics solutions such as a new harbour.

"Actually, we often talk about problems that we have had. We rarely sit and talk about how fabulous we all are."

(Maria Ax, manager, Import Department)

The meetings increasingly include strategic issues, and according to the manager of the Import Department, this development is likely to continue.

4.3.1 ENVIRONMENTAL WORK

To date, Clas Ohlson has not conducted any follow-ups on the LSPs' environmental work. Because of the new transport management function (see Chapter 8) this is likely to change in the future, and according to the manager of the Import Department, environmental demands are likely to play a more prominent role in the procurement process.

In relation to the transport management function, one change with regard to inbound flows has been made since the new transport manager took over the responsibility for both inbound and outbound and their environmental impact. Previously, 85% of goods delivered from Asia to Gothenburg were transported to Insjön by train, whereas the remainder was transported by truck. Since the beginning of 2013, all goods arriving in Gothenburg from Asia are transported by train to a terminal in Insjön (as mentioned in section 4.1.1 - Goods flow from Asia). This change was made by Peter Bergestål a few months into his new position as transport manager. The reason for the 15% delivery by truck was safety issues – if something were to go wrong with the rail transports, the trucks would still be able to deliver to Insjön. The 15% means that between one and two trucks have gone from Gothenburg to Insjön each day. According to the transport manager, this might have been a good solution ten years ago when around ten containers a week arrived in Gothenburg, around half of which were transported by train and the remainder by truck. A crisis on the railway would mean that Clas Ohlson would have to find trucks for the 85% of goods that were transported there in order to deliver them to Insjön, and the extra 15% would not cause significant complication for the company. There have been some problems due to the fact that the terminal in Insjön is rather small, but Clas Ohlson has found solutions that speed up the unloading process, which reduces the problem of the small terminal.

Estimations have shown that the decision to transport 100% of the goods arriving in Gothenburg by train has lowered the CO₂ emissions from 11.7 tons to 115 kilos (for the 15% that have switched transport mode).

"...and this is just because we eliminate one truck per day from Gothenburg to Insjön. Because it is visible in our total [environmental impact] – not a lot, but it is noticeable, we can see that it is decreasing. So that was low-hanging-fruit number one. It was very easy to discontinue that."

(Peter Bergestål, transport manager)

As far as the manager of the Import Department is aware, all LSPs who have reported their environmental policy have been able to meet the environmental requirements from Clas Ohlson.

"The degree to which LSPs focus on environmental work probably varies. But I actually think that it is about to increase and that more and more customers place higher demands on environmental issues. I hope so at least. It feels like we're on the right track."

(Maria Ax, manager, Import Department)

Even though Clas Ohlson has made some demands on the LSPs in terms of environmental work, these have not been very prominent and there has so far been little focus on them in the previous procurement processes for inbound logistics. There is, therefore, not much evidence to illustrate what would have happened if an LSP had not fulfilled the environmental demands.

However, this is likely to become more important in the future and LSPs will then need to show that they can fulfil all the environmental demands placed on them.

"...there is the issue of follow-ups. I mean, you handle a procurement process and then you have contracts that last two years. That means that you have to do the follow-up during this time. What we have done is, in fact, to measure how our transports have affected the emissions, but as to what extent we have checked if they [the LSPs] meet their goals, that I'm not sure of. /.../ It hasn't been part of my role."

(Maria Ax, manager, Import Department)

Current changes within Clas Ohlson are likely to have an impact on the environmental work. More precisely, the environmental work will be decentralised and each function will have its own responsibility for these issues. This is a positive development, according to the manager of the Import Department:

"I think that is really important, because then it [the responsibility] will be in the right place, so to speak – those who work with certain functions should also include environmental issues. For example, the people who work with transports should also have the environmental responsibility for them. It is difficult for someone else to do follow-ups on things that they are not involved in. So this is a step in the right direction, definitely."

(Maria Ax, manager, Import Department)

There is another example of Clas Ohlson's environmental work with regard to inbound logistics during the on-going LSP-relationships. The environment coordinator was, namely, for some years a member of Geodis-Wilson's environmental board. The board was established on the initiative of the transport provider, more specifically the environmental manager at Geodis-Wilson, and Clas Ohlson was one of around six Geodis-Wilson customers who joined the board. The environment coordinator was asked to join in 2008 because of his environmental work at Clas Ohlson at the time.

"So I've been a member of this board and have gained a lot of valuable information during these three to four meetings per year."

(Per Hedberg, environment coordinator)

During the meetings, people within environmental logistics were invited to talk on the environmental board. According to the environment coordinator, his previous involvement on the board was a good way to hear about trends and developments within environmental logistics. These included matters such as clean shipping, acidification and which projects Geodis-Wilson should support through their environmental fund. The environment coordinator brought the information and the ideas he thought would be of interest to Clas Ohlson back to Insjön, but for various reasons no projects were implemented.

4.4 INBOUND LOGISTICS, PURCHASING DEPARTMENT AND ENVIRONMENTAL IMPACT

The inbound flow of goods to Clas Ohlson is closely linked to the choices made by the purchasing department. As described previously in this chapter, a large portion of the products are bought from Asian suppliers. If Clas Ohlson were to replace some of the Asian suppliers with European, that would naturally have an effect on the inbound flow and its environmental impact. However, that has not thus far been the main issue.

"The focus has been on 'Where can we find the products?'. I see a difficulty there – to include the environmental thinking as well."

(Maria Ax, manager, Import Department)

However, there seems to be consensus that the purchasing department can have an impact on the environmental effects arising from the inbound flow. Closer collaboration between the two departments might be one way to improve this work:

"I have a feeling that our department will have to work more closely with the purchasing department and raise awareness of these issues [environmental impact] in their decisions. That includes what country to buy from and from which supplier. I think there has to be a joint effort there in order for us to achieve our aims. So while they [the purchasing department] naturally also have environmental concerns, their focus is on the product itself. I don't think they include considerations as to what then happens to the product - the transport and all that. I actually think that we need to collaborate between the departments in order to succeed in this."

(Maria Ax, manager, Import Department)

The terms of delivery are one example of what can be of importance in a negotiation process (for which the purchasing department is responsible) and that is related to inbound flows. In order for Clas Ohlson to have as much control as possible over their transports, it is important that the supplier use, as far as possible, the LSPs with which Clas Ohlson has agreements. Clas Ohlson cannot control the environmental work in cases where suppliers use their own transport agreements, and thus use LSPs with whom Clas Ohlson is not involved. This is one area where the manager of the Import Department identifies potential improvements:

"In order for us to be able to influence and have control of this [environmental impact from inbound flows] as much as possible, we should really aim at using our own agreements with LSPs, since we know how they work and know their environmental work. It would, of course, be possible to place requirements on the supplier too: 'Okay, if we are going to use your contract of affreightment, we have these demands'. I don't think this is the way it works today, but I think it is an important issue in order for us to be able to influence this [environmental impact] to a greater degree."

(Maria Ax, manager, Import Department)

The transport manager also recognises that there is an important link between inbound transports and the purchasing department. Although he believes that he can influence the decisions that the purchasing department makes, he is clear about the fact that they are the ones who make the commercial decisions.

"If a product manager says 'We are going to buy this product from this supplier', it is my job to make sure that we have a contract of affreightment for the product. We can, of course, also turn it round and I can offer some advice: 'It would be really good if you could source this product from these regions instead, since we already have large goods flows there.'. /.../ But as I said, I basically have zero impact on the commercial decision about which products we buy and where we buy them. In other words, no mandate. But I'm allowed to have an opinion."

(Peter Bergestål, transport manager)

The purchasing department also agrees that their work can have an effect on Clas Ohlson's environmental impact from inbound flows. Today, however, this is outside the department's area of expertise. Nonetheless, the location of suppliers does sometimes have an influence on the decisions made by the purchasing department. Some locations can be unsuitable from financial, environmental and lead-time perspectives. This is something that the Shanghai office takes into consideration when they find suppliers, and they try to cluster shipments to certain harbours. For very remote suppliers in Asia, the infrastructure might not even be fully developed and it would therefore be necessary to use trucks instead of trains. With regard to the location of suppliers, the manager of Technology and Quality adds:

"This is in part controlled by volume as well. That is, if we buy small consignments and want frequent deliveries, then we might switch to European suppliers."

(Henrik Alfredsson, manager, Technology and Quality)

5 DISTRIBUTION CENTRE

In this chapter, Clas Ohlson’s distribution centre (DC) is briefly described. The distribution centre is involved both in the inbound and outbound flows of goods (see Figure 5.1). Since the DC is an internal part of Clas Ohlson, there are no interorganisational relationships to elaborate on in this chapter. The overview of the DC is given to provide an understanding of several parts of the supply chain. The information in the chapter mainly comes from Peter Bergestål, the transport manager.

FIGURE 5.1. DISTRIBUTION CENTRE

All the products sold in Clas Ohlson stores pass through the distribution centre (DC) in Insjön. Some of the goods arrive at the terminal in Insjön by train, while others are delivered directly to the DC by truck.

The personnel at the DC have the capacity to unload on average 14-15 containers each day. The time it takes to unload one container is highly dependent on content; while it can take one hour to unload one container, the next can take four hours. Sometimes 30-40 containers are delivered to the terminal in Insjön at the same time, which means that it is impossible to handle all the goods at once. The personnel at the DC work with one container at a time and contact the terminal just before they finish, so that a new container can be delivered. This means there is always a small number of containers waiting to be unloaded at the terminal, but Clas Ohlson has good control over which products are there, so that they can request specific containers if needed.

Since 1995, the DC has been rebuilt and expanded several times. There have been occasions when the DC in Insjön has not been sufficiently large to take care of all of Clas Ohlson’s goods, and in three cases external warehouses have been used for short periods of time. During the construction of the high-bay warehouse in Insjön, an external warehouse in Borlänge was used for two years. This is the longest period of time during which Clas Ohlson has used extra space in an external warehouse.

In addition to the DC in Insjön, Clas Ohlson uses a small warehouse in Immingham in England. The reason for this is that the lead time to the UK stores is longer than to, for example, Swedish stores. Because of this, buffer stocks are held in Immingham, mostly for popular and promotional items. DFDS is in charge of this warehouse.

At present the DC in Insjön is sufficient for Clas Ohlson’s needs. Clas Ohlson knows for approximately how long the capacity of the current DC in Insjön will suffice, given that the company continues to open new stores at the planned rate. No further extensions are planned for the current DC, for two main reasons. Firstly, a very large warehouse can easily become inefficient because of its size. Internal transports can, for example, become unnecessarily long.

Secondly, a solution with only one warehouse is vulnerable in the event of disruptions, as explained by the transport manager:

"We are very vulnerable in the event of interruptions. If you have two warehouses and one fails, well, then it would be possible to manage. If you have one warehouse and that fails, then you're in big trouble."

(Peter Bergestål, transport manager)

When capacity is not sufficient there will be a need for one or more additional DCs. Unlike the DC in Insjön, it is possible that the potential new DC(s) will be managed by logistics service providers.

Establishing a DC in Insjön might seem controversial, because of the relatively remote location. Estimations made by Clas Ohlson, however, indicate that the location is a good choice, given that there are stores both in the northern and southern parts of Sweden and in Norway. Despite this, a potential new DC would not be located in Insjön.

6 OUTBOUND LOGISTICS

This chapter focuses on Clas Ohlson's relationships with LSPs who manage the outbound flow of goods, i.e. from the DC to Clas Ohlson's stores (Figure 6.1). The initial part of the chapter introduces the various LSPs involved, after which different aspects of their relationships with Clas Ohlson are described. The majority of the information in this chapter comes from Peter Bergestål, transport manager, with additional contributions from the environmental coordinator, Per Hedberg.

FIGURE 6.1. RELATIONSHIPS WITH LSPs IN THE INBOUND FLOW

6.1 OVERVIEW OF OUTBOUND LOGISTICS

The distribution from the central warehouse to the stores is handled by three different LSPs: PostNord Logistics delivers to Sweden and Finland; DHL delivers to Norway; and DFDS delivers to the UK (see Table 6.1). It is also worth mentioning that there is one goods flow that does not go to the stores, and that is the mail order goods flow. Since this portion is so small (1.5%) there will no further reference to it in this report.

TABLE 6.1. OUTBOUND LOGISTICS SERVICE PROVIDERS

Logistics service provider	Location of stores	Number of stores
PostNord Logistics	Sweden	68
PostNord Logistics	Finland	21
DHL	Norway	56
DFDS	UK	12

Clas Ohlson states that all the LSPs currently involved in the outbound logistics flows are of equally importance. However, for natural reasons, they are responsible for different numbers of stores: PostNord Logistics delivers to 89 stores in Sweden and Finland whereas DFDS delivers to 12 stores in the UK. Despite this, the transport manager says:

“But I wouldn’t say that they [PostNord Logistics] are more important.”

6.2 FINDING LOGISTICS PROVIDERS

Many LSPs are interested in becoming a logistics service provider for Clas Ohlson. The transport manager estimates that he has been contacted by 35-40 different companies during the months since he took up his position.

“During the years you are constantly being contacted by LSPs and suppliers that want to get a foot in the door.”

(Peter Bergestål, transport manager)

The most recent procurement process for outbound logistics started with a survey sent out to potential LSPs. The questions in the survey concerned traffic safety and environmental work. In addition, general information about the procurement was provided, such as the number of stores and the requirement that one provider must cover a whole country. Almost all the respondents returned a completed survey to Clas Ohlson. A few of the respondents could be eliminated from the process because of poorly filled-in surveys or because of inadequate focus on traffic safety and environmental work. However, the majority of LSPs who had responded were still in the process.

Following this, a request for proposal was sent out to the remaining LSPs. Some of the original questions from the survey were now formulated as “You *must* be able to...”, meaning the demands were higher. Four or five LSPs fulfilled these new requirements and the transport manager had a meeting with each of them in order to ensure that he had understood their bid correctly. The different bids were then compared. Some companies were strong in some regions of one country but weaker in others. Throughout the process it had been clear that one country would not be split between different service providers.

In the procurement process, the current LSPs have an advantage against competitors since they already know what Clas Ohlson needs. The transport manager explains:

“If they [the prices] are about the same, it is probably very easy to choose the current [provider] – you know what you’re getting.”

(Peter Bergestål, transport manager)

PostNord Logistics, for example, has been the logistics provider for Clas Ohlson in Sweden since 1989. However, if the prices were to differ significantly between competing LSPs, the final decision might be different.

The prices are thus an important aspect of the decision made at Clas Ohlson. However, in order to be considered as one of the few LSPs for which prices are compared, the LSPs need to be on a specific level with regard to traffic safety and environmental work. The transport manager gives an example where three remaining LSPs all provided the same answers in the survey:

“There is no reason not to believe that they are equally good. Some had flaws – they were not even part of the final process. So we have environmental demands as an order qualifier: we want you to meet the requirements up to ‘here’, with regard to both environmental and safety work. All these three [LSPs] are well above this minimum requirement, so ‘check!’. Then we can evaluate them based on prices.”

(Peter Bergestål, transport manager)

Normally, more than one LSP is able to provide the services that Clas Ohlson requires. As mentioned above, certain criteria must be met, with price also a factor. The service level is another important parameter. According to the transport manager, the main requirement with regard to service is that the LSPs can deliver to most stores at 7 am sharp. There has been a problem with this requirement in the past, more specifically in Finland. When Clas Ohlson opened the first stores in Finland in 2003, PostNord Logistics was hired to deliver the goods to the stores. PostNord Logistics was already responsible for the Swedish flows, so Clas Ohlson knew that they worked well. However, trouble occurred when PostNord Logistics hired subcontractors in Finland; they did not deliver at 7 am as stated in the contract. It is important

to know that Clas Ohlson signs contracts with the LSP, who can then hire the subcontractors of their choice. The main LSP has to ensure that the subcontractors live up to Clas Ohlson's demands. This resulted in a difficult time for Clas Ohlson, and PostNord Logistics did their best to rectify the problem. In the next procurement process, DHL offered lower prices than PostNord Logistics and because of the quality problems that had occurred, the Finnish goods flow was given to DHL. As soon as DHL started their contract in Finland, the same problems reoccurred. They managed to overcome the problems, but because of the inadequate service, the contract was given back to PostNord Logistics in the next procurement process. In Sweden and Norway, on the other hand, the same LSP has been used throughout (PostNord Logistics in Sweden and DHL in Norway). The example from Finland illustrates that this is not something that should be taken for granted.

"Just because you've had Sweden the whole time doesn't mean that you are safe; you have to continue to deliver what's expected of you, otherwise you will lose Sweden. Or look what happened in Finland, you lost Finland. So it felt good to be able to make that point."

(Peter Bergestål, transport manager)

With regard to the outbound flow, Clas Ohlson has never felt that they need to compromise in order to find an LSP who can take care of their flows of goods. The transport manager says:

"No, so far we have not come across that. But we don't place such high demands. We can't demand the impossible."

(Peter Bergestål, transport manager)

One such example is given by the transport manager: the requirement is that all Swedish stores should receive deliveries at 7 am, something that is made very clear in the procurement process. This is, however, impossible for the stores in Skellefteå, Luleå and Kiruna, as a result of the way in which the central warehouse is currently organised. So these stores in the north of Sweden receive their goods at 2 pm instead.

"So we don't make impossible demands. But then again, we could perhaps /.../ increase our environmental demands a bit more. As I said, I asked them a few questions and if they reached the bar I'd set, so to speak, then they got the green light. Perhaps we should have something else where it actually becomes more of a selection criterion and we can evaluate them /.../."

(Peter Bergestål, Transport Manager)

The next logistics procurement process will include both inbound and outbound flows, something that has not been done before at Clas Ohlson. Although the main responsibility for this lies with the transport manager, it is likely that the manager of the Import Department will be involved to some extent since she was previously in charge of the inbound procurement process. The procurement process will most likely be similar to the one described here for outbound logistics. However, it has not yet been decided if it will be divided into regions or if it will be a more holistic approach.

6.2.1 ENVIRONMENTAL DEMANDS

Ten years ago, Clas Ohlson made very few demands regarding environmental activities. This has changed gradually, and some demands were introduced in the most recent procurement process, in 2009. The transport manager considers the demands were modest:

"They [the LSPs] were not allowed to have trucks of lower environmental classification than EUR3. And look at the situation now – EUR3 is nothing to be particularly proud of. /.../ In addition to the demand that they should have trucks with at least environmental class 3, we also required that they should be able to report according to NTMCalc."

(Peter Bergestål, transport manager)

During the most recent procurement process, the transport manager collaborated with the environment coordinator with regard to the environmental demands they should place on potential transport providers. They wanted to demand more specific environmental data from the providers, but according to the environment coordinator, this is difficult:

"/.../we tried to improve the quality of the environmental reports, or the environmental data. /.../ We are in a situation where the environmental data is based on broad generalisations. /.../ So we have tried to see if it is possible to include that as a demand in a procurement process – that the transport provider should show data which is more or less specific for Clas Ohlson, to the extent that that is possible."

(Per Hedberg, environment coordinator)

The reports that Clas Ohlson now receives include company-specific numbers for grams of CO₂ per ton-kilometre. It is important for Clas Ohlson to be able to measure the reductions of CO₂ emissions that they strive to achieve.

Clas Ohlson cannot hire small LSPs, since they need nation-wide distribution. That limits the selection to 4-5, according to the transport manager. All of these are in effect equally good, and all work with environmental issues, even though the transport manager sometimes questions the accuracy of the environmental work:

"But I am convinced that DHL shows us pears and Posten [PostNord Logistics] shows us apples and then we collect these numbers and put them together and maybe they are accurate, maybe not. I have not dug deeply into these accounting principles – our requirement was that they could report according to NTMCalc and Per [environmental coordinator] was happy and we have received the yearly numbers."

(Peter Bergestål, transport manager)

According to the transport manager, Clas Ohlson is probably in a position to influence the LSPs in their environmental work. He believes that sending out the surveys is probably enough to influence some of them. From some of the responses, the transport manager could see that the LSPs had tried to give "the right answers", but he could also see that they did not work with, for example, environmental issues.

6.3 DURING THE RELATIONSHIPS

The transport manager, together with two representatives from the DC, has strategic meetings with the LSPs every three (PostNord Logistics and DHL) or six (DFDS) months in order to discuss how well the collaboration is working and whether changes can, or should, be made. In addition to these meetings, contact is sometimes required on a more operative level, such as for missing goods or delays, and this handled by the two co-workers at the central warehouse. The strategic meetings often also include matters that are a source of dissatisfaction to Clas Ohlson, but on a more strategic level. In addition, the strategic meetings include thoughts regarding the

future, such as if Clas Ohlson is about to open a new store or whether the mode of transport should be changed.

6.3.1 ENVIRONMENTAL WORK

One example of a matter which has been discussed during the strategic meetings mentioned above is the EUR3 demand regarding trucks that is stipulated in the contracts. In Stockholm, there are a number of low passages where the trucks deliver and the LSP did not have trucks that were both low enough and of the right environmental classification. In this case, Clas Ohlson accepted a lower environmental classification in order to have the goods delivered. The transport manager explains:

"In this case I have made an exception. If I had said 'No, I don't accept this, I insist that you buy a new truck for distribution to Gallerian and Kista', that would have increased the prices, so it's a question of what's reasonable. This concerned two specific stores where they [the LSP] asked to make an exception and I said 'OK' to that."

(Peter Bergestål, transport manager)

The transport manager has checked the type of vehicle that delivers the goods to the stores, in order to see if they were of EUR3 class or higher as stipulated in the contracts. In most, but not all, cases, the LSPs used appropriate vehicles, often of a higher environmental class than EUR3. The checks are made mainly to show the LSPs that Clas Ohlson actually follows up on the demands they make. The controls have shown that newer trucks are used for the low passages described above, which pleases the transport manager.

Distribution to the UK is by truck from Insjön to Borlänge, from where the goods are taken to Gothenburg by train. The transport manager has started to think about whether more rail alternatives are possible for other parts of the goods flows.

As far as the transport manager is aware, no LSP has approached Clas Ohlson with a suggestion that would lower their environmental impact in the outbound flow.

"This bothers me quite a bit. I have an idea that would make our distribution to Norway more efficient, as well as the distribution to the northern parts of Sweden. We will save money and decrease environmental impact. And I'm very annoyed that our LSPs have not come to me with this idea. /.../But sure, their business is to keep the truck driver busy, that's something we need to recognise. But still, when I see that both we and DHL will save money..."

(Peter Bergestål, transport manager)

7 STORES

This chapter focuses on Clas Ohlson’s stores. The stores are wholly-owned by Clas Ohlson, and there is thus no explicit inter-organisational relationship between them and the company (see Figure 7.1). Because of this, the chapter centres around the stores as such and describes relationships with other actors to a more limited extent. Most of the information in this chapter comes from the environment coordinator, with additional contributions from Peter Bergestål, the transport manager.

FIGURE 7.1. THE STORES

7.1 OVERVIEW OF THE STORES

Clas Ohlson has 157 stores in four different countries (Clas Ohlson, 2013a). Of these, 68 are located in Sweden, 56 in Norway, 21 in Finland and 12 in the UK. The majority of the stores receive deliveries at 7 am, giving them time to unpack the goods before the stores open. The stores have little or no storage space other than the actual retail area, which is why it is important that the personnel have time to unpack the pallets. Clas Ohlson requires the trucks to arrive as close to 7 am as possible, and the stores are asked to report delays of five or more minutes to the head office in Insjön. However, according to the transport manager, the LSPs’ level of delivery service is high, and he adds:

“Price is not the most important thing for us. The quality is more important and for that we gladly pay a little extra.”

(Peter Bergestål, transport manager)

In accordance with Clas Ohlson’s wishes, the LSPs always make Clas Ohlson the first stop on their distribution routes. This is important because of the tight time frame in which Clas Ohlson wants the goods delivered. The LSPs can, however, consolidate with other goods in the trucks they use for Clas Ohlson.

All products bought by customers in a Clas Ohlson store are registered at the checkout and the information is linked directly to the DC in Insjön. Thus, Clas Ohlson is aware at all times of what has been sold and where refills are needed. During the nights, the information is translated into refill orders and the personnel at the DC then pick the products that are needed for each store. This also means that the stores do not send orders to the DC; instead, this is done automatically. Deliveries to most stores are made five days a week, while some remote stores receive deliveries two or three times a week. All deliveries to the stores go by truck, although the deliveries to the UK and Finland include a small share of rail and sea transport.

A few of the stores have special requirements regarding delivery. One reason is low ceiling heights at the loading ramp, meaning they need custom-built distribution trucks. Some stores

cannot handle Clas Ohlson's regular height pallets because of the limited capacity of elevators from the loading ramp to the store.

7.2 ENVIRONMENTAL WORK

Environmental work in the stores is mostly related to energy efficiency, product-specific work or waste management, all of which are mainly intra-organisational activities. Energy efficiency in the stores is an issue which has been discussed in Clas Ohlson's CSR forum. There have, for example, been many discussions about how lighting appliances should be designed. Clas Ohlson has mapped the different stores in order to identify those which use the most electricity, and plans to find ways for them to improve. Clas Ohlson has also developed the concept for new stores, in order to influence energy efficiency at an early stage.

With regard to product-specific environmental issues, one of the things that Clas Ohlson works with is safety issues regarding substances that can be injurious to people's health. Products that might include such substances must be correctly labelled and sealed, and information regarding the substances must be made available to customers. Clas Ohlson rarely receives complaints about these substances and the information, but some customers do have questions regarding them. In addition to information contained in, or on, the packaging, Clas Ohlson tries to provide information through the web page.

In the first years of the EU WEEE (Waste Electrical and Electronic Equipment) directive, the stores were required to take care of electric and electronic waste according to a one-for-one rule. That meant that it was possible for customers to hand in a broken electrical product, such as a drilling machine, when they bought a new one. In 2006 this regulation changed, allowing Clas Ohlson to stop accepting WEEE from customers. This was an improvement, because by accepting certain types of waste, Clas Ohlson becomes a middleman for the storage of hazardous waste. The company thus becomes a form of environmental station, with all the rules that this implies. While this would simply be too complicated for Clas Ohlson to commit to, the company has recently tested the concept by installing a small disposal plant for fluorescent lamps and batteries in order to develop customer services.

"Some customers want to bring their broken light bulb to the store, in order to know that the right type when they buy the new light. So we have an unwanted flow of scrap metal and waste."

(Per Hedberg, environment coordinator)

The environment coordinator is one of the participants in Clas Ohlson's CSR forum, and has been involved in discussions regarding displaying more information about sustainability work in the stores to customers. He says:

"In our CSR forum we have discussed whether we should produce information about our sustainability work and display it in the stores. We need to be better at that and we get such signals from external persons as well: 'You do so much [with regard to sustainability], so why don't you let people know?' So, communication and information about environmental and sustainability work will most likely increase in the stores."

(Per Hedberg, environment coordinator)

A number of logistics-related environmental efforts have been made with regard to the stores. The most prominent example is the one where Clas Ohlson worked with filling rates on the

trucks that deliver to the stores. Around 2005 and 2006, Clas Ohlson received a visit from the Swedish Work Environment Authority, who said that Clas Ohlson needed to improve the ergonomic conditions for the store personnel when they deal with the pallets arriving from the DC. The authority felt that the pallet height was too high for the personnel, and the height was subsequently lowered. That resulted in lower fill-rates on the trucks delivering to the stores, something that bothered the environment coordinator:

"...and since then we have thought of a solution for this problem. How can we make use of the trucks' capacity? Because we are not near the maximum load weight on the trucks."

(Per Hedberg, environment coordinator)

In the spring of 2011, a new ergonomic risk analysis was conducted for the specific task of opening pallets. The analysis showed that as long as two conditions were fulfilled, Clas Ohlson could increase the pallet height by twenty centimetres. In order for this to be ergonomic, Clas Ohlson could not load goods that weighed more than 15 kilos onto levels above 140 centimetres. Moreover, the stores needed to distribute the task of opening pallets among the staff so that no one individual made more than 40 lifts of heavy goods from above 140 centimetres per day. The environment coordinator is happy with this project and points to the results:

"This way we save 550 tons of CO₂ each year and we save a lot of money. Just by increasing the height by 20 centimetres."

Neither the environment coordinator nor the transport manager knows of any cities that have specific demands with regard to environmental regulations. However, the company was contacted by the municipal environmental administration when Clas Ohlson were planning to open their store in Karlstad, since the city had considered opening a consolidation centre in the outskirts of the city. The environmental coordinator explains:

"When we were about to open our store in Karlstad, I was contacted by someone within the municipal environmental administration, who had a project where they wanted a minimum of distribution trucks in the city centre, like some type of consolidation centre in the outskirts of the city, so that they could drive full truck loads instead of half-empty trucks arriving all the time. I haven't heard of it in any other places, but Karlstad discussed it."

(Per Hedberg, environment coordinator)

Clas Ohlson does not know what happened in Karlstad or if they ever opened their consolidation centre, but Clas Ohlson is not involved in this project and delivers directly to their store.

8 THE TRANSPORT MANAGEMENT FUNCTION

This chapter mainly includes information about the recently implemented transport management function, which takes a more holistic approach to inbound and outbound logistics than when the two functions were separated. In addition, initiatives that were taken before this function was introduced, but still concerned a more holistic view of transports, are also included in this chapter. As transport manager, Peter Bergestål has the main responsibility for the new function and has contributed with most of the information for this chapter. Additional information has also been received from Per Hedberg, the environment coordinator.

8.1.1 TRANSPORT STRATEGY

Clas Ohlson currently has a number of transport contracts which will expire at the beginning of 2014. One of the tasks of the new position as transport manager is to analyse the present situation with regard to inbound and outbound goods flows. The next step is to write a transport strategy, which is something that Clas Ohlson has not previously had. One reason for this is that during the past few years, Clas Ohlson has focused on expansion, with the result that a number of issues have fallen between two stools. The big question that needs to be answered in the new transport strategy is:

“What do we want to achieve with our transports? It hasn’t been done before – too many people have been involved.”

(Peter Bergestål, transport manager)

It is not yet clear what the transport strategy will include. The end result may be that Clas Ohlson decides to hire a large number of LSPs in order to spread the risks. Another alternative would be to keep the number of LSPs to a minimum, in order to increase volumes, increase interest from the LSPs and keep prices down. An extreme case would be that one LSP handles all inbound and outbound logistics for Clas Ohlson. According to the transport manager, Clas Ohlson is virtually at the other extreme today, with 12-13 LSPs.

The length of transport contracts has to date been between 2 and 4 years. Initially they ran for four years, but when the supply chain management function was developed, the idea of better coordination of the different transport contracts emerged. Consequently, the most recent contract period for the outbound distribution was for a period of two years, which implies that all inbound and outbound contracts end at the same time. This creates opportunities for the next procurement process. The transport strategy will most likely include guidelines for the length of contracts.

“It is a very strategic matter. The longer contracts I sign, the better prices I can get, definitely.”

(Peter Bergestål, transport manager)

The transport strategy will also have an environmental focus. Clas Ohlson’s web page (Clas Ohlson, 2013b) states:

“Clas Ohlson sources products from approximately 600 suppliers in 30 countries, and transport impacts on the climate are therefore a prioritised area for our environmental work. In cooperation with our logistical partners, we strive to develop solutions that reduce carbon emissions. Our overarching environmental objective states that carbon emissions per tonne-kilometre of

freight and person-kilometre business travel are to be reduced by 30 percent by 2020, compared with 2007."

The new role as transport manager means that Peter Bergestål also has the main responsibility for a decrease in Clas Ohlson's CO₂ emissions of 30% by 2020.

"And I work like this: If we've said 30%, then I would like to deliver 50%."
(Peter Bergestål, transport manager)

However, unless major changes are made, Clas Ohlson will not even achieve a 20% reduction. The transport manager believes that biofuels will make a difference and together with more goods transported by rail, he hopes that he will exceed the 30% target.

The next step for the transport manager is to start the procurement process for inbound and outbound goods flows. He knows how complicated "only" the procurement process for outbound flows has been, so he anticipates that this more holistic procurement approach will take a lot of time. It is possible that the process might need some extra resources in terms of external or internal experts within certain transport areas.

The total transport costs for Clas Ohlson are about a quarter of a billion SEK, so even small changes could result in large cost savings.

"If we can improve so that we become as little as 1% more efficient, well, there you have 2.7 million [SEK]. Then I will have paid for my whole [potential] transport department."

(Peter Bergestål, transport manager)

8.1.2 ENVIRONMENT AND TRANSPORTS

According to the environment coordinator, 2008 was an intensive year with regard to road transports. Despite there not being any transport management function, Clas Ohlson took the initiative of brainstorm meetings with their transport providers.

"We brought all of our transport providers at the time to us and we had brainstorm meetings, more or less, in which we left no stone unturned in our efforts to find environmental improvements, or financial and environmental improvements."

(Per Hedberg, environment coordinator)

The project concerned inbound as well as outbound logistics. One of the ideas that emerged during these brainstorm meetings was to increase the volume of goods that went by train from Europe to Insjön. At the time, some of the goods transported from Europe were already transported by train, but Clas Ohlson and Schenker, who was and still is the transport provider for European goods flows with regard to rail transport, saw the potential for additional goods being transported by train. The environment coordinator emphasises:

"This happened during the on-going contract, so it wasn't in the gap before a new contract – it was improvement work."

(Per Hedberg, environment coordinator)

At the time, Schenker kept a high profile with regard to environmental issues, and their environmental manager visited Clas Ohlson during the brainstorm meetings. The environment

coordinator believes that these could be some of the reasons why the discussions with Schenker were so productive. However, it was not only Schenker who took part in the brainstorm meetings:

"DHL and other transport providers were here as well, and they described their research or their development plans with regard to accurate measurements of fuel consumption and other improvements."

(Per Hedberg, environment coordinator)

Because of a change in job description, the environment coordinator left the ideas from the brainstorm meetings before anything was really finished. In addition to the meetings with logistics service providers, one person from Green Cargo conducted simulations for some of Clas Ohlson's outbound flows. At the time, these were all transported by truck, but the goal of the simulation was to find beneficial intermodal solutions. However, this also petered out when the environment coordinator changed work tasks. Because of his earlier involvement in the projects described above, the environment coordinator adds:

"I'm really happy that Peter [Bergestål, the transport manager] has picked up the reins and is carrying on with this. There is a four-year gap here, but now he's onto it. I am really happy about that! He is well suited to manage this, with his background and knowledge. I think that he will find some successful solutions."

(Per Hedberg, environment coordinator)

During 2008, it was discovered that the volume of transportation by air at Clas Ohlson was increasing. The company recognised that this was not a good development and acted in order to decrease the amount of air freight. One of the changes made was that the Shanghai office was given increased areas of responsibility, which meant that they could test and evaluate demo versions in China without having to send them to Sweden by air. The environment coordinator also believes that some Chinese suppliers have been replaced with European suppliers and that this also contributes to the decrease in air freight.

When the transport manager started his new position, he tried to gain insight into the environmental numbers in the annual report. He quickly realised that more needed to be done:

"We can't just rely on new engines and new fuel – we have to do more. Then I found this documentation where someone at Clas Ohlson – and this is quite clever – has actually written 'We should, wherever possible, switch from road to rail.'"

(Peter Bergestål, transport manager)

He started working with rail alternatives and has so far conducted one project (earlier described in section 4.3.1) and has two more in the pipeline. During this work there has been close collaboration between the transport manager and the environment coordinator.

"Per [the environment coordinator] is my mentor with regard to these matters."

(Peter Bergestål, transport manager)

The second project which has been conducted within the scope of the new transport management function is focused on the flow of goods from Insjön to the northern parts of Norway, where there are six stores. The central warehouse sends goods to these stores on

Tuesdays and Fridays. Because the volume of goods is greater on Fridays, three trucks deliver the goods to the six stores, whereas two are sufficient on Tuesdays. The idea is now to transport these goods by train, from Borlänge to Narvik. Narvik would then become a hub for Clas Ohlson from which the goods would be distributed by truck. The transport manager estimates that this would result in 5,000 fewer road kilometres each week than the previous solution. He has contacted the LSP who manages the distribution in Norway; they have shown interest in the solution and are going to have a meeting with the transport manager to discuss it.

There is also a similar suggestion regarding the goods distributed to the northern parts of Sweden and Finland. In this third project, Luleå would become a hub and goods would be distributed from there to some other cities in the northern parts of these countries. The transport manager has contacted the LSP responsible for outbound logistics in Sweden and Finland and arranged a meeting with them.

Because of the ideas outlined above, the contracts with both PostNord Logistics and DHL have been prolonged for one year, extending the initial two years that were agreed in the procurement process:

"I want to make a change during the current contract period, because I see a possibility for us to start using rail transports. I don't want to wait one more year and do this at the next negotiation. They [the LSPs] could see this as a something positive – if they do a good job and we get this rolling during the current contract period, they will have yet another advantage over competitors when we get to the next procurement process. As for me, I don't mind being in long-term relationships, as long as they work and both parties are happy."

(Peter Bergestål, transport manager)

If the projects are successful, both financially and environmentally, Clas Ohlson will move on to look at other goods flows. The environment coordinator predicts that distributing more goods by rail might have internal consequences for Clas Ohlson and lead to a greater need for collaboration between different functions. Moreover, it is possible that Clas Ohlson would have to rethink if the stores were to receive the same level of deliveries as today.

"...perhaps they should have a larger capacity to store things on the shelves so that it is possible for the level of products to fall lower [than today] and for the stores to manage with deliveries three times a week."

(Per Hedberg, environment coordinator)

These are examples of possible consequences if Clas Ohlson extends the portion of goods transported by rail. However, the environment coordinator does not think it will be entirely easy to change too much:

"It could be a challenge to get all the decision makers, or the ones who are affected by the changes, on board."

(Per Hedberg, environment coordinator)

Since the transport manager is responsible for the transport procurement process, he is the one who can make demands that Clas Ohlson sees fit.

"Well, I can demand anything I want from them [the LSPs] in a procurement process. I can tell them: 'I want every millilitre of the fuel you use to be

biofuels of some sort'. But the line must be drawn somewhere, because the higher the demands I make, the more expensive it will be. But they would definitely do it."

(Peter Bergestål, transport manager)

As in many businesses, the costs need to be weighed against the benefits. This is also the case for Clas Ohlson:

"With regard to transport costs, I naturally need to keep them as low as possible; to buy transports as cheaply as possible, with the highest possible quality and the highest possible environmental performance. There you have the balance, so to speak. There will be solutions, for example the rail solutions that I am currently working on, where I will lower prices, increase quality and decrease our environmental impact – well, there we have a win-win-win-solution. But there are not endless good examples like these, but we will find some at least. Other than that, there will have to be a balance."

(Peter Bergestål, transport manager)

As mentioned in both Chapter 4 and Chapter 6, no LSP appears to have approached Clas Ohlson with a suggestion for environmental improvements. The transport manager is frustrated about this:

"This is exactly the reason why we have our meetings every three months, so that we can discuss things like these."

(Peter Bergestål, transport manager)

However, he acknowledges that the main goal of LSPs is to keep truck drivers occupied. Then again, given that both Clas Ohlson and DHL (as in the Norwegian rail suggestion described above) would save money through the new solution, the transport manager is still surprised that the LSPs do not take initiatives in this matter.

As implied by the sections above, there has been limited environmental focus in the relationships with LSPs to date. The transport manager is, however, working for a change in this matter. The planned rail projects described above are examples of this. The transport manager attempts to give an explanation as to why this has been done to a limited extent before:

"...it sounds bad, but no-one has owned these issues at Clas Ohlson before. Sure, Per Hedberg [the environmental coordinator] has environmental responsibility; Peter Bergestål [the transport manager himself] has the responsibility for outbound transports to the stores and Maria [Ax] has the inbound responsibility, but no one has really had the resources. It is only now that environmental issues are part of someone's job description – that we should work with and develop this and make sure that we improve all the time. It's great fun."

(Peter Bergestål, transport manager)

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APPENDIX I – INTERVIEW GUIDE

QUESTIONS FOR INBOUND- AND OUTBOUND LOGISTICS

The questions below were asked to the individuals involved in the work with inbound- and/or outbound logistics. For the other studied parts of the Clas Ohlson's supply chain the questions were similar but adapted to the specific context.

THE RESPONDENT

- What is your position at the company?
- How long have you been working at the company?
- Who do you report to?
- Who reports to you?
- Are you in contact with environmental issues? If yes, how and why?

THE SUPPLY CHAIN

- What is the general picture of in- and outbound flows at Clas Ohlson?
- Which LSPs do you use?
- Do you buy more than transport services from the LSPs? If yes, which?
- Do you or the suppliers have the responsibility for inbound logistics?
- How do you choose LSPs in the procurement process?
- Are there one/several options in this process?
- Which criteria do you apply in the procurement process?
- Are the criteria equally important? If not, which are more important?
- Is it easy or difficult for Clas Ohlson to find LSPs that fulfil the criteria?
- Can the LSPs always deliver what Clas Ohlson requires? Are compromises necessary in some cases?
- Can you categorise the LSPs in some way?
- Are certain LSPs of more importance than others?
- Are you more important for certain LSPs than for others?
- Do you have control over the LSPs' "suppliers"? If yes, how?

ENVIRONMENTAL FOCUS

- Do you place environmental requirements on your LSPs before you decide to use them? If yes, which environmental requirements to you place and why?
- Are the requirements the same for all LSPs? If no, why not?
- Do you work with environmental issues during the on-going relationship with LSPs? If yes, how? If yes, do you work in the same way with all LSPs?

- Has an LSP become a logistics supplier to you even though it did not fulfil environmental requirements? If yes, why?
- Has lack of environmental work of the LSP led you to not choose that LSP? If yes, was it before or during the relationship? What was the reason?
- Have LSPs improved their environmental work due to your requirements? If yes, how?
- Do you work together with your LSPs with regard to environmental improvements? If yes: How, why and with whom?
- What happens if LSPs do not fulfil the requirements placed on them? If yes, is the situation similar for all LSPs? Why/why not?
- Has an LSP ever initiated a discussion about environmental work with you? If yes, what was the result?

APPENDIX II - THE CODE OF CONDUCT

Code of Conduct

INTRODUCTION

Clas Ohlson is a customer-oriented retailing company, without our own manufacturing operations.

We support the UN's Global Compact and OECD's guidelines for multinational enterprises. We acknowledge that we have a duty to safeguard the human rights of those involved in our enterprise as well as contributing to a sustainable development.

Our Code of Conduct applies to our own business operations and to all our dealings with suppliers of products and services. The code is an integral part of our business and reflects our regard for working conditions, working environments and the environment in general.

Clas Ohlson requires its suppliers to respect the principles of the Supplier Code of Conduct in their business operations and to comply with it in their business practice.

Suppliers of Clas Ohlson products are responsible for ensuring that their manufacturers fulfil our Supplier Code of Conduct. Suppliers shall provide details of the manufacturers they use upon Clas Ohlson's request.

If any breach of Clas Ohlson Code of Conduct should occur, we encourage our employees and suppliers' employees to report any such breach to: supplychain-report@clasohlson.com. Your information will be treated confidential and Clas Ohlson prohibits retaliation against anyone for raising or helping to address this type of issue.

1. LEGAL REQUIREMENTS

We expect our suppliers to be aware of the national legislation regarding their business operations in those countries where they operate, and to follow this legislation as a minimum requirement.

However, the requirements of the code are not limited to laws, regulations, conventions and guidelines. The requirements of the Supplier Code of Conduct are to be observed in addition to national legislation.

2. WORKING ENVIRONMENT

Employees shall be provided with a safe and healthy workplace.

2.1 Health and safety

The supplier must meet the minimum laws and requirements pertaining to working conditions and the working environment. We also require our suppliers to prioritise the health and safety of their employees. We expect appropriate working protection to be used, equipment and premises to be safe, hazardous substances and waste to be handled in a safe way.

2.2 Housing facilities

If the supplier provides employee housing facilities, these shall be safe and hygienic, and shall provide satisfactory personal privacy and space.

3. WORKING CONDITIONS

Clas Ohlson requires its suppliers to respect basic human rights and requires that employees be treated in accordance with the ILO Declaration on Fundamental Principles and Rights at Work (1998).

3.1 Discrimination

Clas Ohlson values and respects different cultural backgrounds and traditions.

Employees shall be appraised and treated on the basis of their own ability and qualifications to carry out their work, not on the basis of personal characteristics or convictions.

3.2 Forced labour

No form of forced labour, involuntary or uncompensated work will be accepted. This includes all forms of compulsory agreements and illegal labour.

No person may be detained at work against his or her will for any period of time.

3.3 Disciplinary practices

Employees shall be treated with respect and dignity.

Under no circumstances may any employee be subject to corporal punishment or other forms of physical, sexual or psychological punishment, harassment or coercion.

Pay deductions may not be made for disciplinary reasons, unless this is regulated by collective agreement or permitted by law.

3.4 Child labour

The UN Convention on the Rights of the Child (1989), the ILO Convention on Minimum Age for Employment (no. 138, 1973) and the ILO Convention concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour (no. 182, 1999) are guidelines for all activities, which take place in the company's name.

No person may be employed below the age for having completed compulsory schooling or under the age of 15 years (or 14 years in those countries referred to in article 2.4 of ILO convention no. 138).

If a child is found to be working for a supplier manufacturing Clas Ohlson products, we request that measures are taken to rectify the problem without worsening the child's social situation. If corrective action is not implemented after this situation is brought to our attention, Clas Ohlson will replace the supplier.

3.5 Wages and working hours

Suppliers shall stipulate working hours and pay wages and overtime pay as a minimum in accordance with national laws and agreements, or in accordance with local industry standards.

Employees are entitled to a contract of employment.

3.6 Freedom of association and the right to collective bargaining

Employees shall be free to exercise their legal rights to join, form or work for organisations which represent their interests as employees.

Suppliers must not threaten or penalize workers, or in any other way restrict or interfere with employees' legal and peaceful exercise of their rights.

Suppliers shall respect employees' rights to collective bargaining.

3.7 Alcohol and unlawful drugs

The workplace must be free from alcohol and unlawful drugs in order to provide a good and safe working environment. Suppliers shall ensure that alcohol and unlawful drugs are not used during working hours.

4. ENVIRONMENT

Clas Ohlson is actively working to continually reduce its direct and indirect environmental impact.

Suppliers are expected to work in line with Clas Ohlson's environmental policy. Suppliers shall therefore be well informed about and comply with requirements in accordance with national legislation, regulations and industry standards. This involves being aware of and monitoring their environmental impact, and constantly working to improve environmental performance in their operations.

As a minimum requirement, suppliers shall handle hazardous substances and waste in a safe way. Requirements restricting hazardous substances in those markets where Clas Ohlson sells its products, as well as any additional requirements made by Clas Ohlson, shall be met.

5. APPLICATION AND MONITORING

Clas Ohlson's management is responsible for ensuring that work relating to the code of conduct is an on-going process, and for documenting and communicating how well we and our suppliers meet the requirements.

Clas Ohlson expects a high level of integrity in all business interactions. The business relation and our work with sustainable development in the supply chain are depended on co-operation, mutual trust and respect. We strive for long-term relationships and mutual development. We believe in active dialogue and cooperation with suppliers in order to agree on realistic action plans in every individual case of deviation from the code, without compromising our long-term goals.

Observation, discussions and information that we receive during monitoring CSR performance from our suppliers are treated confidentially by Clas Ohlson or any of us appointed 3rd party organisation.

5.1 Application

Employees responsible for purchasing products and services within Clas Ohlson shall ensure that the relevant suppliers are well informed about the Supplier Code of Conduct.

Suppliers shall ensure that a local language version of the code is available to employees involved in production for Clas Ohlson. Managers shall be aware of this code, and responsible for its application within their area of responsibility. They shall also be aware of the relevant national laws and regulations.

5.2 Monitoring

Our purchasing and CSR organisations are responsible for supporting and monitoring suppliers and manufacturers. Any non-compliance with the code must be reported, acted on and followed up.

In order to ensure that the code of conduct is practised, Clas Ohlson reserves the right to carry out unannounced inspections of suppliers and manufacturers. Inspections can also be made by an independent third party of our choice. The suppliers or manufacturers should on request provide a labour force register, records of hours worked and wages paid, work-related injuries and accidents, preventative action taken, fire protection measures implemented and evacuation drills carried out, as well as other appropriate information.

If a supplier or manufacturer fails to implement the agreed-upon improvements in accordance with the action plan and within the settled time frame, Clas Ohlson will cease doing business with the supplier or manufacturer.

6. ANTI CORRUPTION

No form of extortion and bribery, including improper offers for payments to or from employees, or organizations, is tolerated.

Incidents of suspected bribery attempts or other unethical behavior should be reported to Clas Ohlson's HR-department (anti-bribery@clasohlson.se) or to our CSR department (supplychain-report@clasohlson.com). Clas Ohlson prohibits retaliation against anyone for raising or helping to address this type of issue.

The full version of our Corporate Guidelines on Ethical Business and Anti-Bribery can be downloaded at www.clasohlson.com.

APPENDIX III - NTM GUIDE

Environmental Evaluation of Suppliers

Pertaining to transportation of goods and personnel

Internet: www.ntm.a.se

NTM

Company Information

Date:

Company	VAT number	Phone no.
Address	Post code, City	Fax no.
Environmental manager	E-mail address	Direct phone no.
Logistics / Travel manager	E-mail address	Direct phone no.

Which management function is responsible for and follows up on environmental issues:

This questionnaire is available and regularly updated on our homepage:

Environmental aspects

1. Have you documented your environmental aspects? YES ☐ NO ☐

If "YES" please state the three main aspects:

- a)
- b)
- c)

2. Do you have a written programme for reduction of your environmental effects? YES ☐ NO ☐

3. Energy and emissions data, for the supplied services, can be provided on demand:

☐ Customer Specific ☐ General ☐ Not at all

4. Have you specified measurable environmental objectives that are followed up? YES ☐ NO ☐

If "YES" please state the most important objectives:

- a)
- b)
- c)

5. Has the concerned staff received basic environmental training? YES ☐ NO ☐

If "YES", what proportion of the concerned staff?

☐ 1-25 % ☐ 25-50 % ☐ 50-75 % ☐ 75-100 %

6. Has your staff received training in either

a – fuel efficient driving **or**

b – actions for energy reduction

YES ☐ NO ☐

If "YES", what proportion of the concerned staff?

☐ 1-25 % ☐ 25-50 % ☐ 50-75 % ☐ 75-100 %

Environmental management

7. Do you have an environmental policy approved by management? YES ☐ NO ☐

If "YES", please enclose

Environmental Evaluation of Suppliers

Pertaining to transportation of goods and personnel

Internet: www.ntm.a.se

NTM

8. Do you regularly publish an environmental report? YES ☐ NO ☐

9. Do you have a routine for making sure that laws and regulations are followed? YES ☐ NO ☐

10. Do you have an emergency plan? YES ☐ NO ☐

11. Do you have an environmental management system? YES ☐ NO ☐

If "YES", how large a part of your business? (in relation to number of employees) %

Is the system certified by a third party? YES ☐ NO ☐

If "YES", according to which standard (enclose certificate or similar):

☐ ISO 14001 ☐ EMAS ☐ Other, specify

12. Are you prepared to meet with a representative from our company, for a presentation or audit of your environmental work? YES ☐ NO ☐

If "NO", please specify why not:

13. Do you evaluate your subcontractors in a similar way to this? YES ☐ NO ☐

Please provide examples of your main subcontractors:

- a)
 - b)
 - c)
-

14. Do you make environmental demands of your subcontractors? YES ☐ NO ☐

If "YES" please provide examples of these demands:

- a)
 - b)
 - c)
-

Other information