

Chapter 5

Purchasing Green Transport and Logistics Services: Implications from the Environmental Sustainability Attitude of 3PLs

Pietro Evangelista

*IRAT-CNR, Italy & University of Naples
Federico II, Italy*

Karin Isaksson

Linköping University, Sweden

Maria Huge-Brodin

Linköping University, Sweden

Edward Sweeney

*National Institute for Transport and Logistics,
Ireland & Dublin Institute of Technology, Ireland*

ABSTRACT

Environmental sustainability is an area of increasing importance for third party logistics (3PL) companies. As the design and implementation of services requires interaction between buyer and 3PL, the 3PLs are in a critical position to support the efforts towards greening operations of different supply chain participants. However the literature in this field reflects a gap between the perspectives of buyers and 3PLs. This chapter attempts to fill this void through an explorative case study analysis on the environmental attitude of 3PLs in order to derive implications for buyers' behavior. The results indicate that the buyer's role is critical in different ways in the development of green initiatives among 3PLs. An increased orientation towards longer-term contracts and joint development would likely enhance the level of green initiatives. Indirectly, the buyer has the opportunity to influence its 3PLs through interaction with employees on different levels in the company, including top management.

INTRODUCTION

For all types of businesses, locally as well as on a global level, environmental sustainability is of increasing concern. Within the area of logistics, the main negative environmental impact emanates

from transport (McKinnon, 2006). In addition, warehousing is an activity that causes both direct and indirect environmental effects, through energy consumption and increased land use in attractive areas (Marchant, 2010). Moreover, companies are continually forced, by customer demands and by legislative measures, to reduce, reuse and reapply packaging materials, by-products of production

DOI: 10.4018/978-1-4666-4852-4.ch005

and obsolete items. Hence, environmental issues have an impact on several logistics decisions along the supply chain such as location, sourcing of raw material, modal selection and transportation planning (Wu and Dunn, 1995).

Efforts towards the achievement of green logistics require the extension of traditional economic supply chain objectives (such as reduced costs and improved delivery reliability) to include environmental objectives (see e.g. Aronsson and Huge Brodin, 2006; Kohn and Huge Brodin, 2008). In the specific area of transport and logistics services this means that buyers (e.g. manufacturers and retailers) have to pay more attention to environmental criteria of the transport and logistics services they purchase, alongside the more traditional trade-off between cost and customer service.

The recent evolution of logistics and supply chain management (SCM) suggest that 3PLs are playing a more critical role in the supply chain than in the past. While supply chains become longer, consisting of more tiers over longer distances, the performance of the “glue” between the different actors, i.e. the 3PLs, becomes critical for the success of the total supply chain. In turn, 3PLs are in a critical position to support efforts aimed at improving the environmental sustainability of supply chain operations. In consequence, manufacturers and retailers need to respond to this challenge in their purchasing of logistics services. Although the importance of green aspects of logistics services has increased in recent years, there is still a great deal of uncertainty among buyers regarding how to consider environmental sustainability. Existing models and standards are often considered complicated and difficult to apply, and there is still a lack of adequate and standardized tools that could support the green purchasing of logistics services (Björklund, 2010). Recent research into the green logistics market suggests that there are evident mismatches between market requirements and 3PLs’ offerings. This can in part be explained by the market being at an early stage in its development (Martinsen & Björklund, 2010).

Most previous research efforts (Srivastava, 2007) and empirical studies (Eltayeb & Zailani, 2009; Hong, et al., 2009) on green logistics and SCM have taken the perspectives of manufacturing companies. Environmental practices in 3PL services have only recently attracted the attention of researchers (Kassinis & Soteriou, 2003; Wolf & Seuring, 2010; Lieb & Lieb, 2010). As it is of crucial importance for companies purchasing logistics services to incorporate green considerations into their purchasing decisions, the purchasers’ capability regarding sustainability issues is a key to competitive advantage of the company (Foerstl et al., 2010).

The objective of this chapter is to suggest - based on an analysis of the attitude among 3PLs towards greening their services - implications for the buyer when sourcing transport and logistics services.

Following this introduction, the remainder of the chapter is organized as follows. The next section reviews the literature on environmental aspects in both buyer and 3PL providers in order to demonstrate the existing gap between the two perspectives. The third section portrays the research methodology used. The fourth section presents the main findings of a qualitative case study analysis exploring awareness, adoption as well as drivers and barriers influencing 3PLs’ green initiatives. Implications that may affect the buyer’s behavior are proposed and discussed in the fifth section. Future research directions derived from case study results are outlined in the sixth section. Concluding remarks are then drawn in the last section.

LITERATURE REVIEW

In supply chain management literature, the role of environmental sustainability is gaining increasing interest among researchers and practitioners, which is sometimes referred to under the labels Green Supply Chain Management (GSCM) or

SSCM (Sustainable Supply Chain Management). Besides the deterioration of natural environment, this is also due to companies' recognizing possible competitive advantages associated with environmental awareness (van Hoek 1999). It is generally perceived that GSCM promotes efficiency and synergy among business partners and their lead corporations, and helps to enhance environmental performance, minimize waste and achieve cost savings (Rao and Holt, 2005). This synergy is expected to enhance company image, competitive advantage and marketing exposure. In fact, an increasing number of companies are enhancing their competitiveness through improvements in their environmental performance (Bacallan, 2000).

In the realm of GSCM, green purchasing has over the past decade received increased attention (Zhu and Geng 2001) and the strategic importance of introducing green aspects into purchasing practice has been recognized (Markley and Davis, 2007). In a wide reaching literature review, Walker (2009) concludes that previous research into GSCM has focused on manufacturing companies and their operations, including purchasing and supply, product design, production, distribution, environmental management and customer attitudes. Walker et al. (2008) reveal the relative lack of empirical research identifying the influence of suppliers as driving force for GSCM projects, and poor supplier commitment is considered as one of many barriers to developing green supply chain management practices. Although suppliers may not be the drivers, improved integration and cooperation in supply chains can support more effective management of environmental issues (Klassen and Vachon, 2003; Theyel, 2001; Vachon and Klassen, 2006), and specifically green procurement (Hollos et al., 2010). Moreover, Gimenez Thomsen et al. (2009) suggest that while supplier assessment has little immediate effect on environmental performance, collaborative initiatives have a more direct influence. Nevertheless, the involvement of suppliers in innovative and green efforts cannot be pursued without an as-

essment of supplier companies that reflect their role in the supply chain.

This is particularly evident in the case of purchasing transport and logistics services from 3PLs. In order to meet the customer requirements, 3PLs have gradually transformed scope and characteristics of their service offering over the last decades (Daugherty et al., 1992). For many 3PLs this evolution consisted of a shift from a single-activity toward a business model based on providing a wider range of integrated services (Ashenbaum et al., 2005). In this process, core service offerings are being commoditized (e.g. transportation), while value-added services and ICT capabilities are considered points of differentiation (Evangelista, 2011). This has given 3PLs a new potential role in customizing the supply chain as a growing number of activities beyond transportation and warehousing can be carried out by logistics service providers (Cooper et al., 1998; Hertz and Alfredsson, 2003). In this evolving process, environmental sustainability is an increasingly important area for 3PLs as their core activities often have a strong environmental impact as in the case of transport activities.

Research in the field of green logistics suggests several ways for companies to green their transport and logistics activities, including modal changes and intermodal solutions (McKinnon, 2010a; Woodburn and Whiteing, 2010), advances in technology solutions (McKinnon, 2010b), tools for assessing logistics' carbon footprint (Eglese and Black, 2010; Lieb and Lieb, 2010; McKinnon, 2010c; Piecyk, 2010), green transport management (Lieb and Lieb, 2010), and green logistics system design (Aronsson and Huge-Brodin, 2006; Kohn and Huge-Brodin, 2008; Harris et al., 2010).

However, the role of the 3PLs in the development of green logistics systems has been on the periphery of the scope of green logistics research (Wolf and Seuring, 2010). Some exceptions are the works of Lieb and Lieb (2010) reporting from a global survey about developments in the 3PL industry, and Wolf and Seuring (2010), who base

their results on buying as well as supplying green transport and logistics services. The authors share the concept that information sharing between suppliers and buyers are crucial for greening the supply chain, and that a main driver for greening 3PLs is customer pressure. With regard to 3PLs, there is still great potential for them to better use their physical, human and relational resources (Maack and Huge-Brodin, 2010). While Lieb and Lieb (2010) notice a positive trend in acknowledging green aspects among 3PLs, Wolf and Seuring (2010) stress that there is very little evidence of concrete green initiatives undertaken by 3PLs or spurred by their customers.

The literature on purchasing transport and logistics services is limited with a paucity of research into the purchasing of green transport and logistics. Holter et al. (2008) present a framework for the purchasing of transport services by small and medium sized enterprises (SMEs), which includes comparative bids, measurement and quantification of costs, services and transit times, as well as - at the heart of the framework - supplier management. Furthermore, the main strategic decisions are the trade-offs between service/cost and between transit time/cost. Holter et al. (2008) also make a distinction between transport purchasing (i.e. the process of negotiating the contract with the 3PL) and transport management, referring to the activities associated with transport operations, internal to the company as well as externally directed activities.

Research on green aspects from the buyer's point of view when sourcing transport and logistics services is particularly focused on "green" as a criterion for selecting 3PLs (Björklund, 2010; Schmitz et al., 2010; Wolf and Seuring, 2010; Meade and Sarkis, 2002). In these papers the emphasis is on the buyer perspective and how buyers may identify specific green service attributes for selecting 3PLs. For example, Björklund (2010) has investigated how a large variety of contextual issues impact the purchasing of green transport. The author found that, amongst others, the cus-

tomers of the purchasing organization are seen as strong drivers for greener purchasing behavior.

On the other hand, when considering the 3PL green perspective, existing papers focus on:

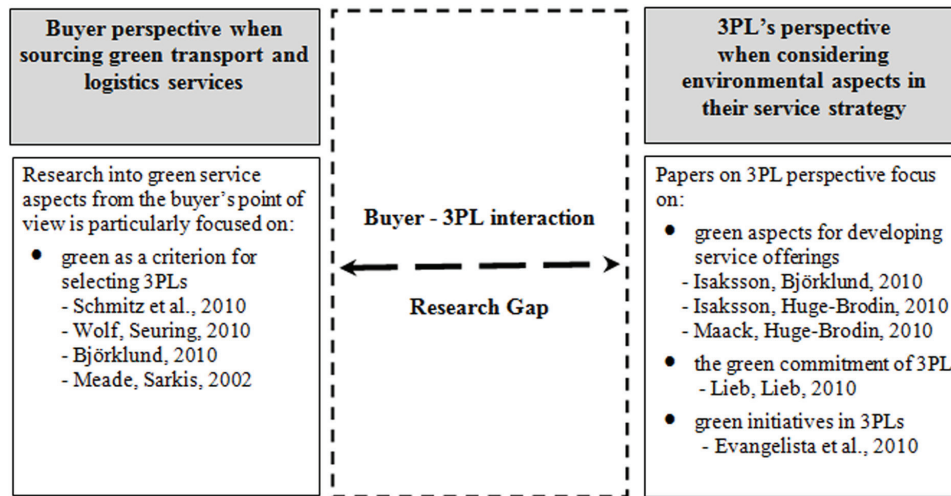
- How environmental aspects may be used to develop service offerings (Isaksson and Björklund, 2010; Isaksson and Huge-Brodin, 2010; Maack and Huge-Brodin, 2010)
- Documenting the extent to which 3PL companies have committed to environmental goals (Lieb and Lieb, 2010)
- Investigating the initiatives undertaken to reduce the environmental impact of transport and logistics (Evangelista, et al., 2010).

As the literature on green logistics does not address the role of environmental aspects in buyer-3PL relationship, this chapter aims to provide a contribution to filling this gap (see Figure 1) through an analysis of the attitudes of 3PLs to greening their services. Based on this analysis, implications for buyers' purchasing behavior are derived. The next section will describe in detail the research approach used.

RESEARCH METHODOLOGY

In order to achieve the above objective a research design based on three different steps has been adopted. The first step was based on the literature review that has been summarized in the previous section. It was instrumental in designing the data collection guide. In the second step, a multiple case study analysis involving a set of logistics service providers has been carried out. The empirical analysis has explored a number of key issues concerning 3PLs' green offerings. In the last step, from the findings achieved we derived implications for buyer's behavior when sourcing green transport and logistics services.

Figure 1. Research gap in green buyer-3PL relationships



The case study investigation focused on the analysis of eight case studies. Given the lack of theory and the scarcity of empirical studies in this field, the case study approach appears to be a suitable research method. The case study approach with increasing application of multiple case studies is quite common in purchasing and supply management research (Dubois & Aurajo, 2007). One of the main benefits associated with the use multiple case studies is that the comparison of two or more case studies provide concepts that are relevant to an emerging theory and support explorative investigations. Yin (1994) argued that, in most situations, 6 to 10 cases should provide evidences to support or reject propositions, while Eisenhardt (1989) recommends 4 to 10 cases. Our selection of 8 cases falls within these recommended frames.

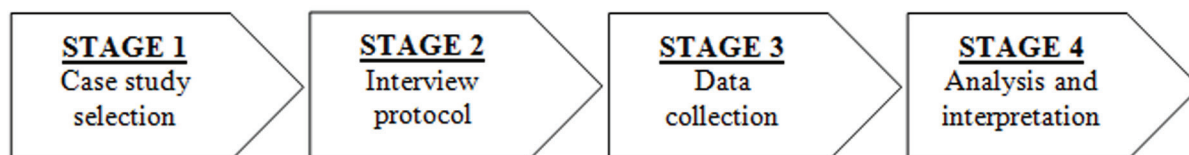
The case companies are 3PLs operating in the Swedish, Italian and Irish logistics service markets. In accordance with this approach, a specific methodology consisting of the following four phases has been adopted (see Figure 2),

1. Case study selection;
2. Interview protocol;
3. Data collection; and,
4. Analysis and interpretation.

Case Study Selection

Eight companies were involved in the survey: four Swedish, two Italian and two Irish. While the countries share some features, the LSP industry differs in many respects (e.g. in Italy the market comprises a multitude of small 3PLs while in

Figure 2. The case study methodology



Sweden the market is more consolidated with a few large 3PLs that dominate). The market maturity for green requirement is also believed to differ between the countries. Nevertheless, with this narrow sample it will not be possible to identify or even suggest country based differences. The choice of 3PLs from different countries is also justified as they represent the resident countries of the researchers, thus facilitating data access. The selection process has been organized into two steps. Firstly, a range of companies was identified based on the authors' previous research collaborations and on knowledge of the respective geographical markets. This allowed access to specific information concerning green initiatives and facilitated data collection. In the second step, the following specific criteria have been used to select the companies to be included in the study:

1. **The company size:** According with the latest European Union definition of small and medium sized enterprise (see European Commission, 2005), small = firms whose employees range from 10 to 50, large = firms employing more than 250 people. Small and large companies may differ in their attitudes towards green investments, and hence in their level of ambition regarding green initiatives.

2. **The geographical reach of operations:** The wider the reach, the more comprehensive an awareness of green aspects could be expected.
3. **The range of services offered:** With a wide range of general services, green aspects are more likely to appear than in a more focused business. A focused business may be more green, or less green, depending on the nature of its business.
4. **Previous contacts and collaboration:** In order to facilitate access to company information.

Table 1 displays the main characteristics of the case companies. All the companies involved in the survey have a number of initiatives in place aimed at greening the service provided. A more detailed picture of the range and content of such initiatives is shown in Table 3.

All companies take on the co-ordination of the transport and logistics network and, in some cases, transport operations have been outsourced.

Interview Protocol

The interviews with the 3PLs were conducted using a data collection guide. This interview tool included open questions relating to:

Table 1. Main characteristics of the case companies surveyed

Company	Size	Geographical Reach	Service Offering
SWE A	Small	Local	Diverse road transport services, including distribution and heavy transportation
SWE B	Small	Regional	Variety of transport services in a limited region
SWE C	Large	International	Wide range of transport and logistics services with a focus on air and ocean freight services.
SWE D	Large	International	Wide range of transport and logistics services, covering all transport modes
ITA A	Small	International	Logistics services focused on warehousing, inbound and outbound logistics and distribution
ITA B	Large	International	Several transport services (mainly rail and sea) and specialised logistics services (automotive, container and production logistics)
IRL A	Small	National	Contract logistics and freight forwarding
IRL B	Large	International	Wide range of transport and logistics services, covering all transport modes

1. General company information;
2. Awareness of the importance of the environment;
3. Adoption of green initiatives; and
4. Drivers and barriers affecting the adoption of green initiatives undertaken by the company.

The data collection guide was designed in a semi-structured way in order to ensure the necessary flexibility when companies with different characteristics and competencies are being surveyed. It was tested during a number of meetings with industry experts working in the green logistics field.

Data Collection

The data collection guide was sent out to the respondents in advance to allow them to familiarize with the topic. The respondents were generally interviewed by telephone although a number of them were interviewed face-to-face at the company site. It was agreed that company names would remain anonymous to encourage openness of response. Each interview lasted for about one hour. When possible, interviews involved the general manager and the operations manager in order to obtain both the strategic and operational perspective in relation to the role of the environment in selling services. All interviews were recorded and transcribed. Additional information about the companies was collected from a variety of information sources including company reports and company web-pages. In this way, data were triangulated across data sources, which means that data from different sources can complement and support the findings from each of them, and thus improve the validity of the research and increase the richness of the case studies (Yin, 1994). Such information has been integrated with information obtained from the interviews and stored in a case study database, i.e a structured collection of data, including the different aspects investigated for all the case companies, following the recommenda-

tions of Yin (1994). In order to ensure data quality, the interview transcripts were resubmitted to the interviewees for validation. In this way, the authors ensured that the collected data was reliable, and through the first structuring of the data the internal validity was secured (Yin, 1994).

Data Analysis

The data were analyzed through a cross-case analysis comparing evidence from the eight case companies investigated (Swedish, Italian and Irish). In the first step, the cases were compared with each other in order to identify commonalities and potential patterns between them. This approach requires that the analysis be done in an iterative manner, where the researchers reconsider the analysis and also the need for new literature to support the analysis (Yin, 1994). Eventually, the resulting patterns can describe simple commonalities and suggest co-variations. The emerging patterns have been analyzed and compared with the literature findings in order to identify potential explanations of differences and also to provide the basis for further research in this field. The analysis is aimed at transforming the results from the multiple-case study on the provider side into challenges for buyers. These challenges are identified through a deductive analytical process.

BUYER IMPLICATIONS BASED ON THE 3PL CASE STUDY

The results of the case study analysis are presented based on three areas: awareness of the importance of the environment; adoption of green initiatives; and, drivers and barriers affecting the adoption of green initiatives undertaken by the 3PL companies interviewed. The implications for buyers, in terms of recommendations on how to proceed in purchasing green transport and logistics services, are discussed directly in relation to each finding from the 3PL case study.

Awareness of the Environmental Sustainability Importance

Awareness among the 3PLs regarding environmental sustainability is described in terms of the general priority of environmental issues, as well as the organization of the responsibility of greening operations. In Table 2, the results are summarized.

All the interviewed companies were well aware of the importance of green issues, which supports Lieb and Lieb's (2010) findings. However, differences emerged in relation with how they prioritized the greening of their services. While green aspects were considered mainly as a strategic and long-term priority, three out of four of the small 3PLs focused also on the short-term perspective. One explanation for this might be that the smaller 3PLs in general are more focused on meeting customers' immediate requirements than building strategic market positions. This supports the suggestions of Holter et al. (2008), where the small buyers feared to approach larger 3PLs, due to low "self-esteem".

A buyer needs to understand the priorities of its supplier. A strategically oriented buyer might meet difficulties when offerings from smaller 3PLs should be evaluated against offerings from large 3PLs. This mismatch regarding how the green

aspects are considered could result in the buyer dismissing the offering from the small 3PL. On the other hand, the buyer could handle the mismatch in intents through a supplier development process between the buyer and the 3PL, thus enhancing the awareness and longer-term commitment to green aspects with the small 3PL.

In general, it is a common feature among the companies that responsibility for green issues is distributed among many employees, across functions and business units. The Swedish cases all include at least one dedicated employee focused on green issues, while the other cases showed less dedication of organizational resources specifically to these issues.

From a buyer perspective, it might be beneficial to have a dedicated green resource with the potential supplier that can support the procurement process. On the other hand, the more the green issue is distributed among many, the more likely it is that buyers' questions on green offerings will be promptly and correctly answered during negotiation as well as under contract implementation.

It is also noticeable in relation to resources allocated to green issues, that there are few differences between small and large companies. That might indicate that there is a minimum investment necessary to address green issues independently of

Table 2. Awareness of environmental importance

Company	Priority	Responsibility
SWE A	Long and short-term	2 full-time employees with green responsibility (spread among more people). Supportive function
SWE B	Long and short-term	3 dedicated full-time employees for environment, quality and education. Supportive function
SWE C	Long and short-term	4 full-time employees with supportive function. 7 "Green Champions" at each Business units, working 1/3 of full-time employees
SWE D	Long-term, strategic	5-6 full-time employees, 1 dedicated, the rest as part of their ordinary duties.
ITA A	Long and short-term	Operations director has main responsibility Cross-functional responsibility within the company
ITA B	Long-term, strategic	Green team (3 employees), coordinated by the Operations/Quality manger
IRL A	Non strategic issue	No people involved
IRL B	Long-term, strategic	Cross-functional responsibility

company size. Company IRL A had no resources officially committed to green issues, in consequence with its non-strategic priority.

For a buyer, this might provide a useful insight. “Forcing” green initiatives upon a small 3PL might cause a rather high initial investment as well as operating costs for a 3PL that has not yet prioritized green issues. Therefore, an approach that involves a high degree of supplier development would be more fruitful (should that 3PL be the preferred supplier in other aspects), than simply forcing demands upon that company. The supplier development process could then imply a higher degree of co-creation of “green” value, which could lead to higher value for all parties involved. This is in line with the work of Yazdanparast et al., 2010.

Adoption of Green Initiatives

The green initiatives of the 3PLs are summarized in Table 3, under the headings: current green initiatives; ICT support; and, planned future green initiatives.

From the buyer point of view, the content of the service offering is at the heart of a supplier evaluation. The most important green initiatives among the 3PLs are reported in Table 3. A common picture among the cases is that many green initiatives directly involve transportation. This is in line with research stating that most of the CO₂ from logistics emanates from transport (McKinnon, 2006). However, as none of the case companies actually perform transport themselves but buy transport from transport providers, they have reduced control over the most critical element.

Table 3. Green initiatives

Company	Current Green Initiatives	ICT Supporting Green Initiatives	Future Green Initiatives
SWE A	<ul style="list-style-type: none"> • Eco-driving • CO₂ declaration • Better alternative offered for each type of transport 	Self-developed ICT system supporting green initiatives	No planned initiatives
SWE B	<ul style="list-style-type: none"> • CO₂ declarations • Internal education • Partnerships with customers 	Self-developed ICT system supporting green reporting	<ul style="list-style-type: none"> • Work with employees and customers • Integrate awareness into every business unit
SWE C	<ul style="list-style-type: none"> • CO₂ declarations • Wide climate protection programmes 	ICT system does not supporting green initiatives	<ul style="list-style-type: none"> • Collaborate with suppliers • Visualise green benefits • Investing in ICT
SWE D	<ul style="list-style-type: none"> • Emission calculations • Customised solutions • Environmental friendly vehicles 	ICT system does not support green initiatives	No planned initiatives
ITA A	<ul style="list-style-type: none"> • Follow the regulations for vehicles • Intermodal solutions 	Self-developed software supporting green measures	<ul style="list-style-type: none"> • Increase intermodality • Environmentally friendly vehicles
ITA B	Choice of alternative transport modes	ICT system does not support green initiatives	<ul style="list-style-type: none"> • No planned initiatives • Adaptation of ICT systems
IRL A	Diverse transport initiatives	ICT system does not support green initiatives	<ul style="list-style-type: none"> • Green fuel • Solar panels
IRL B	<ul style="list-style-type: none"> • Co-ordinated initiatives in transport • Initiatives beyond transport 	Network optimisation software	<ul style="list-style-type: none"> • Coordinated transport initiatives • Route optimisation software • Solar panels

This might impede development of their service offerings, as suggested by Maack and Huge-Brodin (2010). From a buyer's perspective, this may result in difficulties in obtaining adequate reports on transport-related environmental performance. It might also prove harder to influence the 3PLs offering the closer the offering is associated with transport.

In purchasing green logistics services, it is necessary to be aware of the supplier's skills in managing, measuring and quantifying the emissions of its transport providers. This is in line with the work of Holter et al. (2008). Some differences have been detected in relation to the measuring of emissions - however, the differences are subtle. Basically, the 3PLs offer what their most demanding customers - who operate in an international market - require.

In relation to ICT solutions, a mixed picture emerges with several case companies indicating that their ICT systems do not support the adoption of a more environmentally sustainable approach. The companies that use ICT solutions tend to adopt two broad approaches. On the one hand, there are small 3PLs using simple self-developed tools, used primarily for communication purposes. On the other hand, large companies use more sophisticated software and applications especially in the transportation area (e.g. distribution network optimisation tools).

The implication for buyers is that the level of technology in 3PLs may positively influence the purchasing of more green services when these services are supported by ICT applications that are able to reduce carbon emissions. This is the case of transport optimization applications such as transportation management systems. Furthermore, as in the future the importance of ICT in transport and logistics sustainability will increase (European Commission, 2009), buyers should stimulate 3PL companies to invest in green ICT applications. This can be done, for example, by jointly investing in cross-industry technology platform that preserve existing ICT investments and limit costs.

Future plans vary considerably among the studied cases. While some of them have no plans at all and some want to continue and enhance their present line of work, a number allude to fresh planned initiatives. The Swedish companies focus more on environmental communication and collaborative issues, while the Italian and Irish companies tend to highlight mainly transport related activities.

Drivers and Barriers Affecting the Adoption of Green Initiatives

The identified drivers affecting the adoption of green initiatives and their impact on each of the case companies are presented in Table 4. The categorization is based on the literature review.

Table 4. Impact of drivers on green initiatives

Company	INTERNAL		EXTERNAL		
	Managerial	Employees	Customers	Competitors	Environmental Legislation and Regulations
SWE A	High	High	High	Low	High
SWE B	High	High	High	Low	High
SWE C	High	High	High	High	Low
SWE D	High	High	High	Low	High
ITA A	High	High	Low	No	High
ITA B	High	Some	Low	Low	Low
IRL A	High	None	Low	No	No
IRL B	High	Some	High	No	Some

The most prominent driver of green initiatives among the case companies was the managerial driver. Furthermore, employees seem to have a significant impact as a driver influencing green initiatives. There appears to be a more or less even dispersal among the case companies regarding the impact of customers and of environmental legislation and regulations, with competitors having a significantly lower impact. Other possible drivers that were investigated - suppliers, consultants and experts - were not mentioned as having any impact by any of the case companies.

For the buyer, this raises the requirements for clearly stated demands regarding green initiatives, in the short as well as longer term. The longer-term requirements would probably increase the willingness to invest in green initiatives among the 3PLs. It is interesting to note the slightly heavier

impact on the upper half of the table (i.e. the Swedish 3PLs). In order to understand the 3PL, any buyer of green logistics and transport services would need to understand the barriers hindering the adoption of more green initiatives. The barriers that the 3PLs investigated have indicated are presented in Table 5.

The financial barriers for 3PLs are huge, with large investment costs and long payback periods. Some companies (SWE B, SWE D, ITA B) refer explicitly to market aspects relating to investment costs, i.e. if customers were willing to pay for greener services, or at least share the cost of the investment in green solutions, then such services would probably reach the market sooner.

The lack of customer/market support is a clear barrier in our investigation. This implies that the customer's role is crucial for 3PLs in their

Table 5. Barriers to green initiatives

Company	Financial	Technical	Market/ Customers	Information	Organisational and Policy
SWE A	Green solutions expensive	Automotive sector	Lack of customer demand determines lack of investments	n.a.	Must invest due to policy, even if economically not good
SWE B	No investment without customer support	Alternative solutions not available	Many customers separate purchasing from environmental department	n.a.	Lack of understanding in the organisation
SWE C	Difficult in justifying investment	Too slow development	Lack of customer interest	Technical systems not supporting environmental information	n.a.
SWE D	Customers do not want to share investment	n.a.	Lack of consensus regarding solutions	IT systems do not support CO ₂ declarations	Different processes in different parts of company
ITA A	Too high costs associated with green investments; too long pay-back period	n.a.	Lack of customer pressure for green initiatives	n.a.	n.a.
ITA B	The price competition prevents investment against unsure income	n.a.	Low willingness to use greener solutions	n.a.	n.a.
IRL A	High costs; too long pay-back period for investments	n.a.	Negative impact on the customer supply chain	n.a.	Lack of competence in the area of green logistics
IRL B	High costs	n.a.	Lack of incentives	n.a.	n.a.

development of green services, and the purchaser of transport and logistics services should seriously consider this. As well as buyers driving the adoption of green initiatives, lack of clear buyer communication and requests can constrain the development. It should also be noted that many respondents did not specifically identify barriers that can easily be categorized as ‘technical’, ‘information’ or ‘organizational and policy’.

IMPLICATIONS FOR BUYING TRANSPORT AND LOGISTICS SERVICES

Transport and logistics providers are key supply chain actors due to their important role. This is also emphasized when green initiatives are considered where 3PLs can contribute substantially to reducing the environmental impact of supply chain operations, specifically through reducing the carbon footprint associated with transport activities. From the buyer (manufacturers and retailers) point of view, this increases the importance of capable purchasing of green transport and logistics services. In this way, a buyer can benefit from the improved green transport provided through enhanced brand value, preparedness when their customers demand greener transport and logistics, and preparedness for future stricter legislation regarding the environmental performance of transport.

In order for buyers to take advantage of the 3PLs, they need to consider the 3PLs’ general awareness regarding green initiatives. While some 3PLs maintain a long-term perspective on green initiatives, this is not true in all cases. Our research indicates that smaller 3PLs are more focused on short-term commitment, which needs to be considered when evaluating bids from various 3PLs.

The buyer of a green logistics service from a 3PL should be aware of the fact that the transport part of the service is seldom directly controlled by the 3PL, and that transport is the logistical

activity that contributes most to environmental damage. This can be handled through a thorough declaration of what a buyer expects in terms of CO₂ reports, something which seem to differ relating to the actual customer requirements.

The results of the present study also suggest that the buyer’s traditional approach to 3PL supplier selection needs to be improved by incorporating new criteria such as the green awareness and level of green initiatives adopted by 3PLs.

Finally, the crucial role of the buyer of transport and logistics services is more or less confirmed by our research. The customer is one of the main drivers of green initiatives among 3PLs; however the lack of customer requirements is unanimously indicated as a barrier towards the adoption of green initiatives. This indicates that the buyers of 3PL services still have a long way to go before a greening of the supply chain is satisfied. On the positive side, there is a high potential that initiatives from buyers can really show direct results in terms of greener transport and supply chain operations.

FUTURE RESEARCH DIRECTIONS

This research is empirically based in the 3PL industry, and the results presented here are derived from 3PL cases studies. The next step in our research would be to further explore how the perceptions among 3PLs align with those of buyers. Is the customer as the driving part equally considered on both sides? And how do buyers of 3PL services actually adjust to the 3PLs green capabilities? Investigating the customer side would allow the comparison of our suggestions for buying behavior with actual buying behavior, and the result of such a comparison would inevitably show both matches and mismatches. The mismatches could provide clues to why the green logistics market is a slow starter.

Another area for future research in this field concerns the analysis of the impact of green initiatives undertaken by 3PLs on buyer’s per-

formance. A study of this kind could be of help in better orienting buyers' choices as the impact of green actions on profitability should increase in the future. The issue of incorporation of green considerations into the supplier selection processes of buyers relates to this. There is a need for further evidence of the extent to which buyers are using green selection criteria and the impact of such approach.

The research presented here has highlighted the importance of the 3PL industry in general in a supply chain context. In line with the previously identified lack of studies relating to the role of 3PLs in literature on GSCM, this research area would benefit from the inclusion of 3PLs. This refers both to the type of company, which is more or less ignored despite its crucial role in the supply chain, and to the environmental assessment of a supply chain where transport can constitute an important portion of the environmental impact from the supply chain or the product.

This research has generated a lot of useful insights and ideas about supply and demand in the logistics market, when it comes to green aspects. However, the sample is narrow, as a consequence of the selected research method. For this reason, empirical generalization may be achieved through a wide reaching survey questionnaire study that would enhance the knowledge about green logistics supply as well as green buying behavior regarding transport and logistics services.

CONCLUSION

This research indicates that the role of the buyer in promoting greener logistics solutions is crucial in many ways. As drivers of green initiatives among 3PLs, the buyers can clearly take a strong role in pushing the development further. Considering also that the strongest drivers among the providers are in fact their internal management as well as the employees, a consequence for the buyer could be to ascertain that there is interaction,

with both management during contract agreement and co-operation set-ups, and broadly with the employees of the firms in terms of sales and operations personnel. This would imply an indirect driver, which could strengthen the green efforts among the providers even further. As a result, this could strengthen both the operational and strategic concerns for green services.

On the other hand, the research findings highlight that the buyer is also seen as a barrier to the development of green initiatives, limiting the providers' investments into green technology. One way of addressing this problem would be to establish willingness to pay extra for greener solutions among the buyers. Another way would be for the buyers to engage in a more long-term commitment regarding the contract time frames. Such options would likely reduce the barriers among the providers to invest, and it would simultaneously enhance the possibility that the buyer, as well as the providers' managerial and employee drivers were materialized into decisions that would promote the greening of the transport and logistics service industry. In response, such behaviour on the buyer side would probably pay off in terms of enhanced brand value, and also attract more customers concerned with environmental aspects at large.

The long-term perspective of the relationship between the buyer and the provider of 3PL services also promotes the development of green initiatives in collaboration between the buyer and provider. Even more, there seems to be a high potential for buyers to participate actively in the development of their 3PLs' green service offerings, which is well in line with research on buyer-supplier relationships in product or component supply.

Another interesting aspect to consider is the strategic choice for the buyer to perform joint development with 3PLs. While the potential is higher with small 3PLs, as well as the possibilities to really influence the development of their green services, the larger 3PLs are in general more prepared for going greener. Evidence of

this relates to the possibilities to obtain reports on environmental performance from the 3PLs, where the larger providers have superior access to standardized software for this purpose. Although the smaller firms in our investigation to a large extent follow up the environmental performance of their transport operations, they do so with help from in-house developed software.

Compared to previous research these findings rather confirm than contradict other studies, whether on purchasing transport and logistics services, or other services and goods in general. Nevertheless, the findings among the studied companies again highlight both the importance of the buyer, and also the responsibility of the buyer to carefully consider green aspects in its purchasing of transport and logistics services. As buyer behavior is considered as an important aspect in the 3PLs' development and adoption of green initiatives, it is now time for them to take the lead and exploit the possibility to become the more involved in the development of green logistics services.

REFERENCES

- Aronsson, H., & Huge Brodin, M. (2006). Environmental impact of changing logistics structures. *The International Journal of Logistics Management*, 17(3), 394–415.
- Ashenbaum, B., Maltz, A. B., & Rabinovich, E. (2005). Studies of trends in third-party logistics usage: What we can conclude? *Transportation Journal*, 44(3), 39–50.
- Bacallan, J. J. (2000). Greening the supply chain. *Business and Environment*, 6(5), 11–12.
- Björklund, M. (2010). Influence from the business environment on environmental purchasing - Drivers and hinders of purchasing green transportation services. *Journal of Purchasing and Supply Management*, 17, 11–22.
- Cooper, M. C., Lambert, D. M., & Pagh, J. D. (1998). What should be the transportation provider's role in supply chain management? In *Proceedings of the 8th World Conference on Transport Research*, 12-17 July, Antwerp (Belgium).
- Daugherty, P. J., Sabath, R. E., & Rogers, D. S. (1992). Competitive advantage through customer responsiveness. *The Logistics and Transportation Review*, 28(3), 257–272.
- Dubois, A., & Aurajo, L. (2007). Case research in purchasing and supply management: Opportunities and challenges. *Journal of Purchasing and Supply Management*, 13, 170–181.
- Eglese, R., & Black, D. (2010). Optimizing the routing of vehicles. In A. McKinnon et al. (Eds.), *Green logistics: Improving the environmental sustainability of logistics* (pp. 215–228). London, UK: Kogan Page..
- Eisenhart, K. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550.
- Eltayeb, T. K., & Zailani, S. (2009). Going green through green supply chain initiatives towards environmental sustainability. *Operations and Supply Chain Management*, 2(2), 93–110.
- European Commission. (2005). *The new SME definition. User Guide and Model Declaration*. Bruxelles, Belgium: DG Enterprise & Industry..
- European Commission. (2009). *ICT impact on greenhouse gas emissions in energy-intensive industries*. DG Enterprise & Industry, Sectoral e-Business Watch study, Impact Study No. 03/2009.
- Evangelista, P. (2011). ICT diffusion in SMEs. An investigation into the Italian transport and logistics service industry. *Collana di Ingegneria Economico-Gestionale*, 43.

- Evangelista, P., Sweeney, E., Ferruzzi, G., & Carrasco, J. C. (2010). Green supply chain initiatives in transport and logistics service industry: An exploratory case study analysis. In *Proceedings of the Logistics Research Network Conference Towards the Sustainable Supply Chain: Balancing the needs of Business, Economy and the Environment*, 8th-10th September, Harrogate, UK, (pp. 195-203).
- Foerstl, K., Reuter, C., Hartmann, E., & Blome, C. (2010). Managing supplier sustainability risks in a dynamically changing environment - Sustainable supplier management in the chemical industry. *Journal of Purchasing and Supply Management*, 16, 118–130.
- Gimenez Thomsen, C., Large, R., & Corbett, C. (2009). Green SCM: Supplier development strategies. In *Proceedings of the 16th EUROMA Conference*, paper No. 61, June, Gothenburg, Sweden, (pp. 14-17).
- Harris, I., Sanchez Rodrigues, V., Naim, M., & Mumford, C. (2010). Restructuring of logistics systems and supply chains. In A. McKinnon et al. (Eds.), *Green logistics: Improving the environmental sustainability of logistics* (pp. 101–123). London, UK: Kogan Page..
- Hertz, S., & Alfredsson, M. (2003). Strategic development of third party logistics providers. *Industrial Marketing Management*, 32(2), 139–149.
- Hollos, D., Blome, C., Foerstl, K., & Henke, M. (2010). Antecedence and performance implications of supplier coordination for sustainable business practices. In *Proceedings of the 17th EUROMA Conference*, paper No. SSC3, June 6-9 2010, Porto, Portugal.
- Holter, A., Grant, D., Ritchie, J., & Shaw, N. (2008). A framework for purchasing transport services in small and medium size enterprises. *International Journal of Physical Distribution & Logistics Management*, 38(1), 21–38.
- Hong, P., Kwon, H. B., & Roh, J. J. (2009). Implementation of strategic green orientation in supply chain. An empirical study of manufacturing firms. *European Journal of Innovation Management*, 12(4), 512–532.
- Isaksson, K., & Björklund, M. (2010). Development of sustainable logistics services. In *Proceedings of the NOFOMA Conference* (pp. 985-1000).
- Isaksson, K., & Huge-Brodin, M. (2010). Driving forces and barriers when pricing the environmental service offering: A cross case study of logistics companies. In T. Whiteing (Ed.), *Towards the Sustainable Supply Chain: Balancing the Needs of Business, Economy and the Environment, Proceedings of the 15th Annual LRN Conference*, Harrogate, UK (pp. 303-311).
- Kassinis, G. I., & Soteriou, A. C. (2003). Greening the service profit chain: The impact of environmental management practices. *Production and Operations Management*, 12(3), 386–403.
- Klassen, R. D., & Vachon, S. (2003). Collaboration and evaluation in the supply chain: The impact on plant-level environmental investment. *Production and Operations Management*, 12(3), 336–352.
- Kohn, C., & Huge-Brodin, M. (2008). Centralised distribution systems and the environment: How increased transport work can decrease the environmental impact of logistics. *International Journal of Logistics: Research and Applications*, 11(3), 229–245.
- Kruschwitz, N. (2009). Sustainability and competitive advantage. *MIT Sloan - Management Review*, 51(1), 18–27.
- Lieb, K., & Lieb, R. (2010). Environmental sustainability in the third-party logistics (3PL) industry. *International Journal of Physical Distribution and Logistics Management*, 40(7), 524–533.

- Maack, C., & Huge-Brodin, M. (2010). Logistics companies' potential in greening their offered services. In *Proceedings of the 17th EUROMA Conference*, paper No. SSC11, June 6-9 2010, Porto, Portugal.
- Marchant, C. (2010). Reducing the environmental impact of warehousing. In A. McKinnon et al. (Eds.), *Green logistics: Improving the environmental sustainability of logistics* (pp. 167–192). London, UK: Kogan Page..
- Markley, M., & Davis, L. (2007). Exploring future competitive advantage through sustainable supply chains. *International Journal of Physical Distribution & Logistics Management*, 37(9), 763–774.
- Martinsen, U., & Björklund, M. (2010). Green logistics offerings and demands - Matches and gaps. In T. Whiteing (Ed.), *Towards the Sustainable Supply Chain: Balancing the Needs of Business, Economy and the Environment, Proceedings of the 15th Annual LRN Conference*, Harrogate, UK (pp. 453-461).
- McKinnon, A. (2006). A review of European truck tolling schemes and assessment of their possible impact on logistics systems. *International Journal of Logistics: Research and Applications*, 9(3), 191–205.
- McKinnon, A. (2010a). Environmental sustainability: A new priority for logistics managers, (pp. 3-30)..
- McKinnon, A. (2010b). Increasing fuel efficiency in the road freight sector. In A. McKinnon et al. (Eds.), *Green logistics: Improving the environmental sustainability of logistics* (pp. 229–241). London, UK: Kogan Page..
- McKinnon, A. (2010c). Product-level carbon auditing of supply chains, Environmental imperative or wasteful distraction? *International Journal of Physical Distribution and Logistics Management*, 40(1/2), 42–60.
- Meade, L., & Sarkis, J. (2002). A conceptual model of designing and selecting third-party logistics service providers/*Supply Chain Management. International Journal (Toronto, Ont.)*, 7(5), 283–295.
- Piecyk, M. (2010). Carbon auditing of companies, supply chains and products. In A. McKinnon et al. (Eds.), *Green logistics: Improving the environmental sustainability of logistics* (pp. 49–67). London, UK: Kogan Page..
- Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? *International Journal of Operations & Production Management*, 25(9), 898–916.
- Schmitz, J. H. H., Hofenk, D., & Semeijn, J. (2010). The role of sustainability issues in supplier selection decisions of freight transport services. In *Proceedings of the 19th Annual IPSERA Conference Supply Management - Missing Link in strategic management*, 16-19 May, Lappeenranta, Finland, (pp. 410-426).
- Srivastava, S. K. (2007). Green supply-chain management: A state-of-the-art literature review. *International Journal of Management Reviews*, 9(1), 53–80.
- Theyel, G. (2001). Customer and supplier relations for environmental performance. *Greener Management International*, 35, 61–69.
- Vachon, S., & Klassen, R. (2006). Extending green practices across the supply chain: The impact of upstream and downstream integration. *International Journal of Operations & Production Management*, 26(7), 795–821.
- Van Hoek, R. I. (1999). From reversed logistics to green supply chains. *Supply Chain Management*, 4, 129–135.

Walker, H. (2009). Sustainable supply chain management and organizational performance: An analysis of constructs in the literature. In *Proceedings of the 16th EUROMA Conference*, paper No. 60, June 14-17 Gothenburg, Sweden.

Walker, H., Di Sito, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing and Supply Management*, 14, 69–85.

Wolf, C., & Seuring, S. (2010). Environmental impacts as buying criteria for third party logistical services. *International Journal of Physical Distribution & Logistics Management*, 40(1), 84–102.

Woodburn, A., & Whiteing, A. (2010). Transferring freight to greener transport modes. In A. McKinnon et al. (Eds.), *Green logistics: Improving the environmental sustainability of logistics* (pp. 124–139). London, UK: Kogan Page..

Wu, H. J., & Dunn, S. C. (1995). Environmentally responsible logistics systems. *International Journal of Physical Distribution and Logistics Management*, 25(2), 20–38.

Yazdanparast, A., Manuj, I., & Swartz, S. M. (2010). Co-creating logistics value: A service-dominant logic perspective. *The International Journal of Logistics Management*, 21(3), 375–403.

Yin, R. (1994). *Case study research design and methods* (2nd ed.). London, UK: Sage Publications..

Zhu, Q., & Geng, Y. (2001). Integrating environmental issues into supplier selection and management. *Greener Management International*, 35, 27–40.

KEY TERMS AND DEFINITIONS

Green Initiatives: Those initiatives taken within single companies and supply chains, which aims at improving the environmental performance in the system. This can refer to the utilization of greener fuels or vehicles, but also to transport planning and system design related specifically towards greener solutions. We include initiatives with direct environmental impact (as described above) as well as initiatives with more indirect impact, such as educational efforts and carbon reports, which rather affects the greening of logistics and supply chain on longer term.

Third Party Logistics Companies (3PLs): Those companies specialized in providing other companies with various transport and logistics services. In this chapter, 3PLs can be small or large companies; more specialized or offering a wide range of different services; and supplying everything from local services to global solutions.

Transport and Logistics Service: The services discussed include a wide range of transport and logistics related services, such as single transport assignment, transport solutions, warehouse services, logistics management services and services related to those (e.g. packaging and labeling).

This chapter was previously published in Outsourcing Management for Supply Chain Operations and Logistics Service edited by Dimitris Folinas, pages 449-465, copyright 2013 by Business Science Reference (an imprint of IGI Global).