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A case study investigation on purchasing green transport and logistics services

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Summary

In the context of green supply chain management, green purchasing has received increased attention over the past decade and the strategic importance of introducing green aspects into purchasing practices has been recognised. Despite this growing importance, little has been written in relation to purchasing green transport and logistics services. Considering the strong environmental impact associated with transport and logistics activities, much remains to be learned concerning buyer's practices when sourcing more sustainable services from third party logistics companies (3PLs). The aim of this paper is to explore practices of buying green transport and logistics services in three different European countries (Italy, Ireland and Sweden) using a multiple case study research approach. The paper analyses how general environmental company ambitions and environmental purchasing practices are reflected when green transport and logistics services are purchased. The results of the paper indicate that while the case companies show a relatively high concern of green issues at company level, a lower importance is attributed to green issues at the purchasing function level. When green concerns in purchasing transport and logistics services are analysed the level of importance decrease dramatically. It emerges a conflicting attitude among the overall company level and the purchasing of transport and logistics services. This suggests that there is the potential for improvements especially in the area of green collaboration in buyer and supplier relationships.

Keywords: Purchasing green transport and logistics service, company environmental ambitions, environmental purchasing function concerns, Swedish, Italian and Irish buyer companies, case study analysis

1. Introduction

Environmental sustainability has assumed a growing importance as a result of increasing of global warming and scarcity of some critical resources. Moreover, the recent economic crisis has accelerated the need for sustainable growth in which the better use of natural resources is a prerequisite for developing a sustainable economy. The impact of corporate activities on the natural environment is one of the areas on which governments and international institutions are paying more attention. In this scenario, companies are required to reduce the negative environmental impact of activities they carry out. Purchasing is seen as an

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important function to reduce the environmental impact of business activities along the supply chain (Zsidisin and Siferd, 2001). The introduction of environmental concerns in the purchasing activities contributes not only to the improvement of the overall company performance (Green et al., 1996; Carter et al. 2000) but it may have positive effects on greening the supply chain through suppliers involvement and cooperation (Theyel, 2001; Klassen and Vachon, 2003; Vachon and Klassen, 2006; Hollos et al., 2010). Nevertheless, most of the existing studies have focussed on the product suppliers rather than service suppliers. Among the latter, third party logistics service providers (3PLs) are known to make a substantial contribution to the environmental stress that is considered harmful for the environment. In fact, transport and logistics activities contribute substantially to greenhouse gas emission at global level (World Economic Forum, 2009). For this reason, it is of critical importance to incorporate green considerations into purchasing decisions when companies source transport and logistics services (Foerstl et al., 2010). Despite this, little research has been conducted on purchasing green transport and logistics service (Wolf and Seuring, 2010).

The aim of this paper is to explore buyer practices in purchasing green transport and logistics services analysing six case studies in Italy, Ireland and Sweden. The results allow drawing managerial implication for buyer companies and the identification of future research avenues in this field.

This introduction is followed by a literature review on green purchasing of products and services, green logistics and recent developments in the transport and logistics service industry. The third section provides a description of the methodological approach adopted. The results of the case study analysis are presented in the fourth section and discussed in section five. In the concluding section implication and future research agenda are outlined.

2. Literature background

Considering that little research have been conducted on purchasing of green transport and logistics services, the background literature of the paper relies upon the three following streams: green purchasing of products and services; green logistics and developments in the transport and logistics service industry. As result the contribution of this paper is placed in the intersection between the above three areas as shown in figure 1.

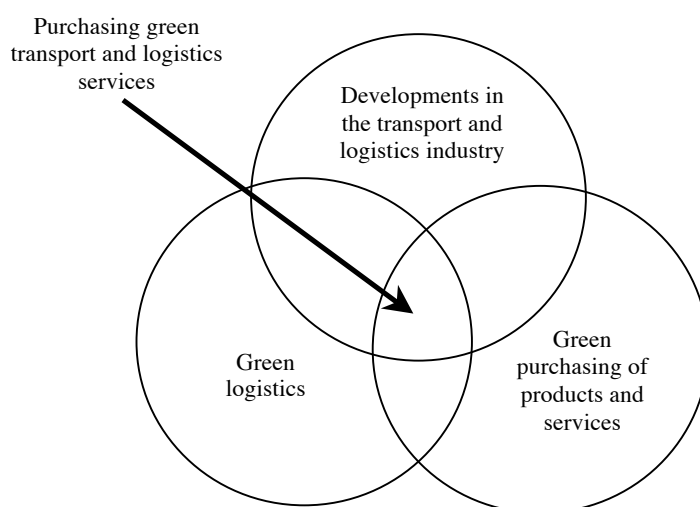


Fig. 1 The literature background of the paper

2.1 Green purchasing of products and services

The greening of purchasing can yield higher profitability, which is an important reason why the topic has reached increased attention over the past decade. For example, Carter et al. (2000) shows that environmental purchasing can lead both to increased net income and lower costs, thus promoting improved firm performance. In previous research into green purchasing the main efforts have been directed towards private purchasing, as opposed to public purchasing (Walker et al. 2008). When in its cradle research on green purchasing focussed on product suppliers, where the interest has somewhat shifted to include services. However, research on the purchasing of transport services is still scarce (Björklund, 2011).

Common drivers in green purchasing are regulatory compliance, customer pressure, risk minimisation and monitoring of green performance (Walker et al., 2008). An investigation of Björklund (2011) among Swedish purchasing managers reveals, that management, customers and carriers are among the most influential aspects for greening the performance of purchasing. The barriers for green purchasing seem to vary more depending on specific cases, however costs and lack of resources occur more commonly (Walker et al., 2008).

In green purchasing, as in general, supplier evaluations of different types are important (Zsidisin and Siferd, 2001), and efficient tools can be helpful in the evaluation process. Large et al. (2011) suggest that a high level of supplier assessment influences the environmental performance. In more specific, Foerstl et al. (2010) argue that in assessing the suppliers from a sustainability perspective, risk assessment is crucial, and hence risk assessment abilities become a key to success. While environmental assessment of suppliers has grown in importance over the past years, there is still a lack of tools that facilitates the assessment of suppliers. One example is a benchmarking tool, which can support companies in improving their environmental considerations in purchasing (Björklund 2010).

According to Zsidisin and Siferd (2001), suppliers should not only be evaluated, but also supplier development is part of green purchasing. Socially responsible purchasing (including green dimensions) is according to an investigation by Carter and Jennings (2002) associated with commitment to the suppliers, trust building between the buyer and supplier, and also to supplier performance in general. Hollos et al. (2010) suggest that cooperation between the purchasing organisation and their suppliers is crucial in order to green the purchasing process, and this also enhances the firm performance significantly. Working with sustainable supplier development can also be seen as a way to reduce the environmental risk in supplier relationships, something which also should have positive effects on operational costs and competitive advantage (Foerstl et al., 2010). In addition, Large et al. (2011) suggest that green collaboration with a supplier supposedly influences the environmental performance of the supplier (Large et al. 2011).

2.2 Green logistics

Research in the field of green logistics identifies several ways for companies to reduce the environmental impact of 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 the carbon footprint of activities (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, as noted by Wolf and Seuring (2010), the role of the 3PL industry in the development of green logistics systems has been on the periphery of green logistics research to date. Some exceptions are the work of Lieb and Lieb (2010) based on a global survey of key developments in the sector, and Wolf and Seuring (2010) with their focus on the

procurement and supply of green transport and logistics services. These contributions highlight the importance of information sharing between suppliers and buyers and the fact that customer pressure has been the main driver in the process of greening 3PLs. While Lieb and Lieb (2010) note a greater acknowledgement of the importance of environmental sustainability among 3PLs, Wolf and Seuring (2010) point out that there is little evidence of concrete green initiatives being undertaken by 3PLs. Maack and Huge-Brodin (2010) highlight the potential for 3PL firms to better use their physical, human and other resources for developing green initiatives. More recently, Evangelista et al. (2011) suggest that a key focus of ongoing research needs to be on exploring how the perceptions of the 3PL sector align with those of their customers - i.e. the buyers.

2.3 Recent developments in transport and logistics service industry

In recent years a number of driving forces have affected the logistics service industry, posing new strategic challenges and opportunities to logistics service companies. For many 3PL companies the main changes associated to the evolving industry scenario consisted of a transition from a single-activity company toward a business model based on providing a wider range of integrated services (Ashenbaum et al., 2005). The expansion of the range of services offered is reflected by the commoditisation of core service offerings (e.g. transportation), on the one hand and, the provision of value-added services and technological capabilities as points of differentiation (Evangelista, 2011), on the other.

This has given 3PLs the opportunity to penetrate segments of supply chains with higher added-value services compared to traditional transportation and warehousing services. This has fuelled the transition from the traditional “arms length” approach to the supply of integrated logistics services packages on a “one-stop shopping” basis (Panayides, 2005) facilitating the evolution of 3PL companies from playing their traditional tactical roles to become adaptive supply chain providers. As a result, 3PLs play a more important role than in the past. In this changing process, environmental sustainability is a challenging area for 3PLs as these companies have to face two different pressures. The first source of pressure relates to transportation costs due to rising fuel prices. This is leading 3PLs to implement cost-cutting initiatives such as the optimisation of transport network (van Hoek and Johnson, 2010). The second source of pressure comes from buyer side (Foster, Sampson and Dunn, 2000). Manufacturers and retailers are investing an increasing amount of resources in accomplishing their environmental objectives. As a result, 3PLs are requested to improve their sustainable capability in order to support the environmental strategies of their customers. As the importance of green supply chain initiatives is likely to grow in the near future, it is reasonable to expect that the criteria for selecting 3PLs will be increasingly based on the evaluation of their sustainable practices and performance.

2.4 Summary of the literature review and research questions

The review of the three streams of literature presented above indicates some interesting results. Firstly, the literature on green purchasing of products and services highlights that the commitment on green issues of management is important for ensuring a more sustainable purchasing processes. This leads to believe that the overall company environmental concerns should have a positive influence on greening purchasing processes including the purchasing of more sustainable transport and logistics services. Moreover, supplier evaluation and cooperation are crucial to increase the environmental sustainability of purchasing processes and supplier performance.

Secondly, the literature on green logistics reports contrasting evidences about concrete adoption of sustainability initiatives carried out by 3PLs. The size of 3PL companies seems to

have a role in the sense that large 3PLs seems to have a more prominent green culture (that is reflected on planned initiatives in place) in comparison with smaller companies. Moreover, the alignment among 3PLs and buyers companies on the perception of the importance of green issues seems to have a role in triggering collaborative initiatives.

Thirdly, the evolution of the logistics service industry and the more critical role played by 3PLs in the supply chain indicates that buyer's companies could receive a relevant support from 3PLs in successfully exploiting their environmental strategies and initiatives. In addition, this should facilitate the purchasing of more green transport and logistics services through cooperation on green projects.

The literature review presented above allows the following research questions to be posited:

- RQ1: Are the general environmental ambitions of the surveyed companies reflected on the purchasing of more green transport and logistics services, and if so, in which ways?
- RQ2: How is the sourcing of green transport and logistics services influenced by the environmental concerns of the purchasing function in the surveyed companies?
- RQ3: Are there collaborative projects among the surveyed companies and 3PLs to greening transport and logistics services, and if so, to what extent?

3. Research Methodology

The purpose of the research described in this paper is to improve the understanding of buyer practices when purchase green transport and logistics services. The paper takes the buyer's perspective, and it is of an exploratory character given the relative dearth of literature in this area. To generate fresh perspectives and to gain deep insights into this issue, the authors conducted interviews with managers from one Swedish, three Italian and two Irish buyer firms. The summary profile is reported in table 1.

Table 1. Company profile

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
<i>Type of product</i>	Sports and leisure wear, sports equipment	Coffee for bar	Functional products and food integrators	Frozen food	Consumer foods	Electronics
<i>Company system description</i>	Retail chain: global supply, distribution centre, over 100 outlets	Coffee makers controlling the down stream part of the supply chain (bars) through 100 sale agents	Design and marketing of product and coordination of outsourced manufacturing and distribution channels	Product processing. Logistics and merchandising outsourced but controlled by internal staff	Supply from factories to distribution centres for large retail and direct to store for smaller customers	Regional distribution centre supplying customers
<i>Geographical market</i>	Nordic countries	Domestic (90% of turnover) and foreign (10% of turnover)	Domestic	Domestic	Britain and Ireland (some in continental Europe)	Europe, Middle-East and Africa (EMEA)
<i>Turnover 2010 (in Mln €)</i>	460	30	5	500	Not disclosed	Not disclosed
<i>Employees 2010</i>	1700	44	9	550	650	400

This is not meant to be a definitive sample, nor are we implying that the sample can be generalised to all professionals and industries. Instead, it provides examples of how the issues under investigation are being addressed in the surveyed companies.

This sample of companies handles a wide variety of product groups thus enabling the authors to generate a breadth of perspectives. Individual respondents are senior managers with specific responsibility for the procurement of transport and logistics services.

The research has been conducted through semi-structured interviews with each respondent. Each interview was guided using a data collection guide developed by the authors. It comprises four parts. The first dealt with the main characteristics of the company including turnover, employees, geographical market covered, type of products, and the supply chain role covered. The second concerned the overall company environmental concern and importance. The third was focused on environmental concern in the purchasing function, while the last section investigated green concern in purchasing transport and logistics services.

This allowed the interviews to be based primarily on specific topics of interest in the research but provided interviewees with some latitude in how they would respond to the questions. Most interviews deviated from the precise questions based on responses given by the interviewees. Interviews were recorded and transcribed.

The interviews were held during face-to-face meeting and integrated with phone calls to clarify or get in-depth knowledge on specific issues. The company's role of informants participating in the meetings includes supply chain managers, purchasing manager, logistics managers, quality and environmental managers and marketing managers. It was requested that at least two managers (possibly with different responsibility in the company) participated in the meeting in order to get different views about the topic investigated. As indicated by table 1, all companies interviewed show a strong focus on domestic market (excluding IRL2) and control over downstream part of the supply chain. The sector in which the companies operate is FMCG with a particular emphasis on food industry.

The analysis of interview transcripts followed the two approaches suggested by Easterby-Smith et al. (2008): content analysis and grounded analysis. The former involves interrogating the data for constructs and ideas that have been decided in advance. The latter involves letting the data "speak for itself" thus allowing for more intuition in guiding the researcher towards an understanding of the data. The authors adopted a combination of both approaches, thus integrating the strengths and mitigating the shortcomings of the two alternatives.

The transcript analysis employed by the authors (as shown in Figure 2) involved four main stages in distilling the raw transcript data into information based on comparing and contrasting the main issues set out by respondents.

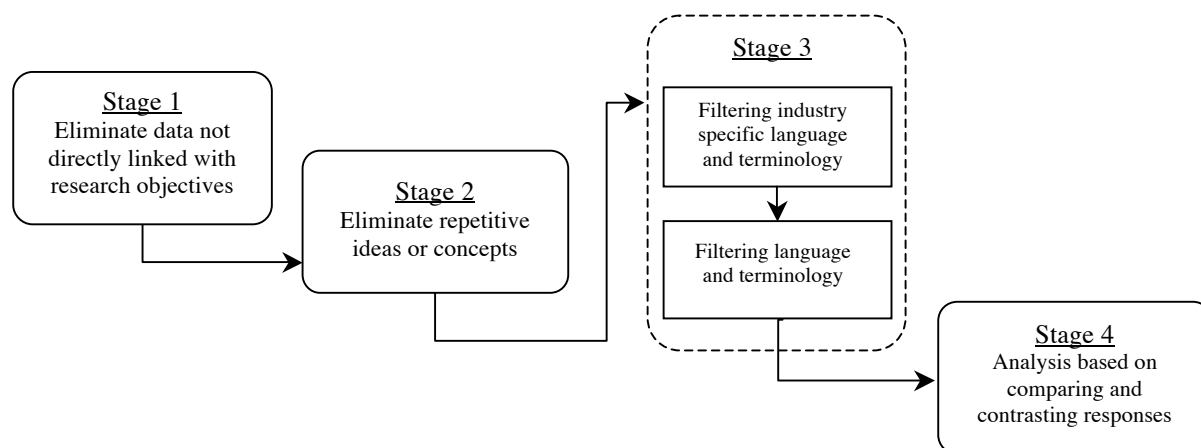


Fig. 2 The transcript analysis process

Stage 1 reflects the advice of Robson (2003) that good transcript analysis has to be aimed squarely at answering the research questions asked or addressing the overall research objectives. Stage 2 reflects the fact that repeated use of a particular word or phrase by a single respondent can not be logically considered to imply that the concept in question is necessarily of particular importance beyond the specific environment in which that respondent is based. A considerable amount of time was spent during the interviews in clarifying terms used by respondents to ensure that the authors were absolutely sure of the intended sense of the terminology used. This is particularly important in the SCM field where a large number of metaphors are used to describe concepts. Stage 3 (essentially a two-stage ‘filtering’ process) addressed this issue and was carefully considered during the planning and execution of the interviews. The final stage involves the analysis of data based on comparing (i.e. identifying key elements of similarity or convergence) and contrasting (i.e. identifying key elements of difference or divergence) the main issues set out by respondents.

The main results of the case study analysis are summarised in the tables presented in the following section and indicate the use of a variety of emphases and approaches in respondents’ firms.

4. Main results of the case study analysis

This section reports the main findings emerging from the case study investigation. Initially, the general environmental concern of the investigated companies is analysed, where after their environmental ambition in overall purchasing is described. The section ends with the analysis of the environmental concern when transport and logistics services are purchased.

The overall environmental concerns among the buying companies (summarised in Table 2) vary, from “of growing concern but not part of core business” (SWE1) to very important, described in terms of “key driver in company decisions” (ITA2) and “very high priority” (IRL2). Production, purchasing and logistics are the functions that are often mentioned as main sources of environmental stress. All companies pay internal attention to environmental issues, while only some of these companies also are active externally.

Table 2. Company environmental concern

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
<i>Importance of green aspects today</i>	Of growing concern, but not part of the core business	Important but does not play a key role in orienting company strategy	Important role that drive key company’s decisions	Part of the company mission and it is seen as a business opportunity	High priority but reduced due to recession	Very high priority driven by the managing director
<i>Main functions causing green concern</i>	Production, logistics, HR, new establishments	Production and logistics	Production, HR, marketing and logistics	Production, HR and logistics/ distribution	Purchasing, manufacturing, transport and logistics	Purchasing and procurement of components
<i>Mainly internal/ external concern</i>	Mainly internal concern	Mainly internal concern	Mainly internal with some eyes to suppliers and 3PLs	Both as sustainability may be achieved leveraging internal and external resources	Both	Both

While the companies investigated are similar in some dimensions, they vary in others. What is most common is that there is a general environmental concern and they include internal matters in their environmental concern.

The next level is to capture how the different companies consider the role of environmental sustainability in the purchasing function in general, which was previously mentioned by some of them as important. The literature review also indicated that green purchasing may lead to increased net income and cost reductions, which in turn can generate improved firm performance (Carter et al., 2000). As for the general environmental awareness, purchasing environmental awareness varies among the companies as shown in Table 3. All the surveyed companies have been asked to indicate which main aspects they address in green purchasing, and the range of aspects is again wide. While some of them are quite specific about transport and supply (SWE1, ITA3 and IRL2), others are on a more general level (ITA1 and IRL1), while the ITA2 is focused on packaging material. In the literature, different types of supporting tools are considered important in the supplier evaluations process. Furthermore, Large et al. (2011) suggest that a high level of supplier assessment can also influence the environmental performance. Despite this important fact there seems to be a lack of tools concerning environmental considerations in purchasing. This scenario is also reflected among the case companies studied. All but one (IRL2) lack tools that support environmental concern in purchasing. In order to green the purchasing process, Hollos et al. (2010) stress the crucial role of cooperation between the purchasing organisation and its suppliers. Regarding joint development with suppliers among the companies studied, the most common item seems to be packaging issues of various kinds (ITA1, ITA2 and IRL1), while both SWE1 and IRL2 support more long-term capability-based projects. The outcome of joint sustainable development with suppliers can be such as reducing environmental risk in the specific relationship that in turn can have positive effects on operational costs and competitive advantages (Foerstl et al., 2010) as well as a way to influence and improve the environmental performance of the supplier (Large et al., 2011). However, none of the companies studied have made joint investments with their suppliers.

Table 3. Environmental concern in the purchasing function

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
<i>Main aspects addressed</i>	Suppliers and transport. General all-over sense rather than specific aspects	Low environmental awareness of suppliers limit the adoption of measures	Increase recycle material for packaging	Reduce impact of raw material procurement	General increase in awareness of green in purchasing function	Green procurement of physical inputs
<i>Supporting tools</i>	None	None	None	None	Not formalised	Green dimension built into supply assessment
<i>Joint development with suppliers</i>	Regarding the functions of the products	Joint project on using a more sustainable packaging	Joint project for design recyclable packaging	None	Sustainable packaging by packaging suppliers	Awareness to joint training and development courses)

Table 4 reports the results relating to the environmental concern of the surveyed companies when they source transport and logistics service. The first element investigates the importance attributed to green aspects when transport and logistics services are purchased. All the surveyed companies indicated that environmental aspects are important but, excluding

ITA3, green aspects are not considered as a key criterion for buying transport and logistics services. The low priority assigned to green aspects is reflected in a number of other elements. The main aspects that are asked to be addressed by 3PL mainly concern to have in place a green policy in order to ensuring that minimum legal and emissions requirements are addressed. The organisation of the work between buyer and 3PL evidence a limited amount of human resource involved without a specific professional profile committed to manage environmental issues. Generally the supervision of green aspects relies upon the responsibility of the logistics/supply chain manager or supervisory team visiting the 3PL's site periodically in order to check how green requirements are managed. When it comes to supporting tools regarding environmental concern in purchasing transport and logistics services, the presence of these kinds of tools seems to be lacking among the surveyed companies. However, one company (IRL1) mentioned that there was a general statement in place even if there were no formal supporting tool. Another company (SWE1) pointed out there existed a tool developed by industry members in order to meet demands from 3PLs for standards.

Table 4. Environmental concern in purchasing transport and logistics services

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
<i>Importance of environmental aspects Vs. others</i>	Green is a knock-out criterion for the providers to be considered. Price, quality, safety are more important	Important, but price and reliability are key decision aspects	Very important. The company is willing to pay an extra price to buy more green 3PL services	Important, but price, quality and reliability of services are the main criteria	Green considered in the overall supplier assessment but based on defined minimum standards	Low priority. Logistics function responsible for buying transport and logistics while purchasing function dealing with contractual and transactional issues
<i>Main aspects addressed</i>	Legal aspects, drivers' behaviour, technology standards, equipment management, green policy	Green policy of the logistics providers and actions to reduce emissions	Green certification and use of recyclable packaging	No specific aspects are defined	Minimum standards (emissions) defined (not very exacting) and minimum legal requirements met	None beyond compliance with legal minimum requirements
<i>Organisation of the work</i>	Manager reports to Managing Director. Tactical plan present. Logistics manager responsible for green issues	Supervisory environmental team visits 3PLs to check green management	Team supervising green management of 3PLs	Meeting involving the company logistics manager and 3PL's managers	SC Manager (reporting to Operations Director) is responsible	Logistics Manager (with support from purchasing function)
<i>Who drives?</i>	Distribution is joint concern (DC up to company and supply to 3PL)	Buyer ask for environmental issues and 3PL react	Logistics function interact with 3PL to ask green service	The company asks for green issues to 3PL	Buyers rules and 3PL react	In some cases the buyer and in some other the 3PL depending on the product and market

Almost all the surveyed companies take the initiative to ask green requirements for transport and logistics services and generally 3PLs react. In the case of SWE1 there is a shared responsibility in managing green issue among the buyer company and the logistics providers. IRL2 provides a different example where it is the buyer or the 3PL who take the initiative depending on the type of product or the market. As mentioned earlier, the companies

under investigation evaluate their 3PLs based on green considerations in some extent. However, Zsidisin and Siferd, (2001) stress that supplier evaluation only may not be enough; the authors also highlight supplier development as an evident part of green purchasing. This effort can be crucial in order to green the purchasing process as well as lead to a positive effect on the firm performance (Holloos et al., 2010). However, the empirical data show a low level of cooperation among buyer company and 3PL. This in turn indicates the scarce importance attributed to green issues in transport and logistics. Joint developments and investments with 3PLs among the companies studied are rare. When collaborative deals have been set up they concern energy efficiency (SWE1) and modal shift (ITA3).

The low importance of green issue in buying transport and logistics seems to be conflicting with the role of logistics for the companies interviewed. All the companies declared that logistics has an important role for the company business. This is reflected in the focus on the management of downstream stage of the supply chain and collaborative investments that most of the companies have in place.

5. Discussion

When putting the three pictures depicted above together (general environmental awareness; environmental purchasing awareness and environmental awareness in purchasing green transport and logistics services) an overall pattern emerges. While the case study companies show a relatively high concern of green issues at company level, the importance of green issues decrease looking at the purchasing function, which is manifested through either very focused efforts, or very general statements. When green concerns in purchasing transport and logistics services are analysed the level of importance decrease dramatically. It emerges a clear conflicting attitude among the overall company level and the purchasing of transport and logistics services.

This overall pattern is reflected in the literature; while the general environmental awareness and concern has increased, the attention paid to purchasing green transport and logistics services is very low (e.g. Wolf and Seuring, 2010; Björklund, 2011). It is also evident, that the purchasing of green transport and logistics services has not yet become a well diffused practice, which is reflected on the hesitant attitude of 3PLs in adopting initiatives for greening their service offering (Evangelista et al. 2012).

In sum, this area needs much more attention to turn more ambitious; while practice needs more models and tools to support the greening of transport and logistics purchasing, researchers will need more substantial evidence of how this is accomplished in practice, which per se propose a status quo.

What could be considered as remarkable among the surveyed companies is the fact that the environmental concern in purchasing in general is very low, compared to what can be expected from the more mature research stream of environmental purchasing. This can either be evidence, that our sample firm is not that wisely chosen: that we have studied the wrong companies. But it could also be a sign that despite the relative maturity of the research field, practice lags behind when it comes to concrete action, and when general statements are not enough.

6. Conclusions and implications

While company mission statements often stress the “green attitude” of companies, environmental sustainability does not directly involve the purchasing function, in general, and the purchasing of transport and logistics services particularly. This in turn put in evidence that

the efforts of companies toward more sustainable manufacturing initiatives are generally used for advertising reasons rather than to reduce the environmental impact of the company activities.

Based on the findings achieved concerning the attitude of the purchasing function to greening transport and logistics services, it is clear that there is potential for improvements especially in the area of green collaboration between buyer and supplier. As emerged from the analysis, few joint developments and investment projects existed regarding both green purchasing in general, and green purchasing of transport and logistics service between the buyer companies investigated and their 3PL suppliers. However, more research is needed in order to investigate how buyer companies and their 3PL supplier can work more closely, what they can learn from each other and how they can improve each other's environmental activities. This is an area that needs to be improved in the future in order to improve the environmental sustainability of transport and logistics services.

The results of this paper are in line with the results of the paper the authors presented at the IPSERA conference 2011 (Evangelista et al., 2011) in the sense that the lack of buyers' commitment in collaborative green initiatives has been indicated as a barrier by 3PL companies. This forces 3PLs to be engaged in tactical initiatives (point solutions) involving some supply chain functionalities only (e.g. vehicle utilisation and energy efficiency) rather than to develop a more strategic end-to-end green supply chain view. The result of this situation produces a low impact on the environmental supply chain performance. There is a clear block among buyer and 3PLs in the environmental sustainability field. In order to overcome this situation it is necessary that buyers innovate their approach when sourcing transport and logistics services through enlarging the areas of collaboration with 3PLs, including packaging design, supply chain re-organisation and joint environmental planning and control.

One critical area of collaboration to improve green supply chain performance is technology. In fact, the low level of adoption of ICT tools in the purchasing function of the buyer companies may be considered as another element that does not stimulate information sharing among buyers and 3PLs on environmental issues. Buyers and 3PLs should jointly invest in green ICT applications that are able to facilitate data exchange and provide increasing visibility on transport and logistics related carbon emissions.

This is supported by the recent literature (see for example the work of Wolf and Seuring, 2010) that stresses the importance of environmental development between buyer company and their 3PL suppliers however there are no stated knowledge how such development could be designed and no best practice is given how these environmental relationships can be realised. The importance of co-ordination and collaboration between buyer and 3PL suppliers regarding environmental sustainability in transport and logistics services is a consideration that not yet has been developed in prior research and calls therefore for further investigations.

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A case study investigation on purchasing green transport and logistics services

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AGENDA

1. Background and objective of the paper

2. Literature review:

- green purchasing of products and services
- green logistics
- developments in the transport and logistics service industry

3. Research questions

4. Methodology

5. Main results

6. Discussion and implications

Background of the paper

- ✓ Purchasing is seen as an important function to reduce the environmental impact of business activities along the supply chain (Zsidisin and Siferd, 2001)
- ✓ The involvement of suppliers in green supplier collaborative projects have direct influence on environmental performance (Theyel, 2001; Klassen and Vachon, 2003; Vachon and Klassen, 2006; Hollos et al., 2010)
 - Most of the existing studies have focussed on the product suppliers rather than service suppliers (Walker et al., 2008)
 - Among the latter, third party logistics service providers (3PLs) are known to make a relevant contribution to the environmental stress due to the substantial contribution to global greenhouse gas emission (World Economic Forum, 2009)

Objective of the paper

- ✓ For this reason, it is of critical importance to incorporate green considerations into purchasing decisions when companies source transport and logistics services (Foerstl et al., 2010)
- ✓ Little research has been conducted on purchasing green transport and logistics service (Wolf and Seuring, 2010)
- ✓ **The aim of this paper is to explore buyer practices in purchasing green transport and logistics services analysing six case studies in Italy, Ireland and Sweden**

The paper takes the buyer's perspective, and it is of an exploratory character given the relative dearth of literature in this area

Literature review

Considering that little research have been conducted on purchasing of green transport and logistics services, the background literature of the paper relies upon the three following streams:

- a) green purchasing of products and services
- b) green logistics
- c) developments in the transport and logistics service industry



Literature review

➤ The literature on **green purchasing of products and services** highlights that commitment on green issues of management is important for ensuring a more sustainable purchasing processes

- overall company environmental concerns should have a positive influence on greening purchasing processes including the purchasing of more sustainable transport and logistics services
- supplier evaluation and cooperation are crucial to increase the sustainability of purchasing processes and supplier performance

➤ The literature on **green logistics** reports contrasting evidences about concrete adoption of sustainability initiatives carried out by 3PLs

- size of 3PL companies seems to play a role
- alignment among 3PLs and buyers companies on the perception of the importance of green issues is important in triggering collaborative initiatives

➤ The **evolution of the logistics service industry** and the more critical role played by 3PLs in the supply chain indicates that buyer's companies could receive a relevant support from 3PLs in successfully exploiting their environmental strategies and initiatives

- this should facilitate the purchasing of more green transport and logistics services through cooperation on green projects

Research Questions

RQ1: Are the general environmental ambitions of the surveyed companies reflected on the purchasing of more green transport and logistics services, and if so, in which ways?

RQ2: How is the sourcing of green transport and logistics services influenced by the environmental concerns of the purchasing function in the surveyed companies?

RQ3: Are there collaborative projects among the surveyed companies and 3PLs to greening transport and logistics services, and if so, to what extent?

Research methodology

STAGE 1

Case study selection

Six companies were involved in the survey (one Swedish, three Italian and two Irish)

Companies was identified on the basis of:

- previous collaboration with researchers in each countries
- criteria: i) companies environmental concern; ii) firm size (small and large); iii) geographical reach of operations (local, national or international)

STAGE 2

Interview protocol

Semi-structured data collection guide:

- a) general company information
- b) overall company environmental concern and importance
- c) environmental concern in the purchasing
- d) green concern in purchasing transport and logistics services

STAGE 3

Data collection

Respondents interviewed by telephone or face-to-face meetings

Interviews involved managers (e.g. supply chain manager, purchasing manager, logistics manager, environmental manager and marketing manager)

Additional information was collected

Interviews were tape-recorded and transcribed

STAGE 4

Analysis and interpretation

The transcript analysis involved four main stages:

1. Eliminate data not directly linked with research objectives
2. Eliminate repetitive ideas or concepts
3. Filtering specific industry language and terminology
4. Analysis based on comparing and contrasting responses

Characteristics of surveyed companies

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
Type of product	Sports and leisure wear, sports equipment	Coffee for bar	Functional products and food integrators	Frozen food	Consumer foods	Electronics
Company system description	Retail chain: global supply, distribution centre, over 100 outlets	Coffee makers controlling the down stream part of the supply chain (bars) through 100 sale agents	Design and marketing of product and coordination of outsourced manufacturing and distribution channels	Product processing. Logistics and merchandising outsourced but controlled by internal staff	Supply from factories to distribution centres for large retail and direct to store for smaller customers	Regional distribution centre supplying customers
Geographical market	Nordic countries	Domestic (90% of turnover) and foreign (10% of turnover)	Domestic	Domestic	Britain and Ireland (some in continental Europe)	Europe, Middle-East and Africa (EMEA)
Turnover 2010 (in Min €)	460	30	5	500	Not disclosed	Not disclosed
Employees 2010	1700	44	9	550	650	400

- The sector in which the companies operate is FMCG with a particular emphasis on food industry
- All companies interviewed show a strong focus on domestic market (excluding IRL2) and control over downstream part of the supply chain

Main findings

Company environmental concern

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
Importance of green aspects today	Of growing concern, but not part of the core business	Important but does not play a key role in orienting company strategy	Important role that drive key company's decisions	Part of the company mission and it is seen as a business opportunity	High priority but reduced due to recession	Very high priority driven by the managing director
Main functions causing green concern	Production, logistics, HR, new establishments	Production and logistics	Production, HR, marketing and logistics	Production, HR and logistics/ distribution	Purchasing, manufacturing, transport and logistics	Purchasing and procurement of components
Mainly internal and external concern	Mainly internal concern	Mainly internal concern	Mainly internal with some eyes to suppliers and 3PLs	Both as sustainability may be achieved leveraging internal and external resources	Both	Both

- High general environmental concern between case companies
- Production, purchasing and logistics are the functions mentioned as main sources of environmental stress
- All companies pay internal attention to environmental issues, while only few of them are also active externally

Main findings

Environmental concern in the purchasing function

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
Main aspects addressed	Suppliers and transport. General all-over sense rather than specific aspects	Low environmental awareness of suppliers limit the adoption of measures	Increase recycle material for packaging	Reduce impact of raw material procurement	General increase in awareness of green in purchasing function	Green procurement of physical inputs
Supporting tools	None	None	None	None	Not formalised	Green dimension built into supply assessment
Joint development with suppliers	Regarding the functions of the products	Joint project on using a more sustainable packaging	Joint project for design recyclable packaging	None	Sustainable packaging by packaging suppliers	Awareness to joint training and development courses)

- Main aspects addressed in green purchasing range from specific (e.g. transport, raw material and packaging) to more general level
- Lack of tools concerning environmental considerations in purchasing
- Joint development with suppliers seems to be focused on packaging

Main findings

Environmental concern in purchasing transport and logistics services

	SWE1	ITA1	ITA2	ITA3	IRL1	IRL2
Importance of environmental aspects Vs. others	Green is a knock-out criterion for the providers to be considered. Price, quality, safety are more important	Important, but price and reliability are key decision aspects	Very important. The company is willing to pay an extra price to buy more green 3PL services	Important, but price, quality and reliability of services are the main criteria	Green considered in the overall supplier assessment but based on defined minimum standards	Low priority. Logistics function responsible for buying transport and logistics while purchasing function dealing with contractual and transactional issues
Main aspects addressed	Legal aspects, drivers' behaviour, technology standards, equipment management, green policy	Green policy of the logistics providers and actions to reduce emissions	Green certification and use of recyclable packaging	No specific aspects are defined	Minimum standards (emissions) defined (not very exacting) and minimum legal requirements met	None beyond compliance with legal minimum requirements
Organisation of the work	Manager reports to Managing Director. Tactical plan present. Logistics manager responsible for green issues	Supervisory environmental team visits 3PLs to check green management	Team supervising green management of 3PLs	Meeting involving the company logistics manager and 3PL's managers	SC Manager (reporting to Operations Director) is responsible	Logistics Manager (with support from purchasing function)
Who drives?	Distribution is joint concern (DC up to company and supply to 3PL)	Buyer asks for environmental issues and 3PL reacts	Logistics function interacts with 3PL to ask for green service	The company asks for green issues to 3PL	Buyers rules and 3PL reacts	In some cases the buyer and in some other the 3PL depending on the product and market

Discussion

- While the case study companies show a relatively high concern of green issues at company level, the importance of green issues decrease looking at the purchasing function (which is manifested through either very focused efforts or very general statements)
- When green concerns in purchasing transport and logistics services are analysed the level of importance decrease dramatically
- It emerges a clear conflicting attitude among the overall company level and the purchasing of transport and logistics services
- This is supported by the literature (Wolf and Seuring, 2010; Björklund, 2011)
- Purchasing of green transport and logistics services has not yet become a well diffused practice, which is reflected on the hesitant attitude of 3PLs in adopting initiatives for greening their services as emerged from the last year case study survey on 3PLs in the same countries (see Evangelista et al. 2012)

Implications

Our research on both buyer and 3PLs side converge on the fact that there is a clear block among buyer and 3PLs on the environmental sustainability:

- ✓ lack of buyers' commitment in collaborative green initiatives has been indicated as a barrier by 3PL companies (low joint developments and investment projects)
- ✓ 3PLs reluctant to invest in greening their service offering
- to overcome this situation it is necessary that buyers innovate their approach when sourcing transport and logistics services through enlarging the areas of collaboration with 3PLs, including: packaging design, supply chain re-organisation and joint environmental planning and control
- a critical area of collaboration to improve green supply chain performance is technology (low level of adoption of ICT tools in the purchasing function)
- buyers and 3PLs should jointly invest in green ICT applications that are able to facilitate data exchange and provide increasing visibility on transport and logistics related carbon emissions as indicate by the recent literature (e.g. Wolf and Seuring, 2010)

Future research directions and limitations

Future research directions

- ✓ Researchers will need more substantial evidence of how this is accomplished in practice, which per se propose a status quo
- ✓ Environmental concern in purchasing in general is very low, compared to what can be expected from the more mature research stream of environmental purchasing. It could be a sign that practice lags behind when it comes to concrete action
- ✓ More research is needed to investigate how buyer companies and their 3PL supplier can work more closely, what they can learn from each other and how they can improve each other's environmental activities (collaboration and co-ordination)

Limitations

- ✓ This research is empirically based on buyer view only and the sample is narrow
- ✓ The next research step consists in a survey questionnaire on the 3PL industry. It will take into account the results of this paper in order to ensure that the buyer view is considered

Thank You !

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