Achieving a greener freight transport purchasing process through a voluntary governmental program in France

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ABSTRACT

The purpose of this paper is to examine closely the transport purchasing process among pro-active companies who are willing to reduce their CO2 transport emissions. Highlighting stakeholders and industrial purchasing theories as well as the IMP network perspective, this study helps us to understand how environmental concerns can better be taken into account during the transportation procurement operation. Building on sustainable transport purchasing review, we address the following questions:

1) Which department inside the company chooses the carrier, being aware of sustainable transport purchasing activities and what are the main motivations?
2) In a B-to-B context, how is the carriers' environmental performance taken into account by shippers during the tender process?

The uniqueness of this study resides in its ability to identify which actors/departments play a key role when choosing a carrier and explore the transport buyer's behavior toward environmental initiatives. It adds to the relatively limited empirical research that has been conducted on transportation purchasing processes, exploring the impact of a governmental voluntary program. Indeed, the recent voluntary initiative, launched by the French Environmental Agency (ADEME), called FRET 21, aims to reduce freight transport's impact on the environment, encouraging shippers to reduce their CO2 transport emissions. To date in France, only 10 pro-active shippers are committed to this program, but a target of 1,000 signatory companies by 2020 is forecast. An explorative study is then conducted based on semi-structured interviews in order to investigate what motivates these companies to take into account environmental aspects when purchasing freight transport services. Data from these 10 case companies are then used to explore the transport purchasing operation, intra and inter organizational collaborations as well as transport selection criteria. The study results will also confirm or reverse literature suggestions.

Keywords: Sustainable freight purchasing policies, freight transport purchasing process, green transport purchasing decisions, transportation CO2 reduction policies

INTRODUCTION

Over the last three decades, the recurring theme of global warming, caused by increasing concentrations of greenhouse gases (GHGs), has opened many debates and discussions, pointing out transport activity as one of the most important contributors. Taking into account that the majority of greenhouse gas emissions from transportation are caused by CO2 emissions (Piecyk and McKinnon, 2010), it is worrying to note that worldwide transport CO2 emissions grew by 45% between 1990 and 2007[1]. Besides, within Europe, 72% of the GHG related to transportation are affiliated to the road-freight sector[2], resulting in a variety of significant questions and polemics. As a matter of fact, the 22nd session of the Conference of the Parties (COP 22) which took place in Marrakesh in November 2016, highlighted the importance of the transport sector on climate change. Since each country has its own

[1] OECD report: Reducing Transport Greenhouse Gas Emissions, 2010
[2] Greenhouse gas emissions from transport by mode in 2014, European Environment Agency

challenges regarding pollution generated by transport, some mandatory actions and voluntary joint efforts are emerging in order to educate businesses toward their CO2 transport emissions (Huwart and Verdier, 2012) and relevant studies compare their methods and effectiveness (Tan and Blanco, 2009; Stelling, 2014). These initiatives, launched by governments or private companies, encourage partnerships between technology providers, transporters (carriers) and client firms (shippers) in order to measure and reduce CO2 emissions generated by their freight operations.

For its part, the French Government assisted by the ADEME (French Environmental Protection Agency) has introduced various initiatives toward shippers, who are "the owners of the goods" and toward "carriers" whom transport activities are entrusted. Carriers, who can voluntary adhere to a charter of commitments (Charte Volontaire CO2), are however constrained to put into practice a legislation (decree n°2011-1336) that obliges them to calculate and inform their customers about their CO2 impacts.
In response to these measures, a new voluntary charter, called FRET 21, has been under experiment by 10 pro-active shippers since May 2015 in order to test it and open it to development so as to embed it in more French companies in the future. Therefore, the purchasing process, applied specifically to acquire more sustainable transport services represents the core of our study.

From an academic perspective, green and sustainable supply chain management has gained valuable insight and expertise (Seuring and Müller, 2008; Srivastava, 2007; Ahi *et al.,* 2013; Hong *et al.,* 2017). Although most authors acknowledge that transport, especially freight transport, has negative effects on the environment (Schwanen *et al.,* 2011), Wu and Dunn (1995) state that within a management logistics system, transport operations represent the biggest environmental threat. For this reason, the transport purchasing process and more specifically shippers' final decision in selecting the carrier, remains meaningful, relevant and essential to explore. This article, which is aimed at addressing the lack of knowledge regarding government transport initiatives, scrutinizes how environmental performance is taken into account when transportation services are purchased. This investigation is consequently organized around two broad research questions:

RQ1: Which department inside the company chooses the carrier, being aware of sustainable concerns and what are the main motivations?

RQ2: In a B-to-B context, how is the carriers' environmental performance taken into account by shippers during the tender process?

The contribution of the paper is two-fold: On the basis of the stakeholder and industrial purchasing theories as well as the IMP network perspective, we want to better analyze the transportation purchasing process and the decision-maker sensitivity toward environmental concerns. Furthermore, providing incentive levers would help the ADEME to spread this scheme to more and more shippers in France on a long term perspective. The paper is organized as follows: The first section summarizes the results of a literature review on sustainable transport procurement. Although this theme is quite large, the transport purchasing process and consequences regarding governmental initiatives to promote sustainable transport are few. The second section outlines the methodology used to conduct the case study analysis based on semi-structured interviews. The main analysis and findings of the case study investigation are presented in the third section.

LITERATURE REVIEW

From an academic perspective, the strategic role of the purchasing function has been largely demonstrated, including its influence to reduce the impact on our natural environment (Green *et al.* 1996; Schneider and Wallenburg, 2012). While some literature clarifies concepts justifying the incorporation of social and environmental criteria (Carter and Jennings, 2004; Maignan *et al*., 2002), it remains difficult to precisely define and evaluate the benefits and advantages in return. However, a growing amount of academic research reveals that sustainable purchasing policies can lead to significant financial performance benefits (Thornton *et al.,* 2013; Li *et al*., 2016), the acquisition of competitive advantages (Lash and Wellington, 2007; Markley and Davis, 2007), and better control of the company's image (Maignan *et al*., 2002; Worthington, 2009).

Whereas the purchasing function can be considered as a collection of isolated buying decisions (Benton, 2010; Johnson *et al.,* 2011), other alternative perspectives on purchasing have emerged, through the IMP community (Anderson *et al.,* 1994; Håkansson *et al.,* 2004; Gadde *et al.,* 2010; Najafi, 2013; Hessel, 2014). Inspired by a global Scandinavian model (Hakansson, 1982), they underline interactions between buyers and suppliers as fundamental in the decision making.
With specific reference to our research topic, it can be seen that motivating factors linked precisely to sustainable transportation purchasing have scarcely been explored. Nonetheless, previous studies demonstrate that a better transportation management may lower costs over time (Giunipero *et al,.* (2012), preventing cascade subcontracting and the multiplication of distribution networks, which generate pollution and unnecessary expenses (Plambeck, 2012).
Moreover, the purchase of services, including transport requisitions, are intangible by nature and do not seem to be handled, nor have the same selection process as the purchase of goods (Jackson *et al,.*1995). This area has attracted the attention of many academic researchers (Marasco, 2008; Lammgard and Andersson, 2014) and it is essential to reveal its specificities, as well as its organizational and decisional procedures in order to better incorporate environmental principles.
Refining our literature review essentially on the transport purchasing process, we detect 5 main mechanisms which incite environmental issues to be taken into account.

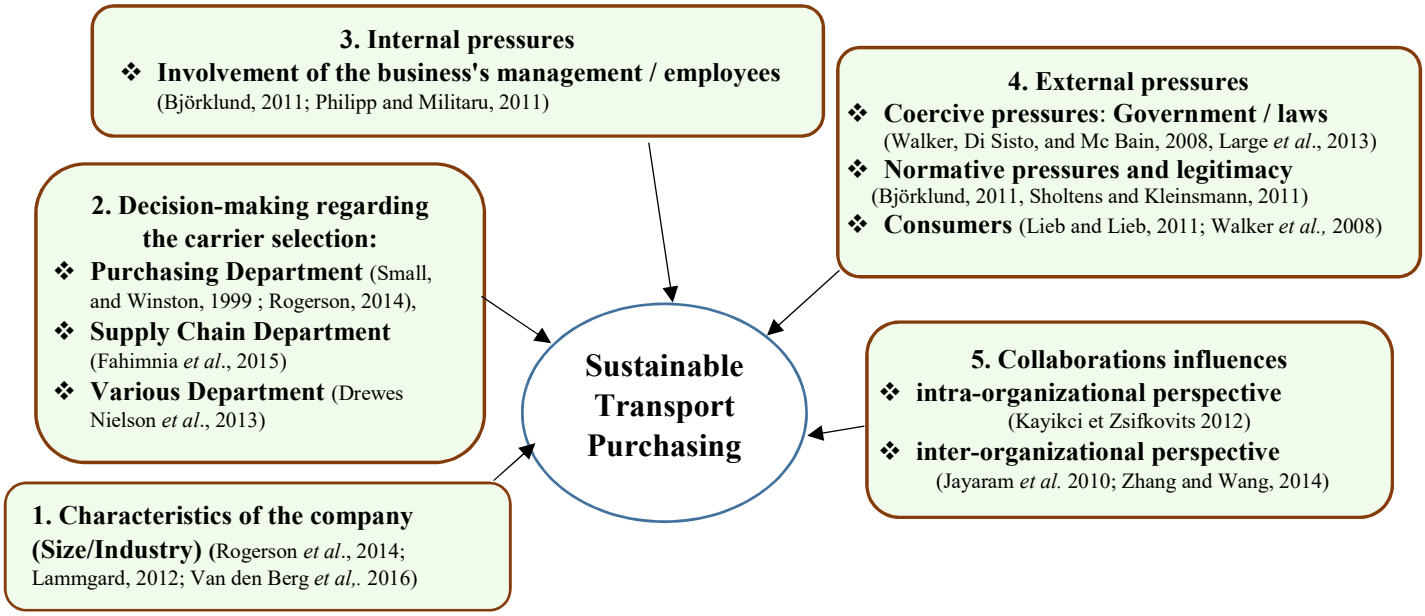

Figure 1: Mechanisms influencing the Sustainable Transport Purchasing Process

The characteristics of the company (1), which can be linked to size and corporate values as well as the industry sector can exert a great influence on including environmental concerns into its transportation purchasing process (Rogerson *et al*., 2014, Lammgard, 2012; Van den Berg *et al.*, 2016). Furthermore, building on the industrial purchasing theory, the model of Webster and Wind (1972) suggests that **the decision-making process (2)** for industrial purchases is as follows: purchasing behavior is a function of individual characteristics, interprofessional relations between members (users, advisors, decision makers and buyers), organizational characteristics and environmental factors (economic, legal, technological ...). Our field of study is inspired in part by this model since the purchase of transportation within a company brings together various expectations and objectives. We can then wonder which department within the company makes the transport purchasing decision, prioritizing accordingly interests, methods and means when choosing the carriers. Small and Winston (1999), Rogerson (2014) underline that managers working for the purchasing department are often the decision-makers, whereas other researchers reveal that the supply chain department exert a stronger influence (Meinberg et Muller, 1995, Fahimnia *et al*., 2015). Other academic studies reveal that transport decisions are often shared between several departments (Gentry and Farris, 1992; Drewes Nielson *et al*., 2013). This may include

various people working in inventory management, or related to the purchasing, procurement or supply-chain departments.

Furthermore, factors related to employees, administrators and partners are suggested through the stakeholder theory. In this context, the significant research on **internal pressures (3)** clearly states that the management's involvement (Philipp and Militaru, 2011), top management priorities and environmental sensitivity (Björklund, 2011) as well as employees' values (Gelderman and Van Weele, 2002), have consequences on the purchase of greener transportation services. Refering to **external pressures (4)**, governmental legislation (Walker *et al*., 2008; Lin and Ho, 2008; Large *et al*., 2013), normative isomorphism (Björklund, 2011, Sholtens and Kleinsmann, 2011) and final customers (Lieb and Lieb, 2011; Walker *et al.,* 2008), also seem to exert a strong influence. The fifth mechanism, named **collaborations' influences (5)** is inspired by the IMP approach concerning inter-organisational networks. It demonstrates that trade is not limited to simple transactions, but consists of established relationships as well as visible characteristics between the organizations (Ford and Haakansson 2005; Gemünden, Ritter, and Heydebreck, 1996). The IMP network perspective is applied to sustainability by Ryan *et al.* (2012), who underline that specific organizational capabilities are required to note changes. This idea, specifically applied to a sustainable transport perspective shows that intra-organizational collaborations (Lin and Ho, 2008; Kayikci and Stix, 2012), as well as inter-organizational collaborations (Jayaram et al., 2010; Kayikci and Zsifkovits, 2012) emerge as being a strategic environmental asset for both shippers and carriers. They can for instance minimize encountered inefficiencies on poor capacity utilization, avoid empty backhaul and reduce high transport costs.

Besides these 5 mechanisms detected, it is crucial to detect how the selection criteria toward carriers is made. Numerous studies, involving field surveys from various companies have shown that service and cost are the two most important issues when selecting the carrier (Pederson and Gray, 1998; Whyte, 1993; Van Laarhoven *et al*., 2000; Marasco, 2008; Lammgard *et al*., 2012). Other academic studies reveal that quality, on-time delivery (Van Laarhoven *et al.*, 2000), supplier responsiveness, administrative papers to fulfill (Axelsson and Wynstra, 2002) are determinants. However, a carrier's environmental performance is frequently cited but does not seem to be a selection criteria so far (Large *et al*., 2012; Govindan *et al*., 2013), except in the findings of Theißen and Spinler (2014). Several doubts and questions are then raised due to the lack of attention regarding environmental concern when selecting a carrier.

METHODOLOGY

In order to identify operational and decisional processes related to transportation purchasing activities and provide a substantial basis to this study, it is useful to share and explain the methodology deployed for this paper. An explanatory research design (Mc Cutcheon and Meridith, 1993; Yin, 1994) based on a limited number of cases studies seemed relevant to scrutinize consideration of environmental factors during transportation tender process. According to Yin (2009), case studies are indeed especially relevant for 'how' or 'why' questions and when an in-depth description is needed. Miles *et al.,* (1994) asserts that the use of multiple cases allows the researchers to obtain a deeper understanding of the phenomenon.

Furthermore, the results of other researchers (Fabbe-Costes *et al.* 2017) explored the consequences of the decree 2011-1336, obliging all French carriers to calculate and inform their customers about their CO2 impacts. Their results reveal that companies initiate green transportation when the process is promoted by legislation or on the basis of a customer request. In response to these findings, the new voluntary FRET 21 charter, experimented by 10 pro-active shippers since May 2015 appeared particularly appropriate to deepen these results. Conducting semi-structured interviews with the first 10 companies to sign this commitment would not only provide multi-faceted explorations of this complex issue but also give a detailed understanding of how sustainable transportation procurement practices are concretely achieved by shippers sensitized to this subject. Therefore, these 10 selected companies, committed to reduce the total CO2 emissions caused by the freight road transport within the 3 next years, provide an ideal field study for various reasons: Not only for their involvement toward the CO2 transport emissions, but also because their industry type, country of origin, size and location are diversified. Therefore each of these companies yields a different insight depending on its strengths and weaknesses. The richness of the case study evidence leads indeed largely from this multi-facetted perspective.

Company	Industrial Sector	Size	Country of origin	Person interviewed
Air products	Petrochemical	Large Company	American	Supply Chain Manager
Carrefour	Mass distribution	Large Company	French	Sustainable Supply Chain and Transportation Manager
Coca-Cola	Food industry	Large Company	American	Sustainable Supply Chain Manager
Ferrero	Food industry	Large Company	French	Transportation Purchasing Manager
Fleury Michon	Food industry	Large Company	French	Transportation Purchasing Manager
Hénaff	Food industry	Medium-size	French	Transportation Purchasing Manager
Orrion Chemicals Orgaform	Chemical	Small Company	French	Transportation Purchasing Manager
SCA Hygiene Products	Hygiene	Large Company	Swedish	Supply Chain Director (SCA Incontinence Care South Division)
Saing-Gobain (Placoplatre)	Building materials	Large Company	French	Supply Chain Director, and 2 Transportation Buyers
Renault	Automotive	Large Company	French	Environment Supply Chain Director

Figure 2: The 10 companies who signed the FRET 21 charter in France

The person interviewed was selected according to 3 criteria: Being steadily in relation with the carriers, participating in the decisional transportation purchasing process and having expertise on the environmental strategy of the company. Each semi-structured interview lasted around two hours which gave the opportunity to the interviewing researchers, for a short period of time to enter another person's world (Patton M.Q., 2002). Each interview was fully recorded and transcribed by the researchers. This method of *"typing and organizing handwritten field notes offers another opportunity to immerse in the data in the transition between fieldwork and full analysis, a chance to get a feel for the cumulative data a whole"* (Patton M.Q., 2002). Furthermore this technique enables to obtain verbatim transcriptions.

The coding process which consists of reading, analyzing and underlining key sentences and keywords, was organized question by question, so that responses from these 10 companies to one same question were grouped together. This cross-case analysis offers a way to group together answers from different respondents to common questions, analyzing different perspective on central issues (Patton M. Q., 2002). A coding frame which highlights main theme and sub-theme elements was then elaborated. Verbatim has been incorporated to illustrate the idea. Finally, to describe the results and synthetize this cross-case analysis, the challenge was to *"retain the uniqueness and holism of accounts"* (Noblit et Hare, 1988), identifying and extrapolating lessons learned from these 10 cases. The main goal of this work was indeed to centralize and synthetize key answers to our research questions.

ANALYSIS AND FINDINGS

Our objective was not to statistically test stakeholder models or IMP group models gathering pre-codified data but rather deepen their findings (Cova et Salle, 1992), by comparing different interaction processes among these 10 particular cases. Although our findings cannot be generalized, they do suggest interesting « inside stories ».

❖ **The Supply Chain department is pro-active to implement sustainable transportation practices**

Our semi-structured interviews reveal that the Supply Chain department is «pro-active » to commit the company toward this sustainable program FRET 21, thus for two main reasons: (1) To respond to the mandatory and voluntary initiatives settled for carriers (Charter CO2 + decree 2011-1336) and (2) to valorize the Supply Chain Department initiatives toward environmental actions. In this way, in line with the IMP core theory, this voluntary program seems to enhance sustainable purchasing practices and reinforce the supplier-carrier relationship.

On the other hand, at an intra-organizational level, the supply chain department exerts a strong influence encouraging the top management to accept concrete proposals regarding sustainable transport. Admittedly, our results prove that the top management is open and receptive towards environmental issues but the supply chain department definitely exerts a driving force in adopting this FRET 21 charter, as it is demonstrated by the following verbatims : *« This is our department which has been the engine on this subject », « The Supply Chain management did a presentation to the headquarters expressing his wish to sign the FRET 21 charter; This has been accepted by the Top management ».*

❖ **The supply chain department participates more in the choice of the carrier than the Purchasing Department. However, the decision-making is often made between both departments.**

Our results follow the work of Meinberg and Muller (1995) and Fahimnia *et al.* (2015), showing that the supply chain department is more involved in the transportation organizational and decisional processes. These results are however nuanced since the purchasing department plays a participatory role in half of the interviews conducted. These results confirm Webster and Wind's model (1972) stating that industrial purchasing happens through a "decision process where needs are specified as well as brands and suppliers assessed and selected". Deepening this argument, Inter-professional relations then play a key role in establishing the concept of a buying center through users, advisors, decision makers and buyers. Comments received, such as "The *purchasing department and the supply chain department are the only ones, and we always work in tandem*" or "*The supply chain defines its requirements to the purchasers*" illustrate an operational and collaborative purchasing process. However, the final decision mainly comes from the Supply Chain headquarters, as described by the following verbatims: "*In any case, the purchasing department and the supply chain department have the same boss, and this is the Supply Chain manager*", "*The drafting of the contract is up to the purchasing department, however the final decision comes from the supply chain*".

❖ **Motivating factors highlighted: Adequacy with the values of the company, team-building, obtaining a better image, reducing the costs, increasing supply chain involvement toward environmental issues.**

Our results confirm that environmental values communicated through top management (Björklund, 2011) as well as employees values (Van Weele, 2002), have great influence on purchasing greener transportation services. Additionally, the same applies to obtain a competitive advantage (Lash and Wellington, 2007; Markley and Davis, 2007) in front of other shippers, and obtain financial advantages as well as was perceived by the work of Owens (1972) and Thornton *et al*., (2013). The respondents also mentioned that this FRET 21 charter is an environmental challenge that boosts team-building and networking inside the company, influencing the intra-organizational collaboration from a stakeholder theory perspective. In furtherance of Maignan *et al.* (2002), the 10 shippers interviewed also wish to work on the company's image, with regard to public opinion.

❖ **In a B-to-B context, FRET 21 program stimulates and reinforces inter-organizational network**

Carriers are the first stakeholders mentioned to value these 10 shippers environmental implication. As shown by these verbatim comments: "*With the FRET 21 charter, our carriers became strategic partners*", "*this reinforces the collaboration with the carrier X*", "*this really empowers collaborations with our carriers*", this voluntary program united various businesses around the same problem, reaffirming or reinforcing their organizational practices. Therefore, our findings, which give greater depth to Jayaram *et al.,* (2010) and Kayikci and Zsifkovits, (2012)'s work, suggest that inter-organizational collaborations around a voluntary environmental program are reinforced, representing a real asset.

Furthermore, in line with research focused on the IMP network perspective (Anderson *et al.,* 1994; Håkansson *et al.,* 2004) our results establish visible characteristics of the relationships due to the positive influence of this FRET 21 charter. Besides, Ryan *et al.,* (2012), who also use the IMP network perspective precisely in the field of sustainable development, underline that specific organizational capabilities are required to note changes, therefore allowing companies to perceive the "other" as a partner within specific market realities. In line with these findings, we notice that this voluntary program does indeed help shippers to consider carriers as real partners, hence strengthening collaborations.

Lastly, another inter-organizational network has been demonstrated between these 10 shippers and the ADEME, which provides them with methods to calculate CO2 emissions as well as new management practices to reduce and optimize freight transport demand.

❖ **Criteria prioritized when choosing a carrier:**

The results indicate that price is the first selection criteria in carrier choice. For others companies, service quality (punctuality; reactivity, truck availability) or safety (especially for transportation of dangerous materials) remains the first criteria of selection. The environment is an "incentive criteria" for half of the interviewed companies, in particular by favouring carriers equipped with a Euro 5-Euro 6 fleet. However, most of these shippers do not yet create competition between carriers based on environmental

criteria (six companies from ten). The four pro-active shippers who take into account a carrier's environmental performance award points to their carriers regarding their fleet of vehicles, fuel consumption, truck standards, truck consumption, or their engagement to sign the voluntary carriers'charter of commitment (Charte Volontaire CO2). These pro-active shippers also add value on environmental proposals from carriers that use lighter trucks and to those who set up benefit sharing, as well as fronthauling/ backhauling practices. Awarding innovative initiatives is also prioritized since a solution "*at the same price, but less polluting*" will be favoured. As a consequence, contrary to Theißen and Spinler's work (2014), our study shows that environmental concerns such as CO2 transport information are not yet integrated into carriers's selection criteria.

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