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Factors driving shippers' compliance with a voluntary sustainable freight programme in France

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6 Abstract

7 This paper explores the responses of French transport services' buyers to environmental 8 initiatives, thereby contributing to understanding the impact of governmental sustainable 9 freight policies, including the FRET21 programme launched in 2015 by the French 10 Using a multiple case study design involving 10 pilot companies, the government. 11 heterogeneous data collection (semi-structured interviews, access to internal documents, 12 direct observations, programme participants brainstorming) has been carried out with the 13 assistance of French transportation services purchasing managers from Carrefour, Coca-Cola, 14 Saint-Gobain, Renault, Fleury Michon, Air Products, Henaff, Ferrero and Orrion. Our study 15 reveals the voluntary participation of the companies to reduce their CO₂ emissions related to 16 their freight operations, regardless of company size or their sector of activity. Furthermore, 17 the environmental sensitivity of the shippers stems more from an internal dynamic, be it supportive employees or top management, rather than the obligation to calculate their CO₂ 18 19 emissions. Although the FRET21 charter enhances substantially intra- and interorganisational collaboration, especially between carriers, ADEME - the French 20 21 Environmental Protection Agency - and shippers, environmental issues do not yet constitute a 22 decisive criterion in carrier selection by shippers. This paper is original in its research area 23 since very few studies in the existing literature explore the application of a sustainable freight 24 transportation programme, scrutinizing the successes and failures encountered in its 25 application. Our study contributes to the green freight transportation field in two ways: by 26 providing appropriate recommendations to help spread the sustainable freight programme to 27 other shippers in France, but also by providing public and private entities worldwide with 28 managerial insights and relevant guidance to influence shippers' responsiveness in the 29 direction of sustainable freight. The study also stresses the need of having transparent tools 30 and a standard method to measure freight CO₂ emissions, thereby supporting shippers in their 31 sustainable freight endeavours.

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38 **1. Introduction**

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40 Worldwide transport CO₂ emissions grew by 38% between 2000 and 2018 (from 5.8 to 8 Gt) 41 (International Energy Agency, 2019). Within Europe, 72% of the greenhouse gas (GHG) 42 emissions related to transportation are caused by the road-freight sector. A recent study 43 highlights that road-freight transport still accounts for 25% of the world's energy 44 consumption, with conventional diesel still being the predominant fuel used for heavy-duty trucks (Teixeira et al., 2021). Additionally, Miller and Facanha (2014), who examined 45 national and international regulations to reduce energy use, highlight that trucks represent the 46 47 largest source of GHG from freight, accounting for over half of all transport-related carbon 48 emissions.

The 25th Conference of the Parties (COP25), which took place in Madrid in 2019, highlighted 49 50 the impact of the transport sector on climate change. Nearly all countries have now ratified 51 the Kyoto Protocol and are undertaking initiatives to decrease pollution generated by transport. 52 Developing countries are an integral part of this process. In this perspective, Kumar (2021) 53 underlines a lack of coordination between the freight logistics organisations and public 54 entities in India, which would improve the environmental sustainability of the freight 55 distribution process, especially the last mile delivery. Apart from the use of enforcement 56 legislation, a study conducted in Brazil points out the difficulties of involving shippers in 57 sustainable freight projects, above all when it concerns extensive geographical areas (Froio et 58 al., 2021).

59 In other countries, both mandatory and voluntary programmes have emerged, such as in the USA through the SmartWay programme (Bynum et al., 2018), in China (Liu et al., 2019; 60 61 Zhang et al., 2020), and in the Netherland (Pieters et al., 2017) in order to increase the 62 awareness in companies regarding their CO₂ transport emissions. These public or private 63 programmes encourage technology providers, transporters (carriers) and client firms (shippers) 64 to collaborate in order to reduce CO_2 emissions from freight transport. However, as was 65 underlined by Nyabusore (2015), research to understand the motivation that leads shippers and carriers to collaborate and adopt environmental-friendly transportation practices is limited. 66 67 In this regard, the following main research question is addressed in this study: How has the 68 voluntary sustainable freight programme "Freight21 charter" been adopted and deployed by 69 the 10 proactive programme-participating shippers in France?

This study seeks to fill a research gap by carrying out an investigation of shipper companies that have voluntarily committed to a sustainable freight transport model. The objective of this research is not to examine a governmental sustainable freight programme; rather, it is to investigate the behaviour of the proactive shipping companies that signed-up to a voluntary programme, namely the FRET21 charter.

75 The French Government, assisted by the French Environmental Protection Agency 76 (ADEME), has launched various sustainable freight programmes directed at shippers, who are "the owners of the goods" and at "carriers" to whom the transport of the goods is entrusted. In 77 78 this regard, carriers, are required by legislation (decree n°2011-1336) to calculate and convey 79 to each customer data on the CO_2 emissions they generate, but most of them do not do so as 80 there is no penalty applicable in respect of non-compliance. However, those carriers who have 81 voluntarily signed-up to the charter of sustainable freight commitment called Charte 82 *Volontaire CO*₂, are required by the charter to implement the legislation. In addition, another voluntary charter, called FRET21, has been undertaken by 10 proactive shippers since May 83 84 2015 in order to road test the effectiveness of the programme. This paper explores the 85 transportation purchasing process among these 10 proactive shippers, in order to identify how 86 they aim to integrate sustainability into their freight transport practices.

87 As highlighted by Touboulic and Walker (2015, p. 19), "in the case studies and survey 88 articles (conducted in sustainable supply chain management), authors present their empirical 89 conclusions and results with no or little attempt to explore concepts, relationships and make 90 further predictions for theory building purposes". In this regard, our study, inspired by the 91 International Marketing and Purchasing (IMP) approach, more specifically the interaction 92 model (Håkansson, 1982, p. 23; Ford and Håkansson, 2005), explores interconnections, 93 innovations, and freight services purchasing practices among environmentally proactive 94 shippers. It contributes to the existing literature in two ways. Firstly, it examines the features 95 of transportation services purchasing practices, highlighting the decision-making process as 96 well as potential intra- and inter-organisational influences. Secondly, it highlights incentive 97 levers that will assist the French Government, and especially ADEME to gradually and 98 permanently spread the FRET21 charter to many additional shippers in France. In sum, this 99 research aims to address the lack of knowledge regarding the reasons that prompt some 100 shippers to join a voluntary sustainable freight programme, exploring their whole transport 101 services purchasing process. A proper understanding of their motivation as well as their intra-102 and inter-organisational capabilities will give clear guidance to the environmental science 103 community, other interested shippers and public freight policy authorities.

The paper is organised as follows. Section 2 presents some of the green freight services programmes set-up worldwide with a special focus on the FRET21 initiative. Section 3 provides a literature review on sustainable freight services procurement. Section 4 outlines the research design and the methodology used to conduct the case study analysis based on semi-structured interviews and the collection of data from other sources. The main findings of this investigation are presented in section 5 and section 6 outlines the conclusions of the paper.

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2. Green Freight programmes are being initiated to tackle the challenge of climate change

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114 2.1 An overview of green freight programmes set-up worldwide115

116 Various sustainable freight initiatives have been initiated in many countries to reduce CO₂ 117 emissions related to transportation. While some regulations, especially freight trucks 118 standards regulations are mandatory, complementary policy instruments have emerged to 119 encourage sustainable freight practices. Implemented on a voluntary basis, these programmes 120 have the objective of raising environmental awareness among businesses and the general 121 public (Goetz et al., 2019). In North America, the SmartWay programme launched in 2004 by 122 the Environmental Protection Agency (EPA) was conceived to support freight companies to 123 integrate sustainability throughout the supply chains (Bynum et al., 2018; Goetz et al., 2019). 124 By measuring and benchmarking freight transport efficiency and atmospheric emissions, the 125 SmartWay programme encourages collaboration between shippers, carriers and technology 126 providers. Technically, collaborative platforms allow them to calculate, communicate and 127 decrease the CO₂ emissions coming from freight operations. All the companies that take part 128 in the SmartWay programme receive recognition of their participation, which is then recorded 129 in a promotional magazine. As is underlined in their 2019 report, since 2004 Smartway has 130 helped subscribers to the programme to save 312 million barrels of oil that corresponds to the annual electricity usage in over 20 million homes¹. These estimates provide a useful overview 131 132 of SmartWay's effectiveness.

In Asia, mention can be made of the China Green Freight Initiative (CGFI), which has replicated many key elements from the SmartWay partnership model. Launched in 2012, this public-private partnership aims to enhance carriers' fleet operational performance through better loading practices (Liu et al., 2019). The CGFI is based on an action plan divided into 3

¹ Accessed on January 12th 2021: SmartWay Saves Money and Contributes to American Prosperity: https://www.epa.gov/smartway/smartway-program-successes

137 main parts: 1) improving fleet standards as well as their management through better loading 138 practices, 2) promoting the adoption of green technologies and 3) establishing eco-driving 139 practices (Bynum et al., 2018). Furthermore, two standards known as "the Green Freight 140 Enterprise Standard" and the "Green Freight Vehicle Standard" have been developed to 141 reinforce companies' behaviour through recognition of their achievements. Besides this 142 Chinese programme, the Green Freight Asia (GFA) network, which is a nonprofit 143 organisation, commits member companies to decreasing their fuel consumption and their road 144 freight journeys across the Asia-Pacific Region. Initiated by DHL and UPS in March 2015, this programme aims to encourage shippers into making conscious, 'green' sourcing decisions 145 146 when selecting a carrier based on its GFA Label rankings. Other studies, conducted shortly 147 after the Second United Nations Global Sustainable Transport Conference in Beijing, (5-7 148 May 2020), have highlighted the role of public private partnership (PPP) investment in 149 helping to restore ecological balance through sustainable transportation infrastructures 150 (Anwar et al., 2021).

151 In Europe, several voluntary policies encourage behaviour change as well as shippers 152 and carriers' interaction in order to improve freight transportation' environmental 153 performance. The Lean and Green programme for instance, offers significant opportunities to 154 cut down freight CO₂ emissions (Kaledinova et al., 2015). Currently involving more than 300 155 companies across Europe, this programme had initially just 10 participants in 2008 when it 156 was launched. After having identified three sources that are mainly responsible for 157 transportation CO₂ emissions (i.e., international transit, delivery and small vans, and work 158 vehicles) they encourage signing-up companies to come up with an emissions reduction 159 action plan. Subscribers can work on strategies in respect of route optimisation, empty 160 vehicles miles reduction, rail and barge utilisation as well as the use of alternative fuels. 161 Furthermore, companies are eligible for Lean and Green Award certification if they reduce 162 their transportation CO₂ emissions by 20 percent within a period of five years.

163 Other independent collaborative programmes such as the Logistics Emissions 164 Reduction Scheme (LERS) or the Carbon Trust Organisation, both set up in the United 165 Kingdom, assist companies as well as public entities to identify, measure and manage 166 emission hotspots. It provides them with the tools to achieve year-on-year reductions as well 167 as an independent certification system. Besides the various private initiatives, some European 168 freight regulations have been applied locally in the last decade to regulate freight CO₂ 169 emissions, in particular through "Low Emissions Zones" designations, where access by 170 polluting vehicles is restricted (Zhai et al., 2021). However, in light of the climate change

emergency, one may question why governments do not strive to implement collaborativeprogrammes on a national scale.

173 In the Eurozone however, France has initiated a series of voluntary and mandatory 174 measures in order to decrease pollution generated by freight transportation. On the one hand, the "Objectif CO₂" introduced in 2008 and developed by the French Ministry of Ecology with 175 176 ADEME and other freight transport professional organisations, was aimed at all carriers that 177 voluntarily agreed to reduce their CO₂ emissions. Complying companies have to undertake specific actions in accordance with issued guidelines and measure their actions in four areas: i) 178 179 vehicle standards; ii) fuel consumption; iii) driver behaviour; and iv) logistical efficiency. An 180 independent audit report which tests whether a given level of CO₂ emissions reductions has 181 been achieved for three consecutive years, enables participating companies to be certified as 182 being "Objectif CO_2 " compliant. In parallel, the already mentioned French legislation (decree 183 n°2011-1336) applicable since October 2013, obliges all carriers to calculate their CO₂ impact 184 according to four possible levels of accuracy, from level 1 based on estimations, to level 4 185 involving accurate data collection in respect of each journey's exact operating conditions. 186 These two voluntary and mandatory French schemes concern essentially carriers and reveal 187 information asymmetries as pointed out by Touratier-Muller et al. (2019). Furthermore, 188 scrutinising their impact on SMEs, the authors highlight the lack of requisite human resources 189 dedicated to monitoring transport-related CO₂ emissions.

190 The French Ministry of Environment decided that further steps needed to be 191 undertaken to increase awareness by shippers regarding CO₂ emissions generated by their 192 freight operations. This gave rise to the FRET21 project.

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2.2 The FRET21 initiative

195 The early French freight programmes focused exclusively on carriers, without addressing 196 shippers' environmental contributions. To address this issue, the French Shippers Council 197 launched a programme called "FRET21", a specific "shipper programme" that aims to 198 support shippers in reducing their freight transport's impact on the environment. With this 199 perspective in mind, ADEME with the support of the Ministry of Ecology launched this 200 project with just 10 participating companies to road-test the programme before rolling it out to 201 other shipper companies. By the beginning of 2021, 54 companies signed up to the 202 programme. The signatory companies have the option of implementing four different types of 203 action lines, divided into four axes

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 Table 1: FRET 21 charter main strategic thrusts

	Action line	Features
T 21	Loading ratio	Optimisation of palletised loads, delivery conditions, reduction in empty runs, pooled supply management.
	Distance	Optimisation of distance travelled between the production/distribution site and the customers.
	Means of transport	Selection and optimisation of road vehicles, use of alternative routes.
	The purchasing services	Considering overall environmental performance as well as CO_2 data when selecting a carrier.

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Although these four axes include all aspects of the FRET21 project, no concrete tools have been proposed to develop the "purchasing services" function. Therefore, there is a need to scrutinise the shippers' actual transportation services purchasing process. Essentially, the better one understands the behaviour of companies including their motivation in developing internally and externally sustainable transportation systems, the more likely one is able to facilitate the expansion of sustainable freight programmes.

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3. Sustainable freight procurement: literature review

3.1 Motivating factors in implementing sustainable freight practices 220

221 A growing amount of academic research reveals that sustainable purchasing policies can 222 generate significant financial benefits (Thornton et al., 2013; Li et al., 2016), the acquisition 223 of competitive advantages (Lash and Wellington, 2007), and better control of the company's 224 image (Worthington, 2009). However, the levers that encourage shippers to consider 225 environmental sustainability when choosing a carrier have scarcely been explored in the 226 literature. As underlined by Bask and Rajahonka (2017), limited knowledge about the 227 reasoning behind the choice of intermodal transport as a sustainable mode, or about the 228 transport mode selection criteria in tenders and transport contracts, represents a significant 229 gap in better understanding the freight transportation services procurement process. 230 Wolmarans et al. (2014) analysed some leading companies that strongly integrate 231 transportation sustainability principles into their overall corporate missions. Taking the 232 example of Wal-Mart, they highlight the benefit of shippers' top management being active in

integrating sustainability in their organisation. Additional research clearly states that top 233 234 management responsiveness towards environmental concerns (Björklund, 2011) as well as 235 employees' values (Gelderman and Van Weele, 2002), have a genuine impact on the purchase 236 of greener transportation services. None of these studies however, precisely researched 237 shippers' commitment towards a specific voluntary sustainable freight programme. While 238 Kumar (2021) points out the importance of having a transportation programme that could 239 assess shippers' sustainability practices, the study does not explore how the shippers could be 240 motivated into adopting such a scheme. In addition, governmental legislation (Jazairi et al., 241 2020; Walker et al., 2008; Lin and Ho., 2008), isomorphism (Sholtens and Kleinsmann, 2011) 242 and final customers' requirements (Touratier-Muller et al., 2019; Walker et al., 2008), seem to 243 exert a strong influence on green freight services procurement. For instance, a previous study 244 conducted among small- and medium-sized enterprises (SMEs) in France by Touratier-Muller 245 et al. (2019) explored the consequences of the previously mentioned decree 2011-1336, which 246 required all carriers to calculate and convey their CO₂ imprint to their customers. The study 247 reveals that freight companies initiate green transportation activities when the process is 248 promoted by customer requests.

249 Different actors can encourage carriers to integrate transportation sustainability thanks 250 to the cascade effect (Wolmarans et al., 2014). However, it seems that sustainable freight 251 proactivity may be undertaken by all types of shippers, irrespective of their size or sector. As 252 such, companies in the steel and mining industry in Sweden demonstrate a high level of 253 environmental responsibility in the way they conduct their business (Jazairi et al., 2020). 254 Whereas cultural patterns seem to shape actions in the logistics sector (Walker et al., 2008), 255 sustainability cultures seem to have a positive impact on sustainable entrepreneurial practices, 256 as is highlighted by Thornton et al. (2013). Their study pointed out that developed countries 257 are more inclined to encourage and reward socially responsible supplier selection.

258 Additional studies conducted by Rogerson (2016) and Bask et al. (2018) underline that 259 well- known, globally-operating shippers are the most inclined to be environmentally 260 sensitive for two main reasons: i) external pressures; and, ii) an obvious interest in acquiring a 261 competitive advantage. However, fieldwork practices have not demonstrated that signing-up 262 to a sustainable freight programme will turn out to be an advantage over competitors. Further 263 research demonstrates that a better transportation management system may lower costs over 264 time reducing cascade subcontracting and the multiplication of distribution networks, which 265 generate increased pollution and unnecessary costs (Plambeck, 2012). Substantial research 266 work remains to be undertaken however, to better understand the levers that drive some 267 companies to set up voluntary green freight programmes. Accordingly, while as already stated 268 the main research question we address in this paper is "how is the voluntary sustainable 269 freight programme 'Freight 21 charter' adopted and deployed by some proactive shippers in 270 France?", the first sub-research question to be considered is:

271 SRQ1: What motivates proactive shippers to join the French sustainable freight
272 transportation charter (FRET21)?

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3.2 The key role of shippers in making freight decisions and establishing selection criteria for carriers 276

277 As is underlined by Bynum et al. (2018, p. 4), "to influence behaviour in the freight sector, 278 one needs to understand the roles of each participant, [...], the gaps and challenges that 279 confound decision-making and implementation". Since shippers make major freight decisions 280 covering which carrier to contract, the timeliness of delivery and pickup, transport modes as 281 well as the packaging of products, it is crucial to get a better grasp on carrier services 282 procurement operations. From this perspective, it would be particularly relevant to scrutinise 283 the decision-making process in order to observe which department makes what decisions 284 regarding transport procurement, including decisions regarding incorporating sustainable 285 values. From a theoretical point of view, the Webster and Wind's model (1972), of industrial 286 purchasing behaviour suggests that the decision-making process for industrial purchases 287 derives from a large set of individual characteristics, inter-professional relations between 288 members (users, advisors, decision makers and buyers), organisational characteristics and 289 environmental factors (economic, legal, technological). This paper follows this approach 290 since the purchase of freight services within a company is at the intersection of various 291 expectations and objectives. Within the shipper companies, the paper helps understanding 292 which department plays the key role concerning the transport services purchasing decision, 293 prioritising accordingly interests, methods and means when choosing the carriers.

Research conducted by Small and Winston (1999) and Rogerson et al. (2014) finds that managers working for the purchasing department are often the decision-makers, whereas other studies reveal that the supply chain department exerts a stronger influence (Meinberg and Muller, 1995, Fahimnia et al., 2015). However, the lack of diversity in the authorship as well as in the locations where these studies were conducted gives rise to several limitations.

Additional research underlines that transport decisions are often shared between several departments (Gentry and Farris, 1992; Drewes et al., 2003). This may include various people working in inventory management, purchasing, or supply-chain departments. Regardless, it is 302 essential to understand how the selection criteria in respect of carriers are determined. Various 303 research findings, involving field surveys of various companies in different countries 304 highlight that service quality and cost are the two most important criteria when selecting 305 carriers (Van Laarhoven et al., 2000; Marasco, 2008; Lammgard et al., 2012; Rogerson, 306 2017). Other studies conclude that service quality, on-time delivery reliability (Van 307 Laarhoven et al., 2000), supplier responsiveness and the amount of paper work requiring 308 completion (Axelsson and Wynstra, 2002) are determinants. However, a carrier's 309 environmental performance is frequently mentioned as an influencing factor in decision-310 making while not yet constituting a selection criterion (Large et al., 2013; Touratier-Muller et al., 2019), except in the findings of Theißen and Spinler (2014). Comparative research 311 312 conducted in France and Sweden by Touratier-Muller et al., (2020) point out however that the 313 Swedish shippers put more emphasis on carrier ISO certification, in comparison to French 314 shippers.

315 Several questions need answering to understand how some companies that voluntarily 316 adhere to a sustainable freight programme organise their transportation services procurement 317 process. Accordingly, the second sub-research question may be formulated as follows:

318 SRQ2: Which department inside shipper companies committed to sustainable freight chooses
319 the carrier, and how are the selection criteria coordinated?

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321 3.3 Impact of sustainable freight practices on the participating companies intra- and inter 322 organisational networks 323

324 Commitments and actions towards sustainable practices can naturally transform relationships 325 and working methods inside and outside the company. In order to spread green freight 326 programmes on a larger scale, it is important to identify different changes that may occur 327 when a company chooses to commit itself to such a project. Research studies inspired by the 328 International Marketing and Purchasing (IMP) approach concerning inter-organisational 329 networks underline that trade is not limited to simple transactions, but consists of established 330 relationships as well as visible characteristics between the organisations (Ford and 331 Håkansson, 2005). The interaction model followed by this study is shown in Figure 1, as it 332 seems appropriate to scrutinise the impact of the FRET21 programme on the shippers' 333 networks. This model is based on four key elements:

The participants: the carrier and the shipper. It is important to describe their status and
 their relationships of influence in their respective organisations.

- 336 The interaction process, which reflects the content of the exchanges as well as their 337 evolution over time.
- 338 The atmosphere of the relationship, which refers to the power or dependency of the 339 actors, the cooperation or the expectations generated by the interaction. In our case, it 340 could include the CO₂ information expected by the shippers.
- The environment of the interaction that refers to the market structure, as well as social, 341 • 342 political, economic or cultural contexts. Concerning our specific topic, this dimension 343 could allude to voluntary and mandatory sustainable freight initiatives set-up by the 344 French government.

345 346

Figure 1: Interaction model applied



359 360

Note: This model has been adapted from that proposed by the International Marketing and Purchasing.

361 Now that these four elements are defined as key to the study topic, one may discern 362 that each element can have an impact on the interaction process. Each company, both shipper 363 and carrier, has its own organisational, human and technological specificities that will 364 influence the eventual consideration of the adoption of sustainable development, and that will 365 also transform its dyadic networks as a result. Accordingly, the 10 shipper companies that are 366 committed to the FRET21 charter may have developed specific organisational capacities in 367 sustainable transport, driving change in their relationships with their carriers. The atmosphere 368 (accurate CO_2 emissions information expectations by shippers, for example) as well as the 369 environment (decree 2011-1336 applicable to all carriers in France) could also influence the 370 interaction of both agents. Ryan et al. (2012), who applied the IMP perspective to explore 371 environmental sustainability, underline that policymakers and politicians have the opportunity

to collaborate with business leaders, commercial and social network members in order toinstall an ecological sustainability orientation within the whole market system.

374 From a sustainable transport perspective, intra-organisational collaboration (Lin and 375 Ho, 2008; Kayikci and Stix, 2014), as well as inter-organisational collaboration (Guajardo, 376 2018; Kayikci and Zsifkovits, 2012; Kumar, 2021) emerge as being key environmental 377 benefits for both carriers and shippers. From an intra-organisational perspective, Kavikci and 378 Stix (2014) underline that collaboration between freight transport employees and their 379 departments can significantly contribute to maximising truck-loading capacities, reducing 380 costs and the environmental impact while improving flexibility. In the same vein, in order to 381 reduce CO₂ emissions and save fuel, United Parcel Service (UPS) clearly strengthened intra-382 organisational collaboration by providing all their departments and branches with the same 383 software. This initiative greatly facilitated and optimised their logistics process (Lin and Ho, 384 2008). Other studies exploring inter-organisational collaboration, underline that having 385 collaborative tools and mechanisms with external actors encourages greener transport 386 management systems by facilitating the exchange of data between shippers and carriers 387 (Kayikci and Stix, 2014). Following this approach, the results of research by Kumar (2021) 388 point out that collaborative partnership between freight transport companies would improve 389 vehicle loading and reduce fuel consumption. However, the results of these studies often only 390 apply to a single country (India in this particular case), with only a limited number of freight 391 transport companies being studied. In addition, several case studies, which have been 392 conducted by Guajardo (2018), reveal the benefits of collaborative freight transport practices, 393 by reducing CO₂ emissions by up to 54%. Such collaboration enables reductions in 394 transportation costs as well as carbon footprint. Therefore, the shipper obtains much better 395 service levels and the benefit of receiving standardized data. To complement these studies, 396 McClelland and McKinnon (2004) as well as Léonardi et al., (2004) advocate the use of 397 telematics to decrease transportation CO₂ emissions by gathering accurate information. 398 Although these collaborative tools make it possible to assess transport efficiency, resources 399 and costs (Léonardi et al., 2004), this type of transparency is possible only if the level of trust 400 between collaborators is high. It is furthermore more time-consuming to put these tools into 401 practice. Arising from these findings, the question arises if a green freight programme would 402 affect intra- and inter-organisational networks. Accordingly, the third sub-research question is 403 formulated as follows:

404 **SRQ3:** *How does a voluntary sustainable freight program such as the Freight21 charter* 405 *influence intra- and inter-organisational networks?* 406

407 **4. Methodology**

408 Exploratory research design (McCutcheon et al., 1993; Yin, 2009) based on the study of a 409 limited number of carefully selected cases seemed appropriate to observe the extent to which 410 environmental factors were considered and used in the transportation tender process. 411 According to Yin (2009), case studies are especially relevant for answering 'how' or 'why' 412 questions and when an in-depth description is needed. In addition, Miles et al. (1994) assert 413 that the use of multiple cases allows researchers to obtain a deeper grasp of phenomenon, 414 gathering illustrations that are more sophisticated and which provide definitive clarifications 415 (Miles et al., (1994). Therefore, the whole methodological approach is used in this study.

416 *4.1 Case selection*

417 The FRET21 charter, which has been enacted since May 2015 is relevant in exploring the 418 purchasing process of shippers who are committed to sustainable freight as well as the impact 419 that such a commitment has on intra- and inter-organisational networks. The 10 companies 420 that signed-up to this pilot project provide an authentic field study group. Their geographical 421 locations, as well as their size and industrial sector are very diverse (see Table 2). 422 Furthermore, as emphasized by Symon and Cassell (1998), case diversity is a crucial criterion 423 when conducting this type of qualitative research. Each of these companies yields a different 424 insight depending on its strengths and weaknesses. The richness of the case study arises 425 largely from this multi-facetted perspective.

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Table 2. Signatory companies under the TRET21 charte.	Table 2:	Signatory	companies	under the	FRET21	charter
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Company	Industrial sector	Size	Country of origin	Person interviewed
Air products	Petrochemicals	Large	U.S.A	Supply Chain Manager
Carrefour	Mass distribution	Large	France	Sustainable Supply Chain and Transportation Manager
Coca-Cola	Food industry	Large	U.S.A	Sustainable Supply Chain Manager
Ferrero	Food industry	Large	France	Transportation Purchasing Manager
Fleury Michon	Food industry	Large	France	Transportation Purchasing Manager
Hénaff	Food industry	Medium-size	France	Transportation Purchasing Manager
Orrion Chemicals Orgaform	Chemicals	Small	France	Transportation Purchasing Manager
SCA Hygiana Products	Hugiana saatar	Largo	Swadan	Supply Chain Director (SCA
SCA Hygielle Floducts	Hygielle sector	Laige	Sweden	Incontinence Care, South Division)
Saing-Gobain	Duilding motorials	Largo	France	Supply Chain Director, and 2
(Placoplatre)	Building materials	Laige		Transportation Buyers
Renault	Automotive	Large	France	Environment Supply Chain Director

429 **4.2.** Data collection from multiple sources

430 This qualitative exploration in the form of multiple case studies is based on diverse data 431 collection approaches. Diversified sources of evidence are chosen as is recommended by 432 McCutcheon et al. (1993) and Yin (2009) to ensure reliability and validity. Face-to-face 433 interviews were first carried out in the premises of the ten companies, accessing their internal 434 procedures and gathering direct observations. As is highlighted by Patton (2002, p. 21) "To 435 understand fully the complexities of many situations, direct participation in and observation 436 of the phenomenon of interest may be the best research method". Various documents, 437 organisation charts, internal purchasing procedures were also collected. Once the data were 438 analyzed for each company, face-to-face brainstorming sessions with the 10 participants were 439 carried out in the Association of Users and Freight Transport's (AUTF) premises, which 440 helped, enrich our understanding of the outcome and provided external validity to this 441 research (Symon & Cassel, 1998).

In respect of the individual interviews, the brainstorming interview guide was drawn
up based on the literature review and the specific features of French freight programmes (see
Appendix 1). The final interview guide contained 28 questions covering four main themes:

445 <u>Theme 1:</u> Motivation, resources, and difficulties related to the signing-up to the FRET21
446 charter

447 <u>Theme 2:</u> Transport purchasing process and awareness of environmental criteria

448 <u>Theme 3:</u> Use of the CO₂ transport information and the identification of future needs in order

to better develop the FRET21 programme

450 <u>Theme 4:</u> Impact of signing-up to environmental standards (FRET21 charter included)
451 regarding partner collaboration (inter-organisational dimensions)

452 In-depth interviews were conducted in order to "get the person being interviewed to 453 talk about experiences, feelings, opinions and knowledge" (Patton, 2002, p. 354). The 454 interviewed person was selected according to three criteria: i) length of ongoing dealing with 455 the carriers over time; ii) participation in the transportation services purchasing process; and, 456 iii) degree of expertise on the environmental strategy of the company. The face-to-face 457 interviews with the 10 companies were undertaken all over France and each interview (lasting 458 for about two hours) has been fully recorded, transcribed and coded, meticulously following 459 the recommendations advocated by Dumez (2012). This method of "typing and organising 460 handwritten notes offers another opportunity to immerse in the data in the transition between 461 fieldwork and full analysis, a chance to get a feel for the cumulative data a whole" (Patton, 462 2002, p. 441). Furthermore, this technique enables verbatim transcriptions.

463 **4.3.** Data analysis and validation

464 As is underlined by McCutcheon et al., (2013; p.239) "relevant details must be sorted from 465 the mass of observations, comments, reports and interviews." After having selected internal 466 data and field notes "that the observer believes to be worth noting" (Patton, 2002, p. 302), a 467 coding process was used, based on reading, analysing and underlining key answers and 468 keywords, question by question, so that the responses from these 10 companies to the same 469 question were grouped together. This cross-case analysis provides a way of combining 470 answers from different respondents to common questions (Patton, 2002, p. 438). A coding 471 frame appears progressively, highlighting the main theme and sub-theme elements. An 472 example of this coding structure can be observed in Appendix 2.

Finally, in describing the results and synthetising this cross-case analysis, the challenge was to "retain the uniqueness and holism of accounts" (Noblit and Hare, 1988), identifying and extrapolating lessons learned from these 10 cases.

476

477 **5. Results and discussion**

478 5.1 Motivating factors in implementing the FRET21 charter

479 Table 3 summarises the main reasons that led the companies to sign-up to the FRET21 480 voluntary freight transportation programme. As can be seen, the existence of a global 481 environmental policy approach communicated by the top management as well as employee 482 environmental values, have significant influence on purchasing greener transportation 483 services decision-making. This observation can be associated with the C3 and C8 484 explanations: "This project is part of the company's values, in line with the CSR approach 485 implemented over the past 2-3 years (C3)"; "Our company is very proactive on voluntary 486 environmental initiatives (C8).

This outcome justifies the commitment to and the signing-up to the FRET21 charter. Deepening the work of Gelderman and Van Weele (2002), the results show that employees working in the supply chain department are a strong driving force, willing to undertake pioneering work in their respective duties. This argument is for instance developed by C8 "Our marketing department calculates the CO_2 emissions of the product without including the emissions generated by the transport. It is then important that the supply chain department initiates such procedures."

The global shippers' primary motivation is naturally to obtain a competitive edge over other shippers and to acquire financial advantages as well, as was perceived by previous research (Thornton et al., 2013; Li et al., 2016). Four of the respondents also mentioned that 497 signing-up to the FRET21 charter represented a real environmental challenge as well as 498 promoting a team spirit: "This is a theme that brings teams together, especially young 499 employees (C1)", "it's a way to reboost the involvement of our team (C10)".

500 In line with the findings of Worthington (2009), the 10 interviewed French shippers also wish 501 to enhance the company's image, thereby taking public opinion into account.

502 The results also reveal that external pressures such as government legislation, 503 normative isomorphism as well as final customers' values did not play any role in the 504 FRET21 deployment project. However, half of the companies looked for assistance from 505 ADEME in the provision of calculation tools, as well as in their managerial procedures, as 506 exemplified by C6: "This personalized accompaniment helps us use the tools correctly. This 507 learning pathway allows us to acquire new practices".

508 Some of the respondents see in this environmental commitment an opportunity to 509 share best practices and learn from other shippers' latest experiences as C5 explained: "It is an 510 opportunity to exchange ideas with other shippers. Their CO₂ emission reduction practices 511 may be relevant and inspiring for our own company". Referring to the interaction IMP model, 512 our results reveal a remarkable shared willingness to strengthen horizontal collaboration. 513 Therefore, our research context goes beyond the IMP vertical interaction process between a 514 carrier and a shipper as it allows shippers between themselves to look at improving their 515 environmental actions. Some of them even ponder how to pool their road transport operations 516 with other shippers or even competitors. Sustainable transport is then initiated, motivated and 517 deployed thanks to this horizontal inter-organisational collaboration. ____

518	Table 3: Internal and external incentives model	tivati	ng co	ompa	nies	to joi	n the	FRE	ET21	chart	er

Motivations for joining the FRET21 charter		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	Strengthening the company's values	•		•	•	•		•	•	•	
	Communicating a good image	٠			•		•		•		
	Generating team spirit	٠			•					•	•
	Reducing costs	•		•		•	•				
Internal incentives	Launching environmental actions in the field of logistics			•			•		•		
	Working with carriers in the environmental programmes initiated		•							•	
	Formalising and valourising environmental work that had previously been undertaken	●									•
	Assisting with understanding the measurement and data collection tools			•	•	•	•	●			
External incentives	Sharing best practices with other companies	•		•		•		•			
	Communicating these practices with external partners (distributors, consumers)		•						•	•	

519 Note: The companies' names have not been disclosed for confidentiality reasons

520 In another vein, our results underline that company size and industry sector do not 521 influence the motivation of shippers to sign-up to this voluntary freight programme. Large 522 firms and SMEs in the sample voluntarily comply with the FRET21 charter, incorporating 523 sustainability into their transportation services purchasing process. One firm with only 40 524 employees for instance, showed great proactivity and a strong desire to improve its 525 sustainable transport purchasing system. Whereas the findings of Rogerson (2016) and Bask 526 et al. (2018) underline that larger shippers are more disposed to implementing sustainable 527 transport practices than smaller enterprises, our results indicate that SMEs can also be highly 528 involved in the process. Finally, although the shippers' countries of origin varied, in each case 529 the parent company comes from a developed country. Therefore, one may strongly conclude 530 that socially responsible supplier selection is more encouraged and rewarded in developed 531 countries, as was stated by Thornton et al. (2013). From a theoretical standpoint, these 532 cultural characteristics can constitute the "Environment", within the IMP interaction model. 533 In this way, companies coming from developed countries seem to engage in more 534 environmentally conscious behaviour, mainly due to the influence of different cultural 535 motives.

536

537 5.2 The key role of the supply chain department in deciding to join the FRET21 charter as 538 well as the decision-making criteria when choosing a carrier

539 The main findings of our research suggest that the supply chain department has a strong 540 influence on top management in shipper companies, thereby encouraging different 541 departments' participation in the FRET21 charter. These results are reflected through the 542 following verbatim conversation: « Our supply chain department has the leading role on this 543 subject (C3) », « The supply chain management did a presentation to headquarters expressing 544 its wish to sign-up to the FRET21 charter; this has been accepted by the top management 545 (C7) ». Companies deciding to sign-up to a voluntary freight programme with concrete goals 546 to decrease their transport CO₂ emissions do so for various reasons. Primarily, they wish to 547 positively respond to the mandatory (decree 2011-1336) and voluntary (Charter CO₂) 548 measures applicable to French carriers. Secondly, it comes from a strong desire to 549 demonstrate appreciation for the supply chain department in respect of their initiatives. Most 550 of the respondents (namely supply chain managers) felt excluded when the company initiated 551 global environmental actions.

552 In addition, our study underlines that the supply chain department participates more in 553 the choice of the carrier than the purchasing department. However, the decision-making often 554 involves both departments together. Various comments attest to these collaborative 555 purchasing operations by both departments such as "The purchasing department and the 556 supply chain department are the only ones, and we always work in tandem (C7)" or "The 557 supply chain department defines its requirements to the purchasers (C4)". However, the final 558 decision mainly comes from the supply chain headquarters, as outlined by the following 559 verbatim: "In any case, the purchasing department and the supply chain department have the 560 same boss, and that is the supply chain manager (C2)", "The drafting of the contract is up to 561 the purchasing department; however the final decision comes from the supply chain 562 department (C1)". Our results confirm the findings of previous research (Meinberg and 563 Muller, 1995; Fahimnia et al., 2015), which stated that the supply chain department is more 564 involved in the transportation organisation and decision-making processes. Although these 565 findings should be interpreted with some caution since the purchasing department personnel 566 account for half of the interviewees, they support the studies by Gentry and Farris (1992) and 567 Drewes et al. (2003). From a theoretical perspective, our results confirm Webster and Wind's 568 model (1972) in the sense that inter-professional relations between the supply chain manager 569 and the purchasing manager, combined with the company's organisational characteristics and 570 the adoption of the new FRET21 voluntary charter (environmental factors) influence the 571 whole purchasing decision process.

572 Scrutinising the criteria that are sequentially prioritised when selecting a carrier, our 573 findings indicate that cost is the primary selection criterion for most shippers in carrier choice. 574 For other shippers, service quality (punctuality, reactivity, truck availability) or safety 575 (especially for transportation of dangerous materials) remain the primary selection criteria. 576 The environment is an "incentive criteria" for half of the interviewed companies, 577 demonstrated in particular by shippers favouring carriers equipped with a Euro 5/Euro 6 fleet. 578 As far as carrier selection is regarded, most of the interviewed shippers had not yet made 579 transportation services purchasing decisions based on environmental criteria (six companies 580 from ten). The four proactive companies which have integrated carriers' environmental 581 performance award points to their carriers regarding their fleet-average emission standards, 582 fuel consumption, truck standards, truck consumption, or their engagement in signing-up to 583 the carriers' voluntary charter, Charte Volontaire CO₂. They also value sustainable freight 584 services proposals from carriers that use lighter trucks and those which set up benefit sharing, 585 as well as front hauling/backhauling practices. However, these factors do not constitute 586 decisive criteria in selecting a carrier, although a service "at the same price, but less polluting" 587 will be favoured. Therefore, contrary to Theißen and Spinler's work (2014), our study shows

that environmental concerns such as CO_2 transport emissions are not yet integrated into carriers' selection criteria. Finally, for six out of the ten surveyed companies, the duration of their contract with their carriers is not specified or lasts for one year only. This result is, however, paradoxical given that the shippers state their desire to have durable, stable and strong relationships with carriers. This outcome differs for instance from the environmentally proactive shippers, who were interviewed in Sweden and who had signed transportation contracts with carriers for durations of at least 2 to 3 years (Touratier-Muller et al., 2020).

595 5.3 CO₂ transport emissions information and identification of future needs to develop

596 *FRET21*

597 Examining in detail the transport services purchasing process among these 10 companies, an 598 analysis of their CO₂ emissions information generated by their freight operations was 599 developed. Accordingly, Table 4 summarises how the interviewed companies conduct the 600 work of calculating CO₂ emissions. As can be seen in Table 4, half of them have decided to 601 integrate an automatic calculation facility, thanks to their enterprise resource planning (ERP), 602 which centralises all their transport flows into a common system, as C3 noted: "We 603 consolidate all our transport flows on our own ERP system". Furthermore, six out of the ten 604 companies state that their calculation of CO₂ emissions is modelled on the methodologies 605 communicated by ADEME, as highlighted by C4: "We use the ADEME methodology. It is 606 thanks to this methodology that the CO₂ emissions efficacy of the carriers was assessed (C4)". 607 This result underlines that official standard calculation methods, communicated by the 608 government, are more deployed by shippers than in-house specific calculation models. 609 However, undertaking this task requires allocating specific human and material resources. 610 Consequently, these proactive companies have to acquire new software or set up their own 611 ERP, entrusting the task of monitoring the CO₂ emissions to a specific person (a trainee in 612 some cases). When discussing future prospects in respect of CO₂ emissions data collection 613 and the difficulties encountered to-date in undertaking this task, the respondents were dubious 614 about the effectiveness of decree 2011-1336. Not only did they emphasise the difficulty in 615 gathering CO₂ information from different levels, but also they raised doubts on the reliability 616 of the data provided: "I do not look at the CO₂ information provided by the carriers. Today we 617 consolidate this data internally, via our ERP and we have a level of accuracy that carriers do 618 not have (C2)". Consequently, there was real indifference as to whether or not the carriers 619 complied with decree 2011-1336. According to the IMP interaction model, this decree 620 representing "the environment" does not play a key role in strengthening shipper/carrier 621 interaction towards achieving better sustainable freight performance. The shippers would 622 prefer to work on having reliable and automated methods of data acquisition, by having 623 access to carrier telematics. It is in line with the findings of McClelland and McKinnon 624 (2004) and Léonardi et al. (2004) which highlight the use of telematics to gather accurate data 625 on the measurement of road transport efficiency. Some shippers already deploy these 626 practices, such as C1: "We have access to carrier telematics. For example, we know that a few 627 years ago we used to consume 33 liters per 100 kilometers and that we now consume 29 liters 628 per 100 kilometers". However, this example does not represent the experience of the majority 629 of the companies surveyed. From a theoretical perspective, this element incorporating "the 630 atmosphere" in the IMP interaction model remains as an unmet expectation.

631

Transport-related C	O2 emissions' management	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Means of transmission	Automatic calculations via the ERP of the shipper	•	•	•				•	•		
CO ₂ calculation methods	Using calculation method recommended by ADEME	•		•	•	•		•		•	
	Person dedicated		٠		•		•				•
Dedicated recourses	Training received				•	•			•	•	
and means	Investment in data collection tools				•			•		•	
	Internal tools parameterisation	•	•								•
Feedback in respect of French programmes agreed for carriers &	Shippers highlighting a lack of coordination between the FRET21 charter and decree 2011- 1336	•		•	•	•	•	•	•		•
shippers	Expected CO ₂ information from the decree (level 1,2,3,4)	-	1	3	3	4	3	4	4	3	4
Difficulties	Consolidating CO ₂ information from different levels (when coming from the carriers)		•	•	•						
encountered	Inability to use rail transport	•		•				•			
	Lack of time					٠			•		

632 **Table 4:** Current organisational capacities of the FRET21 charter signatory companies

633 634

Note: The companies' names has not been disclosed for confidentiality reasons

635 5.4 The FRET21 programme as a reinforcing mechanism of intra- as well as inter-636 organisational networks

637 Our results underscore that shippers who have signed-up to the FRET21 charter stimulate and 638 reinforce their intra- and inter-organisational networks. From an intra-organisational 639 perspective, the majority of the shippers involved in the FRET21 programme organise 640 meetings about this subject from once a week to once a month with different departments, as 641 highlighted by C8: "We succeeded in federating all the employees working in the supply 642 chain department and employees from different departments around this FRET21 project. We 643 meet once or twice a month". This approach allows the setting-up of action plans and the

644 coalescing of all the employees from various fields around a same goal. It also promotes the 645 transfer of knowledge. With reference to the IMP theoretical concept, and especially the work 646 conducted by Ford (2001), it is understandable how individuals within a company have 647 different motivations, attitudes and expectations, which alter their actions. When Håkansson 648 and Snehota (1995: p. 192) state: "It is individuals who endow business networks with life", 649 this quotation recognises that the interactions between companies are first affected by the 650 employees' intentions. In our specific context, the commitment to the FRET21 programme 651 allows employees working in the supply chain department to communicate and raise 652 sustainable transport awareness with other departments. Therefore, our results converge with 653 the findings of Kayikci and Stix (2012).

654 From an inter-organisational perspective, carriers are the primary stakeholders 655 mentioned who value the environmental implications of the ten shipper companies' actions. 656 This is shown by these verbatim comments: "With the FRET21 charter, our carriers became 657 strategic partners" (C4), "this reinforces the collaboration with carrier X (C3)"; "this really 658 empowers collaboration with our carriers" (C1). This voluntary programme unites various 659 businesses around resolving the same problem, thereby reinforcing their organisational 660 practices. This finding is in line with Kayikci and Stix (2014), who suggested that inter-661 organisational collaboration around a voluntary environmental programme is reinforced, 662 representing a real asset. However, the absence of common tools to measure and 663 communicate automatically the environmental impact of distances travelled is still lacking.

664 Furthermore, in line with other research focused on the IMP perspective, our results 665 establish visible characteristics of the relationships due to the positive influence of the 666 FRET21 charter. As pointed out by Ryan et al. (2012), specific organisational capabilities 667 such as the signing-up to this programme help shippers to consider carriers as real partners, 668 thereby strengthening collaboration. Finally, another inter-organisational network has been 669 established between these 10 shippers and ADEME, which provides them with methods of 670 calculating CO₂ emissions as well as new management practices to reduce and optimise 671 freight transport demand.

672 673

6. Conclusions

674 Conducting multiple case studies among the pilot companies that signed-up to FRET21 in 675 France facilitates understanding the main motivation as well as the transport services' buyers' 676 attitude towards environmental initiatives. Our study reveals a proactive and voluntary 677 involvement to reduce CO_2 emissions related to their freight operations, irrespective of 678 company size or sector activity. Our results also underline that the environmental sensitivity 679 of the shippers stems more from an internal dynamic, be it supportive employees or top 680 management. The willingness to sign-up to the FRET21 charter to be in line with their values, 681 communicates a good company image and unites teams around a solid environmental project. 682 Furthermore, our results stand out by revealing the leading role of the logistics department in 683 transportation services purchase decision-making. Not only do the logistics departments instill 684 a responsible transport strategy in the 10 companies surveyed, but they are also the 685 departments most likely to make the final decision in terms of transport services purchases. 686 Concerning carrier selection, although the environmental protection concern has an influencing influence during the tender process, our findings highlight that it does not yet 687 688 constitute a decisive criterion in carrier selection.

689 From a theoretical perspective, this study's findings provide a significant contribution 690 to the existing literature. Using the lens of the IMP interaction perspective, rich data about 691 shippers' intra- and inter-organisational networks were collected. On the one hand, the 692 FRET21 charter enhances intra-organisational collaboration, coalescing several departments 693 around the same environmental project, thereby enhancing internal communications. On the 694 other hand, the FRET21 project boosts interaction and targeted inter-organisational 695 collaboration with several partners: i) carriers; ii) ADEME; and, iii) other shippers. Carriers in 696 the sense that they value environmental-enhancing proposals and encourage initiatives to 697 decrease CO_2 emissions, by scrutinising their fleet of vehicles, their vehicle standards or by 698 engaging to sign-up to the voluntary sustainable freight charter. The interaction with ADEME 699 is based on trust and transparency since these shippers wish to obtain accurate CO_2 700 calculation methods as well as acquiring management practices to optimise freight transport 701 flows. Other shippers in the sense that these 10 shippers wish to share best practices and 702 experiences with each other. Finally, calling for more horizontal interactions between 703 companies from the same sector is quite innovative from an academic point of view. Some 704 respondents wish to pool road transport operations with other external stakeholders (other 705 sector shippers or competitors). However, these strategies are difficult to implement and are 706 not yet on the agenda, except in some specific industries, such as oil distribution. Finally, the 707 "atmosphere" which is defined as the expectation generated by the interaction according to 708 the IMP interaction model, points out that a more transparent technological measurement tool 709 is expected by shippers. The lack of reliable and transparent tools and a standard method to 710 measure freight CO₂ emissions impedes shippers and carriers from sharing the real benefits of 711 such environmental-enhancing efforts. At another level, the "environment" described in the

712 interaction model as the social or political context, underlines that decree 2011-1336 does not 713 seem to be a lever enhancing interaction between shippers and carriers. However, both agreed 714 voluntary measures for shippers and carriers seem to have a positive impact. Therefore, inter-715 organisational collaboration is more organised around environmental proactivity rather than 716 the obligation to calculate the CO₂ emissions.

717 Currently, from a managerial perspective, the results highlight a lack of coordination 718 between the voluntary programme FRET21 charter and the mandatory programme (decree 719 2011- 1336). Furthermore, the respondents wish to work with a reliable and automated 720 method in order to be able to compare the CO₂ emissions released by the carriers. Practical 721 applications stemming from this work can be used to support businesses, the French Ministry 722 of the Environment and various organisations such as the AUTF (French Freight Transport 723 Association). The most suitable action would consist of enforcing governmental sustainable 724 freight legislation requiring all carriers to comply with mandatory environmental standards. 725 An accurate measuring tool integrated into the trucks' telematics system would help more 726 accurately measure and compare carriers' environmental performance. This information could 727 be communicated automatically with transparency to the shippers.

728 This paper is not free from limitations. First, due to the small number of shippers in 729 the FRET21 pilot project, the generalisation of the findings is obviously not possible without 730 due caution. Secondly, the shippers were not chosen randomly but were a unique group of 731 shippers all imbued with the common desire to voluntarily commit to a sustainable freight 732 programme. For this reason, again, the results generated by this study should not be 733 generalised thoughtlessly. Thirdly, all companies visited and the supply chain directors met 734 during the interviews are based in France, which is to some extent a specific country in 735 institutional terms.

Additional future research would aim at helping to spread this freight programme to greater number of shippers in France. Currently, the FRET21 charter is based on four main strategic thrusts: i) loading ratio; ii) distance optimisation; iii) alternative transport modes; and, iv) the transportation purchasing service. Although ADEME has provided tools to work on the first three strategic thrusts, the procurement axis still needs to be supported. Additional future research expansion in this direction would help supply chain managers to set-up and follow concrete key performance indicators with the carriers.

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754	

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- 935

Appendix 1. Interview guide	936	Appendix	1:	Interview	guide
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- 937 (Comments in italics just allow the interviewer to relaunch the conversation if needed)
- 938
- 939 Introduction
- 940 Name of the company:
- 941 **Person interviewed** (Name, surname, function and department)
- 942 Date:
- 943 **Company's identity:**
- 944 - Activity sector
- 945 - Intermediate or final consumption goods
- 946 - Size of the company
- 947 - Product value (average value registered)
- 948 - Percentage of turnover accorded to transport modes
- 949 - Mode
- 950 - Regional/National/International
- 951 - Type: Full or low Truck load
- 952 - Quantities transported (Tons per year)
- 953 - Average number of carriers
- 954 - Number of strategic shippers
- 955 - Localisation
- 956

957 Theme 1: Motivation, resources, and difficulties related to the signature of the FRET21 958 charter

- 959 960
 - Who in your company took the initiative to adhere to the FRET21 charter? •
- 961 • Why did your company decide to sign this charter?
- 962 • What do you expect from the FRET21 charter?
- 963 • What are the means and resources that you dedicate toward this engagement? (tools, employee 964 training, people dedicated to special tasks, working hours)
 - Which departments/functions are the most impacted by the new charter?
 - Did you have any difficulties in having this new charter accepted inside your company?
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Theme 2: Transport purchasing process and awareness towards environmental criteria 968 969

- Where does the transport tender take place? At the headquarters of the production/distribution site?
 - Which departments contribute to selecting the carrier?
 - Who takes the final decision and formalises the contract?
- What is the «transport decider» profile (purchaser or logistician)?
- Are they open to sustainable transportation?
 - If yes, in what form? 0
 - o If not, what could be done to ensure greater environmental awareness?
- 978 • What is the usual contract period?
- 979 • What are the main criteria you select when choosing a carrier?
- 980 • Are they identical for regional, national or international carriers? (same question if there are 981 *full or low truck loads*)
- 982 • Is there a policy regarding environmental criteria in carrier selection? (environmental criteria 983 *written in the technical specifications*) 984
 - \circ If yes, how do you do it?
 - If not, why not?
- 985 986 987

988	Theme 3: Use of the CO ₂ transport information and future needs identification in order
989	to better develop the FRET21 programme
990	
991	• Where does the CO ₂ transport information come from?
992	• Method of calculation used? (ADEME methodology, European standards, internal
993	calculation)
994	• Regarding decree 2011-1336, what level do you expect?
995	• Level 1: default values provided for each mode of transport per type of activity or
996	means of transport.
997	• Level 2: average data measured by the carrier for all of its journeys.
998	• Level 3: average data measured by the carrier according to a breakdown of its activity.
999 1000	• Level 4: accurate data collection from the journey's exact operating conditions (load, energy consumption, occupancy).
1001	• How do you follow the CO ₂ information and the environmental performance communicated
1002	by the carriers? (Who does this task in the company, which tools are used, frequency, KPIs?)
1003	• Who diffuses the CO ₂ information internally?
1004	• Is this information communicated to your customers?
1005	• Do you organise audits with your carriers to control the CO ₂ information communicated?
1006	• Is the CO ₂ information that you receive from your carriers CO ₂ relevant and adequate?
1007	• If yes, why?
1008	• If not, why not? (<i>identify the areas needing improvement</i>)
1009	• What is the added value of the CO ₂ information? (<i>What will they do with it?</i>)
1010	• How do you think you can encourage your carriers to decrease their CO ₂ transport emissions?
1011	
1012	<u>Theme 4:</u> Impact of signing-up to environmental standards (FRET21 charter included)
1013	regarding partner collaboration (inter-organisational dimensions)
1014	
1015	• How did your partners react regarding your commitment towards the FRET21 charter? (New
1016	collaboration opportunity or new obstacle regarding emissions calculation, indifference, etc.)
1017	• Is there a working group with your main carriers?
1018	• Before the FRET21 project, did you participate with them in other environmental projects (in
1019	particular to reduce CO ₂ emissions)?
1020	
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1023	

1024Appendix 2: Sample of the coding structure highlighting the main theme and sub-theme
elements.

Main theme	Sub-theme elements appearing progressively	Number of times quoted
	image	3
Reasons for	cost concerns, economic issues	3
FRET21	Unit the teams	4
membership	support carriers since they had started to sign the CO_2 charter (designed exclusively for carriers)	2
	company's core values	7
	undertake environmental action as a Small and Medium Size enterprise	1
	launch a strategic environmental action in the supply chain field	3
	adapt to future new constraints, new regulations	1
	formalize a number of initiatives that had been undertaken by a working group	2

Main theme	Sub-theme elements appearing progressively	Number of times quoted
Expectations		4
from the FRET21 charter	Exchange ideas and initiatives with other shippers regarding their best practices	
	Enhance our image through actions taken to reduce CO ₂ emissions	3
	Communicate with employees, distributors, consumers (3)	3
	Be accompanied to understand the measurement and data collection tools	5
	Economic benefits	2
	Support our leadership in relation to our commitments	1