CHALLENGES OF URBAN DELIVERIES IN THE WHOLESALE TRADE: A COMPREHENSIVE ANALYSIS OF POLICY-MAKERS' SUSTAINABLE STRATEGIES[*]

Stéphane Sirjean[**] and Christian Morel[***]
Jonction Consulting

Gilles Paché[****]
CRET-LOG, Aix-Marseille University, France

ABSTRACT

Faced with the environmental challenges threatening the planet, a societal awareness seems to be emerging and gradually gaining momentum. The movement affects many human activities and questions the sustainable nature of industrial and logistical processes. This movement, which gives rise to an abundant literature, especially with a perspective of ecological economics, scattered works address the wholesaling trade, without always giving it the importance it deserves. Indeed, even as the sustainable city becomes a hot topic, it is often forgotten that the supply of the city remains largely in the hands of wholesalers, who have a key competence in last mile management. In reference to the French context, the paper addresses the topic of sustainability in the wholesaling trade by stressing in particular the regulatory constraints that weigh on urban logistics and which wholesaling trade must take into account.

***Key words**: City logistics, energy transition, France, policy-makers, sustainability, wholesale trade.*

บทคัดย่อ

การเปลี่ยนแปลงของสิ่งแวดล้อมถือเป็นภัยร้ายแรงต่อโลก ทั้งยังเป็นสิ่งที่กำลังอยู่ในความสนใจและเป็นที่ตระหนักในสังคม การเคลื่อนไหวด้านสิ่งแวดล้อมส่งผลต่อกิจกรรมต่าง ๆ ของมนุษย์และก่อให้เกิดคำถามในกระบวนการทางอุตสาหกรรมและโลจิสติกส์ การเคลื่อนไหวนี้นำมาซึ่งงานวิจัยมากมาย โดยเฉพาะอย่างยิ่งผลงานที่เกี่ยวข้องกับเศรษฐศาสตร์ระบบนิเวศ อย่างไรก็ตามงานวิจัยเหล่านี้ก็ยังไม่ได้ให้ความสำคัญกับธุรกิจค้าส่งอย่างที่ควรจะเป็น ถึงแม้ว่าหัวข้อเรื่องเมืองที่ยั่งยืนจะเป็นประเด็นที่กล่าวถึงกันอย่างกว้างขวาง แต่ก็มักลืมเลือนไปว่าอุปทานในเมืองนั้นยังตกอยู่ในมือของผู้ค้าส่งซึ่งมีความสามารถในการบริหารไมล์สุดท้าย บทความนี้เป็นการศึกษาในบริบทของประเทศฝรั่งเศส โดยกล่าวถึงความยั่งยืนทางการค้าส่ง โดยเฉพาะอย่างยิ่งข้อจำกัดทางกฎหมายที่มีต่อโลจิสติกส์เมือง รวมถึงข้อที่ธุรกิจค้าส่งพึงตระหนัก

คำสำคัญ: โลจิสติกส์เมือง การเปลี่ยนแปลงด้านพลังงาน ประเทศฝรั่งเศส ผู้กำหนดนโยบาย ความยั่งยืน การค้าส่ง

Received: May 3, 2019; Revised May 19, 2019; Accepted May 23, 2019

[*] The authors are grateful to the *Confédération Française du Commerce de Gros et International (CGI)*, the French Professional Association of Wholesalers and Intermediaries, for its financial support.

[**] She is Senior Consultant specialized in urban deliveries and the management of logistics process at Jonction Consulting, Aix-en-Provence, France. Email: sirjean@jonction.fr.

[***] He is Senior Consultant specialized in territorial development, city logistics and the railroad transport management at Jonction Consulting, Aix-en-Provence, France. Email: morel@jonction.fr.

[****] He is Professor of Retailing and Supply Chain Management at Aix-Marseille University, and director of the University Press of Aix-Marseille, Aix-en-Provence, France. Corresponding author Email: gilles.pache@univ-amu.fr.

INTRODUCTION

For many years, the role played by wholesalers in the implementation of an efficient intermediation has been largely underestimated. This is surprising because there are many examples that highlight the essential dimension of the wholesale trade in modern history. For example, Tangires (2019) introduces the interesting case of Baltimore (Maryland), which has had a major hub organized around the port since the 19th century: "*Baltimore was one big wholesale center, where public and private enterprise worked in combination to supply the city and region with a variety of commodities that came from around the world by various forms of transport*" (Tangires, 2019, p. 2). The low attention now paid to wholesalers is mainly explained by the fact that major large retailers have integrated the double dimension of the wholesale function, at the transactional and logistical levels, by setting up central purchasing offices, warehouses and platforms, effectively excluding wholesalers but including logistics services providers (LSPs), one of whose purposes was to efficiently organize supplies for small stores. However, the economic dynamism of wholesalers and their ability to offer technologically innovative solutions has remained consistent; the implementation of pooled systems that are particularly efficient in terms of transport, storage, and delivery routes is thus recognized by many observers (Cadilhon et al., 2003; Jones et al., 2017; Sirjean et al., 2017; Aljohani & Thompson, 2018; Pryor, 2018). After decades of neglect and even contempt, wholesalers are now at the heart of much research in marketing and supply chain management.

While an abundant academic literature highlights the excellence of LSPs (for a literature review, see Leuschner et al. [2014]), the logistics practices of wholesalers in this area concern a large number of companies (and jobs). However, the wholesalers acting as business-to-business distributors can take an "*innovation-oriented position*" in distribution channels other than the one imposed by manufacturers (Pardo & Michel, 2015). From this point of view, they are worthy of interest, especially since numerous analyses show that wholesalers are primarily virtuous (optimization of the use of logistics space, creation of jobs, skills, and value for the customer). This presents a paradox. It is commonly acknowledged that the multiplication of small consignments, over a large number of customers, has a negative impact on the environment. For example, collection by customers at wholesale platforms (as in the cash & carry format) generates numerous small vehicles in circulation that saturate the urban space. However, wholesalers are now offering increasingly sustainable solutions, in particular by adopting a model of pooled delivery rounds. Moreover, wholesalers are key players in the current energy transition, which is ultimately very poorly understood.

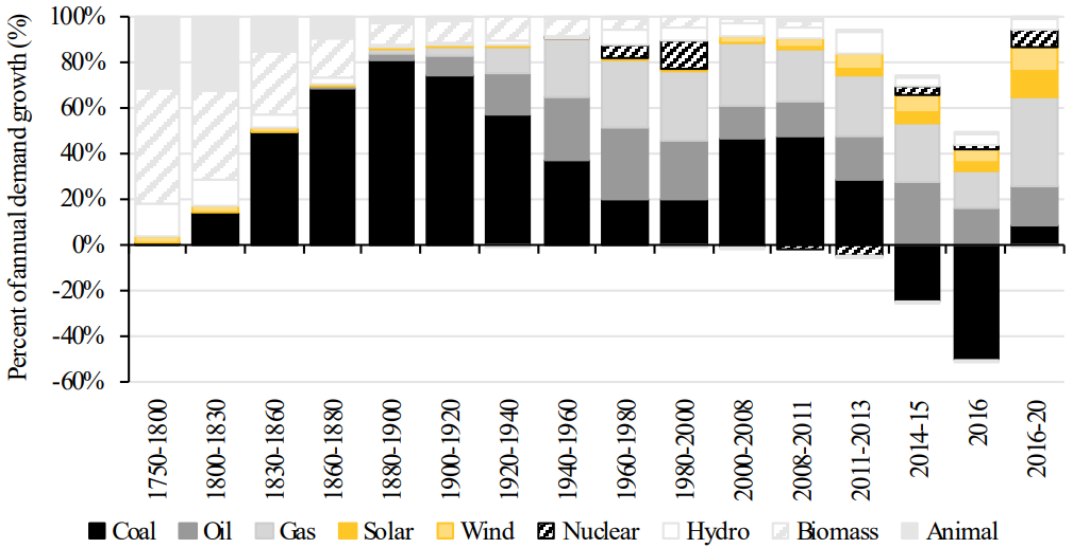
The aim of this exploratory paper is to suggest avenues for reflection regarding the role taken by wholesaling traders in the current development of sustainable strategies, with an emphasis on issues relating to urban logistics. The purpose here is to say that the energy transition will lead to rethinking many business models, and only companies ready to take up the challenge will eventually survive. To the extent that very important stakes specifically relate to the sustainable city, the position adopted is that wholesalers, whose key competence is based on efficient last-mile management in urban areas, are able to offer original solutions, provided that they anticipate and respond to regulatory constraints that weigh on the delivery of products in city centers. For this purpose, this paper is organized into five sections. In the second section, the concept of energy transition and its main issues is briefly presented. In the third section, the focus is particularly placed on sustainable transportation in the warehousing business, emphasizing the importance of digitalization. In the fourth section, an overview of

the possible local regulations is proposed before finishing, with a fifth section, on two key dimensions of the energy transition regarding the future of sustainable urban logistics.

SUSTAINABILITY AND ENERGY TRANSITION

The concept of energy transition appeared in the 1960s, but it was not before the 1980s that it began to generate in-depth reflection (Aklin & Urpelainen, 2018). The gradual shift from carbonaceous, polluting or unsafe energy to clean, renewable and safe energy (solar, wind, geothermal, and hydraulic) responds to a series of complementary challenges: (1) reduction of greenhouse gas emissions; (2) security of energy systems; (3) decentralization and redevelopment of infrastructures with better job distribution; (4) consumption reduction (energy efficiency); (5) reduction of inequalities in access to energy; and (6) protection of public health. The energy transition refers to the transformation of energy production, distribution, and consumption systems within a specific territory in order to make it more ecological (Gaston et al., 2001). Figure 1 highlights the evolution of global energy supplied by source over almost three centuries, with the increasing role played by fossil energy sources. An essential dimension of the "ecological transition" – energy transition – is also associated with sustainable development and climate change policies. Within the context of energy transition, a number of issues and challenges arise for manufacturers and large retailers with sustainable strategies. Indeed, energy transition does not simply mean building wind turbines and solar panels: it relates to issues as diverse as access to energy, the equilibrium between production and consumption, the price and cost of energy production, and the evolution and balance of a new and sustainable energy mix.

Figure 1: Global Energy Supplied by Source (%)



Source: Fattouh et al. (2018)

In France, Law No. 2015-992 (August 2015) on energy transition for green growth sets the main objectives to be achieved and a target calendar. According to the French government of the past President, François Hollande, it seeks to enhance France's energy autonomy, cut its greenhouse gas emissions and provide effective tools to all stakeholders in order to boost green growth. Among these objectives, all of them are of interest to the general public, but some will have an important effect on companies as they impact their business models. The main objectives are organized around two thematic types: (1) *performance* targets, such as

reducing greenhouse gas emissions (divide them by four by 2050 compared to the levels of 1990), or reducing energy consumption (halve it by 2050 compared to the levels of 2012); and (2) *resource* targets, such as reducing primary fossil fuel consumption (-30% by 2030 compared to the levels of 2012) and the corresponding increase in the share of renewable energy in energy consumption (up to 32% in 2030).

Concretely, the energy transition objectives will translate for companies into an in-depth reflection on how best to organize their transport, given their known effects on the environment, and on a reduction of wastes with an optimization of the use of existing energies ("zero waste" target and fuel poverty prevention), at first, as well as a search for alternative economically viable energy sources in a second phase. If the perspectives of optimization deployed in terms of logistics and transport are today illuminated by a new perspective, through their contribution to the energy transition, they are based on an old idea, and disseminated in the academic literature: the search for supply chain efficiency by a drastic reduction of wastes and redundancies in flow monitoring (Christopher, 2016; Genovese et al., 2017). More broadly, as shown in Table 1, the main challenges of the energy transition can be broken down into three complementary pillars to accompany the present pathway towards transformation of the global energy sector from fossil-based economy to zero-carbon economy: an environmental pillar, an economic pillar and a societal pillar.

Table 1: Main Issues of the Energy Transition

Pillar of sustainable development	Main issues of the energy transition
Environmental	– Reduce greenhouse gases – Secure energy systems (eventually, nuclear abandonment)
Economic	– Decentralization and redevelopment of infrastructure, with better distribution of jobs – Decrease in consumption (energy efficiency)
Societal	– Reduce inequalities in access to energy and progress in energy independence – Protect the health of populations

At present, particular attention is given to large manufacturers, who must rethink their organization and strategy in order to meet the challenges of energy transition. On the other hand, little academic attention has been paid to wholesale trade, even though it is central to the dynamics of modern economies. Although an exhaustive literature highlights the operational excellence of LSPs, and policy-makers tend to underestimate the weight of wholesalers, they are in fact at the heart of deep transformations in the field of logistics and supply chain management. Wholesalers present themselves as "virtuous organizations" that are able to reduce the environmental impact of their operations in terms of waste management, optimized round deliveries, and efficiency within transport and distribution activities (Jones, 2017). Past research conducted on the logistics practices of wholesalers has shown that the commitment to work towards sustainable development is becoming increasingly strong in France (Sirjean & Boudouin, 2017). Consequently, it is interesting to clarify the issues associated with energy transition in the French context, and to present the regulatory constraints that the wholesaling trade must take into account to develop and maintain a competitive advantage.

TRANSPORT AND DIGITALIZATION IN THE WHOLESALE TRADE

Transport management is one of the major components of the management of physical flows within the framework of companies' logistics policies, even if this dimension has gradually been considered as secondary in relation to strategic issues related to the implementation of industrial systems to operate on larger scales. Wholesalers do not escape the reality of transport, known since the founding works of Kolb (1972) in France, in the early 1970s. However, the transport problem cannot be disconnected from the flow of information, the control of which is an essential condition to improve flow control, most often put in tension to reduce the level of stocks along the supply chain (Christopher, 2016). From this point of view, it seems appropriate for us to approach the wholesale logistics practices regarding transport in reference to the digital tools mobilized and their contribution to the improvement of these practices. As underlined by Kane et al. (2015), having the right information system in place, collecting the right data and of the right quality, is imperative in the business environment ahead.

Conventionally, digital tools are mobilized by the different functionalities of an information system, and affect the processes of acquisition, storage, processing and communication of data needed to control physical flows. Without concern for completeness, it is possible to mention tools, systems and technologies concerning data (Smart Data, Big Data, Open Data), total traceability, customer relationship (via an effective CRM), flow management and inventory, simulation and optimization (TMS, WMS, among others). Tools, systems and technologies can be used in a static mode, within warehouses and wholesale logistics services, but also in a dynamic mode, to connect different supply chain members with each other and with customers and suppliers. It remains to be seen how tools, systems and technologies interact with the internal and external organizational processes of the wholesaler, and how to improve the physical and informational interfaces.

The overall performance of a supply chain refers to notions of fluidity and continuity of flows, which can only be truly achieved if there is a perfect link between the steps to market products and an ongoing collaboration among all stakeholders. Within this system, intermediation is designed to facilitate the link between supply and demand by connecting several players with complementary interests. The management of flows must then involve various levers and information tools, to communicate indifferently internally and externally with the same level of performance, responsiveness and reliability. The efficient implementation of the levers and tools suppose that the wholesaler, the *middle company*, to repeat the words of Pardo and Paché (2015), acquires a sophisticated information system allowing it to anticipate (planning), to organize (management systems), to control and monitor (dashboards) all physical flows. In fact, it is better understood that digital tools are identified at all stages of mobilization and monitoring of logistics resources: (1) at the level of vehicles (with the reduction of consumption, geolocation, and the maximization of the loading rate); (2) at the level of information systems (with the traceability of flows, the optimization of the rounds); and (3) at the level of the link with the clients (with the EDI, real-time hazard management).

The contribution of digital tools to the improvement of the processes and the organization of transport is part of a global response to societal and environmental issues, through the possibility of improving the organization of the circulation of products, especially in urban area. Here we find problems of quality of life and reduction of negative externalities suffered

by the inhabitants (Taniguchi, 2014; Nathanail et al., 2017; Pichereau, 2018). According to the French data from the *Service de l'Observation et des Statistiques* (*SOeS*, Observation and Statistics Service), light commercial vehicles generated 19% of road transport CO_2 emissions but represented 16.5% of road traffic in 2016. CO_2 emissions have increased by 33.1% since 1990, while their traffic has increased by 60%. Heavy trucks, on the other hand, account for 21% of road transport CO_2 emissions, while they account for only 5.2% of road traffic. Heavy truck traffic fell by 13% between 2007 and 2016, while their CO_2 emissions decreased more rapidly (by 19%). Table 2 shows the air pollution implications of heavy trucks (which run entirely on diesel) and light commercial vehicles (depending on whether they run on diesel or gasoline).

Table 2: Cost of Air Pollution per Transported Ton (fully loaded vehicles)

Cost of the ton transported (€ 2015)	Very dense urban	Dense urban	Urban	Urban sprawl	Intercity
Heavy trucks (diesel)	5.84	1.16	0.55	0.29	0.20
Light commercial vehicles (diesel)	14.51	3.91	1.56	1.14	0.78
Light commercial vehicles (gasoline)	5.03	1.46	0.67	0.56	0.56

Source: Adapted from Pichereau (2018)

In these circumstances, it is not surprising that many studies on the energy transition place importance on the road transport of products. For example, Klitkou et al. (2015) study the process of lock-in, which they use to try to understand the "*persistence of fossil fuel-based environmental systems despite the fact that their well-known environmental externalities contribute to climate change*" (Klitkou et al., 2015, p. 22). It is true that the question is essential in reference to the data relating to sustainable city logistics. Product transport in urban areas is responsible for 15% of carbon monoxide emissions, 41% of nitrogen oxide emissions and 50% of fine particulate matter emissions. In addition, about 25% of fossil fuel consumption and 50% of fine particulate emissions are attributable to urban mobility (Albergel et al., 2006). These figures cannot leave policy-makers indifferent to the extent that they face populations that increasingly require a pleasant city to live in, and rid of pollution that impacts those who are most vulnerable (children, seniors, chronically ill). It follows that drastic regulations are not without effect on the wholesale trade.

Such data, which have a direct impact on the health of individuals, are now known and can no longer be ignored by policy-makers. Moreover, the political dimension associated with logistics, especially urban, gives rise to research that campaigns for increased interventionism (Papageorgakopoulos & Wall, 2015; Sirjean et al., 2018). The use of digital tools to better manage the halting of vehicles in cities (and their duration), to inform the availability of a delivery space, or to better regulate traffic, clearly contributes to improving the useful times of presence of vehicles in the urban space. Thus, a van parked in front of a small store, a truck delivering materials to a building site, a van supplying the craftsman, a vehicle picking up waste, etc., can be better synchronized with the need for reception or removal, closer to the moment when it is expressed. These are important prospects for wholesalers, whose logistical practices have always been closely linked to the city's supply activities, but which must take into account the requirements of policy-makers regarding the sustainability of the city.

LOCAL REGULATIONS

The question of stricter regulation of road transport to facilitate the energy transition is now a European priority. The European Union has therefore initiated a *general approach* (a common position) on the instrument setting CO_2 performance standards for heavy trucks and new light commercial vehicles. The Ministers of the Environment have therefore voted for a 30% reduction target for the average CO_2 emissions of new vehicles registered in the European Union in 2030, and for an intermediate target of 15% by 2025. If activism is therefore significant at the highest political level, it is also, and above all, very dynamic locally. Certainly, the mayor of a city cannot permanently prohibit in France and throughout his territory, a category of vehicles on the grounds that they pollute. Restrictive regulation must be limited to certain hours, allow for credible alternatives (for example, detour routes) and possibly provide exemptions for certain types of vehicles or uses.

Interventionism scope

Policy-makers are required to issue regulations for various economic, societal and environmental reasons. There are five main reasons: (1) to protect road improvements, such as a fragile road structure or a narrow street; (2) limit traffic on certain routes to prevent congestion; (3) preserve sensitive areas, such as a pedestrian area with several pedestrians or sidewalk seating areas; (4) improve delivery conditions for products by developing delivery areas; and (5) reduce the environmental impacts of transportation, for example by banning the older vehicles, or by offering competitive advantages to the cleanest vehicles. Since the privileged area of intervention for wholesalers in terms of the last mile is the city, and where they have been able for years to optimize logistics operations at a micro-level (see Table 3), they are obviously affected by the regulations issued by the local authorities. But what exactly are these regulations that support the energy transition?

Table 3: Three Units of Analysis

Unit of analysis	Level	Scope
City logistics	Macro-level	Logistics as a system in the urban context, i.e. policies, actors, norms, resources, etc.
Urban goods distribution	Meso-level	Network design, logistics services and infrastructure alternatives
Last mile delivery	Micro-level	Logistics operations and optimization

Source: Adapted from Cardenas et al. (2017)

The question of tonnage remains essential, including to answer questions of congestion (Dablanc, 2011). However, while tonnage-related regulations are relatively straightforward to apply and monitor, they do not necessarily respond systematically to the problems of old, inaccessible and topographically constrained city centers (Pulawska & Starowicz, 2014). The occupation of the road is not measured by the authorized weight of the vehicle, but rather by surface or volume. Thus, in the case of streets where narrowness is the dominant constraint, the width of the vehicle must be prioritized. The time slot and the duration are also parameters that are strongly used and combined with each other. In the short term, it is likely that other parameters will be added from an environmental perspective such as the type of engine or the vehicle fill rate.

The organization into separate sectors is a complementary form of constraints to which the wholesale trade must abide to organize the delivery of products. In France, policy-makers traditionally operate according to two models: (1) regulations restricting the circulation of

light commercial vehicles by more or less wide areas (the entirety of a city center vs. specific pedestrian areas); and (2) traffic restriction regulations for light commercial vehicles only on certain lanes (the limitation or prohibition to protect a street with a strong historical heritage, or with strong cultural activity). The current trend in sustainable urban logistics is clearly to meet the specific constraints of a city, in relation to its history and topography, while being readable and understandable by companies. They must conform to it by proposing appropriate responses in terms of types of vehicles, organization of delivery tours and driver training.

Urban constraints

As noted by Gardrat (2017), urban planning remains an important source of constraint because it concretely limits the space dedicated to the road infrastructures of cities, particularly European ones, which have been structured in successive waves without taking into account societal and environmental issues. The case of waste management is also symbolic of an anarchic vision of urban space, from which it will take several centuries to emerge. As men began to regroup in cities around the year 1000, with a population of up to a million, waste management was neglected for a long time (Newman, 2001). As a speedy solution, people threw, in the streets or in the rivers, garbage, excrement or animal carcasses. During the Middle Ages, odors were pestilential, bacteria exposed to the air developed and caused deadly epidemics (plague, cholera). It was not until the 13th century that regulations were imposed in Europe to improve the hygiene of large cities: pave the streets, clean front of house once a week, no throwing garbage out the windows and no leaving it lying around. Slowly, the modern city was built, but without an overall vision or a coordination of individual initiatives.

The result is a major constraint: unless buildings are razed, or even entire streets, to be rebuilt, a sustainable urban logistics must take into account what exists and the concern of many local authorities to preserve their heritage. Thus, the historic hearts of French cities, often characterized by medieval town planning and narrow streets, are difficult to adapt to the traffic of heavy trucks, and sometimes even light commercial vehicles, while the most recent urbanized areas have traffic capacities significantly more important and functional. This poses all the more of a problem as the economic activity of the city is highly dependent on delivery systems, especially those of wholesalers. One of the key skills of wholesalers is to offer services to small stores (Sirjean et al., 2017). While some services rely on marketing or financial support, the quick and efficient supply of products plays a vital role in the competitive advantage that a wholesaler can develop.

The question is how the wholesaler can best manage the contradictory expectations of the delivery of products to retailers in a confined urban space: on one hand, the opening hours of the stores condition strict delivery schedules, while the commercial practices condition the frequency and size of packages; on the other hand, the presence of light commercial vehicles parked or in circulation may be perceived badly when it hinders the mobility of residents. Indeed, if the local residents appreciate the presence of small stores near their home, they reject the disadvantages of necessary supplies. These local residents also appreciate being able to benefit from the services of craftsmen who, themselves, wish to access the city centers to carry out their activity. However, the presence of light commercial vehicles generates congestion phenomena that directly impact the productive time of craftsmen and the satisfaction of local residents (clients). In brief, setting up a regulation that satisfies all city stakeholders is difficult and requires a reflection on the tools to develop. The question here is to combine several parameters, the most frequent configuration being an optimal combination

between the tonnage and the hours (and duration) of parking, irrespective of categories of users of the road network.

TOOLKIT FOR A SUSTAINABLE URBAN LOGISTICS

The set of constraints that the wholesale trade supports now makes it necessary to question the stakes of an environmental mobility policy. For many years, no reflection has really been led to bring about collective schemes of better flow management in the city. The dominant position was to let the various private actors carry out their own strategy, without suggesting the pooling of logistical resources, even if it means multiplying waste and redundancies. It was not uncommon to see hundreds of light commercial vehicles deliver stores at 20% or 30% capacity, which created massive congestion in narrow streets given product unloading times. The energy transition profoundly changes the rules of the game. Two dimensions seem particularly important: ecomobility and delivery terms.

Ecomobility

The energy mix of transport consists of offering reliable motorization alternatives for carriers and wholesalers that are also respectful of the environment. The approach is part of the current movement of an ecomobility research. Ecomobility consists in studying and promoting silent and non-polluting means of transport, the impact of which will be limited on the landscape, which refers to a reasoned use of forms of motorization in the urban space (Kodukula, 2013). In other words, ecomobility promotes movements of goods and people through integrated, socially inclusive, and environmentally friendly options. It is clear that all forms of motorization are not adapted to all uses and do not meet the same compliance requirements for the quality of the air. Today three major types of energy sources are used for the delivery of products:

- Fossil fuels, mainly gasoline and diesel, are supported by both a low selling price and a plethora of vehicles. The use of this engine is however polluting and degrades the quality of the air both locally (fine particles, nitrogen oxides and carbon monoxide) and on a global scale (carbon dioxide).

- Electricity eliminates any form of direct emission of the vehicle and seems the best solution for the respect of the air quality. Nevertheless, the low battery life and relatively high (but steadily lower) cost of vehicles limits their economic appeal, even though infrastructure investment for local authority and businesses remains marginal.

- The natural gas vehicle (NGV), already used for buses, eliminates the production of fine particles, but combustion necessarily involves the discharge of gaseous pollutants. Supply infrastructures are much less developed and require significant investments to offer a satisfactory network. In addition, the supply of vehicles is less developed than for electric vehicles.

The challenge for sustainable city logistics is to favor certain types of vehicles depending on the type of use. The central idea is to segment the use of vehicles according to the routes to be carried out, for example electric vehicles for short distances with low payloads (< 7 tons), gas vehicles for average urban journeys to long distance (between 7 and 19 tons), and conventional vehicles for long distances (> 19 tons). The game of actors is complex here since it includes both carriers and wholesalers, who use differentiated engines to run their operations, energy suppliers, who intervene at the infrastructural level and size the energy

supply, manufacturers, who are responsible for the development of new vehicles and their marketing, and local authorities, which enact the local regulations previously mentioned, but which also influence the potential availability of land for unloading stations.

Optimization of deliveries

The organization of deliveries is a major issue of sustainable city logistics, both for environmental reasons, because they generate visible and audible nuisances (in terms of congestion and noise), and for economic reasons because the maintenance of convenience stores in the city and the development of e-commerce depend on a high level of logistical service quality (Limsirivallop et al., 2016; Paddeu et al., 2017). To solve the problems of accessibility to small city stores, whose survival is clearly threatened, and e-consumers' homes, policy-makers have been thinking for many years about the development of delivery zones. Beyond the traditional diagnosis of inventorying existing zones (either to maintain or to remove), and to deduce the need for zones to be created, it is essential to identify needs, on one side, and the necessary abilities, on the other. According to FRETURB, a software program designed and developed by the *Laboratoire Aménagement, Economie, Transport* (LAET, Laboratory in Urban Planning, Economy, Transport) in Lyon to simulate the transport of products in a city, a delivery area can process an average of three deliveries per hour, i.e. nine deliveries during the peak hours (from 9 am to 12 am). In practice, it can be noted that the setting up of a first delivery zone can be done from 50 weekly movements recorded in a sector, this figure varies according to the hourly restriction applied to the sector.

The setting up of delivery zones from which local rounds can be organized is one facet of the possible solutions (a solution already adopted by several local authorities). However, they can only be fully efficient if it is possible to encourage staggered delivery, especially during the night. The organizational and technical adaptation necessary to accommodate deliveries in staggered schedules requires additional investment from the recipient of the products (a delivery lock, or the cost of the staff to accommodate the delivery man outside the opening hours of the store). Experiments conducted, particularly in New York, show that the vast majority of stakeholders do not wish to become involved in new practices without financial counterparts, because of the additional constraints induced (Holguín-Veras et al., 2014). It turns out, however, that after the implementation of the experiments, the actors mainly pursue staggered schedules for their deliveries, which indicates that it is possible for them to make a real profit.

CONCLUSION

A major societal issue that goes far beyond the boundaries of logistics, the issues of the energy transition are now well-publicized and pose a real challenge for a growing number of companies, including wholesalers. The essential feature of sustainable urban logistics is to focus on an economic activity, the delivery of products, which is part of both the private sector (business practices and strategies) and the public space (professional transport on roads shared with citizens). This ambivalence certainly exists for many other logistical activities, but it is exacerbated here because the city is a confined space, increasingly congested. The energy transition rebuffs the cards and leads the policy-makers to implement a system of constraints that companies can no longer escape. The Principality of Monaco, which imposes drastic rules of access to its territory to carriers and wholesalers from a distribution center located a few kilometers from the city, is a well-known example (Allen et al., 2014). There is no doubt that all the implications of these ongoing developments have not been studied and evaluated.

While regulations weigh heavily on corporate decisions, we should not underestimate the technical and organizational innovations that are changing the urban logistics system. A reasonable projection on the sustainable city of 2050 would undoubtedly be a source of significant surprises regarding the management of space and supply activities. We can think that the changes will be radical, and we must hope that we will escape a generalized dystopia for failing to develop a real collective project. This paper wished to indicate that the wholesaling sector is at the heart of current and future changes. While it has long been neglected, probably because the mass merchandisers developed out of the city in the 1970s, for example with giant malls or networks of hypermarkets, the wholesale trade retains all the attention in the current process of reappropriation of the city by its inhabitants. But these same inhabitants are increasingly concerned with a serene environment and weakly or not polluted, which forces a rethink of all the old logistical schemes. From this point of view, the energy transition is presented as a key moment whose effects will be major for all actors in urban supply chains.

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