

# Electric vehicles' impact on the future mobility - their strengths and pitfalls influence over the commercial transportation industry's evolution

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**Abstract.** With the electric vehicles (EVs) continuing to get constantly higher share in the mobility landscape, commercial fleets start preparing for this transformation. On one side, the pressure on the good and people transportation industry increased significantly in the last years due Covid-19 pandemic and will continue in the current external context of the war in Ukraine. Gas and fuel prices going higher and higher, drivers shortage, cuts in supply chain, these are the main challenges the industry suffers on daily basis. There is a clear need for change. Electrification seen as the future of mobility still represents a whole new world for most of the transportation companies. Due many unknown factors, fleet managers are still assessing the situation, weighing up the advantages and disadvantages of EVs and how suitable they are to ensure operations running efficiently. The big question for anybody that wants to add EVs to the commercial fleet is: how do we ensure getting all of the positive impact while avoiding the pitfalls? This article analysis the current situation, the different perspectives for commercial vehicles, the factors that are driving higher rates of adoption and the new stakeholders who will reshape the eco-system in this new macro-economic, social and political context.

**Keywords:** *mobility, electric, vehicles, transportation, fleets, infrastructure, costs*

## Introduction

The macro political, economic and social trends put under pressure many business all over the world, generating what is called VUCA (vulnerable, uncertain, complex and ambiguous) context. Unpredictability stays among the few constants of the future, impacting the daily reality of decision making and operating in almost overall market segments. One of the most exposed, due its strong elasticity to the external factors, is the commercial transportation industry.

This industry representatives look constantly for efficient tools, solutions and business models to adapt their operations, as the current crises affect them dramatically. On top of the supply chain slow down and the historical increase of fuel pricing, there are also the environmental critical objectives on short and long term that have to be reached. To contribute to the European Union ambitious target to reduce emissions by 40% from 1990 levels by 2030, the commercial transportation industry needs to look for alternative sources to fuel. Based on official data, the transport industry is responsible for 20% of greenhouse gases worldwide, and such realities generate the need for companies in this industry to look for more sustainable ways to operate.

### **Current challenges of commercial transportation industry**

At a glance, the European transportation industry faces big challenges in present. The effects of Covid-19 pandemic are not yet fully quantified. The global security crisis, generated by the war in Ukraine, represents probably one of the biggest events of the century and there is yet no clarity on how will that evolve and the overall impact at human and economic scale.

These are only two of the factors impacting dramatically mobility industry now and in the future. If at individual scale, each household will clearly see the immediate impact of transportation costs in their budget, the situation is even more dramatic for commercial fleets. Last years had already an inevitable impact on fleets operations that register important losses.

The International Road Transport Union (IRU) Intelligence Report estimated losses of 108 billion EUR in Europe, with a drop in annual turnover of 20%. Main challenges that confront transportation operators are : the global cuts in supply chain, the price increasing and volatility for fuel, trade implications of Brexit, the shortage of drivers. All these increase the total cost of ownership (TCO) per transportation fleet. Out of them, fuel cost represents one of the highest daily element of a vehicle's TCO, with an average share estimated by the industry data to be around 25% of total fleet's costs.

### **Electric vehicles (EVs) rising in the commercial fleets requires a new industry eco-system and a new way of fleet management**

The gradual introduction of electrification within the commercial fleets (dedicated to good and services supply) and the markets dynamic will be evolving. New players from OEMs (Original equipment manufacturers) to operational transportation providers will much likely enter in the markets. New interconnections and new dependences are to be created. New harder and software are currently under development, charging stations manufacturers are needed to be put in the market. This will require charging stations operators taking care of various locations. As an effect, new locations for charging will be needed to be provided by the real estate owners. Energy and infrastructure providers will represent key factors in the process to power the EVs, in the fleets segment.

The new mobility eco-system prepares for an increasing complexity. Fundamentally, the transportation business model will be stretched to change in order to adapt to new challenges. Fleets operators start already looking for new solutions to anticipate this future impact and to find efficient ways to manage their fleets. The process is driving by innovation, as EVs innovations change the nature of commercial fleet operations. From drivers, to fleet managers, suppliers and customers, the whole transportation eco-system will face new daily realities. Current jobs should be re-invented to assure the efficient daily operating processes. Even though it's clear that electrification brings already competitive challenges, those fleets understanding, learning and adapting faster could have higher chances to scale the electrification advantages for business growth.

The decision about switching to the electrified fleets and also the speed of implementation are triggered by the pluses and minuses. Among big advantages of running electric fleet there are: lower costs for running the fleet, increasing variety of vehicles offers from OEMs, technological shift towards more data driven operations, less expensive maintenance, financial advantages offered by authorities, reduced carbon footprint. In parallel, electrification has still to overcome aspects that represent pitfalls when making the switch, such as: higher prices to be paid for the vehicles purchase, risks driven by the (yet) limited charging infrastructure involving shorter journeys (limited driving range, more stops translated in potential delays and eventually less business), a different type of maintenance, especially for batteries. Next to the financial and technical aspects, electrification will impact also the human resources, new skills being required for mechanical aspects, for monitoring and managing EVs, as well as the implementation of new workplace layouts and infrastructure, required to ensure the right functions.

The trend is clearly upward, with global EVs fleets growing to more than 10 million vehicles in 2020. If we look at the whole automotive landscape, according to the International Energy Agency (IEA) the global car EVs registrations increased by 41% in 2020. IEA estimates that the EVs

cumulated growth will continue at a similar pace moving forward. If the governments will accelerate their efforts for environment protection goals, then the estimations refer at a global EVs fleet that will reach 230 million vehicles by 2030. This value represents 12% of the road vehicle fleet. Considering these predictions and daily transformations, many fleets managers start to look for more information and to prepare the ground for the transition. Today’s reality is still in favor of traditional stakeholders, but the new industry’s stakeholders start to occupy their territories in clear and distinctive segments. As Table 1 indicates below, these two categories co-exist today, in a slow transition, but the roads ahead converge more and more towards the electrification switch.

The Table 1 shows the current existence of two big categories of actors in the commercial transportation industry, based on the segments they serve and operate. Currently, the switch towards the new stakeholders is increasing, even though the pace rate stays relatively low.

Mobility Eco-system	
<b>Traditional stakeholders</b>	<ul style="list-style-type: none"> <li>• Fuel providers: Oil companies, Petrol stations</li> <li>• Transportation: Carriers, Shippers, Transport planners, Warehousing</li> <li>• Fleet Management: FMS software providers, Hardware suppliers</li> <li>• Manufacturers: OEMs</li> <li>• Others: Insurance companies</li> </ul>
<b>New stakeholders</b>	<ul style="list-style-type: none"> <li>• EVs Infrastructure: Charging stations manufacturers, Charging station operators</li> <li>• Energy: Utility companies</li> <li>• Property: Real estate owners</li> </ul>

**Table 1.** Stakeholders in the commercial transportation industry

**People transportation industry**

The urgency for higher sustainability is even more predominant if we look at people transportation industry, especially when it’s about buses and coaches. Without mentioning again the European regulations for reducing the CO<sup>2</sup> and even beyond cost considerations following same logic as for the other commercial fleets, e-buses offer many advantages for cities, from environmental, economic and quality of life perspectives.

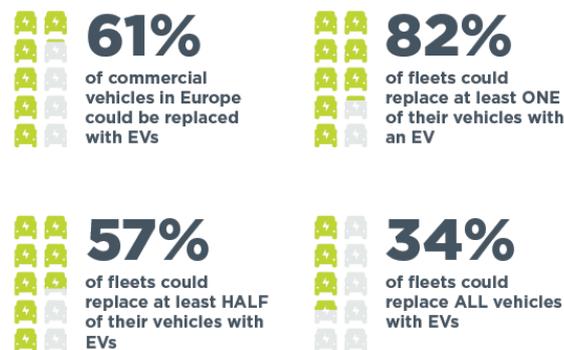
Some of those aspects impact each other’s, as for example the air quality and the financial elements, as based on measurements, over lifetime a diesel bus will cost society 19 000 euros for air pollution alone. Linked to the quality of cities and people’s life, electric buses offer a better customer experience, as they are more silent. So with the noise volume being lower and fewer vibrations, the e-buses create a more comfortable journey. This could translates in financial advantages, by attracting new customers, which is not just more advantageous for the city itself but also generates another positive environmental impact, by increasing the modal shift from private cars to buses. Other indirect positive effects are: traffic congestion reductions and consequently lower risk of accidents, translated into an optimised road safety. Among other positive aspects of electrification, increasing demand for e-buses should bring cost of batteries down more rapidly, this high cost being one of the entry barriers into electric vehicles fleets. On a larger scale, a higher procurement level of electric buses in Europe

should encourage local industrial OEMs players to manufacture clean buses, thus increasing their competitiveness with external electric bus manufacturers.

The above aspects focus mainly on the manufacturing and on use phase for EVs. Still one of the pitfalls remains the post-usage phase, especially for the electric batteries, this bringing most of the contra-arguments to electrification's benefits. Finding ways to reuse the technology is becoming more urgent, as the global stockpile of EVs batteries is forecast to exceed the equivalent of about 3.4 million packs by 2025. Post-usage recycling and reusing aspects are still question marks and one of the main drawbacks for EVs penetration, especially from climate goals perspective.

### Conclusions and next steps

EVs represent still a new territory for the commercial vehicle fleets. There is a clear evolution in that direction despite the rather slow progress due mostly to the challenges mentioned above. Even though the electric mobility registers a more accelerate trend in cars segments, current analysis based on aggregated driving data for the commercial sector indicate a high potential. Figure 1 below shows how many commercial vehicles could be switched with an electric model, at European level.



**Figure 1.** Potential of European fleets to be electrified

The effects of such move would be consecutively impactful: collective CO<sup>2</sup> emissions estimated to be reduced by 31% to 42% decreasing in the gasoline usage and, simultaneously, a 30% drop in diesel usage.

Commercial transportation industry finds itself today at the crossing between the traditional business model, with the environmental and costs pressures, and the new types of future mobility, equally bringing lots of unknowns. There is no shortcut to be taken, so commercial fleets gradually learn about new tools like telematics and data driven solutions, and explore new maintenance needs and new people skills, adapted to the future business model. With sustainability growing importance on the global agenda, all evidences state that EVs will play a significant role in the future of commercial fleets. The next years will be critical for fleets to prepare to run in a greener and efficient way. In order to take the most of these benefits, the agility and the change adoption speed will be key.

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