



an initiative of the Heavy Duty Electric
Vehicles working group of the
Big Buyers for Climate & Environment

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WG Heavy Duty Electric Vehicles

*Market gaps for the roll-out of heavy duty
electric vehicles in European cities*

BIG BUYERS

FOR CLIMATE & ENVIRONMENT

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Introduction

More than 70% of worldwide CO₂ emissions stem from cities. The transport sector alone is responsible for approximately 23% of total energy-related CO₂ emissions. Electric mobility in cities is one of the critical solutions in the fight against climate change and greenhouse gases emissions and pollutants, especially in countries where electricity generation is already quasi-entirely carbon-free.

Cities confronted with the negative externalities caused by traffic (pollution, congestion, noise, etc.) can be frontrunners in promoting electric mobility. By doing so, they can reach their ambitious goals of reducing carbon emissions and exhaust gases and achieving carbon neutrality.

The public sector's purchasing power is considerable (14% of the EU GDP). Local governments are, therefore, perfectly positioned to effect change by purchasing electric vehicles (EVs) for their fleet.

Market uptake of heavy duty electric vehicles

Zero-emission vehicles are widely regarded as an effective way to reduce CO₂ emissions and decarbonise the heavy duty vehicles sector. However, the speed at which the transition from internal combustion engine vehicles towards battery and fuel cell EVs will happen, and for which vehicle segments, are still uncertain.

Similarly, while the decarbonisation of European cities' fleets is already a reality for smaller and vocational vehicles, the roll-out of heavy duty electric vehicles (HDEV) in European cities, particularly for waste collection, street cleaning and heavy transport, is slow. This is also due to the high upfront costs that EVs require.

Several factors, such as technology improvements, cost reductions of vehicle components like batteries, and the future increase of energy prices, will determine market uptake. Possible constraints such as insufficient vehicle ranges, low charging or fuelling infrastructure availability, additional downtime due to longer charging and refuelling times, or payload losses due to heavier vehicles could potentially delay market uptake.

Market gaps

While there is a strong interest in moving towards clean solutions for HDEVs, particularly for long hauls, the market is still unable to satisfy public buyers' needs, particularly for vocational vehicles, such as waste collection, heavy delivery and street cleaning.

Vehicle prices remain high, and public buyers entities or their providers, for example, for waste collection services, have to face several challenges and risks related to the daily use of EVs. There are also insufficient models for waste collection in cities. For example, the market lacks 18-tons-vehicles with good enough payload and smaller trucks to use in narrow urban streets.

Furthermore, many challenges remain outside the sphere of influence of buyers and producers. It is necessary to create suitable policies and economic frameworks for the rollout of recharging infrastructure that facilitates the operation of zero-emission vehicles.

The large gap in the Total Cost of Ownership compared to diesel equivalents, combined with the operational limitations such as range constraints, running time, or payload losses, are the main factors hindering the transition to Zero-Emission vehicles (ZEV).

Big Buyers have reported the following challenges when looking at purchasing HDEVs:

High-cost and high risk

A high upfront investment is required to change the city's fleet of HDEVs. A hydrogen truck can cost up to four times more than a biogas-powered equivalent and twice that for an electric truck. This excludes the cost associated with the charging or refilling infrastructure and maintenance.

Buyers have reported a lack of innovative financing solutions and taxation support systems which allow the deployment of HDEV solutions. In countries where such support mechanisms exist, the uptake can be faster. Similarly, aligning rules, strategies and roadmaps to have fully zero-emission vehicles across EU countries would facilitate their uptake.

Models and data are required to understand the possible differences in Total Cost of Ownership optimisation, renting and subcontracting of services. They would support the development of new business models, which would bring buyers from owning vehicles to contracting services.

The standardisation of the waste collection system across countries would also support wider uptake of trucks, as they do not have to be adapted to specific needs, which usually results in higher costs for the buyer. There is also uncertainty about future technological developments, which increases the risk of investing heavily in technology that could become obsolete with the advancement of new solutions.

The market vehicle specifications do not fit the buyers' needs, particularly regarding mid-sized vehicles for range and carrying capacity. The market does not offer smaller trucks, between 7 and 11 tonnes and 2.30m wide maximum, which is an issue for historic city centres with narrow streets.

Data and planning operation

The EV operation planning needs to consider mileage, speed, topography, temperature, superstructure use and driving culture. More data sharing and analytics are necessary for real-time optimisation, planning operation (i.e. collection routes) and maintenance. Similarly, charging times must be taken into consideration when planning operations.

As such, the operationalisation of EVs might need a complete rethinking of waste collection systems compared to using diesel or biogas equivalents. The development of city digital twins is seen as a way to calculate fleet, traffic, power, and dynamic conditions necessary for running vehicles.

Delivery time and issues in the supply chain

Covid has caused significant issues for the delivery of EVs. While some companies are prioritising the delivery of electric trucks over their diesel equivalents, many are reporting more than one year of waiting time. Others have reported a slowing down in the supply of biogas trucks to focus on electric solutions.

After-sale support and dismantling

There is a lack of resellers' availability in many European countries, which affects product availability, particularly in some of Europe's peripheral regions. Local aftersales support (parts, software, maintenance, etc.) is an apparent necessity for buyers, as are provisions of training on the running and maintenance of vehicles. Similarly, there is a lack of competent maintenance services (chargers interoperability).

The roll-out is slower due to the perceived higher risk in running the vehicles, also by the service operators and drivers, and the lack of knowledge about their reliability. Training of workers for effective deployment is necessary to overcome this resistance.

The offer to supply safe battery dismantling should be a condition related to all sales. When calculating the Life Cycle Assessment, it is still unclear the percentage of materials of trucks which can be safely reused.

Batteries

The current generation of batteries is still too heavy, which results in heavier trucks and less loading capacity. Furthermore, the currently available batteries on the market might have insufficient range for the needs of buyers, especially when

considering the distances travelled in combination with the weight of the load and the energy needed for operating various parts of the vehicles in varying environmental conditions.

The development of vehicle superstructure, for example, to operate electric cranes, doesn't match the progress of electric trucks.

There is insufficient market development for retrofitting solutions, and the few available options are not widely spread across Europe.

The materials for electric batteries need to be resourced in a fair trade way. Currently, not all companies can provide the required certifications.

Energy production and recharging infrastructure

Even if the market could fully comply with the needs of public buyers, the rollout of HDEVs cannot advance without proper recharging infrastructure. Its development is still costly, and low and expensive charging system investments are needed at the depots, logistics centres and other premises.

Cost-efficient and innovative solutions are necessary to maximise the charging capacity of the electricity network and support intelligent charging of big fleets, for example, at night. Vehicles should be able to choose between AC and DC charging depending on the available charging infrastructure at any given location to avoid lock-in solutions.

Finally, uncertainties related to energy costs and the lack of sufficient green energy production of both electricity and hydrogen remain a big obstacle.

About Big Buyers

The Big Buyers is a European Commission platform for promoting collaboration between big public buyers in implementing strategic public procurement. By working together, cities and other public buyers can maximise their market power and impact, facilitating the creation of new solutions more targeted to their needs.

To know more about the activity of the working group focusing on HDEVs:
<https://bigbuyers.eu/working-groups/electric-heavy-duty-vehicles>

ICLEI and Eurocities are currently running the initiative on behalf of the [European Commission, DG Internal Market, Industry Entrepreneurship and SMEs \(DG GROW\)](#).