



FREIGHT ELECTRIC VEHICLES IN URBAN EUROPE

FREVUE Results and Guidance for Vehicle Suppliers



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1. Introduction

Increasing awareness of air pollution from diesel freight vehicles, incentives and regulatory pressures have led to a rise of interest in and demand for electric freight vehicles. Yet despite these developments, availability remains limited, especially for freight vans and trucks above 3.5 tonnes.

These recommendations provide vehicle suppliers with an overview of findings from the Freight Electric Vehicles in Urban Europe (FREVUE) project, highlighting the growing number of reasons to supply electric freight vehicles to the market.

1.1 The FREVUE Project

FREVUE is a 4.5-year EU-funded project that started in March 2013. It involved 32 partners across Europe and deployed over 80 fully electric vans and trucks in eight European cities. Data from the project provides an evidence base on the technical and operational suitability of electric freight vehicles;

their environmental, transport and social impacts; their economics; and policy/governance changes that are required to increase their uptake.

For further information as well as detailed project reports, factsheets and other resources, please see www.frevue.eu.

2. The case for electric freight vehicles

The road transport sector is a major contributor not only to greenhouse gas emissions but also to local air pollutants. According to the European Environment Agency, in 2013 approximately 436,000 premature deaths in the EU28 were due to long-term exposure to PM2.5 (particulate matter) concentrations and 68,000 premature deaths due to NO2 (nitrogen dioxide) exposure. In addition, other significant health risks, such as fertility issues and dementia are also linked to air pollution. Most local air pollutants stem from diesel vehicles and freight vehicles significantly contribute to this.

With zero tailpipe emissions and significant reductions in well-to-wheel CO2 emissions, electric vans and trucks can significantly contribute to addressing the negative environmental and health impacts of freight movements.

2.1. Incentives and regulatory changes

The EU has set the target of zero emission city logistics in urban centres by 2030. Recognising the potential of electric freight vehicles, public authorities in Europe are introducing incentives and regulatory changes at a fast pace.

Examples are:

- Incentives to encourage the uptake of electric freight vehicles, such as exemptions from taxes and charges, free parking, and extended access rights.

City of Amsterdam

Milano



Comune di Milano



Stockholms stad

Amsterdam's successful pilot project granting parking and access privileges to users of electric freight vehicles is being expanded across the city

Only fully electric vehicles can access Milan's low emission zone Area C between 8-10am

The City of Stockholm has included gradual and flexible requirements in their procurement process to increase the use of zero emission capable vehicles in their transport services

- Financial support for the procurement of electric freight vehicles.
- Regulation to discourage the use of diesel vehicles, such as (ultra) low emission zones and restrictions to areas and/or streets for diesel vehicles.
- Provision of electric vehicle charging infrastructure.
- Public procurement requiring or encouraging the uptake of electric freight vehicles.

Furthermore, the mayors of Athens, Madrid and Paris have agreed to outlaw diesel vehicles from city centres by 2025.



On regional and national government level, several countries are banning the sale of diesel cars and vans, e.g. Norway from 2025, and both France and the UK from 2040. The Netherlands and several German states are discussing bans for 2025 / 2030.

2.2 Positive experience with electric freight vehicles

As part of the FREVUE project, nine fleet operators integrated fully electric vans and trucks into their operations.

Overall, the experience FREVUE industry partners have had with electric freight vehicles throughout the project has been very positive. So positive, that most operators have increased the number of electric vehicles in their fleet following the initial trial. For example:

Heineken initially trialled four vehicles and now successfully run a 19t truck in Rotterdam, and one 12t and seven 13t trucks in Amsterdam to distribute beer.





UPS trialed 16 electric freight vehicles as part of the FREVUE London demonstrator (in addition to the 18 EFVs previously deployed) and have increased the total number of EFVs to 52 as of early 2017. This represents nearly a third of the central London fleet and UPS are looking to increase this share further.



The Lisbon Post, CTT, started with 10 electric vans in 2013, increased to 17 vehicles during the project, and has plans to add 10 vans per year over the next two years. In addition, CTT are increasing their number of electric quadricycles in Lisbon from 50 in 2017 to 100 by 2020.

Overall, FREVUE surveys showed that at the beginning of the vehicle trials only 39% of participating fleet managers thought electric vans and trucks were a viable alternative to their diesel equivalents. At the end of the trial, this rate had nearly doubled: Now 72% of fleet managers

believe that electric freight vehicles are a viable alternative.

2.3 Increasing demand

Positive experience, increasing public awareness, incentives, regulatory changes and the desire by fleet operators to play their part have led to a continuous increase in demand for electric freight vehicles.

Throughout the FREVUE project, partners have noted a discrepancy in the perception of demand between fleet operators and vehicle suppliers. While fleet operators and procurers interested in electric freight vehicles are frustrated by the limited availability of vehicles, many vehicle suppliers remain unconvinced of future demand. However, throughout the project lifetime of 4.5 years, the number of vehicle suppliers that rule out the future production of electric vehicles has decreased significantly.

// THE FREVUE DECLARATION OF INTENT
AIMS AT HIGHLIGHTING THE RISE IN DEMAND
AND CLEARLY COMMUNICATING THIS TO
VEHICLE SUPPLIERS.

2.4 What do fleet operators expect from vehicle suppliers?

All operators that deployed vehicles as part of the FREVUE project or that were otherwise associated consistently note the limited availability and high procurement costs of electric freight vehicles currently available. More specifically, vehicle operators would welcome:

- *Larger fully electric vans and trucks*

Current availability of electric freight vehicles differs significantly depending on vehicle type. For smaller electric vans under 3.5 tonnes the market is now relatively well developed and Original Equipment

Manufacturers (OEMs) provide a range of models to choose from, though this range could well be extended.

The availability of electric freight vehicles of 3.5 tonnes and above remains very limited and, as of 2017, is dominated by retrofits. Stakeholders continuously express keen interest in these larger vehicles.

The FREVUE Declaration of Intent (see above) showed that the demand for electric trucks is currently equal to that of electric vans. While not representative of the overall market, it does nevertheless highlight significant interest in electric trucks.

- *Comparable total costs of ownership*

Urban logistics companies are not (yet) in a position to charge a premium for deliveries by electric vehicles. Through a combination of monetary and operational incentives and regulation as well as lower operational costs, vehicle operators need to be able to get to a positive business case over a reasonable depreciation period.

FREVUE results show that for small electric freight vehicles of less than 3.5 tonnes, the total cost of ownership can be favourable for an EFV within a depreciation period of about five years or less where subsidies apply.

For medium sized electric freight vehicles, weighing between 3.5 and 7.5 tonnes, a positive business case is possible although challenging. For the large EFVs, though not impossible, it remains difficult to get to a positive business case.

- *Increased payload*

Related to the above, many fleet operators remain worried about the lack of payload in currently available electric vans and trucks. Due to battery weight, payloads tend to be

lower than diesel equivalents. This is neither in the interest of fleet operators, nor in that of local authorities. The electrification of fleets should not result in an increase in the number of vehicles on the road and therefore congestion.

Several European governments are introducing regulation to allow an adjustment in the weight categorisation for vehicle driving licences. This will allow licence holders to drive slightly heavier vehicles than their licence would normally cover if the extra weight is a result of the electric drivetrain (or other low emission technology).

This will help compensate for lost payload capacity due to the added weight and size of alternative fuel technologies.

// VEHICLE SUPPLIERS SHOULD SUPPORT PUBLIC AUTHORITIES IN THEIR EFFORTS TO ADJUST VEHICLE WEIGHT CATEGORISATIONS FOR ELECTRIC VANS AND TRUCKS

- *More range?*

Operators consistently ask for an increase in vehicle range, whether that is for electric cars, vans or trucks. However, the FREVUE analysis clearly shows that the range of electric freight vehicles currently available on the market is sufficient for the vast majority of freight trips in the urban environment.

Furthermore, surveys with drivers as well as fleet managers show worries over vehicle range decreased over time: 12 months after their first introduction, respondents were significantly more positive about the range of their vehicle than at the start.

For example, at the start of the trial only 6% of fleet managers thought that a range of less than 100km would be sufficient for

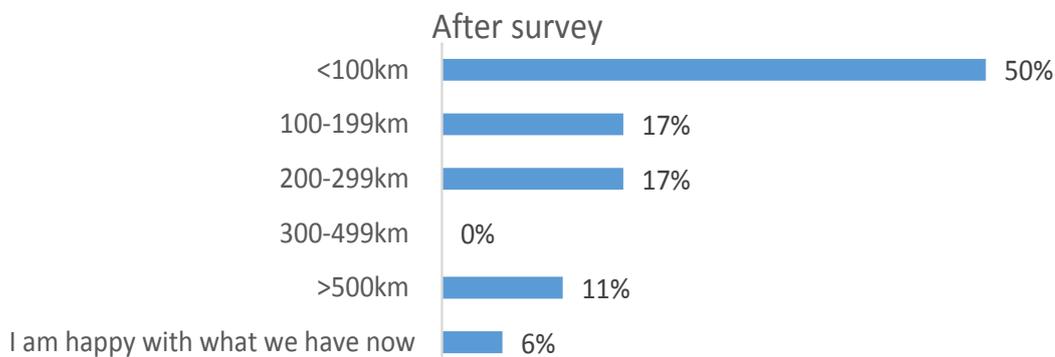


Figure 1. FREVUE After Survey: Preferred Range of Fleet Managers

their type of operation. 12 months on, this rate increased to 50%.

When it comes to drivers, 77% were confident at the end of the trial that their vehicles are able to cope with the current delivery tasks under any weather and seasonal conditions.

- *Charging infrastructure*

Fleet managers also look to vehicle suppliers for dedicated charging solutions. As batteries remain expensive and heavy (having an impact on payload), the optimal configuration might not only be night-time slow charging but also dedicated rapid charging between trips during the day. Vehicle suppliers should be able to provide advice on and ideally offer the dedicated charging infrastructure itself to fleet managers.

- *Repair and maintenance agreements*

Electric vans and trucks are easier to maintain compared to their diesel counterparts. This results in the expectation that savings in maintenance and repair costs are possible.

However, whether these savings materialise or not does strongly depend on the vehicle supplier, cost of the spare parts as well as

location, i.e. the maintenance and repair network available in that region. Some of the most important and expensive parts of an electric truck are the battery pack and the in-vehicle chargers. The risk of having to replace a battery pack is an important issue in the maintenance and repair agreements between fleet owners and vehicle suppliers.

Potentially lengthy and costly repair and maintenance works frustrate fleet operators and undermine their confidence in electric freight vehicles. Establishing clear and reliable maintenance and repair agreements with operators is highly important to the future development of this market.

Adequate repair and maintenance provisions will also depend on an increase in sufficiently trained personnel across the network.

- *Visibility*

Stakeholders note that even those vehicles technically available can be difficult to find. Should you already supply electric vans or trucks, do make sure that these are included in dedicated vehicle finders, examples of which are included on the FREVUE website <http://frevue.eu/links/>.

COORDINATION



CITIES AND AUTHORITIES



RESEARCH AND SUPPORT PARTNERS



LOCAL DEMONSTRATION PARTNERS



CONTACT:

Project Coordinator: Cross River Partnership, Westminster City Council –
Tanja Dalle-Muenchmeyer tanjadallemuechmeyer@crossriverpartnership.org
Project Dissemination: Polis – Thomas Mourey tmourey@polisnetwork.eu



FURTHER INFORMATION

For more information about the FREVUE project, reports, publications and useful links, please see www.frevue.eu.

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