

PROJECT PERIODIC REPORT

Grant Agreement number: MOVE/FP7/321622/FREVUE

Project acronym: FREVUE

Project title: Validating Freight Electric Vehicles in Urban Europe

Funding Scheme: Framework Programme 7

Date of latest version of Annex I against which the assessment will be made: 18.01.2016

Periodic report: 1st 2nd 3rd 4th

Period covered: from 1 April 2015 to 31 March 2016

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² The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

3.1 Publishable summary

The Validating Freight Electric Vehicles in Urban Europe (FREVIEW) project officially commenced in March 2013. The purpose of this 4 ½ year project is to demonstrate how electric freight vehicles can be incorporated in urban logistic operations.

Involving eight of Europe's largest cities, the project covers the breadth of urban freight applications including a wide range of:

- Goods deliveries - including food, waste, pharmaceuticals, packages and construction goods
- Novel logistic systems and associated ICT- with a focus on consolidation centres
- Vehicle types – from small car derived vans to large 18t goods vehicles
- Climatic and geographical conditions – from Northern to Southern Europe
- Diverse political and regulatory settings that exist within Europe.

The overall objective of FREVIEW is to create an evidence base on European best practice which will underpin future uptake of EV by private logistics operators and justify policy interventions to promote the use of EVs for urban deliveries. This will be achieved through widespread introduction of EVs into routine logistics operations, coupled with innovative logistics concepts around freight consolidation.

With 30 partners across the public, private and research sectors, a well-integrated project consortium has been developed to address the project aims (Figure 1).

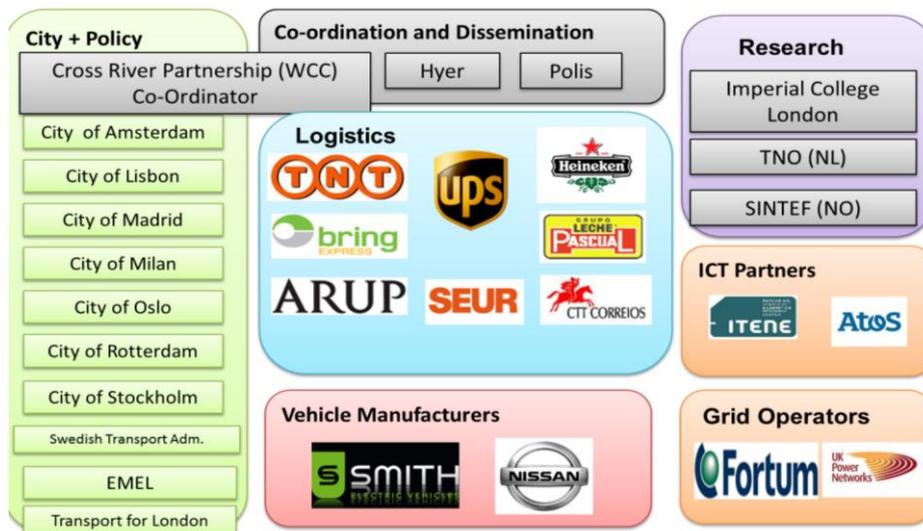


Figure 1: FREVIEW Consortium

The project is developed around five work packages led by highly experienced partners (Figure 2).

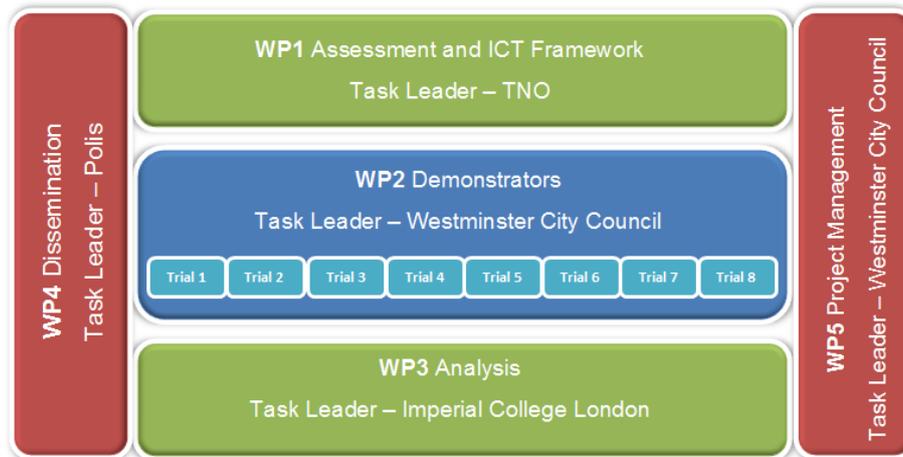


Figure 2: Work package leads

Work Package 1 – Assessment & ICT Framework

Work package (WP) 1 is focused on the development of the assessment framework and analysis methodology for the project. By ensuring a comprehensive and robust procedure is in place, it will be possible for a complete analysis to be undertaken in evaluating the effectiveness and efficacy of electric freight vehicles.

Reporting period one focused on the key outputs that would underpin the qualitative and quantitative assessment process. This included:

D1.1 Central Assessment Framework (CAF)

The CAF was developed to ensure that project monitoring and evaluation is undertaken in a structured and efficient way across all demonstrator sites. The assessment is focused around five core areas:

1. Technical performance of the EVs and charging infrastructure in the city logistics applications.
2. Economics of the demonstrators.
3. Systemic and environmental impacts, including electricity network and traffic aspects, CO₂ emissions, energy use, air quality, noise and safety.
4. Social and attitudinal impacts, including drivers and users.
5. Policies, procurement mechanisms and governance.

The framework was developed collaboratively with the industry and public sector partners to ensure that appropriate and measurable indicators can be assessed.

D.1.2 Core and Site Specific Data Collection Protocols

Following on from the CAF, site specific data collection protocols were established to clarify which data can be collected and by what process. With such a diverse set of partners, operating in a variety of logistic settings, this approach will maintain the consistency of the data outputs.

In year 2 it was identified that some parts of the process could be streamlined to mitigate unnecessary data handling and prevent potential error. A revised process was implemented and this is now operating effectively.

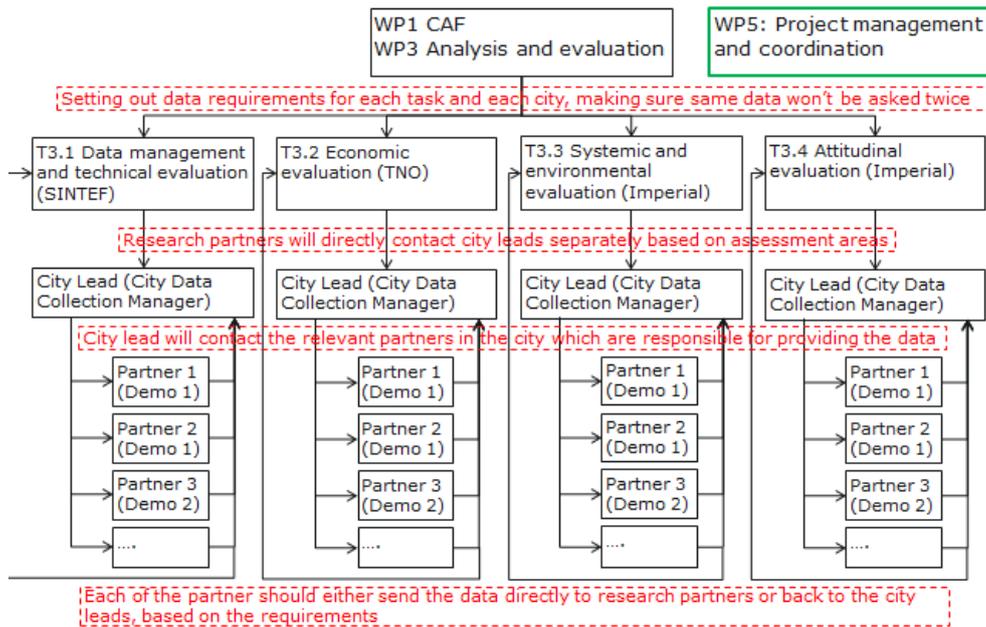


Figure 3: Revised Data Collection Process

D 1.3 State of the Art Logistics Review

At the beginning of the project, a review of state-of-the-art logistics with regard to electric freight vehicles was undertaken to ensure that the lessons from previous projects were taken into consideration.

While electric logistic operations continue to develop as technology and policy frameworks change, the review highlighted three key issues that needed considering:

1. Logistics concepts need to be adapted to address range and load concerns associated with EFVs.
2. Support from public authorities is desirable to increase EFV uptake in city logistics activities.
3. EFVs provide significant opportunities for private logistics companies to demonstrate their commitment to improving their environmental performance.

Given the changing environment with regard to urban logistics and in agreement with the European Commission, an updated version of the State of the Art document was prepared for submission in summer 2015 with a final update due in December 2016.

Work Package 2: Demonstrators

WP2 involves the deployment and demonstration of the different EFVs across a range of sectors, conditions and logistics concepts around freight consolidation.

Although it was originally envisaged that all vehicles would be purchased or leased by the end of year one (April 2014), this has proved more difficult than anticipated. While some partners were able to quickly identify and procure their required electric freight vehicles (EFVs), this has not been the case across all demonstrators. Key challenges in the procurement of vehicles were:

- Vehicle cost:
 - The cost of the vehicles, particularly for those over 3.5t, has been significantly higher than had been anticipated. This made the business case for these EFVs

questionable in many circumstances as the difference in price compared to a standard internal combustion engine (ICE) vehicle increases further for the logistics partners.

- Vehicle supply:
 - The lack of availability of vehicles on the market, again especially for those over 3.5t, has necessitated some logistics partners to retrofit vehicles in order to meet operational requirements. This process invariably increases delivery timeframes for the vehicles.
- Grid constraints:
 - In the case of UPS, insufficient grid supply to their London depot has necessitated a large and complex upgrade, which has directly impacted on the deployment of the vehicles that were procured.

However, as of March 2016, all vehicles have been procured and 75 FREVUE co-funded vehicles are now operational. Based on the positive experience during the first two years of the project, several operators decided to procure further EFVs in year 3. Even though some of the logistics operators have been delayed in the procurement of their vehicles, it is still expected that most demonstrations will last for 18-36 months. However, it is now clear not all vehicles will be operational in all sites for this entire duration due to staggered delivery times or incremental upgrading of the charging infrastructure.

In line with the progress made in procuring vehicles, monitoring and data gathering has increased significantly over the past twelve months. The FREVUE research partners currently receive dynamic vehicle data from 58 vehicles. However, time periods covered vary and the operational parameters covered are less than expected.

Supporting the EFVs, a range of logistics models to improve overall efficiency is also being implemented. Consolidation and distribution centres are operating in London, Madrid, Milan and Stockholm with two sites each in London and Stockholm. Reaction to the operational sites has been largely positive, with some of the models being replicated across other cities. However, the lack of a clear carrot and stick approach often makes it difficult to attract participants and customers and experience shows that there is significant discrepancy between interest in the scheme and the actual number of participants signing up if there are costs involved. Improvements in vehicle range are mitigating some of the concerns for urban operation. Initial perceived difficulties such as range, load capacity and charging times have yet to prove a challenge in reality.

Work Package 3: Analysis

WP3 is focused on the collection, review and analysis of all the data as prescribed in WP1, Common Assessment Framework and Site Specific Data Collection. With the increasing number of operational vehicles, the main efforts of the work package have been focused on data collection and initial analysis.

At the end of year one as more vehicles were becoming operational, issues had started to appear with the specified data collection processes. Due to the complex structure of the demonstrators, particularly in cities with multiple demonstrator partners, data gaps and delays were occurring which were starting affect the delivery of this work package.

Subsequently, a more direct approach to data collection was trialled from the middle of the 2014/15 year. Each research partner is now contacting the data holders rather than going through the city lead as a single point of contact.

The new data collection method has been working well and is now fully adopted.

Summary

Year three of the project has generally proceeded very well with all demonstrators being fully operational and the vehicle procurement process being completed. The fact that many partners looked to expand their EFV activity based on initial performance is particularly encouraging.

More resources were allocated to resolving remaining data collection issues. While many of these could be addressed, the limited duration of some demonstrations, the collection of a lower number of operational parameters than anticipated and other limitations will have an impact on the analyses possible.

For 2016/17, we expect the project to continue delivering however, with an even greater focus on communicating and disseminating the activity to a wider audience as more results become available.

With the view to gather further data on vehicles, especially those over 7.5t, and innovative logistics models, new partners might be added in the next period. The existing consortium partners have been provided with information about these potential additions to the group, which will also present themselves at the partner meeting in Oslo in April 2016. Should the existing partners vote for the enlargement of the consortium, it will be essential to integrate new partners and establish data gathering models quickly.

Contact Details

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Overview of FREVUE demonstrations as of April 2016

	FREVUE City							
Demonstration	Amsterdam	Lisbon	London	Madrid	Milan	Oslo	Rotterdam	Stockholm
Logistics models			CCC UCC Other	DC	DC		UCC	CCC UCC
Types of goods delivered / handled	Food & drink Post & parcel	Post & parcel Maintenance & services	Construction Post & parcel Retail Waste	Food & drink Post & parcel	Pharmaceuticals	Post & parcel	Post & parcel Retail	Construction Retail Waste
No of vehicles								
Up to 3.5t		28		8	1	4	1	
3.5-7.5t	3		16	2			4	
>7.5t	6		1				5	1
Charging infrastructure								
Stand.		14						
Semi	8		17	4	1	6	12	
Fast						6		1

Legend:

Data received	Intermittent / partial data	Data to be received
CCC: Construction consolidation centre		
DC: Distribution centre		
Other: Preferred supplier scheme		
UCC: Urban consolidation centre		