

Smart Electric Urban Logistics

Project Background

Smart Electric Urban Logistics (SEUL) is a 2-year project which commenced in April 2017, designed to support the wider transition to electric vehicles for larger commercial fleets. Smart charging technology integrating energy storage, as well as an innovative tool to assess existing grid capacity, will provide scalable learnings from real-world operation and testing.

The SEUL project is part of the Low Emission Freight and Logistics Trial, funded by the Office for Low Emission Vehicles (OLEV) in partnership with Innovate UK.

Introduction

Growing city populations paired with an increase in online retail result in more goods being moved around than ever, most of them by road transport. At the same time, cities are already impacted by poor air quality and most find it hard to meet their greenhouse gas emission reduction targets. In London, one of Europe's most polluted cities, the global logistics company UPS is committed to an increasingly clean and environmentally friendly delivery fleet. As part of its 'rolling laboratory' strategy, the company has been testing a wide range of alternative fuel and advanced technology vehicles. For inner-city delivery routes that are characterised by low mileage and high stop density, battery electric vehicles have proven the most suitable solution.

At project start, UPS had already integrated 52 plug-in electric trucks in its 170-vehicle fleet operating from its central London depot. However, constraints in the existing electrical grid infrastructure restrict the company in its ability to introduce more without another costly and disruptive infrastructure upgrade to the local grid.



“Electric vehicles are a natural fit for urban logistics fleets, but without smart-grid technology the recharging of many of those fleets will remain cost prohibitive. We are delighted to be working with UK Power Networks and Cross River Partnership to make this technology a reality in London in 2018.”

**Peter Harris, Director of Sustainability,
UPS Europe**

Project implementation

Vehicle deployment

As part of the SEUL project, UPS will convert 20 of its existing diesel vehicles to fully electric trucks. This will bring the number of vehicles at its central London depot above the current maximum of 63 that the charging infrastructure allows for.

UPS will prepare the adapted P80 Mercedes 7.5 tonne vehicles for conversion at its internal workshops, including removing the diesel drive train and auxiliary components. The Internal Combustion Engine (ICE) removed is typically a Euro 5 4.2 litre diesel engine. The vehicle is then transported to a specialist supplier in Germany

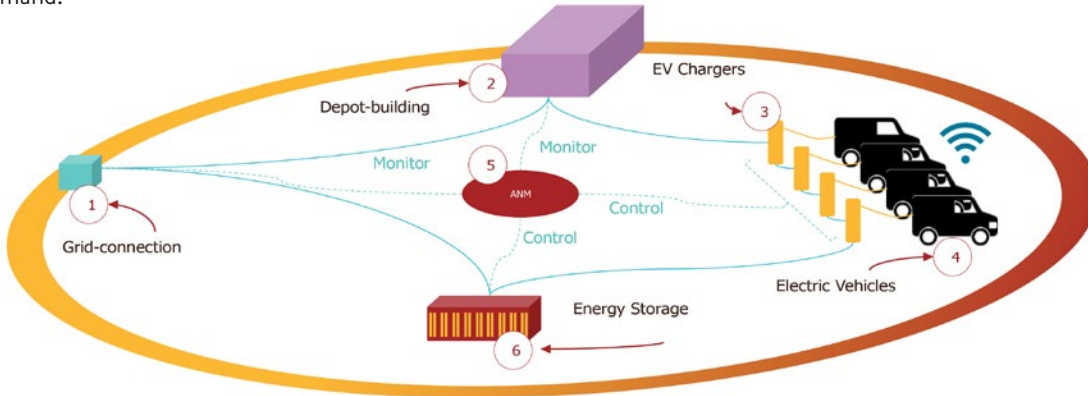


to retrofit the vehicles with an electric drive train and batteries. The converted vehicle has a payload of 3 tonnes and a range of approximately 100km, comfortably exceeding their average daily urban usage.



Smart charging technology

Further integration of EVs on the UPS site in Kentish town is hindered by a capacity constraint. To enable the charging of a growing UPS EV fleet, a smart charging system is being designed, developed and implemented by subcontractor UK Power Networks Services¹. The system comprises of an Active Network Management system coupled with an Energy Storage System (ESS) that has the capability of dynamically controlling the local demand.



The system will be the first of its kind applied in a Business as Usual environment and will inform future decision-making regarding further expansion, on-site electricity generation and second-life battery usage.

EV Fleet and Charging Capacity at UPS Central London Depot

	EV Fleet	Charging capacity
At project start	52	63
Vehicle additions during project	20	
Project before smart charging technology	72	63
Project with smart charging technology	72	170

Network capacity assessment tool

In addition to charging EVs in a smarter way, existing grid infrastructure can be used more effectively. In order to connect new load on a local network, e.g. to supply a cluster of EV charge points, Distribution Network Operators (DNOs) assess the peak demand on the local network to determine spare capacity. However, this peak is only rarely reached throughout the year. As part of the SEUL project, UK Power Networks will design and implement an innovative power capacity calculation tool taking into account time variance in demand, thereby highlighting spare capacity.

Once complete, other DNOs will be able to easily integrate the tool in to their existing systems, increasing DNO intelligence and leading to network efficiencies.

Roadmap to electrification

As the smart charging system, network capacity assessment tool and vehicles become operational, close monitoring and evaluation will allow UPS to develop a 5-year vision. This will assess if and how UPS can electrify its entire central London fleet within this time period, how this can be replicated at other sites, and how to transfer the results to other fleet operators.

For more information, please see

<https://crossriverpartnership.org/projects/smart-electric-urban-logistics/>

Innovate UK



Office for Low Emission Vehicles

¹ The unregulated business of project partner UK Power Networks

