

Results of Competition: Wireless Electric Charging for Commercial Users: Real World Demonstrators

Competition Code: 1902_CRD_MMM_OLEV_EVCOMMERCIAL_P2

Total available funding is £19,400,000 (Total funding for both streams is £38,650,000)

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLEXIBLE POWER SYSTEMS LTD	Wireless Charging in Micro-Fulfilment Centres for Last Mile Delivery	£2,023,276	£1,416,293
Heriot-Watt University		£511,468	£511,468
The City of Edinburgh Council		£146,812	£146,812

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Project description - provided by applicants

Light Goods Vehicles (LGVs) contribute around 15% of UK greenhouse gas (GHG) emissions from road transport and 33% of nitrogen oxide (NOx) emissions, whilst making up <10% of vehicles on our roads. Government policy, as described in the Road to Zero report, is for all new van sales to be zero emissions by 2040, and 40% of new vans to be ultra-low emissions by 2030. This will require rapid increases in uptake of electric vans from the current base of around 1500 electric vans out of 370,000 total vans sold in the UK in 2018.

EVs differ from diesel vehicles in terms of range, maximum payload, and availability of energy infrastructure. Operational implications for the logistics sector that arise due to these differences are not well understood, outside of a few narrow use cases. In future, autonomous vehicles will also need to be considered, as the removal of driver constraints is likely to change the optimality of solutions to vehicle allocation and routing problems.

Wireless Electric Vehicle Charging (WEVC) has the potential to mitigate fleet integration challenges, by making charging sessions quicker to initiate and more easily controlled remotely, which has benefits for opportunity charging. User acceptance by drivers may be helped through timesaving benefits in handling plugs and cables.

This project will demonstrate the benefits and costs of WEVC through six principal approaches:

- i) a hardware demonstration of high power WEVC (22kW) on 4 vans, 2 users, where costs and benefits will be measured;
- ii) a manufacturing study to understand future capability and costs;
- iii) simulation of logistics operations using real world data to explore the impact of WEVC;
- iv) assessment of the network impact of charging/logistic hubs (WEVC-MFCs) enabled by WEVC;
- v) development of a scheduling tool to solve charging session conflicts;
- vi) site selection, design and planning (e.g. vendor selection and finance) for a full scale demonstration of the WEVC-MFC concept at the project's conclusion.

The project brings together logistics modelling expertise from Heriot-Watt University (HWU) and low carbon and vehicle technology, energy infrastructure and commercial knowledge from Flexible Power Systems (FPS). City of Edinburgh Council (CEC) will participate in the project as a vehicle user and work with FPS and HWU to find follow on sites. Lear Corporation (Lear) will advise on WEVC technology, vehicle integration and long-term price trajectories. Hitachi Vehicle Capital Solutions (HVCS) will support expansion of the engaged customer group.

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A.T.KEARNEY LIMITED	AMiCc (Vehicle retrofit charging system for commercial applications)	£1,052,500	£526,250
4TH DIMENSION TECHNOLOGY LIMITED		£517,938	£362,557
BRIXWORTH TECHNOLOGY LIMITED		£295,290	£206,703
Leeds City Council		£478,026	£478,026
Loughborough University		£346,126	£346,126
SPRINT POWER TECHNOLOGY LIMITED		£2,420,883	£1,694,618
University of Nottingham		£472,296	£472,296
University of Warwick		£515,729	£515,729

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Project description - provided by applicants

AMiCc will demonstrate the benefit a vehicle agnostic wireless retrofitting solution will provide for fleets with high utilisation rates, meaning EV adoption options are limited. Wireless charging has the ability to provide a unique solution to a lack of vehicle downtime, however there are currently a number of challenges with the uptake of wireless, including a lack of standards, lack of wireless enabled vehicles and vehicle interoperability issues. The project will seek to work through some of these challenges, creating a vehicle retrofitting framework for multiple vehicle types, demonstrated on a number of key vehicle case studies.

Key objectives are:

- * Create a vehicle retrofitting framework - partners will design a complete vehicle charging solution, from ground pad to vehicle retrofitting, using both innovative new components and off the shelf solutions. The vehicle integration requirements will be developed for a number of different vehicle types, with the design components optimised based on replication across vehicles.
- * Deployment of wireless charging infrastructure to demonstrate the benefits to fleets in their EV transition. Particular focus is on fleets who are currently reluctant to transition due to short dwell times. The project will deploy a number of case studies to demonstrate the applicability of the technology.
- * Create a set of standards for wireless adoption - the project will work these through with UK Government to become a code of best practice and subsequently implement into industry.
- * Implementing an AI machine learning algorithm - to review vehicle movement and identify optimum charging behaviour and locations in order to facilitate and maintain an optimal EV uptake strategy.

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