

Niche Vehicle Network

2021 Collaborative R&D Competition Winners

- “EV Challenge” – Innovative Charging
- “EV Challenge” – Early Stage R&D
- Late Stage R&D

Issued 18th June 2021

“EV CHALLENGE” – INNOVATIVE CHARGING

Funded by Office for Zero
Emission Vehicles (OZEV)

Rural Transport E-Shelter

Lead: RURAL DESIGN CENTRE LIMITED

Small towns and rural communities are not currently well served in terms of EV charging infrastructure. We aim to support those rural communities by developing an innovative, safe, user-centric charging and access point for e-bike hire and e-cargo bikes, powered by on-site renewable energy.

We aim to encourage the uptake of e-bikes and e-cargo bikes for use around small rural towns and nearby villages.

EV-to-Charger Metadata Communication for Service Fleet

Lead: HYPERVOLT LIMITED

Hypervolt is the UK’s leading innovator in smart home & workplace charging, vertically integrated across software and hardware for seamless UX and rapid innovation.

Electrification of commercial vans is constrained, but no longer for lack of viable models. Facilities management EVs (~838,000 in the UK) face a specific pain point without radial-site charging solutions: hub/depot charging is inconvenient/inefficient, whilst distributed charging with low utilisation is capex intensive.

In tandem, EV uptake in social and rented accommodation with shared parking (1.8m homes; 8%) is constrained. Hypervolt proposes an innovative, distributed fleet charging solution based on EV telematics, Plug&Charge and shared-access.

Project Pollen: Secure Universal e-Scooter Charging Network

Lead: HONEYCOMB NETWORK LLP

Project Pollen will scale-up a universal e-scooter charging network deployed in smart lockers across cities in the UK. The project is led by Honeycomb, a start-up focused on battery charging optimisation of e-scooters, and TZ, a market leader in smart lockers.

This project will develop our proof-of-concept, which includes a smart protocol to optimise battery health, energy efficiency and manage grid demand. NVN funding will also support negotiation of a pilot study in a regulatory-approved city in the UK in April 2022.

Deployment of Honeycomb in UK cities could avoid 464tCO₂ annually by 2025, converting 33% of journeys under 5-miles.

“EV CHALLENGE” – EARLY STAGE R&D Funded by Office for Zero Emission Vehicles (OZEV)

Adaptable EV Conversion Kit Lead: GINETTA RESEARCH LIMITED

This early-stage R&D project will develop an adaptable Electric Vehicle conversion kit, designed to fulfil the requirements of specialist converters of ICE vehicles. It will also provide a suitable solution for new build vehicles including the G40-R EV.

The project will build on the innovative PowerPod Battery Pack Production readiness project completed by Brace Technology and scale up the technology from its original intended use within motorbikes and small L-Cat vehicles.

Ginetta Cars will bring their expertise in vehicle design and development aside Raceway Motorsport's manufacturing and testing expertise for the vehicle conversion.

FlexiMod - Flexible Battery Module

Lead: ELECTRON GARAGE LIMITED

A highly flexible, liquid-cooled battery module shall be created that supports multiple series-parallel configurations for a wide range of niche vehicle applications.

The first shall be a working prototype of an affordable, fully electric retrofit for the TX4 taxi, using British-made cells, BMS and HV junction box. The vehicle shall have >50kW rapid charging capability and a range of 120+ miles per charge.

Chassis reuse mitigates approximately 10 tonnes of CO₂, whilst performance shall exceed that of today's market-leading plug-in hackney carriages. A 58% reduction in purchase cost vs a new vehicle shall enable more drivers to electrify their taxi.

High Strength, Low Density Material Integration into an EV Battery

**Lead: TRELLEBORG ROCHDALE
LIMITED**

A skilled team consisting of Trelleborg's applied technologies operation in Rochdale, Far-UK, Engenuity and Great British Sports Cars are applying novel syntactic composite materials to a niche automotive electric vehicle (EV) application. A dual role assembly to form a battery enclosure, and the front-end structure of a sports car will be developed by creation of a suitable material system, precise material characterisation, and finite element analysis optimisation for minimum mass.

Significant weight savings over a conventional separate metallic chassis and battery housing arrangement will lead to vehicle range improvements, rationalisation of part count and subsequently lowering of overall manufacturing costs.

Transaxle Powertrain for Electric Pedal Assist Quadricycle

Lead: INTRA DRIVE LIMITED

E-cargo trikes and quadricycles designed primarily as last mile delivery vehicles, utilise standard e-bike powertrain components, combined creatively. However, these components were not designed for these heavier duty applications, where durability is paramount.

This project will establish the technical and commercial feasibility of a fully integrated transaxle powertrain for EAV's electric pedal-assist cargo quadricycle. A prototype vehicle will be built, based on Intra Drive's innovative 8 speed gearbox & motor unit, with increased motor torque, and modified to incorporate a differential. A transaxle arrangement simplifies installation, and reduces maintenance/OPEX: making ultra-low carbon transport more affordable and dependable.

LATE STAGE R&D

Funded by The Advanced Propulsion Centre UK (APC)

Aerodynamic First Responder Hybrid Motorcycle

Lead: **WHITE MOTORCYCLE CONCEPTS LIMITED**

Building upon the NVN PoC project and further “real-world” development throughout the APC TDAP Programme, advancing the technical/manufacturing readiness of an aerodynamic energy efficiency concept, to be delivered on a first responder hybrid motorcycle application.

Proven, on high speed demonstrator, to be 69% aerodynamically more efficient than the best production motorcycle the concept significantly improves range.

The collaborators will develop, document and productionise a city motorcycle incorporating the patent granted aerodynamic concept and bolt on hybrid, accelerating the supply chain and manufacturing processes toward full production readiness.

The motorcycle will progress to market in 2022 following successful project completion.

MACE (Morris All Carbon Electric)

Lead: **MORRIS COMMERCIAL LIMITED**

The MACE project builds upon previous successful feasibility study and proof of concept research projects to deliver an ultra-lightweight solution for producing complex, feature rich load bearing structural panels reinforced with recycled carbon fibre.

The project will further develop the materials and production processes for cost effectively manufacturing panels capable of being used in structural and semi-structural

applications. Production approaches catering for niche to high volume requirements will be considered. A full carbon fibre production readiness BIW of optimized weight, cost and performance will be built and demonstrated on a prototype zero emission Morris Commercial Van, the Morris JE.

CREATION: Independent 4-Corner Electric Actuation

Lead: **DOMIN FLUID POWER LIMITED**

In this project Domin, Aston Martin and Cranfield aim to demonstrate at high technology readiness level (TRL6) key enabling technology to move to a truly optimised 4-corner electric vehicle actuation system. Whilst there has been significant investment in electric motor technology, other key systems (eg braking, suspension, steering) remain undeveloped and reliant on central hydraulic systems. We will demonstrate on-vehicle a highly innovative and integrated solution for a full active suspension and brake-by-wire system, with the potential to unlock significant benefits for a full electric vehicle architecture, including ~10% range extension across a WLTC.

Moke Low Cost Lightweight Sustainable Body

Lead: **ARC V LIMITED**

MOKE International is a UK Company that has been manufacturing virtually the same vehicle for over 60 years - that is about to change! MOKE, with its partners, will develop a new MOKE vehicle utilising the world's most cutting edge materials used in the niche vehicle segment to create a class leading sustainable, safe and light weight monocoque used across new Electric M1 and L7 variants.

This exciting program is the continuation of a whole vehicle redesign that will deliver a next generation MOKE capable of being the foundation on which the companies continuing journey can be built.

Rift 64

Lead: RIFT TECHNOLOGY LIMITED

RIFT64 is a 64-120kW traction motor development that expands on our existing 10-30kW motor development to bring to market a high-powered, ultra-efficient e-motor with the advantages of significant weight reduction; lower cost; and energy efficiencies that result in many benefits.

The consortium of RIFT Technology, Westfield and SDE brings together innovation, production expertise, customer knowledge and route to market leading to a strong project that proves the concept of the RIFT64 e-motor as suitable for on-road EV's.

This project represents an organisational pivot for RIFT to focus on on-road vehicles for the first time in company history.

Boscoot

Lead: CHESTER32 LIMITED

Building on work completed with Collins Ltd and Pure Electric for the highly successful NVN Proof of Concept, Chester32 has constructed a diverse consortium and Late Stage R&D programme to deliver the UK's first premium electric scooter product.

Boscoot is an ambitious project developing a premium zero-emission urban transport solution. The addition of Airborne and Beeline to the project brings specific expertise essential for the progression to pre-production design and manufacturing analysis.

The project outcome will be development of innovative technical advancements which improve the safety, performance and resultant desirability of the e-scooter form factor.



INNOVATION THROUGH COLLABORATION

FUNDING & COMPETITIONS | PROJECTS | EVENTS & NETWORKING

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