



2020 Production Readiness R&D Competition Winners:

PowerPODs - Modular, Configurable Battery System

Lead: [BRACE TECHNOLOGY LTD](#)

PowerPOD is an integrated, modular battery system demonstrated on an EV motorbike. It is a reconfigurable, hi-energy dense, power source system enabling multiple, cross-sector applications. This project refines the Proof Of Concept PowerPOD and develops it into a low volume, production-ready system.

A UK supply chain will be developed for the PowerPOD and Docking Module. Volume production in an EV motorbike will be developed with UK niche manufacturer CCM Motorcycles as well as new entrant Langen Motorcycles.

PACES (Passenger and Commercial EV Skateboard)

Lead: [JSC AUTOMOTIVE LTD](#)

PACES will build upon a recently completed 2019 NVN-PoC project, advancing the technical and manufacturing readiness of a configurable eSkateboard concept, to be demonstrated on a JSCA vehicle application.

This will facilitate a step change in cost effective electric vehicle platform viability for niche manufacturers and specialist vehicle converters across the passenger, sportscar and light commercial sectors.

The partners will develop and extensively test an eSkateboard with integrated battery enclosure on a JSCA vehicle, accelerating the supply chain and manufacturing processes toward full production readiness. The eSkateboard and JSCA vehicle will progress to market in 2021 following successful project completion.

Body Panels in Recycle Carbon Fibre Composite - Applications, Refinements & Production

Lead: [BRAHMS ELECTRIC VEHICLES LTD](#)

Carbon fibre has a vital role to play in vehicle light-weighting. However carbon fibre is very energy intensive to produce so re-using and recycling this material is also vital in order to gain it's full environmental benefit. Existing vehicle legislation requires that materials are recycled. Vehicle end of life quantities of carbon fibre are increasing. This project demonstrates a wide range of automotive applications of the recycled carbon fibre and brings them to a production capable stage demonstrated on electric hearses. Each partner will take the project knowledge forward to a variety of applications.

ACRIM II

Lead: [CARBON THREESIXTY LTD](#)

A range extending and performance enhancing lightweight wheel for small to medium sized electric vehicles.

Lightweight composite wheels have, until now, been reserved for high-end luxury or performance sports cars. ACRIM II will buck this trend. Reducing rotating and unsprung mass has a measurable and significant impact on the efficiency and performance of a vehicle.

The use of innovative preforming technologies, advanced material systems and process automation ensures scalability and cost reduction for production volumes. By utilising a novel modular construction, multiple wheel stylings can be realised with minimal NRE.

ACRIM II demonstrates the future of ultra-lightweight automotive wheels.

ALECS - Articulated Lightweight Electric Cargo Solution

Lead: [PASHLEY HOLDINGS LTD](#)

Preparing the innovative and lightweight last mile delivery e-trike designed under the ALECS PoC project for production. The resulting product will deliver a safe, zero emission, efficient last mile delivery vehicle with a configurable multi-function platform, creating a significant market opportunity.

Project partners are Pashley Cycles (project lead and vehicle manufacturing), Simpect Engineering (engineering consultancy and product-development specialists), the UoW (manufacturing control, visualisation and low carbon specialists) and Foresight Innovations (Lightweight cargo loadspace specialists). Supply-chain subcontractors include Reynolds and Omnia-CS.

Serco, the provider of mobility projects nationally and Zedify, a leading UK cargo e-trike delivery business, will be observers.

The QXS-E1 Motor – Compact, Rugged 35kW Motor for Electric Motorcycles

Lead: [EDGE MOBILITY LTD](#)

The QXS-E1 motor is a compact, rugged 35 kW electric motor being developed by Edge Mobility. Designed to fit tight packaging volumes with its novel integrated liquid cooling system, it is an ideal solution for manufacturers of both electric motorcycle and other small vehicles.

In collaboration with Brace Technology and Xi Engineering, the goal of this Niche Vehicle Network R&D project is to prepare the QXS-E1 motor for production by taking it through a series of virtual simulations and physical tests before integrating it into an electric motorcycle and scooter for in-vehicle demonstrations.

Clipper Cab Electric Taxi Production Readiness

Lead: ENGINES FOR GOOD LTD

Clipper Automotive and partners aim to make significant improvements to the air quality in our towns and cities by converting diesel taxis to be 100% electric. Taxis are the biggest single polluting vehicle type in UK cities.

We have designed a system to retrofit London taxis with fully electric drive-train and have built a working prototype. The project will now build a production ready version of a zero-emissions retrofitted London black cab, bring this to market, carrying out real-world tests.

We will also complete a full application to TfL for regulatory approval to operate these as licensed cabs in London.

Project Revolution – Production Intent Prototype

Lead: V O VEHICLES LTD

VO is a lightweight EPAC city solar powered taxi for 2 people and cargo with removable battery.

VO embodies the best attributes of car and cycle travel. Legally permitted to use cycle lanes, VO travels at a capped speed of 15.5mph, effectively faster than a car's average 11.3mph through cities using solar, human power and innovative energy storage system.

VO's zero-emission, ultra lightweight, 60kg design enables solar power to be reliable and sufficiently powerful for urban travel.

VO will be the vanguard for solar powered transport, paving the way for heavier solar vehicles as solar cell efficiency continues to advance.

Improving the Range of EV Taxis using Energy Efficient Tyres

Lead: ENSO TYRES LTD

Electric taxis have very specific challenges: increased utilisation rates, heavier weight and higher torque. This can be solved in part by more energy-efficient tyres, which have a lower rolling resistance and extend pure EV range, delaying the need to depend on fossil-fuel range extenders.

In this project ENSO, LEVC and ZETI will engineer/demonstrate/test/validate the GEN1-TX tyre for LEVC's TX electric taxis. We intend to deliver an increased EV range of $\geq 10\%$ using our tyre.

This innovation combines proprietary compounds and lightweight tyre construction that's not commercialised in this sector, a niche market underserved by leading tyre companies.

iEV Motor Family – PCB Hairpin Winding

Lead: [INETIC LTD](#)

iNetic have designed and developed and are now ready to productionise a range traction motors for a wide range of electric vehicle applications.

The motors were designed from the start with a very clear cost down journey consisting of 3 distinct steps, 1 & 2 are complete, this application is for step 3. With each step cost is removed from the BOM and the motor becomes more attractive to volume customers.

Prototype iNetic iEV motors are used in a wide variety of EVs on land and sea, including PR19-1014 11 Ton E-Axle and PR19-1004 HPD EDU.

Technology Transfer R&D Project:

Zero Emission Hydrogen Fuel Cell Hybrid Power System for Light Marine Vessels

Lead: [HYPERMOTIVE LIMITED](#)

“HyMarine” is a collaboration between EP Barrus, Hypermotive and HPi CEproof to develop a hydrogen fuel cell battery hybrid powerplant for light marine applications and demonstrate on a mule vessel. This powerplant will provide a zero-emissions, low-noise, low-maintenance alternative to the ubiquitous marinised diesel helping deliver against the UK’s Clean Maritime Plan.

Barrus are the UK’s leading provider of marine powerplants. Hypermotive are one of the UK’s most experienced fuel cell and battery system integrators. HPi CEproof are the only Notified Body in the UK licensed to certify small marine craft for the European market as well as Pressure Equipment.