

Low Carbon Vehicle Technology - 2019 R&D Competition Winners

POC19-1032

JSC AUTOMOTIVE LIMITED

Project 356

Project 356 will build upon the SEV and Faraday Challenge battery case feasibility studies to deliver a proof of concept prototype vehicle, demonstrating a step change in electric vehicle platform accessibility for niche vehicle manufacturers across passenger, sportscar and commercial vehicle sectors. The partners will design, manufacture and demonstrate an integrated chassis platform, utilising battery modules and drivetrain components sourced from Nissan, which will eliminate the requirement for a stand-alone battery enclosure. The chassis and electrical platform will be flexible and scalable to meet wide ranging requirements for multiple vehicle types, demonstrated on a passenger vehicle application in this project.

POC19-1027

CARBON THREESIXTY LIMITED

ACRIM-Wheel (All Composite Reduced Inertia Modular Wheels)

ACRIM-Wheel is a proof-of-concept project to produce the world's first commercially viable, low cost, lightweight, all-composite, modular wheel system for niche and electric vehicle applications. It will demonstrate the durability of composite wheels and quantify improvements made to vehicle efficiency. During frequent start/stop duty cycles it is predicted that lightweight, optimised wheels can improve efficiency by up to 10%. Cost will be minimised via a unique modular configuration and by utilising cutting edge composite processing technology. ACRIM-Wheel will draw on the UK's world renowned composites expertise to develop and prove a radically different and innovative wheel concept.

POC19-1019

BRAHMS ELECTRIC VEHICLES LIMITED

Body panels in recycled carbon fibre composite

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 its full environmental benefit. Existing vehicle legislation requires that materials are recycled and vehicle end of life quantities of carbon fibre are increasing. This project explores the application of the recycled carbon fibre through the development and demonstration of a vehicle roof and tailgate for an electric hearse. Each partner will take the project knowledge forward to a variety of applications.

POC19-1009

BRACE TECHNOLOGY LTD

Motorcycle Instant Top-Up Battery System

Development of the first modular battery system with quick change capability for use in a motorcycle. The novel hex design energy modules will allow customisable integration into different vehicle platforms to suit any price, power and range requirement. The unique battery management system offers a discharge across the cells simulating a conventional fuel tank allowing for instantaneous top ups. The energy pods can be used on and off vehicles as stand-alone battery pods giving energy to remote locations and emergency situations.

POC19-1026

RML GROUP LIMITED

Low Cost 48v Mild Hybrid add-on solution

Hybridisation of the powertrain is an automotive megatrend, with vehicle manufacturers looking to electrify their products, however the costly nature of developing and manufacturing a hybrid system is a big drawback to its application in niche vehicle products. RML Group and chosen partners (Caterham and Xtrac), have collaborated to share their industry knowledge, skills and expertise to investigate the integration of a 48v mild hybrid system for low volume road-car applications in a cost effective solution, which provides numerous environmental and drivability benefits of such a system. There is also future scope to integrate the proposed systems into motorsport applications.

POC19-1033

PASHLEY HOLDINGS LIMITED

ALECS, “Articulating Lightweight Electric Cargo Solution”

ALECS is an NVN Proof of Concept project that will produce an innovative and lightweight last mile delivery e-trike. Project partners are Pashley Cycles (project lead and vehicle demonstration), Simpact (engineering consultancy and suspension specialists) and Reynolds (specialists in the supply of lightweight tubing). Low overall mass and articulating chassis will be achieved using lightweight materials and novel suspension technology. The concept will be demonstrated in the delivery livery of our observer partner, Serco. The developed concept will deliver a safe, zero emission, efficient last mile delivery vehicle and on a configurable multi-function platform, opening up a significant market opportunity.

POC19-1016

WHITE MOTORCYCLE CONCEPTS LTD

Revolutionary Aerodynamic Motorcycle Design

This project aims to deliver a prototype motorcycle that, under laboratory conditions, will demonstrate dramatic aerodynamic advantages over current production motorcycles. The prototype will demonstrate that the design will be suitable for the next generation of electrically powered motorcycles by addressing current aerodynamic inefficiency to vastly improve range and enhance potential for heat exchanger cooling. In addition, the new design will deliver improved safety performance through enhanced stability at steady state motion and even more importantly in the braking phase.

POC19-1020

WARWICK CONTROL TECHNOLOGIES LIMITED

Battery Passport

Electric vehicle batteries need replacing when their usable capacity decreases. At this point they can be recycled or re-purposed to another industrial application such as domestic energy. The problem is knowing whether a battery is good or bad. The Battery Passport is equivalent of an odometer for the electric vehicle batteries. It provides a robust mechanism that records battery usage over its life and assures future buyers of the worth of the batteries, thus reducing the net cost and CO2 footprint of an electric vehicle. The Battery Passport must be tamper-proof and uses innovations such as Blockchain and CAN Cybersecurity.

POC19-1035

WESTFIELD TECHNOLOGY GROUP LIMITED

Cargo POD

Following a commercial feasibility study with Emirates Airline, Westfield have created, with Heathrow/ZapGo, a specification/design for an electric inwheel powered autonomous cargo pod that is able to take aircraft akes (baggage containers) and ULDs (Unit Loading Device containers) all using the same self powered platform. This will decrease the emissions airside (currently using red diesel), reduce delays at airports by automating the landside to airside security check and increase utilisation of vehicles by minimising charging time using an advanced carbon ion hybrid power plant and fast charge system. The vehicle will be equipped with an AI control system that will optimise the use of Lithium and Carbon Ion power.

PR19-1041

HALL ENGINEERING AND DESIGN LIMITED

11 Tonne Electric Drive Axle

We designed, built and tested a sophisticated electric axle for Dennis Eagle's prototype UV Plugin Hybrid vehicle. After this successful project, Hall Engineering And Design Ltd want to team up with Portland Engineering and EVParts UK Ltd to move this prototype technology towards production reality. The axle has integrated motors, inverters and hub reduction gearing. The main focus will be on simplification and cost reduction to make this axle technology viable for niche manufacturers such as DE. Dennis Eagle are gifting us a donor vehicle to demonstrate the axle on.

PR19-1004

SWINDON POWERTRAIN LIMITED

High Power Density E Powertrain

Between September 2017 and February 2018, Swindon Powertrain led the extremely successful proof of concept project NV17-PC128, E Classic - electrification of a Mini. We now wish to bring its E powertrain, an extremely compact unit with a very competitive ratio power / cost , to production with a widened commercial scope, also covering light commercial, recreational and niche manufacturer's vehicles. In order to achieve this we are bringing Swindon's overall powertrain expertise together with iNetic's electric motor manufacturing know how and Code Automotive's specific transmission design consultancy experience.

PR19-1014

AJE POWERTRAIN LTD

Hybrid Titanium Carbon Fibre Road Wheel

A true titanium wheel with carbonfibre barrel for automotive applications. Manufactured using two NVN developed low cost, low carbon technologies. Comparable manufacturing costs to that of conventional aluminium performance wheels. By combining the high strength of the titanium with the low mass of carbon fibre the benefits are real performance and fuel economy / range extension, a 50% reduction in inertia and the opportunity to improve overall vehicle efficiency by between 3% and 5%. The wheel will be a UK manufactured product with a production run of circa 8000 units per year, being available worldwide to OEMs and aftermarket consumers.

PR19-1034

ARIEL LTD

Ariel Lightweight Electric Cycle 2 (ALEC 2)

The project will take the successful output of the 2018 ALEC technology transfer project and progress the machine toward production readiness. The Partners will apply latest automotive motor, battery system, inverter and control technology to deliver a step change in Pedelec integration and rider controls. Advanced automotive jointing, bonding and mixed material production technology will provide lower weight, improve ride quality and deliver UK based cost down manufacturing. The project will utilise these technology and design benefits to deliver an integrated electrified cycle that delivers a 40% weight reduction over industry standards, increasing consumer appeal, experience, performance and range.

PR19-1023

RIFT TECHNOLOGY LIMITED

RIFT (Reduced Induction Field Torque Drive) - A novel electric motor configuration that reduces the material and manufacturing cost of electric motors by up to 80%.

The "RIFT" EV motor is an innovative approach to an ultra-efficient electric drive, bringing forward a unique range of advantages including, significant weight reduction (circa 50%), lower cost and that results in a range increase of up to 75%, plus other benefits. The consortium of RIFT, MCP and Bradshaw bring together innovation, production expertise, customer knowledge and route to market. This leads to a strong project to improve the production readiness of the RIFT Motor for the automotive sector and is intended to establish a lasting commercial relationship between the parties.