Results of Competition: ATF: Moving the UK Automotive Sector to Zero Emissions - Round 1

Competition Code: 2007_BEIS_FS_MMM_ATF

Total available funding is £10.2m

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
ARCOLA ENERGY LIMITED	Business case for powertrain tier 1 scale up	£229,653	£160,757
NCC OPERATIONS LIMITED		£74,159	£74,159

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
This feasibility study is focused on the investment case and supply chain opportunities in the manufacture of powertrain systems and subsystems for hydrogen fuel cell electric powertrains for heavy-duty vehicles. Arcola Energy as the UK's leading developer of fuel cell electric powertrains will work with strategy consultancy E4tech to carry out market analysis of the heavy duty sector and the position of the UK in the global hydrogen and fuel cell supply chain. In parallel the National Composites Centre, acting as the gateway behalf of the wider catapult network, will identify supply chain and R&D opportunities for the supply of subsystems meeting the requirements of powertrains for this sector. This is expected to lead to partnerships and further R&D in batteries, fuel cells, hydrogen storage, power electronics and traction motors and drives. The main output of the feasibility study will be a business plan and investment case for Arcola Energy as the basis for seeking investment to support scale-up. The study will also produce a public report for dissemination identifying the technology requirements and market value for key powertrain components. This will be shared to support APC roadmapping exercises and to provide a market signal to potential suppliers.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
INTELLIGENT ENERGY LIMITED	Project ION Feasibility Study	£600,200	£360,120

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Project description - provided by applicants
Hydrogen Fuel Cell Electric Vehicles (FCEVs) use fuel cells that can sit under the bonnet like ICE. FCEVs take 3 mins to re-fuel. FCEV architecture is similar to that of BEVs, but the FC replaces the battery pack. FCEVs offer zero harmful tailpipe emissions with minimal compromise on range, refuelling time, and payload relative to petrol and diesel vehicles. Hydrogen Fuel Cells electrochemically react hydrogen with air to produce water and electricity; no combustion, no CO2, no NOx, zero tailpipe emissions. Intelligent Energy (IE) is a world leader in the development of Proton Exchange Membrane (PEM) Fuel Cells. The Project ION Feasibility Study encompasses a range of underpinning assessments essential to successfully develop a world-class fuel cell manufacturing facility capability in the UK

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
TEER COATINGS LIMITED	High-Throughput Coating Processes for Fuel Cell Bipolar Plates	£90,264	£54,158
University of Birmingham		£38,522	£38,522

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Proton Exchange Membrane Fuel Cells (PEMFCs) display the highest power densities of any of the fuel cell types, which makes them particularly attractive for transportation & portable applications where minimum size and weight are required. Conventional PEMFCs utilise bipolar plates which are made from graphite (bulky and expensive to machine) or stainless steel. Stainless steel bipolar plates (BPPs), which are dominant in automotive PEMFCs, require a protective coating to achieve the desired performance and lifetime. Hundreds of cells are required within an automotive multi-kW stack, hence it is important to develop coating processes which provide high throughput and economic production of coatings. It is also highly desirable to deposit coatings on metal sheets prior to the forming of bipolar or separator plates, without the coating being adversely affected by the subsequent forming processes. This project will evaluate the feasibility of scale up of high-performance fuel cell BPP coatings in a semi-continuous inline coating deposition equipment, and the effect of scale-up on critical performance characteristics as well as the cost of production of coatings. The effect of scale-up will be evaluated both for coating of pre-formed fuel cell plates and on plates formed post coating, in order to inform decisions on the most appropriate future scale up processes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ZHUZHOU CRRC TIMES ELECTRIC UK INNOVATION CENTER	Scalable high efficiency DC-DC converter for electric vehicles (EVs) applications	£241,534	£120,767
University of Cambridge		£94,676	£94,676

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
A rapid uptake of Ultra Low Emission EVs (ULEVs), especially EVs, is underway in the UK proposal for ending the sale of new diesel and petrol (gasoline) cars by 2035, and only having zero-emissions vehicles on the roads by 2050 (Modern Transport Bill). The DC-DC converters for the EV plays a pivotal role in reducing the cost of EVs. Low voltage on-board energy storage can be used if the flexible DC-DC converter is adopted, which will significantly reduce the cost of the battery. Meanwhile, the DC-DC converter is largely used in Plug-in Hybrid EVs (PHEVs) which has been considered as an urgent and popular solution to reduce emission in a more managed and economic pace for the customers, governments and industries. In addition, the boost DC-DC converter is also mandatory for the fuel cell vehicles which is also considered as a potential alternative green energy source contributing towards zero emission. To date, UK does not have local supplier of such DC-DC converters and this project is timely important to establish local design, development and supply chain for such critical part. In this project we will develop a novel universal modular flexible DC-DC converter system implementing both voltage step-up and step-down functions. This new technology will enable the BEV/PHEV battery conversion systems to have a reduced volume, maximised commonality while addressing concerns of reliability, fault protection and operating in the severe automotive environment with high efficiency. This will provide the vehicle manufacturers with more flexibility on the battery modules to reduce the cost of the on-board energy storage. This project of DC-DC converter will enable low-cost solution of on-board batteries for EVs or full cell vehicles to support large uptake of zero emission vehicle. The focus on both a new production introduction and feasibility of a UK-based supply chain for such product is a direct response to the competition and the Green Recovery post COVID-19\. Both suppliers and OEMs will be benefited by this research. The DC-DC converter for EVs has a huge market and the wireless charging is a potential solution. The research and development in this project aims to technological improve the power electronics technology and supply chain. We aim to scale up the UK's design and manufacturing capability by combining the local centre of excellence for transport electrification and power electronics (TEIC) and the prestigious and strong research power house (University of Cambridge).

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SHIELD ENGINEERING (SYSTON) LIMITED	Acceleration of cost-effective & scalable manufacturing solution for next generation highly-integrated power electronics, motors & drives	£206,276	£103,138
EMPEL SYSTEMS LIMITED		£383,123	£268,186

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
This collaborative project brings together UK design, manufacturing and supply-chain resources to define how future requirements for this innovative solution for an electric motor with integrated power electronics (inverter) will be successfully configured meeting performance, package, cost, quality and volume demands. This feasibility project will robustly set EMPEL and Shield on the accelerated path to class-leading design and manufacture. This innovative approach is delivered through scalable architecture enabling numerous client applications to be supported with minimal tailoring and unique tooling. The architecture allows the motor & low-cost inverter to be integrated into client's hardware reducing parts count, weight and package dynamics. Collaborative partners: EMPEL Systems bring leading edge motor and power electronics design while accelerating their knowledge acquisition. Shield Engineering (SMT) bring manufacturing know-how and resources.This project drastically advances Shield's plans to support clients with in-vehicle propulsion solutions. Key to the useful outcome of this feasibility study is the contribution of strategic UK based suppliers of core commodities, components and manufacturing equipment. A range of such suppliers will be engaged from the outset to determine optimum specifications which will in turn protect the future scalable architecture requirements and frame the design for manufacture rules. These suppliers will then be equipped to support EMPEL & Shields innovations and growth and the growing broader UK PEMD capability. The project addresses the following investment areas: Power Electronics Manufacture Electrical Machine Manufacture Electrical Steel and Magnet Materials & Manufacturing It will be achieved through definition, value planning and DfM of scalable, core-technology e-motors and inverters for multi-voltage requirements and a large range of motor speeds torques. The products will be configured for stand alone, modular or integrated in-vehicle installation. The project outcomes will include: Higher-volume motor, inverter and key component designs with multi-voltage scalable architecture

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Design for manufacture guidelines for core processes and components

Core process definition backed up by evaluation and verification trials, with estimated manufacturing process-flow, cycle-times and investment requirements at potential volume breaks

Production cost indications and challenges

Acceleration of automotive market opportunities.

Achievement of sufficient TRL and MRL enabling confident transition into future development and exploitation

The main focus areas include application of scalable architecture approach, disciplined DfM reviews with fully engaged UK strategic suppliers addressing the challenges and preconceptions of the industry and enabling investment in volume growth.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SHD COMPOSITE MATERIALS LTD	ATLAS - Advanced Technology Lightweight Automated Structure	£109,726	£65,836
University of Sheffield		£46,943	£46,943

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
This project is a collaboration between SHD Composite Materials Ltd and Sheffield University (AMRC) with Lotus cars as end user. The object is to develop a multi-functional, sustainable composite material meeting the thermal and structural requirements of EV battery boxes whilst fulfilling the requirements for rate of manufacture and cost dictated by Lotus for next-generation vehicles.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ZF Automotive UK Limited	'Proto-LAMINATE' for Proto-Lamination and Magnetic INTegrated Assessment Test Exercise	£154,411	£64,853
Coventry University		£11,660	£11,660
H.V. WOODING LIMITED		£60,038	£36,023

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
As the automotive industry seeks to embrace electrification, part of the drive toward net-zero emissions targets and a future UK green economy, opportunities arise for development of sustainable and competitive UK supply chains for design, manufacture and recycling of zero-emission vehicles and their constituent components and systems. Through its innovation funding services such as the Automotive Transformation Fund (ATF), the UK government seeks to support these developments through accelerating business innovation and boosting R&D investment. Realising the vision of zero-emission vehicles through electrification requires development of new Design-for-Manufacture processes and products across the UK automotive PEMD supply chain. This ATF proposal seeks to investigate an important aspect of this transformation, which currently is a gap in the UK supply chain: the feasibility of new processes for low-cost prototyping and small series production of e-motor lamination stacks. In developing new e-motor products, a critical step is testing and validating designs using small batches of prototype assemblies. These assemblies must be representative of the final product in terms of fit, form, function, and particularly performance-relevant properties, accurately representing those achieved through final production processes. This is especially the case in automotive applications where the final product may well be part of a safety-critical vehicle system. On the other hand, automotive applications are highly cost-sensitive: hence, there is a need to minimize development costs whilst still achieving the required level of developmental rigour. This project seeks to develop and test -- in conjunction with a real automotive e-motor development programme -- new processes that enable rapid, high-quality, low-cost manufacturing of prototype (or small volume production) samples of e-motor lamination stacks. The provision of the proposed new manufacturing processes will boost the UK PEMD supply chain and contribute to future sustainability -- for example by eliminating environmentally-harmful adhesives from stack assemblies and reducing manufacturing waste. The proposed partnership includes ZF Automotive, a Tier-1 supplier of automotive systems, H V Wooding, a UK provider of product design, prototyping, assembly and testing services across a range of engineering areas, including lamination stacks for e-motor assemblies, and the Metrology group of the Centre for Manufacturing and Materials Engineering at Coventry University. The partnership brings together the manufacturing process capabilities, the metrology expertise for process and product tolerance analysis, and the end-user assembly and comprehensive testing expertise required to enable the new processes to be defined and fully characterised as part of a wider automotive e-motor development programme.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Newport Wafer Fab ltd	Silicon carbidE maNufacturing feaSIBILIty sTudY (SENSIBILITY)	£48,316	£24,158
COMPOUND SEMICONDUCTOR CENTRE LIMITED		£12,991	£7,795
Swansea University		£5,076	£5,076

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
At the heart of every EV engine is a MOSFET semiconductor device built in a specialist substrate Silicon Cardide The future net zero plan for the UK will rely on these devices. This feasibility project will study how the existing capabilities of the South Wales Compound Semiconductor cluster can be expanded to create a solution to feed the UK's Automotive supply line. The resultant study will demonstrate how a substantial supply line of innovative , next generation EV TRENCH MOSFET's on 200mm Epi substrates can be established. The final report will outline the key business plan, cleanroom expansion options, employment impact and investment requirements including the potential use of strategic UK RD&I funds. The project will access the RD&I expertise of Newport Wafer Fab (NWF), the UK Largest semiconductor centre and the epitaxy knowledge of Compound Semiconductor Centre CSC (IQE).The project will be supported by Swansea University's (SU) Centre for Intregrative Semiconductor Materials (CSIM). The UK automotive industry needs a clearly defined pathway to develop and supply PEMD devices that will drive the APC and DER's strategic ambitions. This feasibility study will define the fundamental requirements to establish a business plan report that can deliver a scaled, cost effective, technology pathway that will foster UK PEMD innovation, enabling the UK to achieve a leadership position in the net zero challenge

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ECHION TECHNOLOGIES LTD	Scaling Anode Technology for the xEV market (SATE)	£146,234	£102,364

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Project SATE (Scaling Anode Technology for the xEV market) aims to accelerate the large-volume manufacturing of a next-generation fast-charging battery material for electric vehicles in the UK. This patented material has been developed by Echion Technologies ('Echion'), a high-growth company who spun-out of Cambridge University in 2017 to commercialise proprietary fast-charging battery materials. The speed of charge of standard commercial batteries is severely limited by the negative terminal material which they use to store the electricity upon charge, called the anode. Echion has developed a new anode material called Mixed Niobium Oxide (MNO) which enables a unique combination of safe fast charge (down to 6 min for a full charge), high energy and power density, long cycle life and low cost. This technology has the potential to enable more efficient and cost-effective hybrid vehicles benefiting from improved regenerative braking. It also finds application in full electric vehicles by decreasing battery size and cost with the benefit of fast-charging. This technology will accelerate the adoption of mass-market electric vehicles, which is in line with the government Road to Zero strategy and will provide significant environmental and public health benefits in terms of reduction of CO2 emissions and harmful particulates from the transport sector. Project SATE will identify strategies to enable large-volume manufacturing of Echion's MNO material in the UK. To inform this feasibility study, a pilot-scale MNO material batch will be produced by subcontractors, thereby enabling Echion to validate a significant milestone towards scale-up and commercialisation. Ultimately Project SATE will enable Echion to secure its position in the UK advanced battery materials supply chain. Project SATE will fast-track a unique material into the UK electrified automotive value chain, supplying our automotive industry with a high-added value technology. By promoting UK manufacturing, project SATE will contribute to securing the UK's international competitiveness in the field of advanced battery materials development and production.

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AMTE POWER LTD.	Thurso+: Development and Expansion Feasibility Project of AMTE's Cell Manufacturing Plant	£200,331	£140,232
HSSMI LIMITED		£85,358	£85,358

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
The UK Automotive battery supply chain has maintained significant strengths in the chemicals industry and developments of the next-generation anode and cathode technology. The AMTE Power Thurso facility has played a significant role in the upscaling of these technologies, from the lab to low production volumes. However, as the technologies find success there are limited opportunities to continue development and production within the UK. HSSMI and AMTE Power conducted a Faraday-Battery-Challenge round 3 feasibility project to establish the validity of a UK based Gigafactory. This study provided the expected operational and capital costs for such a facility as well as an expected operational date of 2022\. However, while the development of this facility is on-going, AMTE have seen a recent surge of demand from customers that cannot be currently met with the existing processes, equipment and scale of the current facility. To address this challenge, the Thurso+ project aims to determine the feasibility of upscaling AMTE Power's electrochemical battery cell production facility in Thurso and how it can best be aligned with their future Gigafactory. The Thurso+ project will aim to develop a productivity and investment roadmap which will be used to: *Identify and implement immediate opportunities for increasing productivity and efficiency through lean and flexible manufacturing principles. *Understand of how the Thurso facility can best achieve technological parity in production methods to those of state-of-the-art Gigafactories. This will facilitate further development of innovative and high-performance UK based products supporting the Automotive Industry. The project will increase accessibility of cell supply for low volume specialist vehicle manufacturers who struggle with large OEMs buying up capacity. The Thurso+ project is being submitted to Innovate UK's competition: ATF: moving the UK automotive sector to zero emissions. The project will demonstrate innovation in the development of lean, flexible, and state of the art, high volume cell manufacturing capability in the UK of which there is currently a significant lack of. There is innovation in the adoption of high-volume manufacturing techniques and process within a small scale facility. This will reduce scale-up costs through minimising development and trials during each increase in production quantity. The project consortium is made up of AMTE Power, the cell manufacturer, and HSSMI, experts in high volume and scale-up manufacturing.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
COMPOUND SEMICONDUCTOR CENTRE LIMITED	GANDALF - GAllium Nitride process De-risk for uk Automotive suppLy chains -- a Feasibility study	£70,415	£42,249
Newport Wafer Fab ltd		£93,193	£46,596
NEXPERIA UK LTD.		£172,880	£86,440

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
This is a industrial led project in which the partners assess the feasibility of exploiting the WBG manufacturing capability initiated under an existing DER Fast Start project (105891) to manufacture Nexperia's latest generation of D-mode 650V GaN devices in the UK. This 5 month project will deliver a 200mm process definition (epitaxy and fab), transfer specifications and any relevant technical de-risking. Mutual technical information exchange will be exchanged under NDA on: * The epitaxial structure of the 650V GaN on silicon HEMT. * Process flow requirements of Nexperia's proprietary process * Key performance specifications and qualification requirements This work is a vital first phase of a longer term ambition to establish a scalable UK capability in GaN materials and chip manufacturing that will also support the future growth ambitions of Nexperia's GaN business. Successful delivery would enable Nexperia's future demand (5000 wafers per month by 2027) to be reshored to the UK (epitaxy and chip fab) from overseas with the additional benefit of being transferred from 150mm to 200mm wafers. The additional phases needed to deliver the full capability are: * Phase 2: Proof of manufacturing concept including deployment of critical capital equipment * Phase 3: Capacity ramp to 1kwpm - including capital * Phase 4: Capacity ramp to 5kwpm -- including capital It will also significantly expand the scope of project (105891) by both accelerating and de-risking the next stages of delivering a full epitaxy and chip manufacturing capability for 200mm GaN on Si, 650V HEMTs.The complementary capabilities of the three industrial partners provide the UK's most credible route for a cost competitive, 200mm WBG solution that can scale to meet the growing demands of the UK automotive supply chain. Longer-term project benefits include: * Nexperia can evaluate it's GaN device performance on CSC's epitaxy offering (currently using overseas suppliers) and initiate the process transition from 150mm to 200mm. * NWF will run Nexperia's test vehicle through their fab and significantly de-risk the subsequent process transfer. * CSC will validate their 200mm epitaxial wafer products for Nexperia to position them for significant growth in line with Nexperia's forecasts. * The UK automotive supply chain gains a state of the art WBG front end capability i.e. a one-stop shop in Materials, Process and Packaging. It also secures a high volume business opportunity for UK partners which would otherwise go overseas. All partners agree this feasibility project is manageable within 5 months and are ready to start by 1st November 2020\.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
UK SEABED RESOURCES LIMITED	Blue Battery Metals - A UK Processing Feasibility Study	£903,538	£451,769

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
UKSR envisages a field-to-table supply chain for EV batteries, wherein mineral deposits under UK licence in international waters are collected at sea and processed onshore in the UK to provide sufficient cathode-active materials to meet the requirements and demand level of the UK EV industry. This vision is enabled by an existing UKSR-Government partnership to explore Polymetallic Nodule (PMN) deposits in the Pacific Ocean containing manganese, cobalt and nickel, as well as copper, molybdenum and rare earth elements. This element of the project focuses on the UK processing element of the value chain, as part of a wider industry-funded programme. The key project objectives are to assess the feasibility of developing and building in the UK a novel, zero-waste mineral facility to process PMN to produce cathode active materials (Nickel, Cobalt and Manganese) in a form and at a scale that can meet the long-term requirements of the UK's EV battery supply chain. The main areas of focus will be to: -identify the optimal process to meet the requirements of the UK EV supply chain and minimise waste -identify UK and export markets for other process outputs including non-metal materials -identify principal factors determining optimal site location -identify any potentially suitable UK sites, with recommendations to enhance suitability further, and alternative sites if no UK option is suitable -provide quantified input to programme-level investment case and government policy The innovation comes in three forms. First, as there is currently no industrial-scale process capable of yielding the full value of PMN, the chemical process itself will be novel and require further research and development activities to scale-up to maturity. Second, a key programme goal is "zero waste" -- that is, full reagent recycling and a commercial use for all products from the process. Third, a UK-controlled EV battery raw material supply chain, from ore extraction to battery manufacturing, will enable the UK to break its dependence on raw material imports and vulnerability to geopolitical competition for resources. A predictable, low-impact, long-term supply of cobalt, manganese and nickel will de-risk the availability and cost fluctuation of these materials currently for battery manufacturing in the UK, thus building resilience, consistency, and value throughout the UK supply chain for electric vehicles. In addition, it will create skilled UK jobs and enable the UK to benefit economically from the export of critical metals to the growing renewable technology market.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AVL POWERTRAIN UK LIMITED	UK Battery Research and Development Centre Feasibility Study	£348,848	£174,424
University of Warwick		£148,964	£148,964

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
As electrification of transport accelerates in all major sectors, OEMs and battery developers have an increasing need for knowledge and facilities to support research, development and validation of electrified products. The UK does not currently have the capability or capacity to meet this growing demand. This puts UK companies at a significant disadvantage due to the cost and time delays of shipping batteries to the EU or USA for development testing -- even when such capacity can be identified. AVL and WMG propose to set up an advanced battery research and development centre, located at Wellesbourne in the Midlands, that can offer the innovative skills and infrastructure to the UK automotive industry and beyond: the **UK Battery Research and Development Centre (UKBRDC).** This centre will develop and apply state-of-the-art development and validation methodologies, and will offer the combined knowledge and capability of AVL and WMG to UK OEMs and battery developers. The scope of operations will include cell, module and pack scale testing and development, incorporating expected future requirements such as larger and higher voltage modules and packs, and the need for repeatable abuse testing at pack level. Whilst initially focused on the Automotive sector, the centre will be scoped to grow into aerospace, off-highway, marine, rail and static energy storage markets as they evolve. By offering test and development capability, this centre is fully complementary to investments already by UK government in this area, such as the Faraday Challenge, UK Battery Industrialisation Centre, Driving the Electric Revolution, and the APC and IUK research and development programmes.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LOTUS CARS LIMITED	BattCon - Battery Containerised Test Facility	£637,024	£318,512

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Project BattCon is an innovative and technical project to pilot a new battery and battery technology testing facility within the UK and provide Lotus with the understanding to invest in a range of containerised test facilities in line with electric vehicle and energy storage market growth. As automotive and other sectors develop new and novel battery technologies there is an increased demand for suitable battery testing facilities and Project BattCon begins to address this problem by providing available and competitive battery testing opportunities for the UK battery supply chain and OEMs. The new state-of-the-art facilities will enable various battery characterisation tests, performance evaluations and component and lifetime testing to be performed under controlled conditions, providing feasibility study support early in the design phase of a new battery, and validation of the mature pack designs for implementation into product. Performance and component testing will include, but not limited to, capacity determination, resistance mapping, current and power mapping, open circuit voltage (OCV) determination and heat capacity. Lifetime testing is comprised of low voltage cycling, high voltage cycling, self-discharge determination, storage aging, cycle aging, drive cycle aging and orientation. Lotus will provide a safe area with specialist staff experienced in testing batteries, an activity that inherently carries significant potential risk. Companies new to the technology and those who would otherwise need to invest in additional test facilities, can save the cost and inevitable time delays in maturing their range of processes and systems, required to develop and test their technologies. Lotus providing a secure facility enables customers to dramatically reduce their development times and costs and enable products to be taken to market sooner and with reduced risks.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: ATF: Moving the UK Automotive Sector to Zero Emissions - Round 1

Competition Code: 2007_BEIS_FS_MMM_ATF

Total available funding is £10.2m

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
YASA LIMITED	YASA ATF Feasibility Study	£328,533	£197,120

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
YASA has developed proprietary, highly differentiated electric motor and power electronics technology targeted at the automotive market. YASA has a unique opportunity to grow its automotive business in the UK having been nominated by a large European OEM for the development of a high-power electric motor and associated power stage electronics for their battery electric vehicle (BEV). To meet the OEM's production volumes YASA needs to establish a high-volume production line in a new production facility. YASA is looking at possible locations in the UK and Europe for this new volume production facility. The primary objective of this feasibility study is to undertake a more detailed assessment of the cost of manufacturing the YASA e-motor in these countries. The study will also enable YASA to provide prospective premium automotive customers with detailed credible plans for scaling volume production and hence will increase chances of winning additional business.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Results of Competition: ATF: Moving the UK Automotive Sector to Zero Emissions - Round 1

Competition Code: 2007_BEIS_FS_MMM_ATF

Total available funding is £10.2m

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LESS COMMON METALS LIMITED	UK RE Magnet Base	£1,172,470	£820,729

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
This project will investigate requirements for a competitive UK supply chain for rare earth magnets. Rare earth magnets represent between 40 to 50% of the value of the raw materials for an electric motor. This is a critical component in the production of electric motors and is vital for the UK Road to Zero strategy which will see all new vehicles to be effectively zero emission by 2040\.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: ATF: Moving the UK Automotive Sector to Zero Emissions - Round 1

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MEXICHEM UK LIMITED	Feasibility study to investigate potential UK manufacture of salts and electrolyte additives for lithium ion batteries	£1,090,100	£545,050

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The UK government has made a commitment to dramatically reduce its contribution to global warming by 2050\. Vehicle electrification is one of the key technologies which will help the government reach this important milestone. With a commitment to phasing out new ICE-powered vehicles by 2035, the government is now keen to develop a local ecosystem of suppliers for the rapidly growing market of electric vehicles. The manufacture of lithium ion batteries and battery materials has been identified by the Advanced Propulsion Centre UK as one of the highest value opportunities available to UK manufacturers. Electrolyte is one of the key battery materials in addition to cathodes and anodes. Access to fluorinated salts and additives and other key materials used in the manufacture of electrolytes is essential to enable a UK-based lithium ion batteries industry. Koura is a global leader in the mining of fluorspar and production of hydrofluoric acid, the two upstream steps prior to production of electrolytes and solvents. We have a robust and highly competitive supply chain for a UK manufacturing facility. Through a feasibility study Koura aims to carry out technological assessments of manufacturing processes and identify the availability of low-cost key materials to set up a production site for the manufacture of electrolyte salts and additives. The current supply landscape is dominated by Asian manufacturers in China, Japan and Korea. With a total absence of electrolyte salt manufacturers in the UK or indeed the EU Koura is excited about the unique opportunity to establish a truly integrated local supply chain for Lithium ion batteries manufactured within UK and EU. By providing these manufacturers the option of a local partner, Koura would help them reduce the risk of supply chain disruptions and currency fluctuations, create shorter lead times and reduce carbon footprint. Through this project Koura would welcome the chance to offer the latest cutting-edge products on the market, to help the UK government retain its technological leadership globally.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
GKN HYBRID POWER LIMITED	Future Pathway UK: Advanced R&D and Process Development for Integrated eDrive Manufacture	£225,506	£112,753
BELCAN ENGINEERING SERVICES UK LIMITED		£112,159	£56,080
University of Nottingham		£104,506	£104,506

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Future Pathway UK, is a collaborative, industry-led feasibility study between GKN Automotive Innovation Centre, Belcan and the University of Nottingham. The purpose of this feasibility study is to assess the viability of UK manufacture of electric drive and power electronics for global mass-market applications and recommend the pathway to achieve a globally competitive investment case for prospective Industrials. The study will be based upon a blueprint for the technology, design and manufacturing process that will enable cost-effective, efficient, durable and safe machines to be developed and manufactured from Niche to Global scale in the UK. Global mass adoption of electric drive, with the human benefits of vastly reduced street-level toxic emission, is being hampered by the high cost of the systems. The reduction in CO2 produced by utilising xEV cars is offset by the high level of CO2 embedded in their manufacture. For an SUV BEV, where the energy consumed for manufacturing is coal-powered, it could take the life of the car to recover the offset, even on a current European electricity mix this can be over 50,000km. GKN Automotive is the world leader in developing and supplying (P4) Axle-mounted eDrive. They have supplied over 1 million units to the world's global carmakers; BMW, Volvo, Peugeot, Porsche, FCA, JLR and London Taxi. They will lead and provide the critical design parameters. UoN will apply Life-Cycle-Analysis (LCA) methodology from the outset, studying the impact of design, process and manufacture in the UK, EU and China on total embedded CO2\. Belcan, a specialist in supply chain development for the automotive industry, will apply techno-economic analysis against potential technologies and provide an understanding of the commercial trade-off between flexibility, cost, embedded CO2 and performance. Belcan will also examine the UK supply chain availability to support volume EDU manufacture. Combining LCA and TEA will help to configure an optimal system enabling flexible and scaleable manufacture of eDrives from 50 -- 250kW covering current level hybrid vehicles through to performance BEV. With EDU designed to minimise embedded GHG and ease of recycling, whilst being globally cost-competitive. The goal is to understand the opportunities and risk mitigations fully, that would make the UK a cost-competitive country option for the expansion of flexible and scalable EDU manufacture. This will ultimately safeguard jobs, lock UK innovation, increase GDP, support the UK's net-zero CO2 ambitions and ensure the UK is ahead of the competition.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AMTE POWER LTD.	AcouBat: Acoustic Battery testing feasibility for GigaFactory cell manufacturing	£183,753	£128,627
HSSMI LIMITED		£60,201	£60,201
JW FROEHLICH UK LIMITED		£82,776	£41,388
University of Hertfordshire		£52,859	£52,859

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Project AcouBat (Acoustic test for Batteries) will address the next generation of battery production assurance, using novel inline testing processes, and ensuring the delivery of quality, competitive UK products in a high-volume manufacturing environment. The consortium's vision will be to; 1) reduce overall lithium-ion cell production time and cost, while maintaining and/or improving quality 2) validate the acoustic test concepts on functioning cell production lines and 3) validate the business opportunity of the acoustic test. This project will bring together fundamental research organisations, with test integrators and production end-users, to develop leading concept designs for the developing electric vehicle industry. The project will focus on; 1) impact of implementing the acoustic test solution into the overall production time 2) establishing requirements and expectations for the acoustic inline test equipment 3) determining the optimal use of the acoustic inline test method and 4) design and scale-up of the acoustic inline test for high volume manufacturing of cells. The acoustic test method identified in the Faraday Battery Challenge Round 1 project 'VALUABLE' and methods developed by UCL, will be practically assessed on AMTE Power's cell manufacturing line. This non-destructive testing enables quality assurance processes to be implemented throughout the production line, from initial electrode creation to internal analysis of the completed cell. Existing production line testing focuses on mechanical and electrical inline testing methods to qualify the battery joints and connections. Whilst this approach aids manufacturers in ensuring quality product delivery, they cannot establish the overall electrochemical state of the components, which presently can only be measured offline statistically, or in lengthy cycle testing. The use of inline acoustic testing will detect faulty cells or poor electrode coatings early in the process, stopping errors at the source, and preventing their progress through the entire production line, to the expensive bottleneck of final battery cycle testing.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ENSHORE SUBSEA LIMITED	Securing Upstream Raw Material Sourcing for Battery Cathode Manufacture through Subsea Harvesting of Polymetalic Nodules	£999,464	£499,732
OSBIT LIMITED		£499,487	£249,744

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Enshore, together with our collaborative partner Osbit, are supporting the UKs drive towards large scale long term productionisation of EV battery technology through securing the means to harvest subsea polymetallic nodules as an alternative to metal mining of land ores. Metal mining has harmful impacts on our environment, economy, and society that are substantial and growing, including deforestation of some of the world's most biodiverse ecosystems, displacement of communities, human health risks using unregulated artisanal mines and child labor. The urgent transition away from fossil fuels is driving a very large, transitional demand for base metals. It is critical that we source these large amounts of base metals with the lowest environmental, social, and economic impacts possible. The oceans are filled with metals, presenting in part as polymetallic nodules. A significant abundance of these nodules lay unattached on the ocean floor in the area of the South Pacific international waters known as the Clarion Clipperton Zone. The metal composition of this ocean resource is uniquely aligned with the base metal needs of the EV industry; polymetallic nodules contain nickel, cobalt, and manganese required for EV batteries and the CCZ contains enough metal to electrify the global EV fleet four times over. Polymetallic nodules have never been mined on a commercial scale. The use of this resource is regulated by the International Seabed Authority (ISA) who has so far issued 16 exploration contracts, with the stated goal of having regulations in place during 2020 to allow prompt commencement of commercial production. In line with ISA permitting guidance, Enshore has developed a technology concept to harvest these nodules on a commercial scale. This technology is now at a state of readiness to undertake a feasibility assessment of the offshore trials phase. This application is in request for grant funding support to undertake this feasibility assessment to determine a comprehensive Offshore Trials Plan and to scope out the necessary trials requirements.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
EMERSON & RENWICK LIMITED	FEARLESS	£38,094	£22,856
CENTRE FOR PROCESS INNOVATION LIMITED		£16,133	£16,133

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Leading UK manufacturer of pilot and production roll-to-roll (R2R) tools and machines, Emerson and Renwick (E&R) together with CPI, will apply their extensive expertise in R2R processing and equipment, to evaluate and investigate the challenges associated with pilot and high-volume continuous production for coatings and conversion of advanced materials for the production of battery cell materials for next generations of batteries for the rapidly developing EV industry. E&R with CPI will carry out a comprehensive feasibility study of future materials and processing of coatings that will be required for next generation batteries technologies, this will including both conventional and vacuum coating techniques and other required processing steps for their eventual end-to-end R2R production. Analysis of the technologies and supply chain will be carried out as well as aspects of the cost of production.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
JOHNSON MATTHEY PLC	Trinity Up-Scaling Technology Feasibility (TRUST)	£613,638	£306,819

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The Trinity project is designed to investigate prospects for key advanced anode materials for use in electric vehicles. This feasibility project will assess related equipment scale up options and perform technical validation in-house and via third-party to ensure that material from the scaled processes meet the required specifications. This work will include customer engagement to validation the specification and refine the business case.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
JOHNSON MATTHEY FUEL CELLS LIMITED	Production line for high volume addition of GDLs to make MEAs	£154,720	£92,832

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
With the move towards the decarbonisation of transport, the demand for fuel cells is growing exponentially as they can offer carbon-free power. In order to meet this demand, the production of fuel cell components such as Membrane Electrode Assemblies (MEAs) needs to be scaled-up urgently. MEAs are essential components of fuel cells. Their construction is complex and forms a bottleneck in the production process. In this project, Johnson Matthey Fuel Cells and ATM will design a high-volume production line capable of attaching Gas Diffusion Layers (GDLs) to Catalyst Coated Membranes (CCMs) to form MEAs. The design of the line will allow it to produce a range of products, with this flexibility to supply multiple customers from the line further increasing efficiency. This line will be fully automated and include multiple quality control stations to ensure that only the highest quality product is released from the line, and the processes will be scalable, with the ultimate aim being for several of these lines to be installed to allow for the ever-increasing demand.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CB2TECH LIMITED	Scale-up Feasibility of Anodes Supercharging Transport (Scale F.A.S.T.)	£331,071	£231,750

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
CB2tech is supercharging the electric revolution with transformational technologies. They are a Cambridge University spin-out founded in 2019 and a member of the Technology Developer Accelerator Programme at the Advanced Propulsion Centre. As part of the Automotive Transformation Fund program, they are scaling up manufacture of a high-power battery for the automotive industry that enables ultra-fast charging without sacrificing lifetime or safety.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Innovate UK

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Total available funding is £10.2m

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
PATRIMONY EV LIMITED	CICERO (Classic Car ElectRificatiOn)	£71,331	£49,932
CARTAKEBACK.COM LIMITED		£174,433	£122,103
HSSMI LIMITED		£65,796	£65,796
Loughborough University		£39,176	£39,176

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The CICERO (Classic Car ElectRificatiOn) project addresses 2nd life opportunities for EV battery packs that pushes beyond the current state of art. The key objectives are: (i) develop a digital vehicle configurator and digital-twin of a Classic/Heritage vehicle, (ii) create a disassembly process designed and optimised via a digital twin. (iii) address logistics and OEM liability issues, and (iv) design a proof of concept classic vehicle demonstrator.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
GEOTHERMAL ENGINEERING LIMITED	Zero Carbon Lithium Extraction from Geothermal Fluid	£241,841	£169,289

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The project will focus on two areas: 1\. The business case for the production of zero carbon lithium from deep geothermal fluid in Cornwall in order to substantially reduce the carbon footprint associated with the batteries used in electric cars. Even though electric cars have no emissions when driven, there are high emissions associated with their manufacture, particularly the supply of lithium for the batteries. 2\. Securing production of lithium in the UK to build a robust national supply chain of the raw material required for domestic battery manufacture. Storage of electricity in batteries, whether for powering cars or for balancing the National grid, is set to become a very important part of a sustainable, green economy. Most modern batteries use lithium as a raw material. However, the extraction and transportation of lithium has a high carbon footprint. In addition, no lithium is produced in the UK. To address the problem of the lithium carbon footprint, a small number of companies are now looking at extracting lithium from geothermal fluids beneath the ground. The most promising of these projects are in California and New Zealand. **The UK also has a lithium resource, contained within the geothermal fluids in Cornwall. We have recently (July 2020) shown that the concentration of lithium in the deep geothermal fluid in our geothermal wells in Cornwall is the highest in the world.** This project will assess the potential for lithium extraction from geothermal fluid in Cornwall and create an investment grade business case for developing an extraction plant at our existing geothermal site. The project will use data from the deep geothermal site near Redruth (United Downs Deep Geothermal project). The assessment will focus on the different types of technologies currently available for lithium extraction, the economics of the process, the market (present and future) , the impacts on the future economy in Cornwall and the overall carbon footprint (via a Lifetime Carbon Assessment). The project will also assess potential locations for four other follow on geothermal/ lithium extraction plants in Cornwall. The driver for lithium extraction from geothermal fluids is twofold: firstly to produce zero carbon lithium (the current carbon footprint of importing lithium is very high) and secondly, to ensure the UK has a secure supply chain of an essential element for battery technology.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BRAMBLE ENERGY LIMITED	The Integrated Hydrogen Fuel Cell – Lithium-ion Battery Module (Hydrium)	£440,031	£308,022

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
We are currently entering the 'age of electrochemical power', displacing fossil fuels and the internal combustion engine. The critical need to decarbonise the transport sector has led to major improvements in battery technology and the rapidly growing uptake of electric vehicles. Li-ion battery technology has led the way and resulted in massively improved performance and reduced cost. However, the weight/size, recharging time and cost of batteries are a challenge for medium- and heavy-duty commercial vehicles. Hybridising fuel cells with batteries deliveries a 'best of both worlds' scenario that can deliver the needs of this sector. Fuel cells are an electrochemical energy technology that has the highest know efficiency for conversion of chemical fuel into electricity. They work by electrochemically splitting fuel molecules (e.g. hydrogen), with the consequent passage of electrical current. There is no combustion or moving parts involved, and the polymer electrolyte fuel cell (PEFC), which operates on hydrogen fuel at a temperature of 50-80C, is considered to be the most promising fuel cell type for automotive applications. While the PEFC shows great promise and delivers in terms of performance (efficiency, power density, etc.) it still requires cost reduction, a means of large-scale manufacture and improvements to longevity. Bramble Energy's technology uses printed circuit board (PCB) materials and manufacturing techniques to realise a low-cost, light-weight, rugged system with fundamental advantages that make it highly design flexible and durable. The Bramble Energy approach thinks about the structure of a fuel cell in a different way. A traditional fuel cell needs capital intensive, bespoke manufacturing techniques tailored specifically to each application. A Bramble Energy fuel cell uses only standard PCB materials and manufacturing techniques such that its production can be done, in principle, at any PCB production plant worldwide. The global commercial road vehicle market was valued at USD 1.32 trillion in 2017 and is a major source of CO2 emissions. Hydrogen fuel cells offer the opportunity to decarbonise this sector, which, due to weight and range requirements, is exceedingly difficult to electrify using lithium-ion batteries alone. This project will demonstrate how fuel cells can be incorporated within conventional lithium-ion battery modules such that the fuel cell effectively becomes part of the battery pack space within a vehicle. This will significantly improve the ability of fuel cells to be integrated within electric vehicles, improve manufacturability, system weight/volume performance and cost.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ENVISION AESC UK LTD.	Envision AESC UK Gigaplant Feasibility Study	£1,498,259	£749,130

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Envision AESC is the world's leading battery technology company. Headquartered in Japan, with production sites in Japan, the US, the UK and China, the group has a market leading record for safety and reliability and has produced batteries for over 500,000 electric vehicles with zero critical safety incidents. Envision AESC has ambitious growth plans and aims to secure a significant share of the rapidly growing market for batteries for electric vehicles. It is now investigating appropriate locations for future installation of manufacturing capacity at gigaplant scale to produce next generation lithium-ion batteries to satisfy the anticipated future demand. The UK business unit is engaging in a detailed study, to understand the economic feasibility of expanding current operations in the UK, in line with the potential investment opportunity. With an existing manufacturing facility in Sunderland, the UK is an option for consideration for investment as it could capitalise on the existing highly skilled workforce.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
TALGA ANODE UK LIMITED	UK-Si: Creating a Silicon/carbon anode supply chain for UK automotive Li-ion battery industry	£411,479	£288,035

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
A global shift away from fossil fuels is leading to a boom in lithium-ion battery applications, ranging from electric vehicles to energy storage systems. The market is projected to have a value of €250 billion in Europe by 2025\. Ramping up the electric vehicle market relies heavily on improving the driving range as well as on reducing cost. Range of an EV is ultimately defined by energy density of the battery. From anode material development standpoint, energy density is a function of its capacity to store lithium. Silicon has a much larger capacity compared to graphite, (360 mAh/g), however, Si-based anodes fall short in wide industrial acceptance due to severe volume expansion during Li-ion insertion and extraction Talga has developed a promising route to produce a Si/C composite anode product, Talnode-Si, showing a higher reversible capacity than commercial graphite. The project establishes the natural next step towards commercialisation of this product i.e. studying the Talnode-Si product feasibility in terms of its engineering technology, process scale up and commerciality.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
TALGA ANODE UK LIMITED	UK-Anode: creating a graphite anode supply chain for the UK automotive Li-ion battery industry.	£1,448,005	£1,013,604

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
The rapid growth of the EV market in Europe will create an unprecedented requirement for Li-ion batteries in the next decade. To meet this demand, battery manufacturers in Europe have announced new "Gigafactory" projects with capacity around 500GWh by 2028, compared to the 22GWh capacity currently installed. The supply chain for such batteries, including raw materials is predominantly based in Asia. Indeed, there is currently no European manufacturer of anode material capable of supporting the EV market. In Sweden, Talga owns the world's highest-grade deposit of graphite ore and has the opportunity to convert this to anode material to serve the European EV industry in the drive towards electrification and zero emissions. The main objective of the UK-Anode project is to assess the feasibility of establishing commercial-scale production of Talga's Talnode(r)-C anode material in the UK using the graphite concentrate from Sweden and serving upcoming local demand. This would secure anode material for the UK battery supply chain from one of the very few regional sources of anode material. The main area of focus for the project will be: 1\. Engineering study considering planning, permitting, utilities, infrastructure, regulatory landscape, raw material optimisation, key suppliers, plant engineering and risks; 2\. Evaluation of UK anode market; 3\. Financial modelling and feasibility; and an overall execution plan for an anode business with a UK-based refinery.

Results of Competition: ATF: Moving the UK Automotive Sector to Zero Emissions - Round 1

Competition Code: 2007_BEIS_FS_MMM_ATF

Total available funding is £10.2m

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
JAGUAR LAND ROVER LIMITED	Project SMITE - (Standard Modules Integrated in Technologically-advanced Evs.)	£1,309,402	£654,701

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Project description - provided by applicants
Public Description This feasibility study/project considers the application of a planned UK manufactured battery module, of a standardised format, into existing and future battery electric vehicles. This will exploit the emerging economic and technological opportunities available. The battery module is claimed to be highly efficient and sustainable; this will be examined through the study. Managed through project milestones, critical knowledge and capability will be generated within the UK engineering and manufacturing sectors. The project will develop collaboratively through academic research, theoretical analysis and physical manufacturing and testing. The work will establish robust tools, standards and parameters for an existing battery electric vehicle, and it will also deliver a tangible outcome, a running vehicle, for evaluation, knowledge sharing and public demonstration. It is a springboard for accelerated implementation at cell, module and battery pack level, so customers can easily adopt this battery technology which has been developed and produced in the UK.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
JAMES DURRANS & SONS,LIMITED	Graphitization of Carbon for Anodes	£204,741	£122,845

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Project description - provided by applicants
Driven by an ever-greater knowledge of environmental effects, the UK has now legislated for net zero carbon by 2050 -- and thereby for zero transport emissions across all vehicle applications. Over 14 countries worldwide have now proposed banning fossil fuel engines, UK by 2032\. Production of all parts of the Li-Iron battery cell components are therefore a UK priority. This includes Cathode, Terminals, Separator, Electrolyte, additives and in the case of this EOI the ANODE. To produce the Anode materials, you need a source of either Natural Graphite which is mined from the earth or synthetic graphite and or a combination of both. Durrans is a world leader in the development and manufacture of graphite products and is looking to invest in a project to "graphitize" natural and synthetic graphite for Anodes. The project will look to develop a manufacturing capability for 30,000 tonnes per annum. Durrans will set-up a UK factory with production capability to supply global giga factories. Anode intellectual property is at the heart of the Li-Ion economy. Durrans is committed to establishing a world class facility for volume manufacture of Anode material and to develop supportive R&D (Anode and manufacturing especially productivity). This in turn fully supports the drive to a zero-carbon transport system. Meeting the technological challenge and market demand, there is a generational opportunity for the automotive sector and the UK to establish a state-of-the-art supply chain facility for Li-Ion batteries, amongst others, for ICE engine replacement and this project is part of this change. Durrans has IP and experience in manufacture of these products but will partner with others to bring IP and investment to the UK.

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