UK Pavilion Guide

The Battery Show Europe 2024

18–20 June 2024

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Welcome to the UK innovation ecosystem

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Chief Executive Officer
Advanced Propulsion Centre UK

ADVANCED PROPULSION CENTRE UK

The UK has a long and auspicious history with the motor industry and is responsible for some of the world's most cherished and desired brands, especially when it comes to performance and luxury vehicles. The UK is home to many of the world's Formula 1 racing teams and has always been a world leader when it comes all manner of motor racing excellence. The only way to stay ahead in these fast moving and highly competitive fields is by constant innovation.

The UK's automotive innovation ecosystem leverages scientific research from our world-class universities, nurturing technology development through proof-of-concept into commercial reality. Each of these process steps has the support and the commitment of UK Government and the automotive industry. For the past 10 years the Advanced Propulsion Centre UK has been at the centre of this ecosystem – supporting major R&D projects that will bring zero and low-carbon technology to market, and through the Automotive Transformation Fund which aims to accelerate the growth of the supply chain for key zero-emission automotive components and systems.

This brochure shows the breadth and depth of some of the UK-based companies that are constantly striving to create the world's best EV systems. APC UK welcomes and embraces those looking to conduct research and development work or set up manufacturing facilities for advanced EV systems and vehicles in the UK. We look forward to hearing from you.

This brochure shows the breadth and depth of some of the UK-based companies that are constantly striving to create the world's best EV systems.

Automotive Transformation Fund

Support to explore automotive electrification opportunities in the UK

What is the Automotive Transformation Fund?

The Automotive Transformation Fund (ATF) is a comprehensive funding programme set up by UK Government to support companies looking to invest in a high-value end-to-end electrified vehicle supply chain opportunity in the UK. ATF is dedicated to supporting the large-scale industrialisation of an electrified supply chain. The programme supports strategically important capital and R&D investments in the UK, focusing on providing funding and expertise for large-scale, capital-focused projects in the following key electric vehicle technology areas:

- Batteries including cells ('gigafactories')
- Electric machines and drives
- Power electronics
- Fuel cells
- Upstream supply chain for any of the above

Outlined by the UK Prime Minister in November 2020, the fund forms part of the Ten Point Plan and Transport Decarbonisation Plan to help accelerate the transition to electrification, where £850 million has been allocated to date.

Advanced Propulsion Centre UK (APC UK) is the programme delivery partner for UK Government and is the gateway to this support – sponsored by the Department for Business and Trade (DBT) and the Automotive Council.

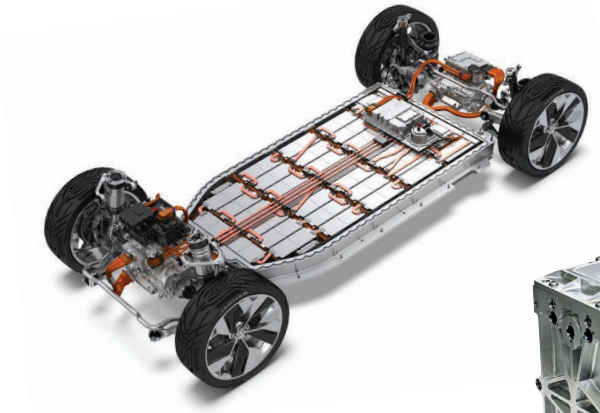
The opportunities for investors as the UK automotive sector transitions to electrification are significant. APC UK has identified a potential UK supply chain opportunity of £24 billion by 2025 in batteries, electric machines, and power electronics for passenger cars.

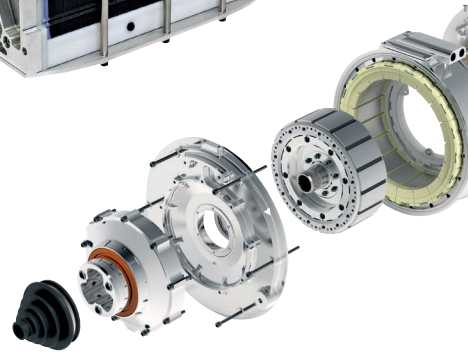
How can the Automotive Transformation Fund help?

A key element of the programme is support for feasibility studies that investigate the viability of a project. For example, we can help UK-registered companies who are considering their business case for investment in large-scale manufacturing in the UK. The ATF can provide financial support and assistance to help with that initial investigation, enabling a company to examine the commercial, technical, legal, or scheduling considerations of a project. Our aim is to help companies turn early consideration of opportunities into investable projects.

Since the ATF's launch, we have funded 77 studies that explore the feasibility of scaling–up product manufacturing or the economic viability of large-scale manufacturing facilities. You can find out more about the studies by visiting www.apcuk.co.uk/funded-projects.

The ATF also runs a regular call for Expressions of Interest (EOI) submissions for capital-centric investment projects. The ATF team will assess a project's eligibility and if successful the project will be invited to apply for a full-stage competition for future funding.





How to apply for funding

Check eligibility for funding

Register your details and we will be in touch to provide guidance on eligibility and how to progress your application.

Create your application

Submit a formal Expression of Interest (EOI) for full capital funding. The ATF team will be available to provide comprehensive support throughout the process.

Assessment

If your project is recommended for final assessment, it will be evaluated by dedicated teams within DBT. The ATF team will notify all applicants of the outcome of their application. All awards will be subject to due diligence, compliance with the relevant subsidy control legislation, and is subject to Ministerial and His Majesty's Treasury approval.

www.apcuk.co.uk/automotive-transformation-fund

Hosted by

UK Government Support

Advanced Propulsion Centre UK

Contact

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Web: apcuk.co.uk

The Advanced Propulsion Centre UK (APC) collaborates with UK government, the automotive industry, and academia to accelerate the industrialisation of technologies, supporting the transition to deliver net zero.

Since its foundation in 2013, APC has funded 264 low-carbon and zero emission projects involving 492 partners, working with companies of all sizes, and will have helped to create or safeguard over 58,000 jobs in the UK. The technologies developed in these projects are projected to save over 410 million tonnes of CO_2.

With its deep sector expertise and cutting-edge knowledge of new propulsion technologies, APC's role in building and advising project consortia helps projects start more quickly and deliver increased value. In the longer term, its work to drive innovation and encourage collaboration is building the foundations for a successful and sustainable UK automotive industry.

In 2020 UK Government established the Automotive Transformation Fund (ATF) to accelerate the development of a net-zero vehicle supply chain, enabling UK-based manufacturers to serve global markets. ATF investments are awarded through the APC to support strategically important UK capital and R&D investments that will enable companies involved in batteries, motors and drives, power electronics, fuel cells, and associated supply chains to anchor their future.

For more information go to apcuk.co.uk or follow us @theapcuk on X and Advanced Propulsion Centre UK on LinkedIn.

Hydrogen Toyota Hilux unveiled at the Low Carbon Vehicle Show 2023

Exhibitors

Electrical Energy Storage

AIS

Contact

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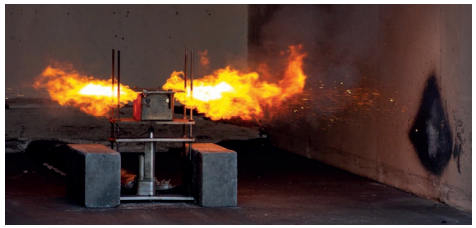
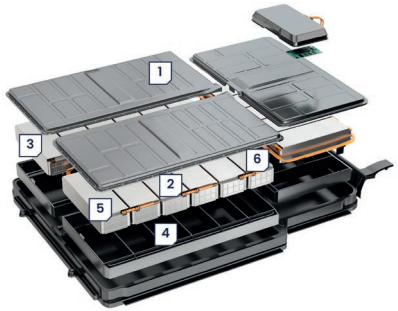
AIS offers a range of anti-propagation and fire-retardant materials to protect all types of battery packs, and a complete battery testing service.

From a single test to complete system development, our capabilities allow our customers to meet safety criteria and mitigate a thermal event.

With decades of experience in passive fire protection, we offer a full range of battery safety materials which allow the design of next-generation battery modules and packs.



93Ah NMC prismatic cell hard venting against representative battery enclosure lined with AIS' thermal barrier material



1 Internal and external enclosure protection
2 Cell divider
3 Potting compound (anti-propagation)
4 Thermal barriers
5 Cell holders and intercell materials
6 Bus bar protection

Electrical Energy Storage

Anaphite

Contact

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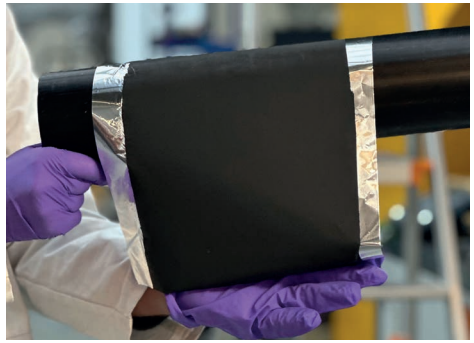
Web: www.anaphite.com

Anaphite is the world leader in chemical technologies for dry coating of Lithium-ion battery electrodes.

Dry battery electrode coating is the future of battery manufacturing, delivering up to 40% reduction in production costs and 30% reduction in energy consumption.

Anaphite's proprietary DCP® process produces fully formulated Dry Coating Precursor (DCP®) powders ready for dry battery electrode coating. DCP® safely and effectively combines cathode active material, binders and conductive additives, including advanced carbons such as carbon nanotubes to produce a well-structured homogeneous powder.

Anaphite's DCP® powders are tailor-formulated to customer specifications, enabling them to move from today's energy intensive wet coating manufacturing processes to dry battery electrode processes without compromising product performance.



Dry coated Anaphite cathode Dry Coating Precursor (DCP®)

The team at the Anaphite Scale-Up Facility

Electrical Energy Storage / Fuel Cells

Avocet Battery Materials

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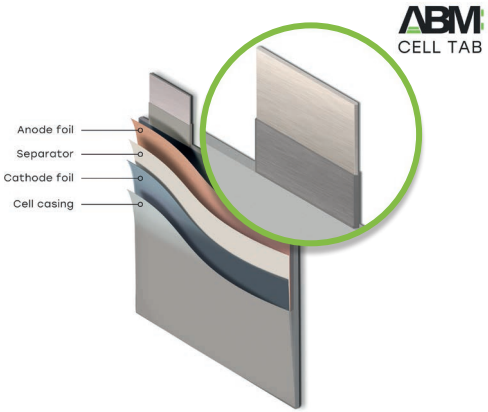
ABM provides innovative lead tab solutions for pouch cell manufacturers. From the ABM Cell Tab Centre of Excellence, ABM helps pouch cell manufacturers scale up their technologies through a collaborative approach supporting both design and high-volume manufacture. From research institutions and pilot lines through to large-volume cell manufacturers, ABM produces bespoke lead tabs to suit each customer's individual requirements.

ABM works in close partnership with cell manufacturers to provide the most sustainable solutions with full traceability and expert raw material selection; full testing is conducted from the inhouse ABM laboratory.

ABM is aware of EU legislation and the demands for a local supply chain for every part of the battery cell. In addition ABM is the UK's largest distributor of foils for new battery technologies. ABM – Connecting to a greener world.



Electrical Energy Storage

Cognition Energy

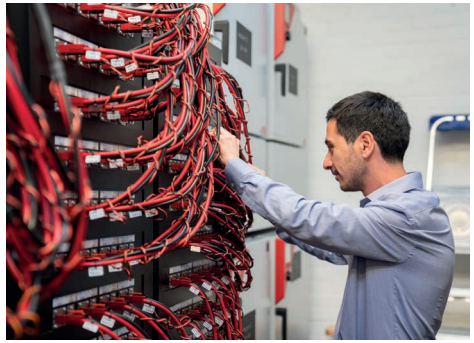
Contact

Tel: +44 (0) 1235 797370
Email: info@cognitionenergy.uk
Web: cognition.energy

Cognition Energy is committed to world-class cell testing, enabling the delivery of safer and more reliable batteries, quickly.

With over 600 channels, our testing services are designed to ensure our customers are provided with the knowledge and insights needed to develop innovative and high-quality solutions. We can offer a range of low and high-powered testing, with a maximum parallel current of 1600A.

We are further paving the way with the evolution of battery testing, with our groundbreaking CellPod system. The CellPod One has been designed to solve the common difficulties that arise in battery testing and has been optimised to make testing more accurate, flexible, and safer. Further to the CellPod One, we are currently in the process of creating the CellPod Air, the next iteration of the CellPod. The CellPod Air will enable bigger cells to be tested at higher currents.



With over 600 channels, we can offer a range of low and high-powered testing

CellPod One: individual thermal chambers, which are surface cooled and independently thermally controlled

Electric Machines

Electrified Automation

Contact

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Web: www.electrifiedautomation.com

Electrified Automation is a leading developer of advanced electric motor and automated manufacturing technology.

Its low voltage permanent magnet electric motors are optimised for scalable manufacturing and deliver performance, reliability, and power benefits to a wide-range of off-highway and two-wheel applications.

Based in the UK, Electrified Automation has a global reach with teams in Europe, the US, and Asia as well as a network of distributors. This enables them to work with customers all over the world and help them drive their electrification journey.

Electrified has a demonstrated history of bringing best-in-class IPM technology to construction, aerial work platform, e-mobility vehicles and many more. By leveraging their patented motor designs and automated manufacturing processes, Electrified allow customers to benefit from its motor's compact size and power density.

Electrified Automation's Permanent Magnet Electric Motor

Electrified Automation's fully automated stator assembly

Battery Intelligence Software

Elysia Battery Intelligence by Fortescue

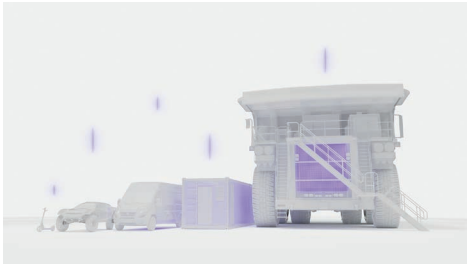
Contact

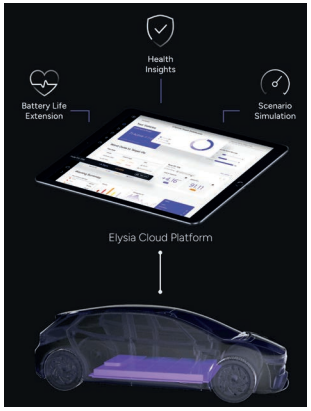
Email: hello@elysia.co
Web: elysia.co

Elysia is a world-leading battery intelligence offering from Fortescue.

Drawing on over a decade of high-performance battery expertise, the Elysia Cloud Platform provides powerful battery life and health insights to OEMs, battery asset owners and financiers. This delivers a step-change in warranty assurance, proactive quality management, smart financing, and second-life opportunities, from any battery system and cell chemistry.

In tandem, Elysia Embedded encompasses a suite of powerful BMS algorithms that are hardware agnostic and compatible with low-cost compute platforms. The algorithms can be integrated into OEMs' existing software stacks, unlocking greater range, peak power, and faster charging from any battery system, whilst ensuring safety and lifetime is never compromised.





Electric Machines / Lightweight Vehicle and Powertrain Structures

Grayson Thermal Systems

Contact

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Web: www.graysonts.com

Grayson Thermal Systems specialises in supplying innovative heating and cooling systems for various sectors including bus and coach, commercial vehicle, rail, off-highway, special vehicle, and stationary battery energy storage systems.

With 45 years' experience, we have established ourselves as trusted partners with leading manufacturers, delivering thermal management solutions that excel in even the most extreme conditions.

Whether you are moving tonnes of earth, hauling goods across the world, storing renewable energy off the grid, or transporting passengers to new destinations, our comprehensive range of solutions ensures ultra-efficient and high-performance heating and cooling.

Our pioneering Battery Thermal Management Systems (BTMS) range of liquid chillers is designed to safeguard the performance and longevity of temperature-sensitive batteries through precise thermal management.

Additionally, we specialise in reliable cooling systems for traction motors and power electronics, along with hydrogen fuel cell cooling systems engineered to to ensure maximum up-time of critical components for the use of clean energy.

Moreover, our high-quality Electric Water Pumps boast an impressive flow rate against high system head pressure, while our durable Electric Water Heaters provide instant heat to conquer the cold.

For HVAC and thermal management solutions capable of handling any climate, visit our stand or explore more at www.graysonts.com.

Advanced heat pump technology providing ultra-efficient battery cooling and heating for heavy-duty vehicles and machinery

Electric Machines

Protean Electric

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Protean Electric's Project Olympus aims to pioneer and showcase innovative lightweight, high-performance In-Wheel Motors (IWM) with state-of-the-art 800V SiC technology. It seeks to expedite IWM adoption by OEM customers by offering both 800V and 400V product options, surpassing current benchmarks and improving electric vehicles range, packaging, driving experience, and more.

Spearheaded by Protean Electric Ltd and supported by the Advanced Propulsion Centre UK, Project Olympus supports the potential for IWM integration in forthcoming vehicle programmes for European and UK manufacturers.

Protean has had a global manufacturing footprint with its 400V products in low-volume production in China since 2017. Acknowledged as a pivotal partner for NetZero-focused electrification, Protean aims to localise 800V IWM development and production in the UK and Europe, bolstering ties with regional OEMs.

Precision-stamped components and assemblies

Samuel Taylor Limited

Contact

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Web: www.samueltaylor.co.uk

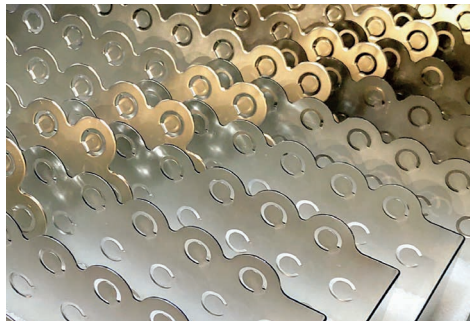
Samuel Taylor Limited (STL), manufactures precision-stamped components and assemblies, specialising in the sophisticated bonding of bimetals like AlCu (bonded aluminium and copper strip) within the development of busbar technology.

With 125 years' manufacturing history, and in-depth understanding of metal stamping, STL has successfully transferred its expertise in busbar technology for smart metering into the development of busbars for electric vehicles.

Utilising this core competency STL recently innovated to manufacture busbars for the world's first fully electric British hypercar and is now utilising decades of metal bonding expertise to explore a variety of other applications within the next generation battery technologies.

Supporting new and existing project developments, STL UK facility has a full in-house design/tool build capability. The company's unique blend of technology, experience, and knowledge enables creating more agile, more effective production solutions to address the most complex of manufacturing challenges from prototype samples to mass production.

Stamped-busbars



Stamped-busbars Multi-pitch, multi-thickness for Lotus hypercar

Electrical Energy Storage

TeraView

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Web: www.teraview.com

TeraView introduces its innovative and unique solution for production measurement of anode and cathode coating thickness, density and conductivity via non-contact methods. The technology on show has been developed over several years with the core technology in use in over 250 installations globally. Several battery manufacturers and leading industry research teams are now implementing terahertz-based solutions.

The solution, based upon terahertz technique, uses highly accurate time of flight measurements to determine coating thickness based on reflections of terahertz pulses from coating interfaces.

The Terahertz measurements enable assessment quality of battery electrodes and detection of any deviation from the initial design in the manufacturing process, along with de-lamination, defects and contamination.

In addition to the thickness evaluation, using the terahertz technique it is possible to evaluate other key performance indicators of the coating such as conductivity and density simultaneously.

TeraView has demonstrated reliable and repeatable measurements for both anode and cathode electrode coatings and is working with leading automotive lithium-ion battery manufacturers as well as academic collaborators.

Electric Machines / Thermal Propulsion Systems

Transense

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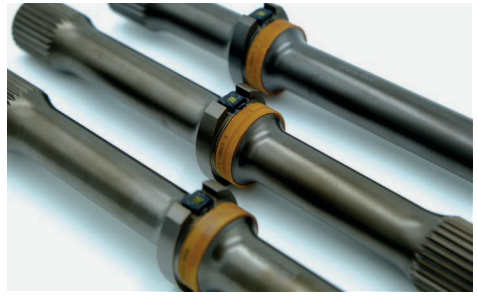
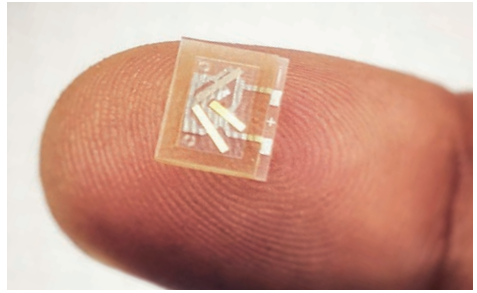
Transense develops, manufactures, and licences advanced Surface Acoustic Wave (SAW) wireless and passive sensor systems to measure torque, force, strain, pressure, and temperature.

Our patented technology enables world-leading Electric Motors and Drive, Performance Automotive, Aerospace, and Industrial Machinery companies to accurately measure mission-critical parameters.



SAW torque sensing technology installed on shafts



Torque sensor

Electrical Energy Storage

UK Battery Industrialisation Centre

Contact

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The UK Battery Industrialisation Centre (UKBIC) is the UK's national manufacturing battery development facility, providing manufacturing scale-up, and skills for the battery sector.

UKBIC is where businesses develop their battery manufacturing processes at the scale they need to move to industrial production and where those working in battery manufacturing can be upskilled and reskilled on the line, working alongside UKBIC's specialist team.

Our facility is where a company's battery technologies can move from electrode and cell materials through to battery modules and packs. We provide the link between prototype scale and mass production.

The UK-based facility, which was opened in July 2021, welcomes manufacturers, entrepreneurs, researchers, educators, engineers, and technicians, and can be accessed by organisations with existing or new battery technology, or those organisations looking at entering the sector.

Established with an initial investment of £130 million, a further £74 million has now been committed by UK Research and Innovation to enhance our facility's technology.

UKBIC is based in Coventry, UK


GREAT
BRITAIN & NORTHERN IRELAND