



By appointment
to HM The Queen
motor car manufacturers
Bentley Motors Limited
Crewe Cheshire



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BENTLEY

Press Information

BENTLEY MOTORS LOOKS TO THE FUTURE OF ELECTRIC DRIVE

- **Three-year OCTOPUS research project aims to deliver breakthrough in e-axle electric powertrains**
- **Recyclable system will remove the need for rare-earth magnets**
- **OLEV funded, delivered in partnership with Innovate UK, nine-partner UK study aims for real-world application by 2026**
- **Supports Bentley's desire to lead sustainable luxury mobility**

(Crewe, 5 August 2020) Bentley Motors today announces a three-year research study that promises to transform electric vehicle powertrains, utilising a fully integrated, free from rare-earth magnet e-axle that supports electric vehicle architectures. This reinforces Bentley's ambition to lead sustainable luxury mobility and introduce the first fully electric Bentley by 2026.

The study, titled OCTOPUS (**O**ptimised **C**omponents, **T**est and simulati**O**n, toolkits for **P**owertrains which integrate **U**ltra high-speed motor **S**olutions) follows an initial 18-month investigation that delivered a technological breakthrough in electric drive systems for high-performance vehicles.

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Building on the UK's leading electronics research, the resulting electric drive system exceeded the latest permanent magnet motor performance while simultaneously removing the need for both rare-earth magnets and copper windings, delivering a package both cost effective and recyclable at its end of life.

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OCTOPUS will take this leading-edge motor, power electronics and packaging transmission design, adding next generation materials, manufacturing processes, simulation and test cycles to deliver a full e-axle powertrain with unique levels of integration and revolutionary performance characteristics suitable for real world application by 2026.

Commenting on the project, Stefan Fischer, Director of Powertrain Engineering at Bentley Motors, said:

“We have made no secret of our ambition to lead the way in the delivery of sustainable luxury mobility, Beyond100. We have a clear roadmap to offer a hybrid option for every model by 2023, starting with the Bentayga Hybrid, and our next goal moves towards a fully electric Bentley by 2026.

“However today, there remains challenges and package constraints on the viability and flexibility of electric vehicle powertrains that are able to fully support EV architectures. With the industry, technologies and cars changing faster than ever before, research projects such as OCTOPUS are crucial to deliver innovative technologies and overcome challenges for the next generation of mobility solutions.”

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OCTOPUS is an OLEV funded project delivered in partnership with Innovate UK which brings together the following partners with distinct roles and responsibilities:

Bentley Motors – Specification setting, vehicle integration plan and system test

Advanced Electric Machines Ltd – Motor manufacturing and systems assembly

Advanced Electric Machines Research Ltd – Motor and transmission design



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The Thinking Pod Innovations Ltd & Nottingham University – Power electronics optimisation and alternative wide band gap system design

The Institute for Advanced Automotive Propulsion Systems (IAAPS) at the University of Bath – Integrated system analysis and proof of concept validation testing

HiETA Technologies Ltd – AM component design and manufacture for thermal management including stator core housing, power electronics and E-axle oil cooling

FD Sims Ltd – Next generation wire technology development

Talga Technologies Ltd – 2D materials development for next generation winding technologies

Diamond Light Source – UK's national synchrotron light source providing access to X-ray facilities for measurements

Hartree Centre (Science and Technology Facilities Council) – Advanced system testing and co-simulation toolkit development

Francesca Iudicello, Programme Manager for low & zero emission vehicles at Innovate UK added, "The IDP Programme is playing a significant part in the UK's push to net zero carbon by providing support for the development of ground-breaking zero emission technologies. The APEX and OCTOPUS projects are an outstanding example of how the partnership between a UK SME and a global OEM can continue through the different development stage of motor drives, which puts UK innovation at the forefront of the high performance PEMDs market worldwide."

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Advanced Electric Machines Group CEO, Dr. James Widmer, said "Having already worked closely with Bentley to successfully deliver a proof of concept, we look forward to this new project to push the performance, packaging and sustainability of electric vehicle drives to a new level, removing the need for rare-earths and copper and achieving the highest levels of system integration."

- ENDS -



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Notes to editors

Bentley Motors

Bentley Motors is the most sought after luxury car brand in the world. The company's headquarters in Crewe is home to all of its operations including design, R&D, engineering and production of the company's three model lines, Bentley, Continental and Flying Spur. The combination of fine craftsmanship, using skills that have been handed down through generations, alongside engineering expertise and cutting-edge technology is unique to UK luxury car brands such as Bentley. It is also an example of high-value British manufacturing at its best. Bentley employs around 4,000 people at Crewe.

Advanced Electric Machines Group

Advanced Electric Machines Group (AEMG) is a UK-based manufacturer of electric machines with established premises and processes to build up to 12000 / year of its class leading rare earth magnet free traction motors in Washington, Tyne & Wear. Focused on passenger car, commercial vehicle and aerospace markets, AEMG has supplied its motor technologies to customers in the UK, Europe, North America and Australia. SSRD is a class leading magnet free motor capable of delivering system level power densities of up to 21kW/l while remaining rare earth and copper free. Completely recyclable at the end of its life, SSRD is one the most sustainable motor technologies in the world.

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