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Taking electric vehicle technology beyond the 'city' car

It has been announced today that Ricardo – in collaboration with its partners in the Low Carbon Vehicle Technology Project (LCVTP) – is developing a new electric vehicle (EV) technology platform to demonstrate technologies capable of delivering acceptable performance across all vehicle market segments

To date, most EV products and research demonstrators have focused upon urban 'city' car segment applications in which vehicle power requirements and recharging needs can comparatively easily be addressed. For larger C-D segment vehicles issues of cost, range anxiety and real-world duty cycles requiring, for example, intermittently fast operation with frequent stopping present some potentially significant and fundamental challenges. At the same time however, these larger vehicles represent a potentially more attractive target than 'city' cars for reducing carbon dioxide emissions due to their typically higher fossil fuel consumption in conventional powertrain form.

Through its work with the LCVTP – a major research initiative which is part-funded by Advantage West Midlands and the European Regional Development Fund – Ricardo aims to develop technologies offering practical solutions to the challenges of EV applications across all vehicle segments, demonstrating both the benefits that can be achieved through existing available technologies as well as the potential for integration of advanced EV architectures with future intelligent transportation infrastructure. For the purpose of this work Ricardo will lead in the development of a technology demonstration platform based on a Freelander 2 SUV that has been loaned to the LCVTP team by project participant Jaguar Land Rover.

The EV technology demonstration platform will be developed through three key stages of work within the LCVTP. The first will see the vehicle converted from its respective conventional powertrain into a simple battery electric vehicle (BEV) incorporating efficiency optimized control strategies within the framework of a simple architecture based on conventional 3kW recharging rate. This basic BEV

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implementation is planned for completion in the spring of 2011. The stage two implementation, planned for completion in the summer of 2011, will incorporate location awareness and adaptive route control – building on Ricardo’s previous work in this area – along with vehicle level improvements and optimization of weight, parasitic losses and aerodynamics, demonstrating some of the achievements delivered by the work of Ricardo’s fellow LCVTP partners.

The final stage of work on the new EV technology demonstration platform within the LCVTP will see the vehicle developed into a range-extended electric vehicle (RE-EV) architecture incorporating an advanced auxiliary power unit (a gasoline engine integrated with a generator) developed within the project, for on-board battery recharging. Scheduled for completion towards the conclusion of the LCVTP in late 2011, this revised architecture will provide the basis for ongoing development of enhanced control strategies for HVAC and other systems to further optimize comfort and energy efficiency.

Following completion of its work on the LCVTP, Ricardo will continue to evolve the EV technology demonstration platform through further technological stages to realise the breadth and depth of research and development that Ricardo is investing in within this field.

Commenting on the announcement of this new technology demonstration platform within the LCVTP, Ricardo chief technology and innovation officer Neville Jackson said:

“The creation of this electric vehicle technology demonstration platform as part of the Ricardo participation in the Low Carbon Vehicle Technology Project is an excellent illustration of how this far-reaching research initiative is acting to help pull forward next-generation automotive innovations. This work will help move the development of electric vehicle architectures beyond the city car, quantifying the benefits of a range of new approaches to energy storage, energy management, “smart” control processes and energy efficient ancillaries whilst addressing range anxiety issues. The challenges in deploying electric drive architectures to larger vehicles create the demand for ever higher levels of innovation, a core competence at Ricardo. The LCVTP programme is wholly integrated with our own strategic activities through which we aim to create a range of practical, cost effective, electrified vehicle technologies that can be applied to create future low carbon vehicle products.”

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NOTES TO EDITORS:

Ricardo plc: With technical centres and offices in the UK, USA, Germany, the Czech Republic, France, Italy, Russia, China, Japan, India and Korea, Ricardo is a leading independent technology provider and strategic consultant to the world's transportation sector and clean energy industries. The company's engineering expertise ranges from vehicle systems integration, controls, electronics and software development, to the latest driveline and transmission systems and gasoline, diesel, hybrid and fuel cell powertrain technologies, as well as wind energy and tidal power systems. Ricardo is committed to excellence and industry leadership in people, technology and knowledge; approximately 70 per cent of its employees are highly qualified multi-disciplined professional engineers and technicians. A public company, Ricardo plc posted sales of £162.8 million in financial year 2010 and is a constituent of the FTSE techMark 100 index – a group of innovative technology companies listed on the London Stock Exchange. For more information, visit www.ricardo.com.

The Low Carbon Vehicle Technology Project (LCVTP): Announced in February 2010 the LCVTP represents a £29 million combined financial investment by Advantage West Midlands, the European Regional Development fund and its seven world-renowned industrial research partners: Jaguar Land Rover, Tata Motors European Technical Centre, Zytec, Ricardo, MIRA, WMG (formerly Warwick Manufacturing Group) at the University of Warwick and Coventry University. The project aims to accelerate the introduction of low carbon vehicles by four years and comprises 15 separate technical R&D workstreams. Each of these is led by a partner who will work closely with other LCVTP project partners and selected SMEs to develop solutions spanning: Battery Cells & Packs, Drive Motors, Power Electronics, High Voltage Electrical Distribution, Auxiliary Power Units, Vehicle Supervisory Control, Lightweight Structures, Vehicle Dynamics & Traction Control, High Efficiency Heating Ventilation & Air Conditioning (HVAC) and System Cooling, Reduction of Parasitic Losses, Waste Energy & Energy Storage, Aerodynamic Performance, Human Machine Interface (HMI) Engineering, Large Saloon Vehicle and Optimized Electric Vehicle Package.

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