



Press Release

ZF, Continental and ads-tec are Developing Components and Manufacturing Processes for Lithium-Ion Batteries for Commercial Vehicles

- Collaboration within the 'Future goes Electric (FUEL)' project sponsored by the German Federal Research Ministry of Education and Research
- The aim is to develop technologies for manufacturing energy storage systems in Germany for use in commercial vehicle applications

Friedrichshafen/Berlin/Leinfelden-Echterdingen, Germany, May 10, 2010. Three automotive suppliers, ZF Friedrichshafen, Continental and ads-tec, are embarking on a joint project to develop production techniques for optimizing the pre-assembly and final assembly stages of lithium-ion energy storage unit modules for use in hybrid commercial vehicles. This joint project - FUEL or 'Future goes Electric' - is being sponsored by the Federal Ministry of Education and Research as part of the Federal Government's economic stimulus package II and the electromobility offensive. According to Stefan Lorenz, head of Energy Management Hybrid & Electric Vehicles in Continental's Powertrain Division, "the objective of FUEL is to develop innovative manufacturing technologies and to apply them to the new lithium-ion energy storage units being produced for trucks and buses. It is also intended to emphasize the German automotive industry's aspiration to secure for itself over the long term a global lead in the intensively competitive emerging market for hybrid and electric drive systems."

Electric-powered trucks and buses too

While the lithium-ion technology vigorously pursued by Continental is already being deployed in the first series production passenger cars, commercial vehicles, especially trucks, present particular challenges as regards power output, service life and environmental requirements. To be precise, these challenges are the necessary battery capacity and voltage status, the number of charging cycles and the several times greater vibration stresses.

In order to push forward the essential development of hybrid systems for commercial vehicles, ZF Friedrichshafen, Continental and ads-tec have come together in the joint FUEL



- 2 -

project. The aim is to develop production engineering principles which will allow the manufacture of energy storage units to hybridize the commercial vehicle sector in Germany.

As the hybrid systems supplier, ZF is responsible for integrating the energy storage unit into the overall system. This consists of the parallel hybrid transmission, the inverter, the hybrid control unit including hybrid strategy plus Continental's lithium-ion energy storage unit and its electronics. ZF will develop and carry out testing to ensure that the lithium-ion battery technology and the other hybrid components are capable of meeting the rigorous demands of the commercial vehicle sector.

Continental will take on the majority of the core work defined in the three packages, i.e. the development of the battery components including production-optimized product design and the essential manufacturing, assembly and test procedures.

As the third company involved in the project, ads-tec is responsible for developing and trialing automated production and testing technologies. "All the partners in the FUEL project are developing the basis for new production engineering skills in the manufacture of energy storage systems for hybrid commercial vehicles", explained Thomas Speidel, managing director of ads-tec. "The whole project implementation demands a high degree of simultaneous engineering, including the simultaneous development of new assembly and joining procedures. If validation throws up problems, we cannot rule out the possibility that this will require adjustments to procedures or design changes to the components affected."

FUEL project completed by the middle of 2011

Once the government-funded project comes to an end in the summer of 2011, further technical development of the results it has achieved will be pushed forward to the point of industrialization for a wide variety of customer projects with the aim of series production within Germany of energy storage units for commercial vehicles. "German automotive suppliers and engineering companies remain important partners for the automotive industry in all the world's markets. As such, for the companies involved, FUEL represents a means of accessing potential markets and thus to achieving sustained growth at German production

.../3



- 3 -

sites", said Bert Hellwig, head of Basic Hybrid Development for Commercial Vehicles at ZF Friedrichshafen AG.

The plan is to develop an energy storage unit which can be flexibly integrated into a variety of vehicle designs. One energy storage system produces 60kW, which is more power than that delivered by the lithium-ion energy storage unit currently used in passenger cars. Light trucks, used for local deliveries in urban areas, will have their hybrid drive fitted with an energy storage system which is designed to boost the combustion engine, especially when starting off and in the low engine speed range. Two energy storage units combined into a single system producing a total of 120kW will be used in city buses because the aim is that they should start off in purely electric driving mode.

ZF is one of the world's leading automotive industry suppliers specializing in driveline and chassis technologies. With a workforce of 59,900 employees, the company operates 125 plants in 26 countries. ZF Group revenues in 2009 a preliminary turnover of €9.3 billion. ZF ranks as one of the top-10 automotive industry suppliers worldwide.

With sales of approximately €20 billion in 2009 **Continental** is among the leading automotive suppliers worldwide. As a supplier of brake systems, systems and components for powertrains and chassis, instrumentation, infotainment solutions, vehicle electronics, tires and technical elastomers, Continental contributes enhanced driving safety and global climate protection. Continental is also a competent partner in networked automobile communication. Continental currently employs approximately 134,500 in 46 countries.

ads-tec offers in its business unit "automation" complex automation systems and solutions, machinery and equipment. With its business units "data systems" and "system technology" ads-tec is a well-established manufacturer of industrial electronic systems with very high development depth, particularly in the areas of construction, electronic- and software development. For approximately eight years ads-tec develops and delivers own intelligent Lithium-Ion battery systems, more than 60.000 are in use throughout the world. Deep know-how and numerous references in the battery- and electronic field are fundamental basis for the development and delivery of optimized production systems for modern, high-performance batteries. Currently about 200 employees are working in the three German locations of ads-tec.

.../4



- 4 -

Direct queries and requests for further information to:

Simone Geldhäuser
External Communications
Continental
Division Powertrain
Siemensstr. 12
93055 Regensburg
Phone: +49 941 790-61302
Fax: +49 941 790-99 61302
E-Mail: simone.geldhaeuser@continental-corporation.com

Thomas Wenzel
Manager Technical Press
ZF Friedrichshafen AG
Corporate Communications
88038 Friedrichshafen/Germany
Phone: +49-7541-77 2543,
Fax: +49-7541-77 902543
E-Mail: thomas.wenzel@zf.com

Nadine Geiger
Assistentin der Geschäftsleitung /
Assistant General Management
ads-tec GmbH
Automation, Daten- und Systemtechnik
Raiffeisenstr. 14
70771 Leinfelden-Echterdingen
Phone: + 49 711 45894- 454
Fax: + 49 711 45894- 990
E-Mail: N.Geiger@ads-tec.de

**www.zf.com / www.continental-corporation.com / www.ads-tec.de
www.mediacenter.continental-corporation.com**