

PRESS RELEASE

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Kick-off event of the KomVar project: HIGH-TEC BATTERY CELL PRODUCTION FOR TÜBINGEN SITE

The partners CUSTOMCELLS® Itzehoe GmbH, CUSTOMCELLS® Tübingen GmbH, P3 automotive and the Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW) together with the associated partners Daimler AG, Manz AG and ANDREAS STIHL AG & Co. KG officially launched the KomVar project "**Competitive Variant** Production for Lithium Accumulators" sponsored by the German Federal Ministry of Economics and Energy (BMWi). The overall project is being promoted by the partners and the BMWi with a financial volume of 8.2 million euros.

At the new CUSTOMCELLS® production site, a flexible demonstrator cell production line for high-quality lithium-ion battery cells in moderate cell geometries in small to medium volumes will be developed and set up during the two-year project period.

The plants should be able to produce various cell designs and cell technologies in mass production quality despite small and medium quantities. In cell production runs, different cell types will be produced in small series of up to 1,000 pieces and a maximum of 200 mm x 200 mm during the project period and their quality and manufacturing costs will be checked. Data on throughput, changeover times, consumption and costs are recorded and evaluated during plant evaluation. These data flow into the development of an economic efficiency concept, which at the end of the project should give knowledge about the general marketability of the concept.



CUSTOMIZED BATTERY CELL PRODUCTION IN GERMANY

Lithium-ion batteries are considered a key technology for many areas of industry. Numerous energy-autonomous products are already differentiated today by the quality of the energy storage device, with the predominant performance advantage being attributable to the lithium-ion battery cell used. In addition to large-volume consumer products and increasingly important applications in electric vehicles, lithium-ion battery cells are increasingly being used by niche markets that are dependent on rapid development and adaptation cycles for their products - on the possibility of having cells developed and produced in small quantities according to specific specifications and performance parameters. Industrial partners, especially in the pre-development and prototype stages, also rely on such a plus in flexibility.

The project represents an important next step for the establishment of a German and European battery cell industry by taking up research and development results from basic projects and bringing them closer to an entrepreneurial application. By focusing on small and medium-sized production volumes, it ideally links up with existing projects to establish large-scale production of lithium-ion battery cells in Germany and Europe. In addition, know-how will be generated and jobs created.

PROJECT COMMENTS OF THE PARTICIPATING NETWORK PARTNERS

Leopold König - CEO CUSTOMCELLS: "For CUSTOMCELLS® and the partners involved, the project forms the basis for the establishment of series cell production in Germany, which will be raised to an unprecedented level in terms of quality, safety and manufacturing transparency of lithium-ion batteries and will help to find the optimum relationship between technical innovation, functionality and costs.

This is an important prerequisite for what will soon be one of the most modern production facilities in Europe. The focus in Tübingen for us is on the operation of critical applications in order to enable safe electrical flying, for example, and also to be able to offer our associated partners such as Daimler and Stihl as well as other CUSTOMCELLS customers a high-quality all-in-one package in the future - from high-quality development to high-quality series production.

"The ZSW contributes its many years of experience in lithium-ion technology and in the development of near-series production processes for large-format lithium-ion cells to the project. Our focus in KomVar is on the development of quality assurance concepts and the accompanying characterization of manufacturing processes," says **Dr. Wolfgang Braunwarth, Head of Production Research - ZSW.**



Markus Woland – Expert Battery Production P3 automotive: "In particular, the ability to produce flexible shapes and geometries using plant technology is highly relevant for the target industries and markets, as German companies from the premium sector in particular can survive in international competition thanks to technological leadership and flexibility. In addition, the findings from the smaller geometries for battery cells suggest that they can be used later for electric vehicles, among other things, where only slightly different cell formats are used in some cases. The ability to flexibly develop, manufacture and test different formats and technologies in battery cells in small batches will enable industrial users to gain the necessary advantage through speed and will be economical in the long term".

PRESENTATION AND COOPERATION OF THE PROJECT CONSORTIUM

A KomVar consortium will be formed to achieve this goal, which will contribute existing knowledge in the field of cell development to the project and expand this knowledge through corresponding research work. As an associated partner, **Manz AG** has in-depth plant knowledge and contributes an existing production plant at the company's site in Tübingen to the KomVar project as a research and development platform. This production platform will cover all steps from electrode separation to packaging the cell body in the pouch.

As part of the project-related implementation (electrolyte filling, pre-aging and degassing of the cells), Manz AG will be subcontracted by **CUSTOMCELLS® Itzehoe GmbH**. In this way, the entire process chain can be mapped and the representability of the KomVar approach can be guaranteed and demonstrated, especially with regard to technical feasibility and competitiveness. Manz will continue to build the KomVar systems according to the development specifications of CUSTOMCELLS® Itzehoe, which are based on the company's own experience of the market situation and on the existing insights and known customer requirements of **P3 automotive** in the market.

After the development of the concept and the construction and reconstruction of the plants in Tübingen, the newly founded **CUSTOMCELLS® Tübingen GmbH** will carry out corresponding test runs on the plants using materials from CUSTOMCELLS® Itzehoe. The test runs are accompanied by the ZSW in order to derive and evaluate corresponding quality concepts under these special new conditions.

The cells resulting from the test runs are examined and characterized by both ZSW and CUSTOMCELLS® Itzehoe in order to compare them with the previous cost, quality and flexibility standards of CUSTOMCELLS® and other manufacturers. Parallel to the test runs, practical information about the costs of changing formats and cell chemistries will be generated, which will flow into the



development of a holistic economic efficiency concept, which will be developed by CUSTOMCELLS® and P3 automotive. After successful completion of the KomVar project, further cooperation with the associated partners **Daimler, Manz and Stihl** with CUSTOMCELLS® will be sought.

THE KOMVAR NETWORK PARTNERS

CUSTOMCELLS® Itzehoe GmbH

CUSTOMCELLS® is one of the world's leading companies in the development of special lithium-ion battery cells. Located in Itzehoe (Schleswig-Holstein - Germany), the company CUSTOMCELLS® - Made in Germany - develops and produces application-specific battery cells from prototypes to small and medium series. On the basis of flexible manufacturing concepts and state-of-the-art research and production facilities, CUSTOMCELLS® guarantees high-tech solutions for special applications and tailor-made development and production of electrodes, electrolytes, battery cells and battery modules, depending on the customer's requirement profile.

P3 automotive

P3 is the leading technology consultancy in electromobility, from the development of battery storage systems and electric drives in vehicles to the testing of charging infrastructure and hardware. With more than 800 consultants and a strong focus on e-mobility, the leading players worldwide are advised on the implementation of technologies. P3's strengths offer customers a professional approach along the entire value chain from battery raw materials to the recycling and 2nd life of electric vehicles. In particular, the service areas: E- and Future Mobility - Process Management - Cost Management - Change Management - Supply Chain Management - Quality Management - Data Analytics - Complete Vehicle Development leading in the market.

ZSW

The Center for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW) is one of the leading institutes for applied research in the fields of photovoltaics, regenerative fuels, battery technology and fuel cells as well as energy system analysis. The three ZSW locations in Stuttgart, Ulm and Widderstall currently employ around 260 scientists, engineers and technicians. In addition, there are 90 scientific and student assistants. The ZSW is a member of the Innovation Alliance Baden-Württemberg (innBW), an association of 13 non-university, business-oriented research institutes.

CUSTOMCELLS® Tübingen GmbH

CUSTOMCELLS® expands its existing portfolio of services and plants with the newly founded company location in Tübingen. For example, Custom Cells Tübingen GmbH has at its disposal a 500 m² drying room for the manufacture of manufacturing cells and the provision of lithium battery cell services. In addition to consulting, electrode production and prototype development, CCT is now concentrating on the development of series production of high-quality lithium-ion battery cells in small to medium volumes as part of the KomVar project at the Tübingen site.



KOMVAR ASSOCIATED PARTNERS

All associated partners are available to support the project in terms of content and ideas as partners who are not sponsored.

DAIMLER AG

Daimler AG is one of the most successful automotive companies in the world. With the divisions Mercedes-Benz Cars, Daimler Trucks, Mercedes-Benz Vans, Daimler Buses and Daimler Financial Services, the vehicle manufacturer is one of the largest suppliers of premium passenger cars and the world's largest manufacturer of trucks over six tons. Daimler Financial Services offers financing, leasing, fleet management, investments, brokerage of credit cards and insurance as well as innovative mobility services. The company's founders Gottlieb Daimler and Carl Benz made history with the invention of the automobile in 1886. As a pioneer in automotive engineering, it is Daimler's motivation and obligation to shape the future of mobility safely and sustainably. The company focuses on innovative and green technologies as well as safe and high-quality vehicles that fascinate and inspire. Daimler is consistently investing in the development of efficient drive systems - from high-tech internal combustion engines and hybrid vehicles to purely electric drive systems with batteries or fuel cells - in order to enable local emission-free driving in the long term. In addition, the company is pushing ahead with the intelligent networking of its vehicles, autonomous driving and new mobility concepts. Daimler sees it as its claim and obligation to live up to its responsibility to society and the environment. Daimler sells its vehicles and services in almost every country in the world and has production facilities in Europe, North and South America, Asia and Africa. In addition to Mercedes-Benz, the brand portfolio includes the most valuable premium automobile brand in the world (source: Interbrand study, 4.10.2018) as well as Mercedes-AMG, Mercedes-Maybach and Mercedes me, the brands smart, EQ, Freightliner, Western Star, BharatBenz, FUSO, Setra and Thomas Built Buses and the brands of Daimler Financial Services: Mercedes-Benz Bank, Mercedes-Benz Financial Services and Daimler Truck Financial. The company is listed on the Frankfurt and Stuttgart stock exchanges (stock exchange symbol DAI). In 2018, the Group sold 3.4 million vehicles with a total of approximately 298,700 employees. Revenue amounted to €167.4 billion and EBIT to €11.1 billion.

MANZ AG

Founded in 1987, Manz AG is a global high-tech mechanical engineering company. In addition to the turnkey production line CIGSfab in the Solar segment, the company also focuses on the automotive industry in the Electronics and Energy Storage segments with economical and competitive systems for the production of lithium-ion batteries - from the cell to the finished pack - and automated assembly lines for cell contact systems. The group of companies, which has been listed on the German stock exchange since 2006, employs 1,600 people in eight countries. The turnover of the Manz Group in the 2018 financial year was around 297 million euros.



ANDREAS STIHL AG & Co. KG

Andreas Stihl AG & Co. KG is the world's leading manufacturer of hand-held forestry and garden equipment. The core products chain saw and power tools such as brush cutters, hedge trimmers and blowers are available as battery/electric drives as well as low-emission combustion engines. Stihl Akku products now place new demands on battery technologies, very low temperatures and high currents in the forest, high temperatures and a very high number of cycles in green maintenance with the robotic lawn mower. The close integration of battery technology potentials with STIHL products is the basis for further growth in battery products. STIHL was founded in Bad Cannstatt in 1926 and today employs approx. 17,000 people in the STIHL Group worldwide. In the 2018 financial year it achieved a turnover of € 3.85 billion.

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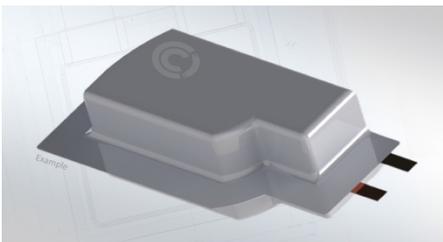
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