

Media Information

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BMW Group and University of Zagreb: Advances in battery cell production using artificial intelligence

+++ Pilot project at Battery Cell Competence Centre (BCCC) +++ Reduced testing effort and savings in raw materials, costs and time +++ Pioneering integration of theory and practice +++

Munich/Zagreb. The BMW Group and the Croatian University of Zagreb's Regional Centre of Excellence for Robotic Technology (CRTA) continue to advance joint research in battery cell production. The "Insight" research project will develop and implement practical AI models to optimise battery cell production at the BMW Group. The research project covers the entire battery cell value chain: from electrode production to end-of-line testing and in-house developed direct recycling.

How the research project saves raw materials, costs and time

At the Battery Cell Competence Centre (BCCC) in Munich, the BMW Group is developing battery cells for future generations of high-voltage batteries. As part of this process, numerous test series are conducted, which by their very nature require significant time and material investment. At the same time, these tests tie up manufacturing equipment and laboratory capacity. This is where the "Insight" research project comes in: Its artificial intelligence network uses existing test data, as well as real-time data from ongoing production, to accurately predict battery cell process parameters and performance data. As a result, the duration and number of test series can be significantly reduced, while maintaining or improving quality. In this way, the newly developed AI systems reduce the material and time required in individual process steps by more than 50 percent.

Other cell production use cases

The research project's prediction models not only reduce the number of test series but also support final approval of battery cells. Following initial charging at the end of production, the cells must be stored for a defined period at precisely specified temperatures before they can be installed in a battery housing. This phase, also referred to as the "quarantine", requires corresponding storage capacity. However, the research project's AI systems are able to conduct a full analysis of the battery cells in advance, potentially eliminating this process step in the future.

Research collaboration combines theory and practice

Since the project was launched in 2024, the BMW Group and the University of Zagreb have been developing joint solutions using artificial intelligence to improve battery cell production. To this end, doctoral candidates and students at the University of Zagreb are collating and structuring available production data and using it to create AI models that can identify specific patterns. These AI models then make predictions that further optimise production performance, quality and costs. "We are working on scaling the newly developed AI models from the prototype environment," explains Christian Siedelhofer, head of Technology Development Lithium-Ion Battery Cells at the BMW Group. One option would be to enable cell manufacturers. "We are also examining to what extent these models are suitable for additional use cases within our production network."

Win-win through knowledge sharing

The University of Zagreb contributes expertise in mechanical engineering, electrical engineering and computer science to the project. Ongoing knowledge sharing benefits both partners: The University of Zagreb provides the BMW Group with access to the latest research findings, while its doctoral candidates and students have the opportunity to apply their theoretical knowledge in practice.

Development of young talent

Another aspect of the cooperation is the development of young talent. "Our joint project gets doctoral candidates and students interested in AI and battery cells and the exciting work we do at our Battery Cell Competence Centres," says Stefan Kerscher, head of Technology Development Battery Cells at the BMW Group. "We are delighted when young talents decide to embark on a career with our company." The cooperation offers students intensive mentoring and the opportunity to expand their professional network across the industry, enhancing their attractiveness on the job market and opening up outstanding career opportunities. The cooperation between the BMW Group and the University of Zagreb strengthens the innovation capability and competitiveness of both partners.

Battery cell expertise along the entire value chain

The BMW Group consolidates its battery cell know-how at its Competence Centres in Munich, Parsdorf and Salching. The Battery Cell Competence Centre (BCCC) in Munich houses research and development for the battery cells of the future. The best battery concept from the BCCC will be produced under near-series conditions at the Cell Manufacturing Competence Centre (CMCC) in Parsdorf. Close cross-divisional collaboration between Development, Purchasing and Production integrates product and process in a unique way. In addition to producing sample cells, the BMW Group is also focusing its efforts on the reuse of materials. As part of this process, the company has put into service a Cell Recycling Competence Centre (CRCC) in Salching, Lower Bavaria, together with Encory GmbH, which will implement the innovative direct recycling concept. The intellectual property for the recycling method is owned by the BMW Group.



If you have any questions, please contact:

Corporate Communications

Christian Marxt
Spokesperson, Production Network BMW Group
Mobile: +49-151-601-79158
Email: Christian.Marxt@bmwgroup.com

Sandra Schillmöller
Head of Communications Production Network BMW Group and Plant Munich
Mobile: +49-151-601-12225
Email: Sandra.Schillmoeller@bmwgroup.com

Media website: www.press.bmwgroup.com/
Email: presse@bmwgroup.com

The BMW Group

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In 2025, the BMW Group sold 2.46 million passenger vehicles and more than 202,500 motorcycles worldwide. The profit before tax in the financial year 2025 was € 10.2 billion on revenues amounting to € 133.5 billion. As of 31 December 2025, the BMW Group had a workforce of 154,540 employees.

The economic success of the BMW Group has always been based on long-term thinking and responsible action. Sustainability is a key element of the BMW Group's corporate strategy and covers all products – from the supply chain through production to the end of their useful life.

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