BMW GROUP
Corporate Communications

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More performance, CO_2-reduced production, significantly lower costs: BMW Group to use innovative round BMW battery cells in NEUE KLASSE from 2025

- Newly-developed BMW round cells optimised for NEUE KLASSE architecture
- Costs for whole high-voltage battery up to 50% lower than for current generation
- CO_2-reduced production – through green power and secondary material
- Development head Weber: "Huge leap in technology for energy density, charging speed and range"
- Purchasing head Post: "We will be building battery cell factories with our partners, each with an annual capacity of up to 20 GWh, at six locations in USMCA, Europe and China"

Munich. The BMW Group is convinced that powerful, innovative, sustainably-produced battery cells will be key to the success of individual electromobility in the future. The company is set to launch a new era of e-mobility from 2025 with the models of its NEUE KLASSE – using **newly-developed round battery cells** optimised for the new architecture **for the first time**.

"The newly-developed sixth generation of our lithium-ion cells will bring a huge leap in technology that will increase energy density by more than 20 percent, improve charging speed by up to 30 percent and enhance range by up to 30 percent," according to **Frank Weber**, member of the Board of Management of BMW AG responsible for Development. "We are also reducing CO_2 emissions from cell production by up to 60 percent. These are big steps for sustainability and customer benefits."

"To meet our long-term needs, we will be building battery cell factories with our partners, each with an annual capacity of up to 20 GWh, at six locations in key markets for us: two in China, two in Europe and two in USMCA," added

Joachim Post, member of the Board of Management of BMW AG responsible for Purchasing and Supplier Network. "We have also reached agreement with our partners that they will use a percentage of secondary material for the raw materials lithium, cobalt and nickel, as well as utilising green power for production, to ensure CO_2-reduced manufacturing."

The BMW Group has already awarded **contracts in the two-digit billion-euro range** for production of the new BMW battery cells. By leveraging the comprehensive in-house expertise of the company's own Battery Cell Competence Centre, the team from development, production and purchasing has been able to **significantly reduce costs for the high-voltage battery, thanks to the new battery cell and new integration concept for battery technology developed by BMW**. Based on current market assumptions, costs can be reduced **by up to 50 percent**, compared to the current fifth generation. The BMW Group has set itself the goal of bringing **manufacturing costs** for fully-electric models down to the same level as vehicles with state-of-the-art combustion-engine technology.

Technological advances: new cell format and enhanced cell chemistry
The battery cell is responsible for electric vehicles' core properties of range, driving performance and charging time. For the sixth generation of BMW eDrive technology used in the NEUE KLASSE, the company has fundamentally refined the **cell format and cell chemistry**. With the new BMW round cell specially designed for the electric architecture of the NEUE KLASSE models, it will be possible to significantly **increase** the **range** of the highest-range model **by up to 30 percent** (according to WLTP).

The new BMW round cells come with a standard diameter of 46 millimetres and two different heights. Compared to the prismatic cells of the fifth BMW battery cell generation, the nickel content in the sixth-generation BMW round cells is higher on the cathode side, while the cobalt content is reduced. On the

anode side, the silicon content will be increased. As a result, the cell's volumetric energy density will improve by more than 20 percent.

The battery system plays a key role in the body structure of the NEUE KLASSE. Depending on the model, it can be flexibly integrated into the installation space to save space ("pack to open body"). The cell module level is thus eliminated.

The battery, drive train and **charging technology** in the NEUE KLASSE will also have a higher voltage of 800 volts. Among other things, this will optimise how energy is supplied to direct current high-power charging stations, which can achieve a much higher charging capacity with a current of up to 500 amperes – thus reducing the time it takes to charge the vehicle from 10 to 80 percent by up to 30 percent.

Battery cell factories in China, Europe and USMCA – each with total capacity of up to 20 GWh per year

To supply the battery cells needed for the NEUE KLASSE, the BMW Group has already awarded contracts in the two-digit billion-euro range for construction of battery cell factories to CATL and EVE Energy. Both partners will build two gigafactories in China and Europe. Each of the battery cell factories will have a **total annual capacity of up to 20 GWh**. Plans call for two more battery cell factories to be built in the North American free trade zone, USMCA, for which the partners have not yet been nominated.
The three regions where the battery cell factories will be built will also benefit economically from the creation of new supply chains, new networks for subcontractors and new jobs.

CO_2-reduced production using green power and secondary material

The BMW Group is particularly focused on keeping the carbon footprint and consumption of resources for production as low as possible, starting in the

supply chain. Cell manufacturers will use **cobalt, lithium** and **nickel** that include a percentage of **secondary material**, i.e. raw materials that are not newly mined, but already in the loop, in production of battery cells. Combined with the commitment to use only green power from renewable energies for production of battery cells, the BMW Group will **reduce** the **carbon footprint** of battery cell production **by up to 60 percent**, compared to the current generation of battery cells.

Reuse of raw materials will be one of the success factors for e-mobility in the future. **Circular loops** reduce the need for new raw materials, lower the risk of infringing environmental and social standards in the supply chain and generally result in significantly lower CO_2 emissions. That is why the long-term goal of the BMW Group is to use fully **recyclable battery cells**. In China, the company is currently creating a closed loop for **reuse of the raw materials nickel, lithium and cobalt** from high-voltage batteries, thus laying the cornerstone of a ground-breaking material cycle.

The cobalt and lithium used as raw materials for the new generation of BMW battery cells will be sourced from **certified mines**. This means the company retains full **transparency over extraction methods** and, in this way, can ensure **responsible mining**. The sourcing of both raw materials from certified mines takes place either directly through the BMW Group or via the battery cell manufacturer.
The BMW Group has been actively involved for many years in initiatives to develop **standards for responsible raw material extraction** and promote compliance with environmental and social standards for raw material extraction through **certification of mines**. In this way, the company is also making itself less technologically, geographically and geopolitically dependent on individual resources and suppliers.

Development of future BMW battery cells at in-house competence centres
The BMW Group is constantly working to further develop energy storage systems. For instance, its sixth-generation battery technology also offers the **option** of using **cathodes made of lithium iron phosphate (LFP)** for the first time. This means the critical raw materials cobalt and nickel can then be avoided entirely in the cathode material. In parallel, the BMW Group is also pushing forward with development of **all-solid-state batteries (ASSBs)**. The company aims to have high-voltage batteries of this type ready for series introduction by the end of the decade. The BMW Group will present a demonstrator vehicle with this technology on board well before 2025.

The BMW Group has been systematically building expertise in the field of battery cell technology since 2008. Since 2019, this know-how has been concentrated at the BMW Group's Battery Cell Competence Centre (BCCC) in Munich. The BCCC spans the entire value chain – from research and development to battery cell design to manufacturability.
To ensure innovations in battery cell technology are put into practice quickly and efficiently, the BMW Group relies on a network of around 300 partners, with cooperation between established companies, startups and colleges, among others.

The knowledge gained in this way will be validated at the new Cell Manufacturing Competence Centre (CMCC) in Parsdorf, near Munich, which will begin commissioning near-standard production of samples in late 2022 for the future BMW battery cell generation to be used in the NEUE KLASSE from 2025 onwards.

The pilot line at the competence centre will make it possible to analyse and fully understand the cell production process under near-standard conditions.

This will help enable future suppliers produce cells to specifications and according to their own expertise – thus further optimising battery cell production with regard to quality, output and costs.

NEUE KLASSE will make major contribution to sales volumes

With a fast-growing product lineup and high demand, the BMW Group aims to have more than two million fully-electric vehicles on the roads by the end of 2025.

The all-electric NEUE KLASSE will make a significant contribution to BMW Group sales volumes from mid-decade. The NEUE KLASSE has the potential to further accelerate the market penetration of e-mobility: This means 50 percent of the BMW Group's global sales could already come from fully-electric vehicles before 2030.

The MINI brand will have an exclusively all-electric product range by the early 2030s, while Rolls-Royce will also be an all-electric brand from 2030. All future new models from BMW Motorrad in the field of urban mobility will likewise be fully electric.

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The BMW Group

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. The BMW Group production network comprises over 30 production sites around the world; the company has a global sales network in more than 140 countries.

In 2021, the BMW Group sold over 2.5 million passenger vehicles and more than 194,000 motorcycles worldwide. The profit before tax in the financial year 2021 was € 16.1 billion on revenues amounting to € 111.2 billion. As of 31 December 2021, the BMW Group had a workforce of 118,909 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company set its course for the future early on and is making sustainability and resource efficiency the focus of the company's strategic direction – from the supply chain, through production, to the end of the use phase, for all its products.

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