BMW GROUP
Corporate Communications

Media Information
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E-drive train production for the fully-electric models BMW iX and BMW i4 begins

- BMW Group continues to expand manufacturing capacity at the Competence Centre for E-Drive Production in Dingolfing
- E-drive trains for 500,000 electrified vehicles per year from 2022
- Extensive in-house drive train expertise: Start of production for fifth-generation high-voltage batteries in Germany
- Successful transformation to e-drive train production

Munich/Dingolfing. Production of fifth-generation high-voltage batteries and battery modules for use in the BMW iX* and BMW i4 is now underway at the Competence Centre for E-Drive Production in Dingolfing. At the same time, the company is also increasing production capacity for its fifth-generation electric motor, which has been built in Dingolfing for the BMW iX3* since 2020 and will also power the BMW iX* and BMW i4. “We expect at least 50 percent of the vehicles we deliver to our customers worldwide to be electrified by 2030. To achieve this, we are relying on our extensive in-house drive train expertise: We are increasing capacity at existing drive train production locations – like here in Dingolfing – and developing capabilities at others – like recently in Regensburg and Leipzig,” explained Dr Michael Nikolaides, Senior Vice President, Production Engines and E-Drives, BMW Group.

The BMW Group is investing more than 500 million euros in expanding production capacity for e-drives at its Dingolfing location alone between 2020 and 2022. From 2022, it will produce e-drives for more than half a million electrified vehicles. The BMW Group will invest a total of around 790 million euros in expanding capacity for electric powertrain components at its Dingolfing, Leipzig, Regensburg and Steyr locations between 2020 and 2022.

Standard production of the BMW iX* will soon get underway at BMW Group Plant Dingolfing, followed by production of the BMW i4 at Plant Munich in the autumn. The highly integrated e-drives and high-voltage batteries for these vehicles will all

Company
Bayerische
Motoren Werke
Aktiengesellschaft

Postal address
BMW AG
80788 Munich

Telephone
+49 89-382-25885

Internet
www.bmwgroup.com

be manufactured at the Competence Centre for E-Drive Production in Dingolfing. The BMW Group already began producing battery components at Plants Regensburg and Leipzig in April and May 2021. In line with growing demand for e-drives, BMW Group Plants Landshut and Steyr are also stepping up production of e-drive housings.

Production of fifth-generation BMW eDrive technology

The output and energy content of drive units and high-voltage batteries with fifth-generation BMW eDrive technology can be flexibly scaled. This means they can be optimally adjusted to suit different model variants.

Each vehicle uses up to two highly integrated e-drives, which combine the electric motor, power electronics and transmission in a single housing. Based on the design principle of a current-excited rotor, the fifth-generation e-drive does not require any materials classified as rare-earth metals.

BMW eDrive technology also comprises a high-voltage battery with state-of-the-art battery cell technology. The BMW Group agreed with its suppliers that they will only use renewable green power for producing fifth-generation battery cells. The entire high-voltage battery boasts outstanding qualities in the areas of performance, charging and discharging characteristics, durability and safety. The technically standardised production process for battery modules has been further developed in such a way that different module variants can be produced on the same production line – in line with the growing range of electrified vehicle models and performance levels. The production systems are highly flexible and scalable. Battery modules are produced from supplied prismatic battery cells at the respective BMW Group production location. A modular system developed in-house allows model-specific high-voltage batteries to be manufactured from these modules in a flexible arrangement.

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The company has outstanding expertise and experience, both in the field of battery cell technology and in production of model-specific high-voltage batteries. The BMW Group conducts basic research in the fields of cell chemistry and cell design at its own Battery Cell Competence Centre. The BMW Group also produces battery cell prototypes itself. These battery cell prototypes are used in tests to validate the development maturity of battery cells and to demonstrate the effectiveness of the production processes. In addition, the prototype production of the battery cells serves the identification of process potentials as well as the optimization of the production processes. In this way, the BMW Group gains a thorough understanding of the entire battery cell value chain and the decisive competitive advantages its chemical and technical properties offer. This enables battery cells to be manufactured to precise specifications that are geared towards each vehicle's individual requirements.

Competence Centre for E-Drive Production

Following extensive expansion, the Competence Centre for E-Drive Production now provides a usable area of 125,000 sq. m. This is where the company manufactures electric motors and the components needed for them, as well as high-voltage batteries and battery modules. A paint coating is also applied to the battery cells at this location. The coating increases mechanical robustness and thermal conductivity, thereby improving insulation and cooling of the even more powerful fifth-generation battery cells.

Plant Dingolfing has been manufacturing standard high-voltage batteries and battery modules since 2013, when the BMW Group's first all-electric vehicle, the BMW i3*, went into production. The first production lines for electric motors and high-voltage batteries for plug-in hybrids went on-stream there in 2014. The Competence Centre for E-Drive Production has been steadily growing ever since. The plant has also been producing high-voltage batteries for the fully electric MINI Cooper SE* since 2019 and, since 2020, also the highly integrated fifth-generation

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e-drive used for the first time in the BMW iX3*. Production of the even more powerful high-voltage batteries for the BMW iX* and BMW i4 is now getting underway. E-drives for future models can also be produced on the flexible production lines.

Qualification for long-term, sustainable jobs

With the BMW Group systematically pursuing progress in electromobility, the demands on employees and their areas of responsibility are also constantly evolving. "We are growing our staff for e-drive production almost exclusively through personnel restructuring. We are actively shaping the transformation process and leveraging our employees' skills so we can develop long-term sustainable jobs," explains Nikolaides.

The Competence Centre for E-Drive Production in Dingolfing currently has almost 1,400 employees. By the end of 2021, around 1,900 employees are expected to work in e-drive production in Dingolfing.

Production employees receive further training at the in-house learning centre, which uses innovative vocational training and further education methods to provide employees with intensive preparation for their new tasks. Employees' knowledge and skills are being expanded specifically to include new electromobility technologies, with a training concept that is constantly updated. The training sessions are held in the classroom, at practice workstations and directly on the production lines. Digital methods and augmented reality play a bigger role here than ever before. Thanks to these methods, the training courses were also able to continue safely during the coronavirus pandemic, in compliance with health and safety measures. "The learning centre takes a holistic approach that supports employees throughout their professional development and further education, from their first day in production," reports Dr Sven Jochmann, head of Production E-Drives Dingolfing, Landshut, Regensburg, Leipzig. "As well as trainers and managers, new colleagues are also supported by trained mentors who help them quickly find their way around their new working environment," adds Jochmann.

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Transformation of the Dingolfing location

The Dingolfing location is a prime example of the successful transformation of the BMW Group plants towards e-mobility and digitalisation. E-drive production, including electric motors and high-voltage batteries, is located in an existing, roughly 50-year-old building at the site, rather than using new space. The infrastructure was adapted to the new requirements and expanded accordingly. A modern staff restaurant seats 300 and there is also a new parking deck with space for 800 vehicles. The structural measures are rounded out by a 25,000 sq. m. logistics hall, new office spaces and social rooms close to the production area, as well as an additional plant gate in the south for improved logistics flows.

On the issue of sustainability, the BMW Group takes a holistic approach to reducing CO_2 emissions and minimising resource consumption that covers the entire value chain, including in-house production, the supply chain and use phase. In Dingolfing, as at all BMW Group locations, production uses only green power. In addition, all BMW Group locations have been net carbon neutral since this year, through corresponding offsets and certificates. The company is also using many other levers: from building technology to energy-efficient installations to increased use of renewable energies. Electric trucks will be used for intra-company goods transport at the Competence Centre for E-Drive Production from the autumn.

2030: At least 50 percent of global BMW Group sales will be fully electric

The BMW Group continues its massive electromobility ramp-up: The company will offer five fully-electric models by the end of this year: the BMW i3*, the MINI Cooper SE* and the BMW iX3*, as well as the two main innovation flagships, the BMW iX* and BMW i4.

Between now and 2025, the BMW Group will increase its sales of fully-electric models by an average of well over 50 percent per year – more than ten times the number of units sold in 2020. Based on its current market forecast, the company

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also expects at least 50 percent of its global sales to come from fully-electric vehicles in 2030. In total, over the next ten years or so, the BMW Group will be releasing about ten million fully-electric vehicles onto the roads.

Global e-drive production network with a focus in Germany

The high-voltage batteries and battery components needed for all BMW and MINI electrified vehicles come from the company's own battery factories in Dingolfing, Leipzig and Regensburg in Germany, as well as from Spartanburg (USA) and Shenyang (China). The BMW Group has also localised production of high-voltage batteries in Thailand, at its Rayong plant, and is working with the Dräxlmaier Group for this. Munich is home to the e-drive pilot plant and the Battery Cell Competence Centre, where the BMW Group is conducting a full analysis of battery cell value creation processes and advancing technology for its production processes.
The company produces electric motors at the Competence Centre for E-Drive Production in Dingolfing and at BMW Group Plant Landshut. BMW Group Plant Steyr builds the housing for the highly integrated fifth-generation e-drive.

***Fuel consumption/emissions data:**
BMW iX xDrive50: Power consumption combined: < 21 kWh/100 km in the WLTP test cycle; CO_2 emissions combined: 0 g/km (data is provisional and based on forecasts)
BMW iX xDrive40: Power consumption combined: < 20 kWh/100 km in the WLTP test cycle; CO_2 emissions combined: 0 g/km (data is provisional and based on forecasts)
BMW iX3: Fuel consumption combined: 0.0 l/100 km; power consumption combined: 17.8-17.5 kWh/100 km WLTP, CO2 emissions combined: 0 g/km.
BMW i3: Fuel consumption combined: 0.0 l/100 km; power consumption combined: 16.3-15.3 kWh/100 km WLTP; CO2 emissions combined: 0 g/km.
BMW i3s: Fuel consumption combined: 0.0 l/100 km; power consumption combined: 16.6-16.3 kWh/100 km WLTP; CO2 emissions combined: 0 g/km.
MINI Cooper SE: Fuel consumption combined: 0.0 l/100 km; power consumption combined: 17.6-15.2 kWh/100 km WLTP; CO2 emissions combined: 0 g/km

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80788 Munich

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Internet
www.bmwgroup.com

If you have any questions, please contact:

Corporate Communications

Lisa Weiss, Communications Production Network BMW Group
Telephone: +49-151-601-93127
Email: Lisa.LW.Weiss@bmwgroup.com

Thomas Niedermeier, Communications BMW Group Plant Dingolfing
Telephone: +49-8731-76-27666
Email: Thomas.Niedermeier@bmwgroup.com

Julian Friedrich, head of Communications Production Network BMW Group
Telephone: +49-151-601-25885
Email: Julian.Friedrich@bmw.de

Media website: www.press.bmw.de
Email: presse@bmw.de

The BMW Group production network

Uniquely flexible and highly efficient, the BMW Group production network is able to respond quickly to changing markets and regional sales fluctuations. Expertise in manufacturing is a key contributor to the BMW Group's profitability.

The BMW Group production network uses a range of innovative digital and Industry 4.0 (IoT) technologies, including virtual reality, artificial intelligence and 3D printing applications. Standardised processes and structures across the production system ensure consistent premium quality and allow a high degree of customisation.

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 31 production and assembly facilities in 15 countries; the company has a global sales network in more than 140 countries.

In 2020, the BMW Group sold over 2.3 million passenger vehicles and more than 169,000 motorcycles worldwide. The profit before tax in the financial year 2020 was € 5.222 billion on revenues amounting to € 98.990 billion. As of 31 December 2020, the BMW Group had a workforce of 120,726 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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