

Press Information
21 March 2023

BMW Group at NVIDIA GTC: Virtual Production Under way in Future Plant Debrecen

- “Revolution in factory planning”: NVIDIA Omniverse enables virtual production in Plant Debrecen more than two years before actual series production is launched
- New dimension of BMW iFACTORY: Faster, more efficient planning processes save time and costs
- Global rollout of virtual planning
- BMW AG Board Member for Production Milan Nedeljković and NVIDIA CEO and founder Jensen Huang deliver joint demo at GTC 2023

Munich. BMW Group has taken factory planning to new heights – setting the latest milestone in the digitalisation of automotive manufacturing. More than two years before the official launch of series production, vehicle manufacturing is already underway in the future plant Debrecen – virtually, at least, as Debrecen is the BMW Group's first facility to be planned and validated completely virtually. The ground-breaking and innovative planning concept was realised in collaboration with its partner NVIDIA. The future plant Debrecen is scheduled to open in 2025. Construction has just begun, and the new facility is scheduled to produce the BMW Group's next generation of all-electric models: the Neue Klasse.

BMW Group is taking a digital-first approach to validate and optimize complex manufacturing systems across its production network using NVIDIA Omniverse Enterprise, a platform for building and operating 3D industrial metaverse applications, to run real-time digital twin simulations to optimise layouts, robotics and logistic systems virtually. Omniverse will be extended across the BMW product network around the world.

“Virtualisation and artificial intelligence are accelerating and refining our planning. With the various planning systems consolidated within a digital twin, our teams around the world can now work together in real-time and make decisions faster

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and on a more solid foundation," Milan Nedeljković explained. "This makes us much quicker and more efficient and saves on costs as well."

"Digitalization is moving fastest in the automotive industry and BMW has been a leader in advancing this vision," said Jensen Huang, founder and CEO of NVIDIA. "We are partnering closely with BMW, using NVIDIA Omniverse to help streamline their manufacturing processes, enhance collaboration and further efficiency. Our collaboration will continue to push the frontiers of virtual integration for the next generation of smart, connected factories around the world".

In a joint demo at the NVIDIA GTC, a global conference for the era of AI and the metaverse, Milan Nedeljković, took Huang on a virtual planning session for the new body shop. Nedeljković described the real-time collaboration between the different BMW Group planning departments and their partners as a "revolution in factory planning", delivered on NVIDIA's Omniverse – which had enabled the first virtual start of production.

Engineering and planning experts from the two companies, both leaders in their respective fields worked, in close collaboration to help BMW build Omniverse applications that meet the BMW Group's specific requirements. The virtual planning approach for the new vehicle plant is now considered a blueprint for all future planning processes at the BMW Group.

Virtual planning facilitates global collaboration – rollout starts end of March

NVIDIA Omniverse makes collaboration across sites and time zones easier and supports the planning and design of structures, production systems and processes at an entirely new technological level. It works as a "cockpit", offering quick, easy access to the digital planning worlds of BMW. At the end of this month, Omniverse, which is both cloud-based and cloud-agnostic, will be available to BMW experts in various technologies and planning departments.

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Next milestone in the BMW iFACTORY

Consistent virtual planning of highly complex vehicle production processes represents the BMW Group's next important step in the transformation to the BMW iFACTORY. First introduced in early 2022, the concept of the iFACTORY is described by Nedeljković as "our masterplan for the automotive production of tomorrow".

Based on a completely new vehicle architecture, the Neue Klasse heralds the fundamental transformation of production to the BMW iFACTORY. It began in 2020, when all of the BMW Group's vehicle and engine plants were 3D-scanned. Since November of that year, more than seven million square metres of indoor and 15 million square metres of outdoor production space have been scanned. Subsequent modifications can be integrated into the digital world with a re-scan, to ensure the available data is always up to date.

Meanwhile, virtual planning is under way for the roughly 1.4 km² production hall for the Neue Klasse in Debrecen, where the success of the virtual start of production is a testament to the high standards that can be achieved through the digitalisation of the planning process. NVIDIA Omniverse allows production experts to use live data both in-house and with suppliers on the detailed planning and optimisation of processes and individual systems – without compatibility issues. It makes structure and facility data easy to retrieve and integrate with equipment and assembly line data. In the future items and part numbers for production materials will be available as well. What's more, layout options – for instance for robots in work cells, or for the various areas of logistics – can be played through in real-time, photorealistic simulations and adapted as required. And with Omniverse, any modifications are evaluated, validated and implemented in real-time. The platform also will allow suppliers to be involved in decision-making and integrates the tried-and-tested design and planning tools that BMW has been using to date. These are made by various producers and include Bentley Systems MicroStation for layout planning, ipolog for logistics planning, Siemens Process Simulate, Dassault Systemes CATIA

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for vehicle design and Autodesk Revit for building planning, with more tools to follow.

Over time all the relevant product, process, quality and cost data will also gradually be available in Omniverse alongside the development, planning and production processes. There will also be further developments to the platform, which are expected to include “invisible” processes such as the consumption of energy and resources.

Omniverse will enhance digital operations as well – a crucial stage that is already being tackled by BMW Group and NVIDIA teams. In the future, this will allow operational faults to be localized in a matter of seconds and thus prevent longer production downtimes. It is also an important step towards, for example, integrating and automating virtual commissioning of new systems into a continuous planning process.

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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 worldwide; the company has a global sales network in more than 140 countries.

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In 2022, the BMW Group sold nearly 2.4 million passenger vehicles and more than 202,000 motorcycles worldwide. The profit before tax in the financial year 2022 was € 23.5 billion on revenues amounting to € 142.6 billion. As of 31 December 2022, the BMW Group had a workforce of 149,475 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company set the course for the future at an early stage and consistently makes sustainability and efficient resource management central to its strategic direction, from the supply chain through production to the end of the use phase of all products.

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