



Wintershall 4.0 – Digital transformation into the future

Against the backdrop of Industry 4.0, Wintershall has established a digital strategy to drive its own digital transformation quickly and effectively. The strategy is not concerned with expanding existing processes with new technologies, but rather about changing the process landscape. Digital technologies such as robotics, big data analytics and artificial intelligence will transform processes along the entire value chain from exploration through field development to production, but also, for example, with mergers and acquisitions. On route to transforming into a digital oil and gas company, Wintershall will redesign its core processes and change the way data is managed and analysed.

In a first step, digital technologies are being selected and tested in pilot projects. The focus is on testing the functionality and applicability of the technologies. When technologies are proven successful, the positive results will be integrated into lighthouse projects that aim to change and improve processes. These include, for example, a joint collaborative platform that gives employees and other stakeholders ongoing access to the same data and documents, enabling them to share common applications and management tools and thus work without wasting time and effort. In another lighthouse project, by using big data combined with high-performance and cloud computing, production facilities will be equipped with a digital twin. This will enable production processes to be constantly optimized. In a third project, Wintershall is working on a supporting system of software packages for analysing geological data. With

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As a lighthouse project, the Brage platform shall be the first to receive a digital twin.

the help of artificial intelligence, the aim is to accelerate processes and deliver faster results when evaluating potential exploration targets.

Together with BASF, Wintershall has tested using the Curiosity super-computer to obtain the best possible information about reserves. Two test cases were investigated with the high-performance computer, which has a computing power of 1.75 petaflops.

The first test case dealt with reservoir models. Wintershall is developing a model of each reservoir that maps its oil and gas reserves as accurately as possible. To ensure that each model is as close to reality as possible, reservoir engineers are calculating and comparing multiple variants of how the respective reservoir might look. A test of the supercomputer in Ludwigshafen has shown that Curiosity can calculate a given number of variants at least 300 times faster than a conventional computer. These time savings enable Wintershall to calculate more variants more quickly, and thus develop a better understanding of the reserve. This can be a decisive advantage when business decisions need to be made under time constraints, such as during licensing rounds. The second test case was concerned with digital core analyzes. Wintershall takes drill core samples from many of the wells it drills, which are then analyzed in the laboratory. However, this analysis can take about twelve months, and only then can the results be incorporated into the reserve model. However, if the core is scanned and virtually replicated, Curiosity can use this digitized core to calculate the same tests as are conducted in the laboratory – not physically, but digitally within days. The tests have been completed with positive results and the applications are now being used in ongoing projects.

The World Economic Forum estimates that, by 2025, digitization will cut manufacturing costs by 20 percent and development costs by 15 percent in the E&P industry. Wintershall is implementing its digitalization strategy to increase the efficiency of its exploration and production, as well as to strengthen its sustainability and HSE performance.

Wintershall. Shaping the future.

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Forward-looking statements and forecasts



The world's largest computer in the chemical industry: BASF's Curiosity supercomputer in Ludwigshafen.

This press release contains forward-looking statements. These statements are based on current estimates and projections of the Executive Board and currently available information. The forward-looking statements should not be considered to be guarantees of future developments and results. Rather, the future developments and results are dependent on a variety of factors; they include various risks and uncertainties and are based on assumptions that may prove to be not applicable. We do not assume any obligation to update the forward-looking statements made in this press release