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## Converting wind power for storage purposes

Power-to-Gas plant at Energiepark Mainz with positive interim results

In the first half of 2018, wind farms in Germany fed around 55 billion kWh into the power grid. 7 billion more than in the same period last year. Scientists are working to improve conversion and storage technologies to temporarily store surplus wind power. The current BINE Projektinfo "Energiepark Mainz" (05/2018) presents a promising process by way of the world's largest Power-to-Gas research facility. Electrolytic hydrogen is produced using wind power, and is then stored and fed into the natural gas network. The aim is to test the processes and novel components on an industrial scale.

Systems based on polymer electrolyte membranes (PEM) are used in the electrolytic production of hydrogen at Energiepark Mainz. In the research phase, systems with peak loads of up to 2 MW were used for the first time. At the beginning of the project, the typical output of PEM electrolyzers was around 100 kW. The advantages of this membrane electrolysis method are that the hydrogen involved is very pure, the process requires little maintenance and it can react well to fluctuations in the power grid. In Mainz, the gas is compressed with ionic compressors, stored and fed into the natural gas network or delivered to hydrogen filling stations and industrial plants. Hydrogen is a versatile chemical energy storage medium and base material. Up to 10 % hydrogen can be added to natural gas, and it can be used directly in industrial production processes while being easy to store.

The electrolysis plant generates up to 1,000 Nm<sup>3</sup> of hydrogen per hour, which is fed into the natural gas network for the Mainz-Ebersheim district. The energy park completed the research phase in 2017 and has started normal commercial operation.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at [www.bine.info](http://www.bine.info) or by calling +49 (0)228 92379-0. The brochure cover and additional image material can also be downloaded from this web portal in the press section.

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