



Joint Press Release  
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## HyStorage first test phase successful – hydrogen extracted again after injection into porous rock

- **HyStorage partners present interim results after first operation phase**
- **Almost 90% hydrogen was recovered – reservoir performance has not been affected**
- **Material tests showed no influence of hydrogen corrosion**
- **Hydrogen storage essential for the decarbonization of the European energy market**
- **Bavarian porous rock formations secure supply and offer further potential for hydrogen storage in Europe**

The first operating phase of HyStorage with a 5% hydrogen blend was successfully completed end of January 2024. The partner companies presented the first interim results of the research project, which examines the integrity of porous rock formations for the storage of hydrogen, in the presence of Bavarian Minister of *Economic Affairs, Regional Development and Energy* Hubert Aiwanger to representatives from politics and industry at the designated well site close to Uniper's Bierwang storage facility yesterday.

"HyStorage is part of the implementation of Uniper's "Greener Gases" strategy and serves to prepare commercial storage projects," **says Holger Kreetz, Uniper's COO**. "The storage of hydrogen in the Bavarian porous rock formations holds enormous potential for the flexibility of the emerging hydrogen market. However, an orderly transition and an integrated view of natural gas and hydrogen demand is required to ensure decarbonization and a rapid hydrogen ramp-up while maintaining the security of natural gas supply with high cost efficiency. Investments require a regulatory framework which should incentivize early investments. The principles of contracts for difference should be applied to achieve the aims in a cost-efficient and effective manner."

"The initial preliminary results are generally optimistic," **says Doug Waters, Managing Director Uniper Energy Storage**. "Although it is still too premature to make a definitive statement on the suitability of the southern German porous rock formations, and thus the Alpine Molasse Basin in general, for pure hydrogen storage. But one thing is certain: Hydrogen is becoming an essential element for the decarbonization process of the European energy market. The existing underground storage facilities in Bavaria are of great importance for the security of natural gas supply in the coming years and, in the long term, for the transition to seasonal hydrogen storage with their large volumes and high injection and withdrawal rates. They provide a solution for storage of volatile renewable energies and also for the connection to European hydrogen corridors."

**Hubert Aiwanger, Bavarian Minister of Economic Affairs, Regional Development and Energy, says:** "I am delighted that the tests have gone well so far. The HyStorage cooperation project is crucial for pushing forward the topic of hydrogen storage in Bavaria. In combination with H2 power plants, hydrogen storage can become a decisive building block for a secure and stable renewable energy industry. It is an important research project for Bavaria. The free state of Bavaria only has natural gas porous rock storages. HyStorage is a good example of how the suitability of a pore storage facility for H2 storage is being examined in order to prepare for the transformation from natural gas to hydrogen and to gather the necessary knowledge in advance. I wish the research project at the Bierwang storage site continuing success and look forward to the final results at the end of the project in 2025."

The close cooperation and expertise of the five experienced European project partners Uniper, OGE, RAG Austria, SEFE Securing Energy for Europe and NAFTA including the scientific support of the test ensured that the collected data of the first phase was deeply analyzed and evaluated.



- During the 7-day withdrawal phase almost 90% of the previously injected hydrogen was recovered. Analysis showed that the reservoir performance remained the same and a very homogeneous hydrogen distribution within the reservoir can be indicated.
- The material testing has been successfully conducted during the test in the subsurface and next to the well in a special pressure vessel. All preliminary results of the tested materials showed no influence of hydrogen corrosion.
- The gas composition was analyzed in detail at three points in the process to ensure the accuracy of the results and to guarantee safe operation.
- Microbiological activities such as methanization and sulfate reduction were observed on a small scale. In preparation for the test a special hydrogen simulation model was developed solely for the HyStorage test that simulates hydrogen and natural gas flow in the reservoir as well as microbiological activity. Tests of the model were accomplished and all data obtained will be used to calibrate the model to be able to even make more accurate future predictions.

Additional steps are planned for the upcoming project phases to investigate whether the initial results remain valid for subsequent phases with higher concentrations and further exposure to hydrogen overall. Depending on further evaluation the second operating phase will be carried out this year.

Within the HyStorage project three different natural gas/hydrogen gas mixtures with 5 per cent, 10 per cent and 25 per cent hydrogen content in the natural gas are injected into the former natural gas reservoir and then withdrawn after a three-month resting period in each case and blended into the station's main field piping system. The first cycle with 5% hydrogen serves as a basic check of the feasibility of the installations, the second will establish comparability with other international industrial projects and the third will be a continuation and preparation for future, higher hydrogen concentrations, but also for possible hydrogen peaks due to concentration fluctuations in the natural gas infrastructure.

Uniper Energy Storage is the consortium leader, operator and responsible for the test under mining law. The consortium is further consisting of the companies OGE, RAG Austria, SEFE Securing Energy for Europe and NAFTA, which contribute their expertise, and is also supported by interdisciplinary partners from industry and science. The project has been approved by the Southern Bavarian Mining Authority.



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F.l.t.r.: Hubert Aiwanger (Bavarian Minister of Economic Affairs, Regional Development and Energy), Holger Kreetz (COO Uniper)



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### About Uniper

Düsseldorf-based Uniper is an international energy company with activities in more than 40 countries. The company and its roughly 7,000 employees make an important contribution to supply security in Europe, particularly in its core markets of Germany, the United Kingdom, Sweden, and the Netherlands.

Uniper’s operations encompass power generation in Europe, global energy trading, and a broad gas portfolio. Uniper procures gas—including liquefied natural gas (LNG)—and other energy sources on global markets. The company owns and operates gas storage facilities with a total capacity of more than 7 billion cubic meters.

Uniper intends to be completely carbon-neutral by 2040. Uniper aims for its installed power generating capacity to be more than 80% zero-carbon by 2030. To achieve this, the company is transforming its power plants and facilities and investing in flexible, dispatchable power generating units. Uniper is already one of Europe’s largest operators of hydropower plants and is helping further expand solar and wind power, which are essential for a more sustainable and secure future. The company is progressively expanding its gas portfolio to include green gases like hydrogen and biomethane and aims to convert to these gases over the long term.

Uniper is a reliable partner for communities, municipal utilities, and industrial enterprises for planning and implementing innovative, lower-carbon solutions on their decarbonization journey. Uniper is a hydrogen pioneer, is active worldwide along the entire hydrogen value chain, and is conducting projects to make hydrogen a mainstay of the energy supply.

For more information, please visit our website:

<https://www.uniper.energy/storage/>

<https://www.uniper.energy/energy-storage-uniper/hydrogen-storage>



### **About OGE**

OGE lets gaseous molecules flow. We create and maintain a modern, safe and efficient infrastructure for natural gas, hydrogen and CO<sub>2</sub>. Our pipeline network with a length of over 12,000 kilometers is fundamental to Germany's energy supply and secures the welfare of our society.

As the market-leading transmission system operator, we are a pioneer, driver and enabler of the energy transition and climate neutrality. We see ourselves as a transformation consultant and service provider for industry, power plants, distribution grid operators and our partners from production and politics.

More than 2,000 people find a future-proof and modern workplace at OGE. In the interests of our employees and shareholders, we are constantly adapting our business model to ensure sustainable profitable development.

You can find more information about the company at [www.oge.net](http://www.oge.net).

### **About RAG Austria**

RAG Austria AG is the largest energy storage company in Austria and one of the leading technical storage operators in Europe. The central focus of the company is the storage, conversion and demand-based conditioning of energy in the form of gaseous energy carriers. With storage capacities of around 6.3 billion cubic metres of natural gas, the company operates around 6% of all EU European gas storage capacities. A large part of the underground natural gas storage facilities developed by RAG has already been converted into energy storage facilities that can provide the stored energy at any time and at high performance. In this way, RAG lives the vision of "sustainable energy mining" and thus decisively strengthens the security of supply of Austria and Central Europe.

RAG developed and operates a total of eleven energy storage facilities ("pore storage facilities"). These include the Puchkirchen/Haag, Haidach, Haidach 5, Aigelsbrunn and 7Fields storage facilities as well as the hydrogen storage facilities in Pilsbach and Rubensdorf.

RAG has been working with hydrogen as an energy carrier for more than ten years in order to store renewable energy on a large scale and seasonally. As a partner of renewable energies, the company develops innovative and future-oriented energy technologies around green gas and hydrogen. In this way, RAG makes an indispensable contribution to achieving Austria's ambitious climate targets and to the sustainable supply of resources and energy. The goal is to provide our customers with safe, efficient, environmentally friendly and affordable energy and gas storage services in a long-term and responsible manner.

[www.rag-austria.at](http://www.rag-austria.at)

### **About SEFE Securing Energy for Europe**

SEFE Securing Energy for Europe GmbH (SEFE) is an integrated energy company owned by the Federal Republic of Germany that is active in various stages along the value chain. Headquartered in Berlin, Germany, the company with more than 1,500 employees has its strongest presence in Germany, supplying industrial customers and municipal utilities. SEFE is a midstream company focusing on trading & portfolio management, sales, storage and pipeline infrastructure. SEFE plays a pivotal role in providing energy supply stability for Germany and Europe.

[www.sefe-group.com](http://www.sefe-group.com)

### **About NAFTA**

NAFTA is an international company with extensive experience in natural gas storage and underground facility development in Slovakia. It is also Slovakia's leader in exploration and production of hydrocarbons. In Europe, the company actively operates gas storage facilities, explores and produces hydrocarbons and participates in renewable energy storage projects. In addition to Slovakia, the company is present in the Czech Republic, Germany, Great Britain, Austria, Hungary and Ukraine.



<https://www.nafta.sk/en>

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