

## Detailing of Basic Data, Information System & Potential Estimate for Site Selection of Salt Caverns for CAES and Hydrogen Storage in Bedded Salt

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### Abstract

The use of renewable energies will play an important role in the future as part of the planned energy transition worldwide. One element is the storage in various power and energy ranges. One storage option for power is the generation of compressed air and hydrogen with the use of geological structures as storage space, which can be used as a long-term storage in contrast to battery storage. In particular, hydrogen storage is of importance, since the use of power-to-gas will play an important role not only in energy supply but also as an alternative for fossil resources in the chemical industry and for mobility applications.

For the construction and planning of storage caverns in Germany mainly salt structures built up from Zechstein salts (Permian) were used. The salt of the Staßfurt formation of the Zechstein has a high degree of homogeneity and low solids content and therefore offers good conditions for the construction of caverns from a geological and rock mechanical point of view. In the context of the research project InSpEE, a storage potential analysis has already been carried out for this type of rock salt (Zander-Schiebenhöfer et al. 2015).

As part of the latest research project InSpEE-DS, the scope of research has been extended to previously unconsidered salt formations. The aim of the project was the development and appropriation of planning bases for the selection of sites and the construction of salt caverns for the storage of renewable energies by means of hydrogen and compressed air storage in bedded salt layers built up of different saliniferous formations.

Within the project DEEP.KBB was responsible for the project coordination and the determination of the storage potential, the BGR provided the necessary input data from geological point of view and the IGtH (IUB) of the Leibniz University of Hannover deals with the development of the rock mechanical boundary conditions for the different salt formations.

After the end of the project in September 2019, the public information system "Salt" is going to be updated. The project was partially financed by the German Federal Ministry for Economic Affairs and Energy (BMWi) within the scope of the Funding Initiative for Energy Storage established by the German Federal Ministries for Economic Affairs and Energy (BMWi), for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) as well as of Education and Research (BMBF).

Within this paper the findings from InSpEE-DS will be illustrated that have been achieved so far.

**Key words:** Bedded Salt, Caverns for Gas Storage, Compressed Air Energy Storage (CAES), Geology, Germany, Hydrogen Storage, Potential Estimation, Rock Mechanics, Storage Cavern, Information System Salt