

UNDERGROUND SUN STORAGE - A STUDY ON PROPERTIES OF HYDROGEN ADMIXTURE IN POROUS UNDERGROUND-GAS-STORAGE FACILITIES BY MEANS OF AN IN-SITU EXPERIMENT

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The increasing share of volatile renewable energies (wind, solar,...) in the energy mix comes hand in hand with an increase in demand for storage of these energies, to cover the fluctuation in the generation of these energies. A generally accepted solution of storing renewable energy is the "Power to Gas" (PtG) technology. Surpluses of electricity generation, which cannot be fed into the electrical grid due to capacity bottlenecks, can be converted into hydrogen gas via electrolysis which in turn is storable in the existing natural gas infrastructure.

The tolerance of hydrogen in the existing natural gas infrastructure is the topic of numerous international research projects. The results of this research show the possibility to transport a share of several percent of hydrogen in natural gas without causing any harm to the transportation grid and the distribution infrastructure. However, for the underground gas storage infrastructure only literature studies exist with no field experiments done yet. RAG is one of the major gas storage providers in Europe and has therefore a vital interest in positioning itself as a sustainable and economic energy service provider in a changing energy market.

To achieve these goals and to use RAG's existing infrastructure in a future energy market, the research project "Underground Sun Storage" was initiated. A competent and experienced consortium was formed, consisting of several institutes of the "Montanuniversität Leoben", the "Universität für Bodenkultur- Department IFA Tulln", the "Energieinstitut at the JKU Linz", the Verbund AG and Axiom, a process engineering company. The whole project is supported by the "Klima- und Energiefonds" of the Austrian government.

The ongoing project already yielded promising results which led to the decision of conducting the field test. As the laboratory and simulation experiments are still in progress, they will yield additional interesting results, which will also be part of the presentation. Additionally first results of the field test are already available.