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**Economic analysis of energy storage in the form of hydrogen in salt caverns****Szymon Kuczynski, Mariusz Laciak, Tomasz Wlodek and Kamil Przymuszala**  
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With currently observed increase of the demand of hydrogen, new ventures and projects are conducted to deal with certain stages of generation of this chemical element. Hydrogen has numerous advantages in various industries. The most crucial one is the wide range of production techniques using several resources, making it more applicable as compared to other chemical elements. The other advantage is its environmental friendly application as an energy source. This issue may make considerable change in automotive industry in the nearest future. With certain number of advantages, a few disadvantages are observed. The most essential problem is associated with lack of necessary facilities: Mass production units, transportation grids and storage systems. The last point could be solved with salt caverns and depleted oil and gas reservoirs, as they offer large deposit quantities and impermeable interior to keep the hydrogen inside. Complex examination of this part would simplify and intensify the technical studies regarding the hydrogen usage. Paper investigates the economic influence of particular parameters of hydrogen storage in salt caverns. The initial point of the research is the stage of leaching the cavern to enable the storage with any relevant machinery. The following cavern elements involve completion devices as wellhead and exploitation pipes. Surface technical setup consists of the hydrogen compressing facility, pumping equipment, gas (hydrogen) drying unit, gas reduction and measurement plants. Necessary supporting infrastructures needed to maintain the work: Electric steerable systems, preparation of plant (ground possession, construction of roads and staff base). The economic analysis covers different scenarios with respect to the localization, cavern volume, years of usage of the facility and resources prices. NPV and IRR factors for scenarios are evaluated.

**Biography**

Szymon Kuczynski is currently working as a Research Assistant in Natural Gas Engineering Department. His research interests are related to fluid mechanics, natural gas composition analysis, real time *in situ* monitoring systems, energy sources and mathematical models.

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