



## Bachelor Thesis

# Hydrogen Storage in geological formations – Potentials and Costs in Europe

Hydrogen is seen as a promising element in establishing a climate-neutral energy system. However, due to the highly fluctuating power generation from renewable energies, hydrogen must be stored. Therefore, sufficient storage capacities must be available to preserve the security of the energy system's supply in times without renewable power generation.

Hydrogen can be stored in different geological formations for short and long periods. Due to their existing characteristics, salt caverns are seen as preferred hydrogen storage sites. Essentially, hydrogen storage capacities can be obtained from converted natural gas storage sites, as well as from the construction of new underground facilities. In this context, several studies show regional differences in storage potentials and costs across Europe.

The objective of this thesis is to provide an overview of the current economics and potentials of underground hydrogen storage in Europe by reviewing literature. Therefore, the European potentials for underground hydrogen storage capacities should be identified, and their costs estimated.

## Key tasks and objectives of the thesis

- Detailed familiarization with underground storages of hydrogen
- Review of the theoretical and empirical literature on the current state and implementation of underground hydrogen storage
- Evaluation of their economic feasibility and potentials in Europe

## Your profile

- Student of economics, best with focus on energy
- Interest in hydrogen, energy storage, energy transition,

## Literature

- Simon et al. (2015). "HyUnder – Hydrogen Underground Storage at Large Scale: Case Study Spain". In: Energy Procedia, Volume 73, Pages 136-144
- Caglyan et al. (2020). "Technical potential of salt caverns for hydrogen storage in Europe". In: International Journal of Hydrogen Energy, Volume 45, Pages 6793-6805
- Le Duigou et al. (2017). "Relevance and costs of large scale underground hydrogen storage in France". In: International Journal of Hydrogen Energy, Volume 42, Pages 22987-23003

## Contact



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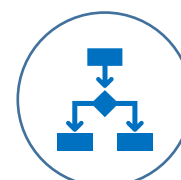
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## Topics



- Hydrogen Storage
- Energy Transition

## Methods



- Cost estimation
- Literature work