

## HYDROGEN UNDERGROUND STORAGE (HUGS)

TOPIC: 1700 - NUMERICAL METHODS AND ALGORITHMS IN SCIENCE AND ENGINEERING

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### ABSTRACT

The European Commission has high expectations for the development of a hydrogen based economy in the coming years.

In 2022, hydrogen accounted for less than 2% of Europe's energy consumption. But the European Commission has proposed to produce 10 million tonnes of renewable hydrogen and to import 10 million tonnes by 2030 [1]. This objective requires efficient and vast storage systems to allow this hydrogen production and to control the energy recovery.

This minisymposium is oriented to the numerical and experimental analysis of the different massive underground hydrogen storage systems (caverns, old depleted oil/gas reservoirs, aquifers, etc.). The analysis from a computational mechanics point of view of crucial aspects like gas properties, mixing processes, gas purity and chemical reactivity, repository stability and capacity, operability and retrieval efficiency, and induced seismicity are the main topics of this minisymposium. Computational mechanics, solid mechanics, structural mechanics, geotechnical stability, computational fluid dynamics, porous media flow, reactive transport, strategic storage operation, optimization, economic viability and other related aspects regarding computational mechanics for underground hydrogen storage are welcome. Experimental analysis and field observations will be also considered for validating numerical models and characterization of properties in hydrogen storage facilities.

Contributions regarding this recent challenging topic are welcome in this minisymposium.

### REFERENCES

- [1] "The EU strategy on hydrogen" European Commission, July 2020, ([https://ec.europa.eu/commission/presscorner/detail/en/fs\\_20\\_1296](https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1296))