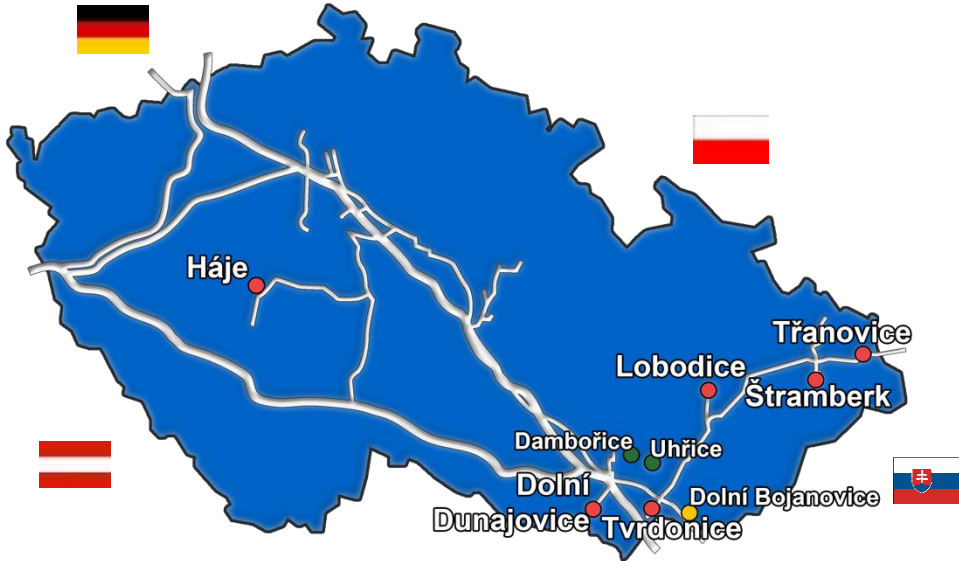




Opportunities and challenges of seasonal hydrogen storage

Pavel Moučka, CEO Gas Storage CZ, a.s.

There are 9 UGS facilities in the CR, some of them Gas Storage CZ close to the H₂ backbone corridor(s).



The majority of UGS facilities in the CR are depleted gas fields, with 2 exceptions:

- Lobodice UGS – aquifer
- Háje UGS – rock cavern

There are no salt caverns or similar known structures (considered the most perspective for H₂ storage) in the CR

Total UGS capacity in the CR: 38 TWh*

* W/O UGS Dolní Bojanovice – currently not connected to CZ network

Technical challenge: every storage consists of 3 main parts; not all can be easily repurposed.

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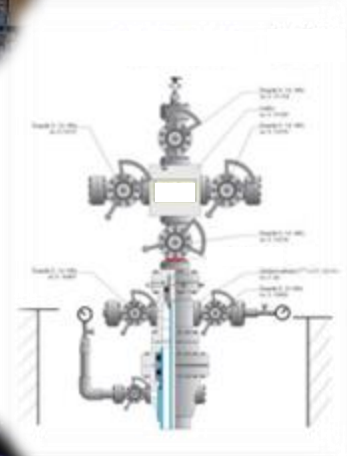
Surface technologies

- To repurpose them for hydrogen is „only“ a matter of investments – however, in billions of CZK
- Mainly the compressors would have to be modified/replaced, but also other technologies



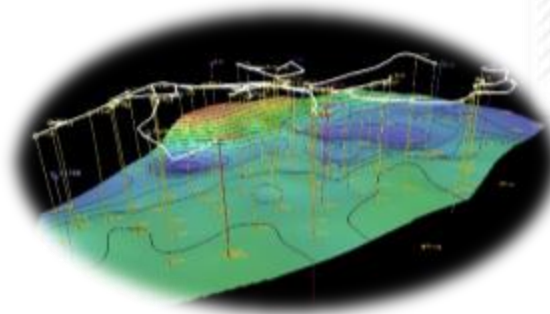
Wells

- Create the surface-reservoir connection
- Only some of their parts can be replaced



Reservoir

- Natural structure, which can't be modified
- The regime must be adjusted to natural conditions and tested



**We are serious about the hydrogen readiness.
Currently, a whole range of hydrogen activities are underway.**

Gas Storage CZ

Surface technologies	Material research – in progress
	Assessment of the UGS facilities – in progress
Reservoir	Test on separated structure for H ₂ blend, designed for gradual increase of H ₂ content – started
	Geochemical interactions research – in preparation
	Assessment of suitable localities in the CR – in progress
Wells	Test of subsurface completion integrity – in preparation

As shown by to-date research, **we should be able to store up to 10% H₂ blend without significant complications presently** - still a long way to go to **verify 100% H₂**.

Commercial challenge: Significant decrease in storage capacity for hydrogen and the related CAPEX and OPEX implications

Gas Storage CZ

Current NG storage capacity:

Storage capacity **38 TWh**

CR consumption in 2023: 74 TWh

=> ~ 50% of annual consumption in the UGSs

Planned H₂ consumption (2050):

39 – 62 TWh*

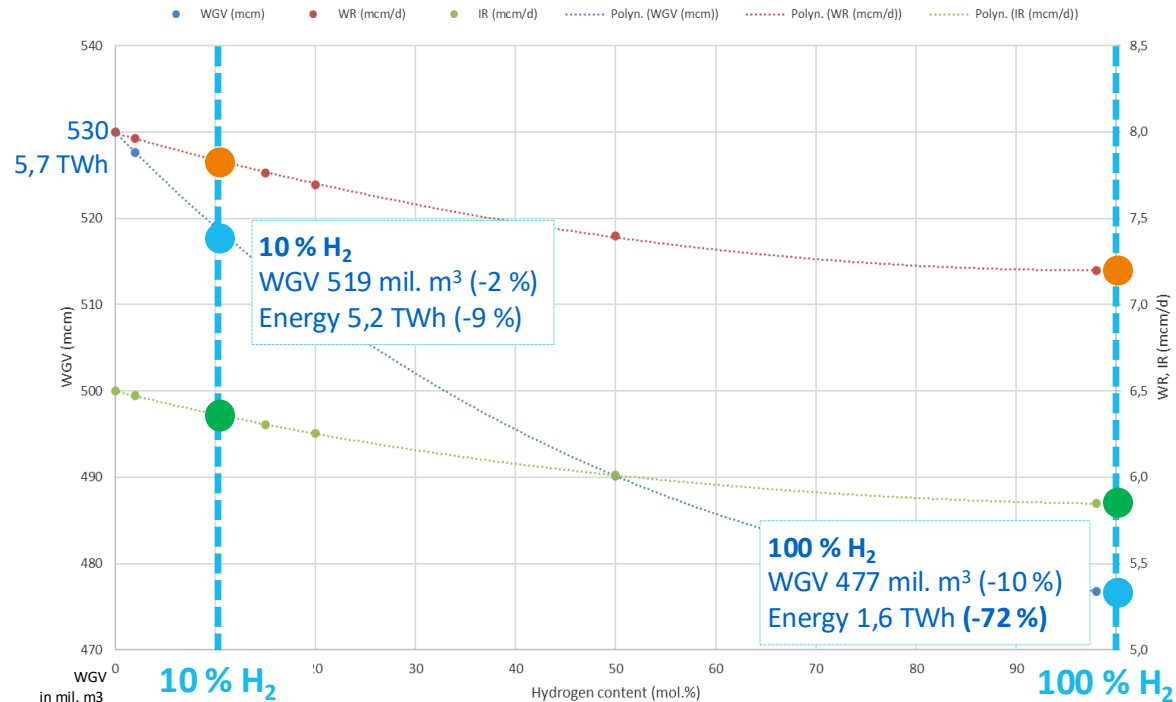
Available storage capacity in the CR at the full conversion of the UGS: 11 TWh

Another possible decrease of UGS capacities:

H₂ suitability of the facilities, pressure limitations, operational regime changes...

Business case when considering all costs of UGS repurposing and operation costs?

Dependence of storage capacity on H₂ content on an example of a specific UGS



* Ranges stated in CZ Hydrogen Strategy (2024 update) for low-case and high-case scenario