



Crude oil storage in caverns

 PATRIZIA

STORAG ETZEL

Energy Storage Solutions

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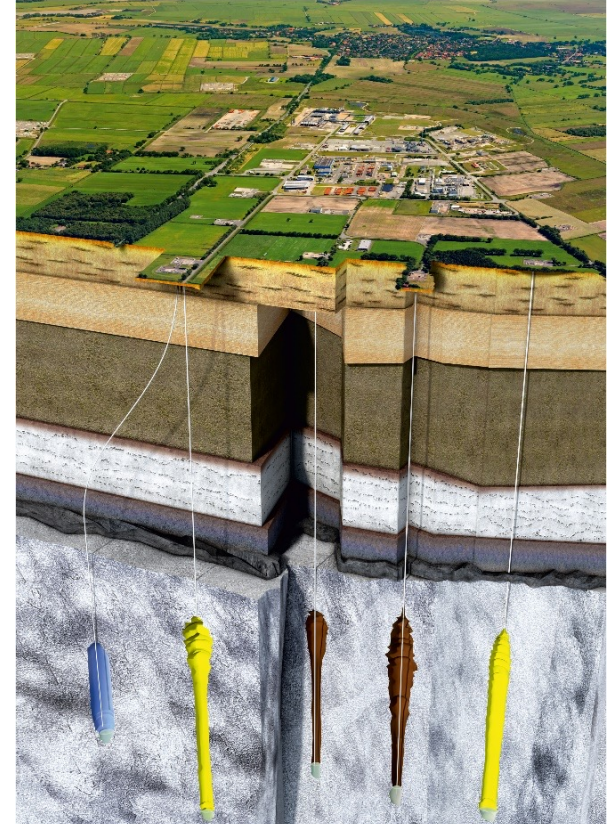
About us

- PATRIZIA and **STORAG ETZEL** as operator build and manage oil and gas caverns in Northern Germany
- 51 caverns for gas and 24 caverns for oil
- Acting on behalf of German institutional investors (insurance industry, pension funds etc.)
- More than 50 years of experience in oil handling
- Connected via pipeline to deep-water port of Wilhelmshaven



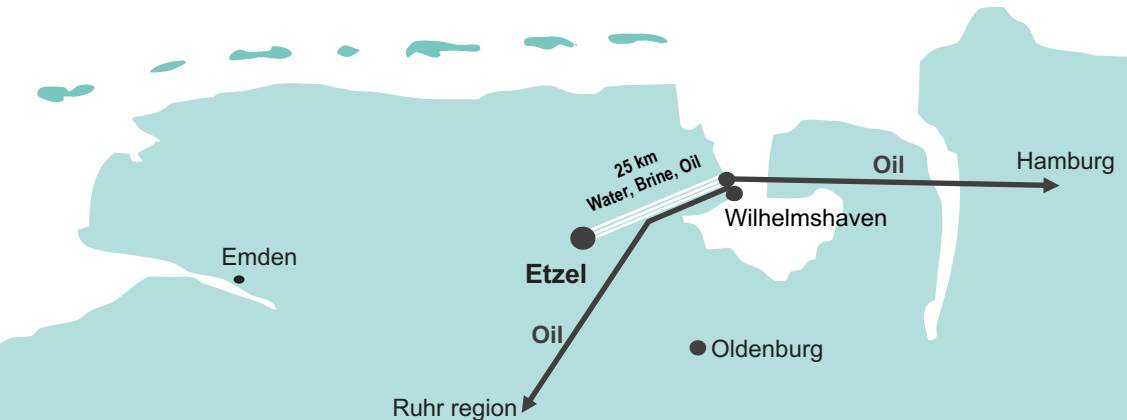
Cavern basics

- Caverns are artificially leached into a salt dome
- They have a capacity of 2 super tankers ($> 480.000\text{m}^3$)
- The oil caverns are used by stockholding institutions and commodity traders
- Storage media can be crude oil, natural gas or hydrogen
- Injection and withdrawal rate approx. $350\text{m}^3/\text{h}$ per cavern



Infrastructure

- Jetty and tank farm in Wilhelmshaven
- Pipeline to cavern site in Etzel
- Central operation for the storage of crude oil in caverns



Tenants

- 24 caverns for crude oil
- Total storage capacity 11 mil. m³
- Long-term contracts with stockholding agencies such as the EBV (Germany), COVA (Netherland) and APETRA (Belgium)

From mid-2023, STORAG ETZEL will have around 5 million m³ of free capacity for the medium- and long-term storage of oil

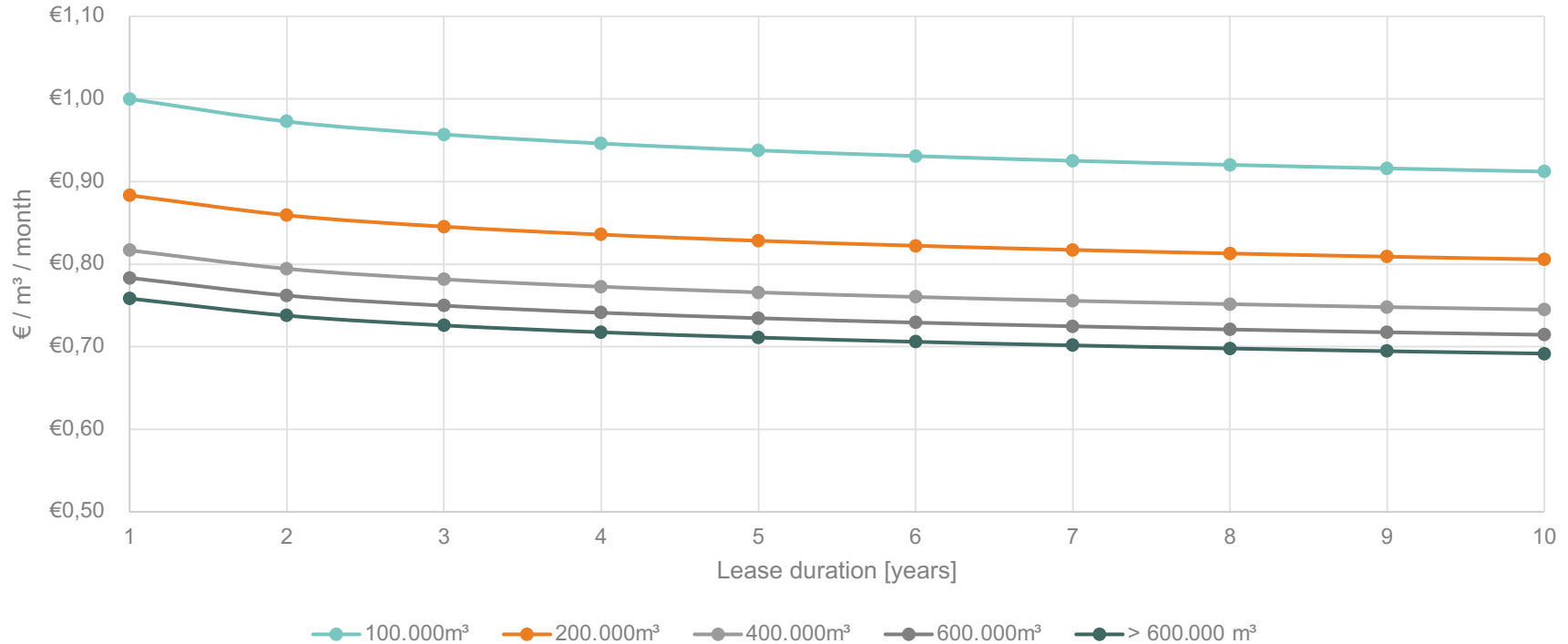


Fact sheet

Number of Caverns:	24	Total Crude Stored:	10.5 Mio. m³	Crude Oil Quality:	e.g. North Sea Crude, WTI, other qualities are subject to specs
Minimum Cavern Size:	280,000 m³	Maximum Cavern Size:	560,000 m³		
Filling and Discharging Activities (Turnover)					
Pump rate per cavern:	Appr. 350 m³/h				
Minimum batch size:	100,000 m³				
Important facts regarding storage & turnover of crude oil in caverns:					
Crude Oil Handling	The storage facility is connected by a 44"-pipeline to the NWO tank farm and the jetty in deep water oil port at Wilhelmshaven (distance appr. 25 km)				
	A separate contract with NWO is required for the ex-/ import handling (www.nwowhv.de)				
Crude withdrawal	Freshwater or brine can be used for the withdrawal of crude oil				
Crude injection	Caverns are filled with brine. The brine will be displaced by injecting crude oil				
Water separation	The cavern acts as a natural water separator: Water content will be separated over time from the crude oil by gravity during long-term storage, so the net volume discharged will contain less water				
Quality loss	No quality loss				
Quantity loss	Due to geological and hydraulic reasons minor quantity losses may occur; the potential volume losses are up to max. 0,5 % to the net volume stored				
Standard Contract Specification					
Standard Minimum Term:	1 year				
Storage Fee:	Upon request (depends on Contract Term and Contract Size)				
Minimum Contract Size:	100,000 m³				
Customer Rating:	At least Credit Rating of A or Bank Guarantee etc.				
Other costs / fee:	Filling and Discharging fee (€ / m³)				

6

Indicative costs



Additional costs: Filling and withdrawal 1,25€/m³ (as of 2023)

Disclaimer

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Thank you very much for your attention!

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