

# Large scale hydrogen storage:

## Why? Where? When?

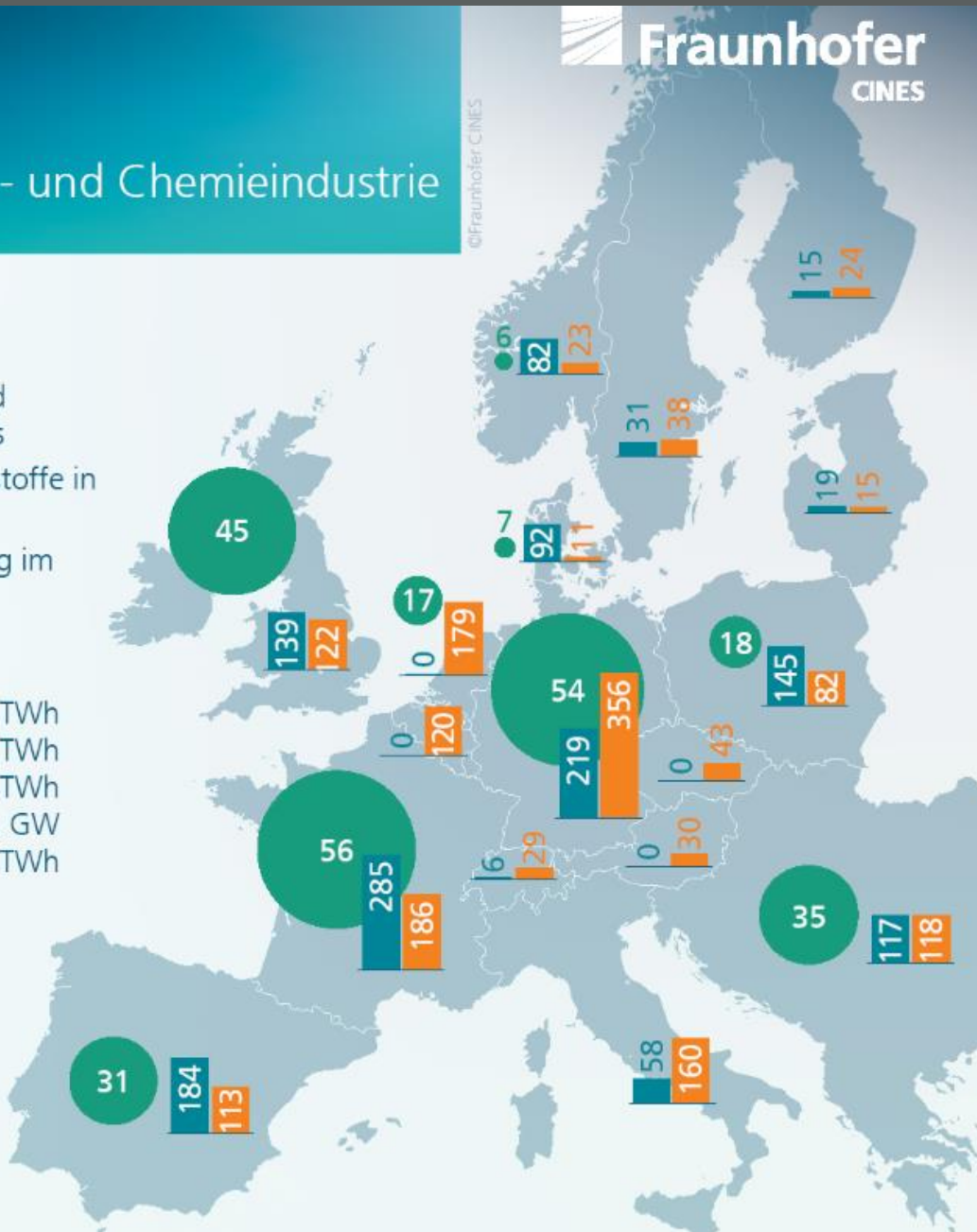
Zuidbroek, 13.03.2025

### Merkmale

- Hochtemperatur-Prozesswärme, Stahl und Chemikalien auf H<sub>2</sub>-Basis
- H<sub>2</sub> u. Synthetische Kraftstoffe in Schiffs- und Flugverkehr
- Keine direkte H<sub>2</sub>-Nutzung im Gebäudesektor

### Eckdaten (europaweit)

H<sub>2</sub>-Erzeugung : 1.590 TWh  
H<sub>2</sub>-Verbrauch: 1.646 TWh  
H<sub>2</sub>-Import: 56 TWh  
Elektrolyseleistung: 662 GW  
Speicherkapazität: 269 TWh



### key takeaways:

1. domestic upstream (Europe!) can dominate in supply
2. storage capacities will be essential
3. systemic costs will be crucial

# North-West Germany: becoming a central pillar of the EU hydrogen economy



1

## Renewable Energies

vast capacities of wind (offshore & onshore) and enormous further potential



2

## Initial Pipelines

free capacities in transport and distribution networks due to market reconsolidation



3

## Established Import Infrastructures

current relevance and future-proof

source: NDR



4

## Cavern Storages

most important gas storage sites inside EU



5

## Central EU Region

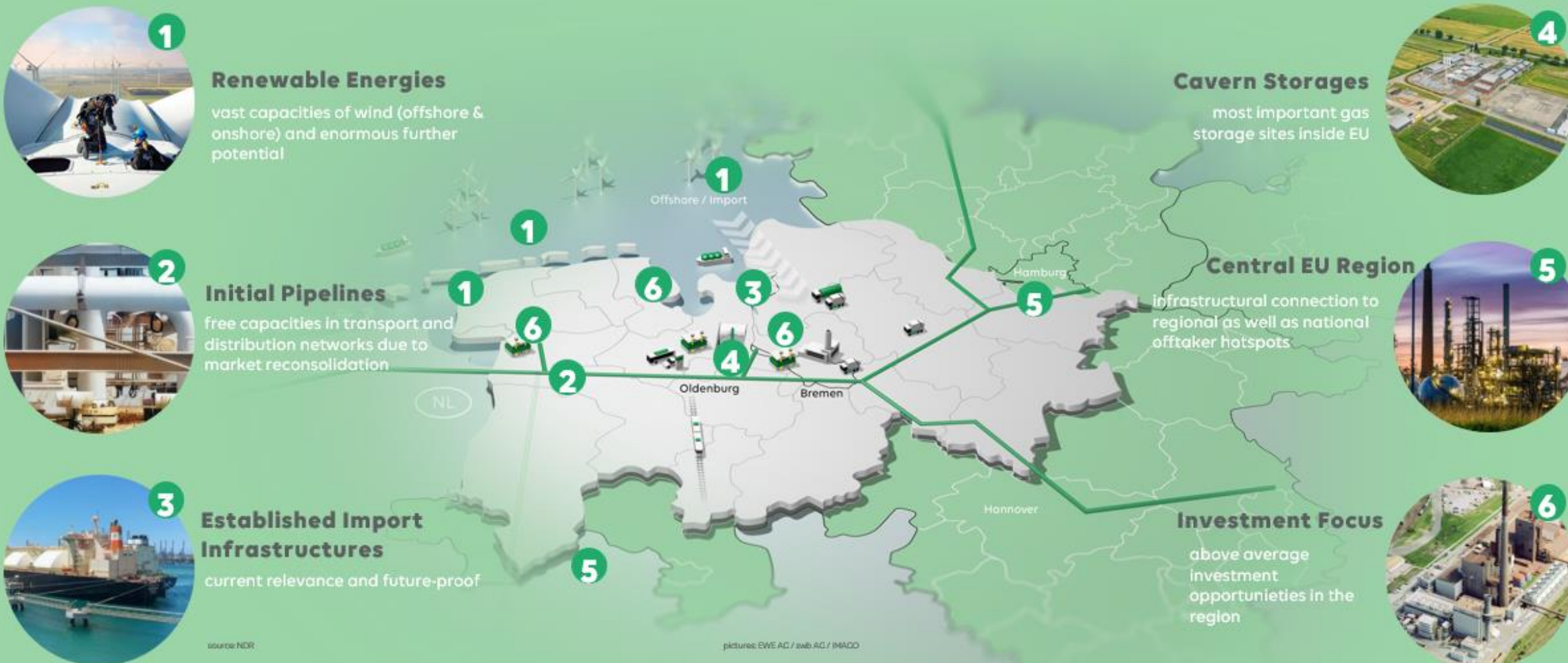
infrastructural connection to regional as well as national offtaker hotspots



6

## Investment Focus

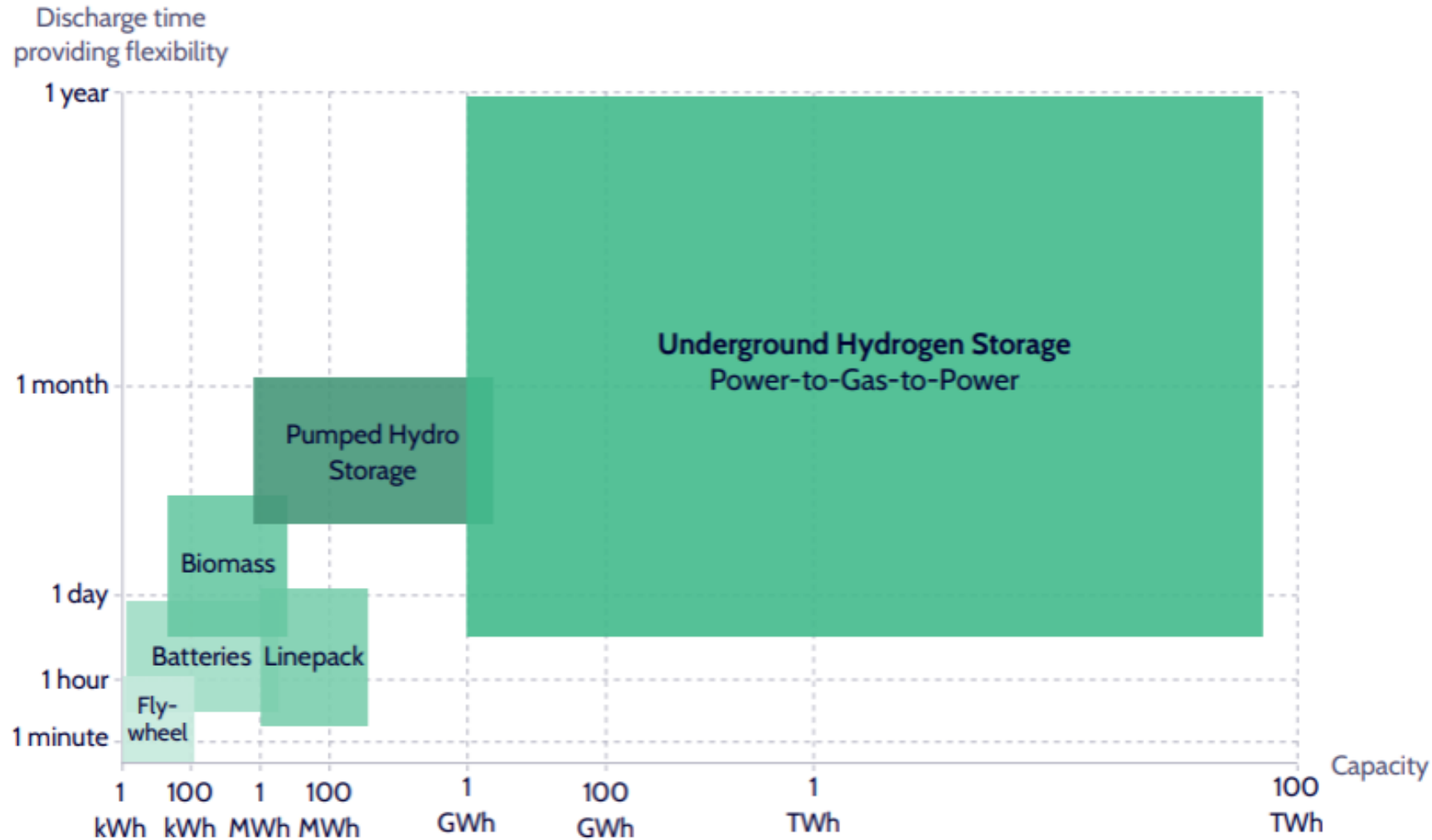
above average investment opportunities in the region



pictures: EWE AG / swb AG / IMAGO

## Comparison of flexibility solutions in terms of discharge time in which they provide the according capacity<sup>17,18,19</sup>

**EWE**



**Attention:** Intervals on the capacity axis are exponential i.e. UHS can have almost 1 million times the capacity of a battery.

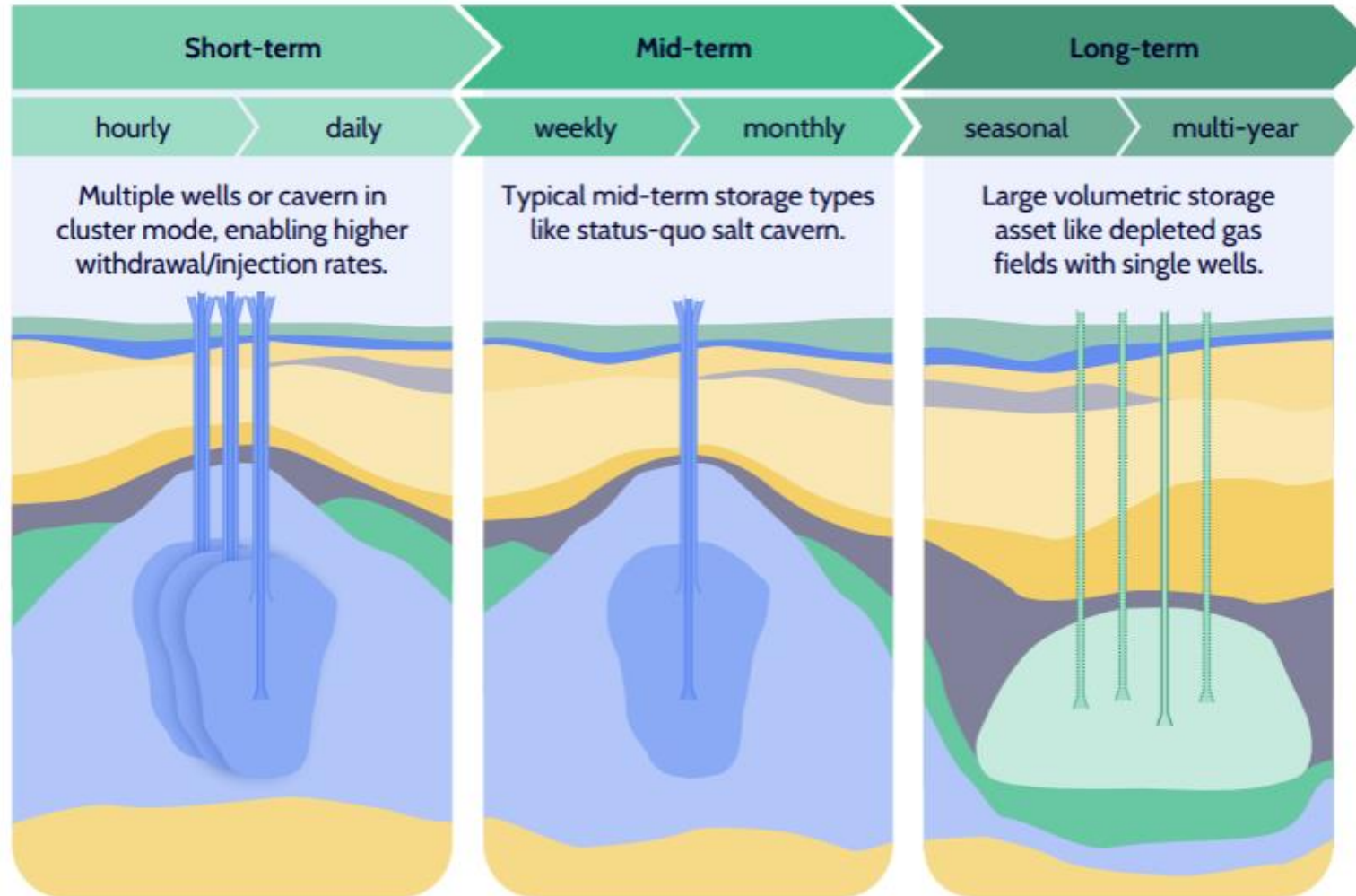
key takeaways:

1. vast capacities only provided by UHS
2. flexibility in time and capacity unrivaled
3. building on existing assets brings significant advantages

## Potential setup of UHS to serve the full flexibility range by efficient well placement to increase withdrawal and injection rates

**Note:** All technologies can be utilised for various flexibility ranges (e.g. salt caverns can provide long-term storage). Drawings are not representative of true size, depleted gas fields are significantly larger.

**EWE**



### key takeaways:

1. UHS can provide any market requirements
2. hydrogen fired power plants would demand peak rates
3. substantial capacities and experiences in Northwest-Europe



## CHC Speicher Huntorf

- Erster kommerziell genutzter H<sub>2</sub> Speicher in Deutschland am Standort Huntorf
- Projektziel: Umwidmung einer Erdgas Speicherkaverne zur Nutzung mit H<sub>2</sub>
- Projekt in 08.2022 gestartet

### Aktueller Stand

- Baufeld wurde festgelegt
- Genehmigungsprozess ist mit der Bergbehörde abgestimmt
- Kaverne K1 ist geflutet und auf Wasserstoff getestet

Kaverne K1

Baufeld für  
Obertageanlagen

Ab 2028 wird EWE  
**30.000t  
Wasserstoff**  
produzieren und  
einlagern.

# Wir informieren fortlaufend über die Projekte:

