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# Geothermal permitting in Flanders

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# Presentation outline

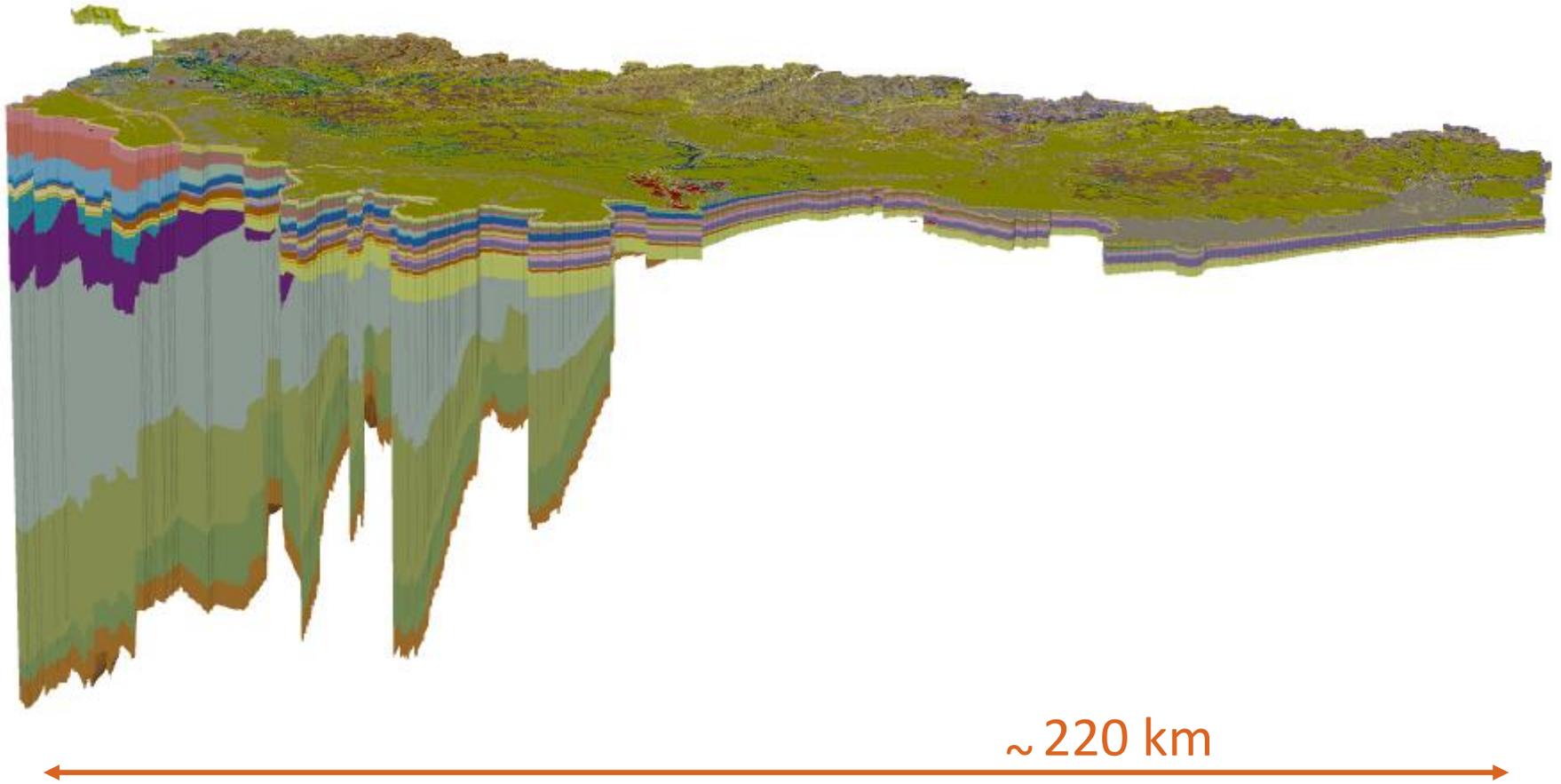
- ▶ Geological situation in Flanders: space pressure at and below surface  
(+ subsurface competences & legal framework split up between political levels)
- ▶ Permitting path & trying to be efficient with limited space and limited administrative capacity



# The geology of Flanders

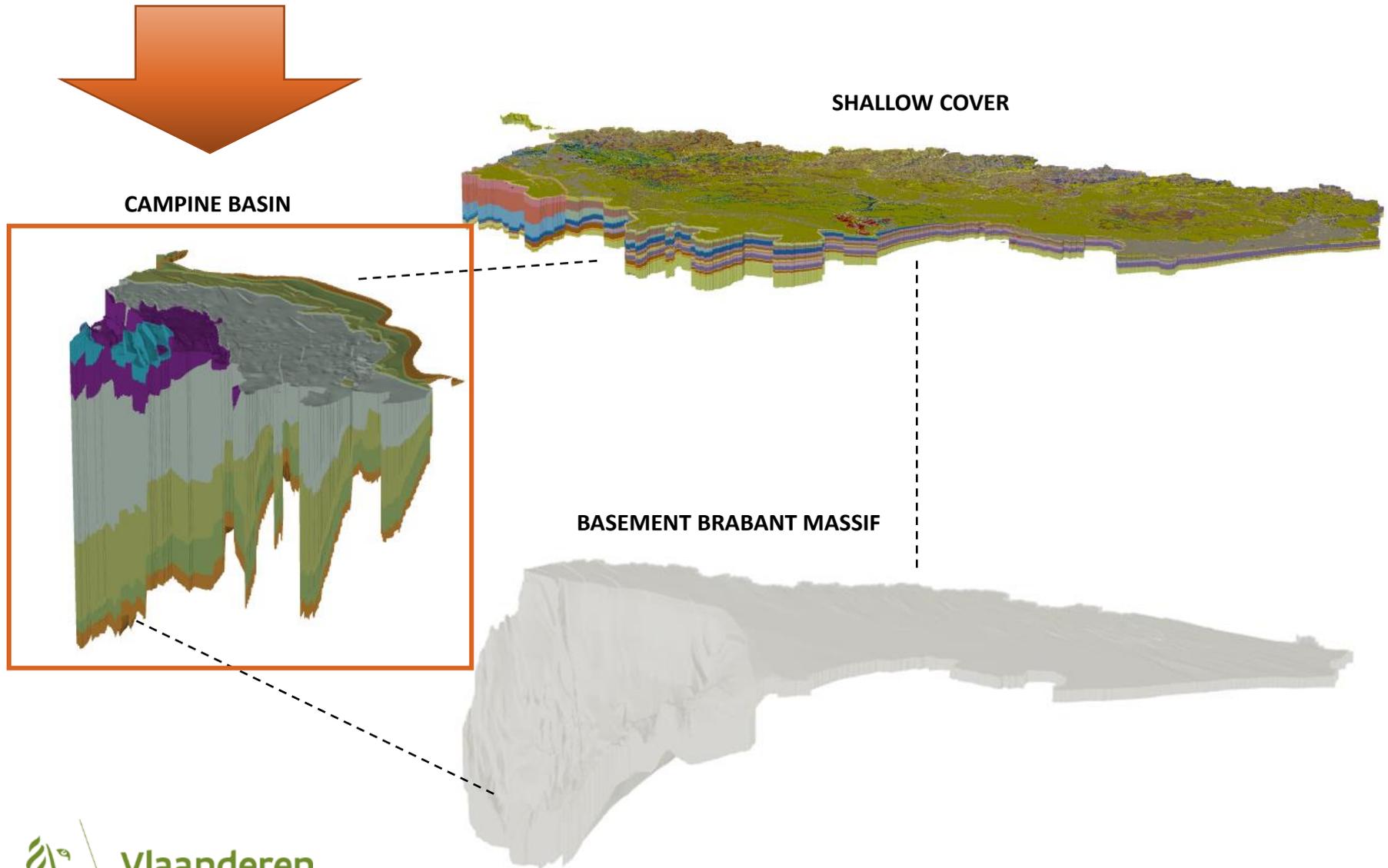
East

West



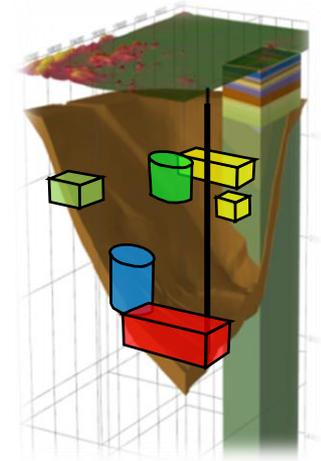
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# Geothermal potential for hydrothermal systems

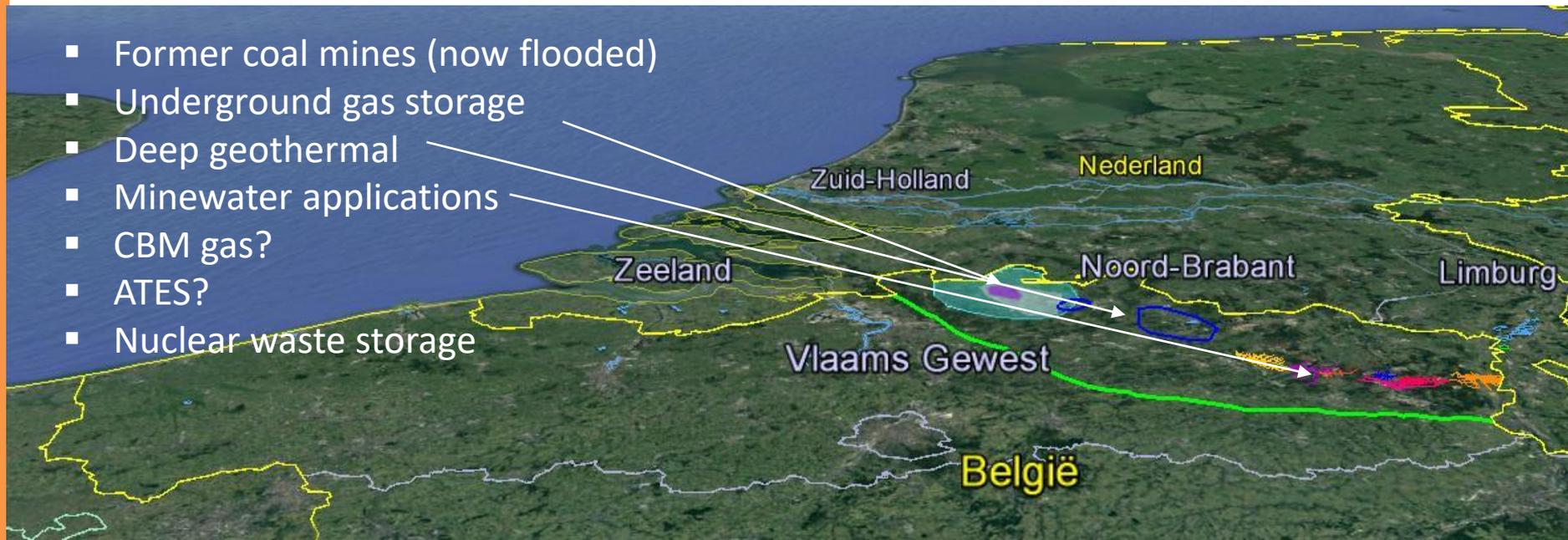


# Efficient use of subsurface volume

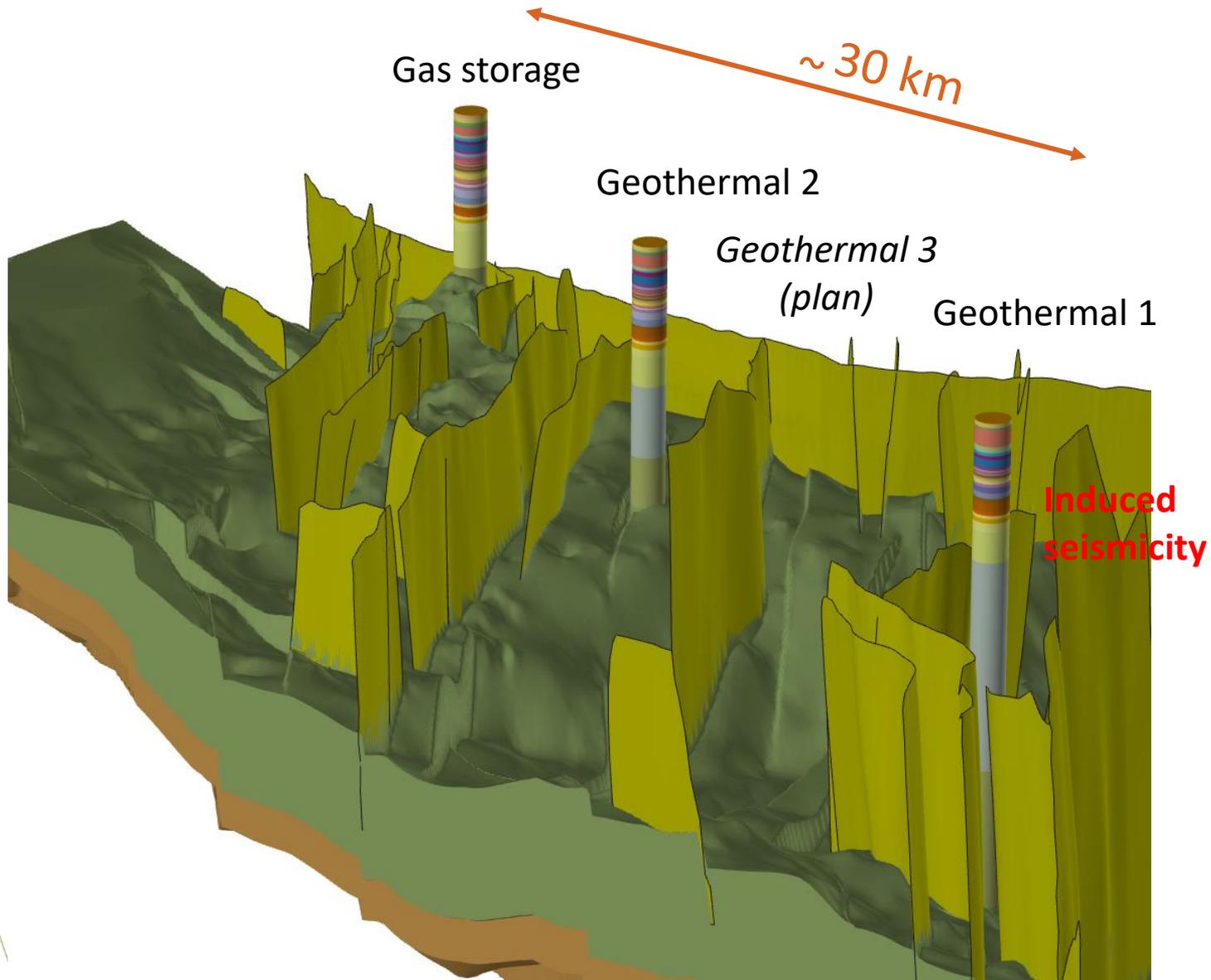
- ▶ The subsurface volume with interesting reservoir characteristics is limited
- ▶ Many applications focus on the same small area
- ▶ Complex geology → uncertainty
- ▶ Dialogue between operators and several regulators
- ▶ Need of a sustainable vision



- Former coal mines (now flooded)
- Underground gas storage
- Deep geothermal
- Minewater applications
- CBM gas?
- ATEs?
- Nuclear waste storage

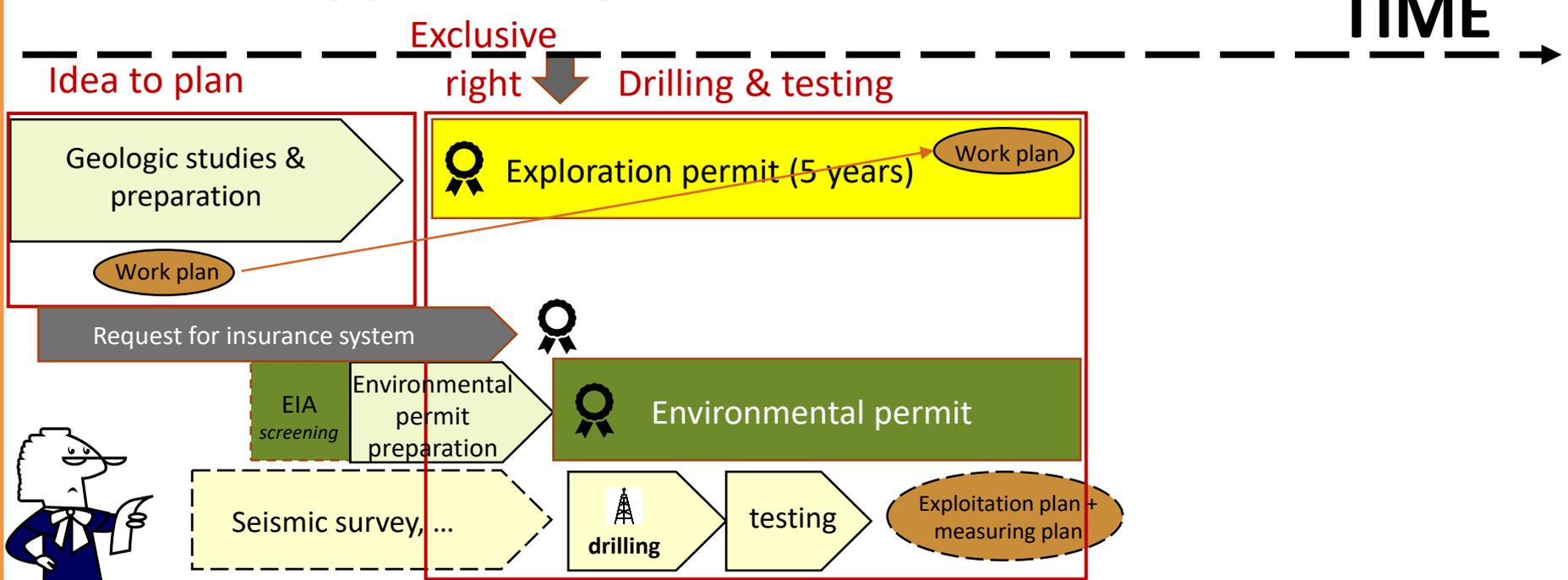


# Complexity & uncertainty

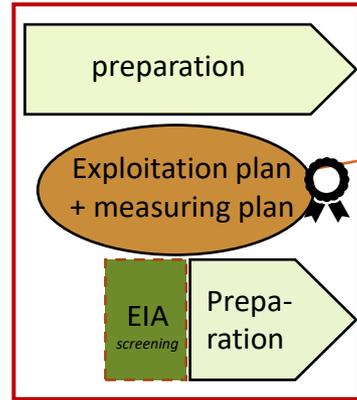


# Permitting path for geothermal below -500m

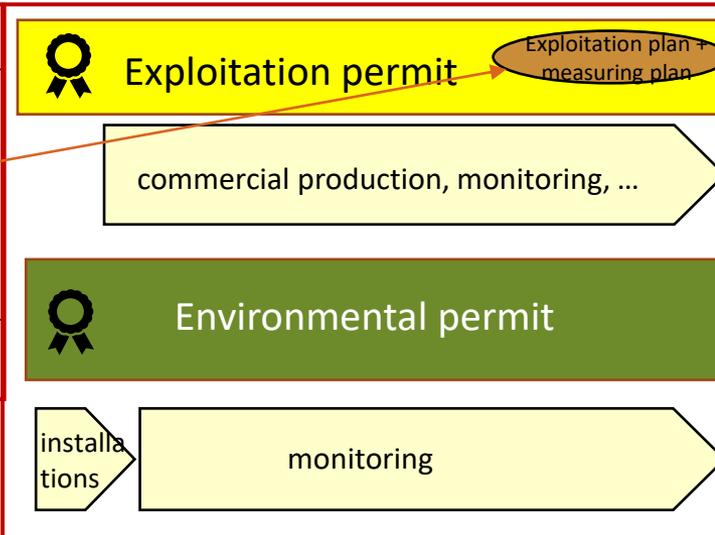
TIME →



## Confirmation & final plan



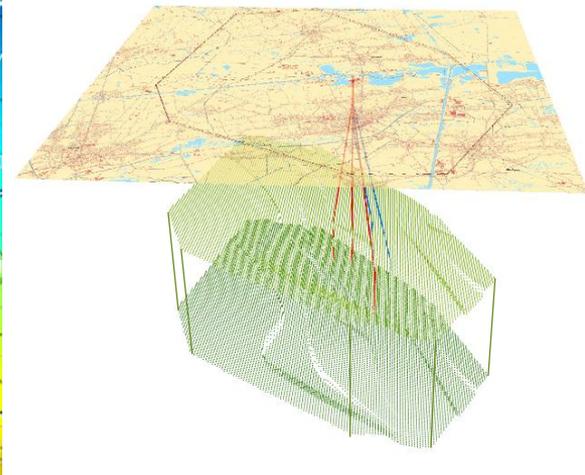
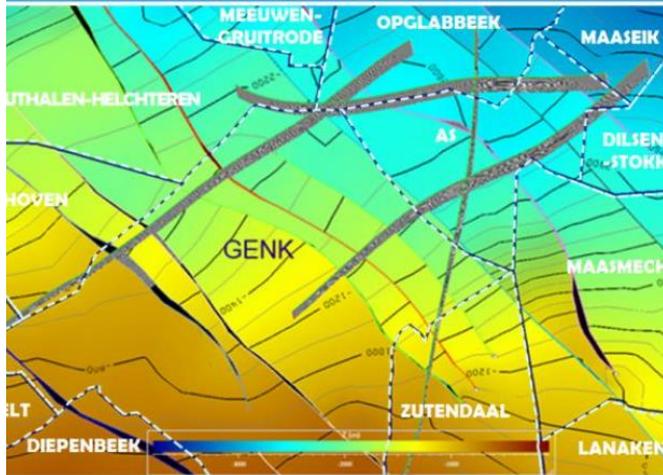
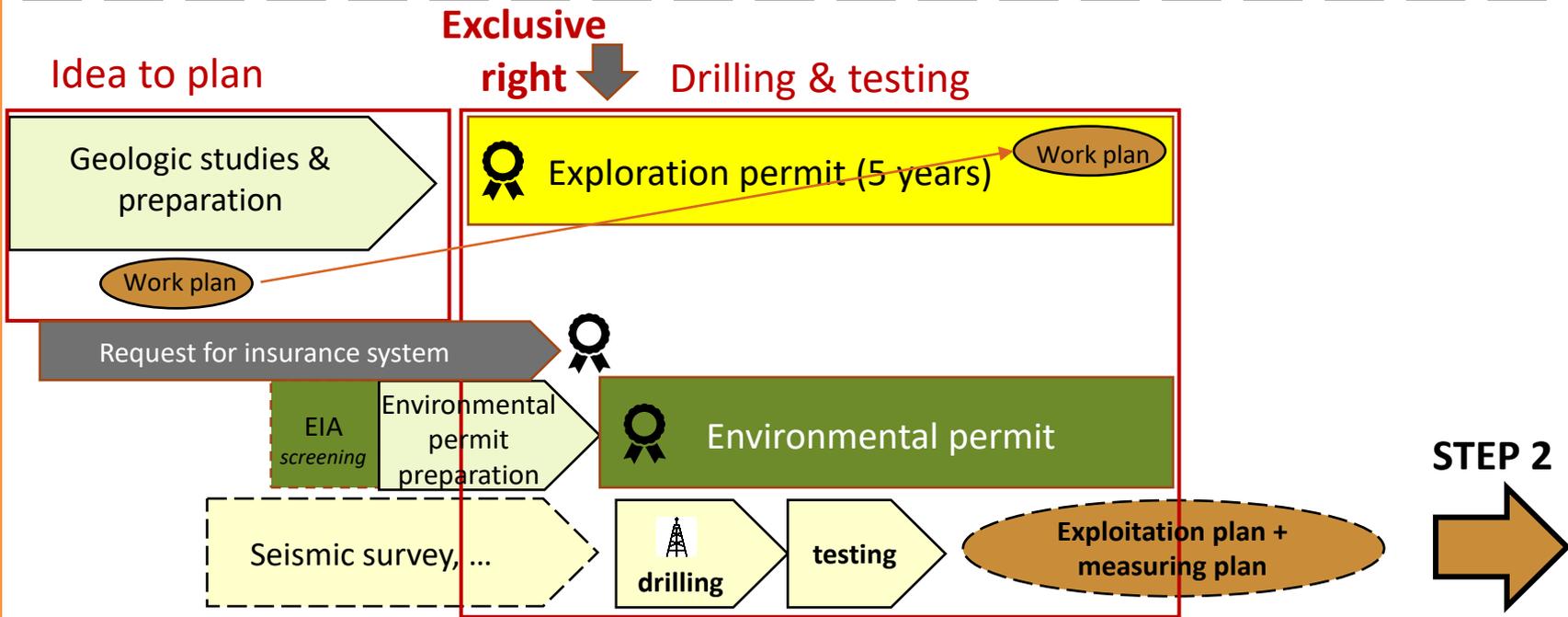
## Exploitation



- Decreet Diepe Ondergrond (DDO)
- Besluit Diepe Ondergrond (BDO)
- Decreet omgevingsvergunning + BVR
- DABM
- VLAREM
- VCRO + BVR
- MER-besluit
- Milieuhandhavingsbesluit
- VLAREL

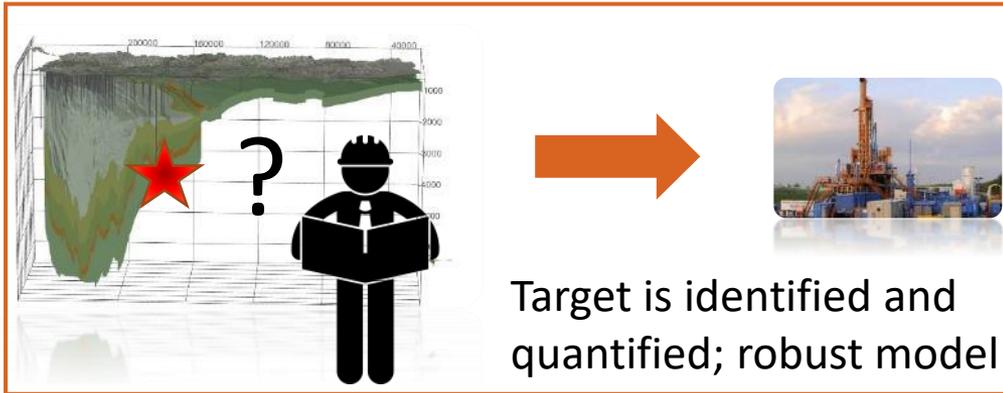
# Permitting path: STEP 1

TIME →

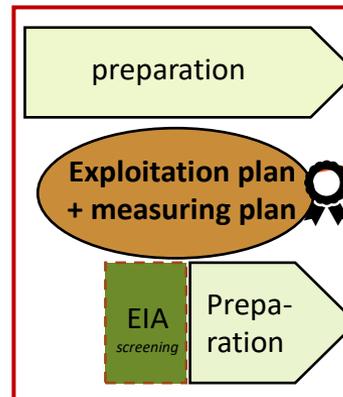


# Permitting path: STEP 2

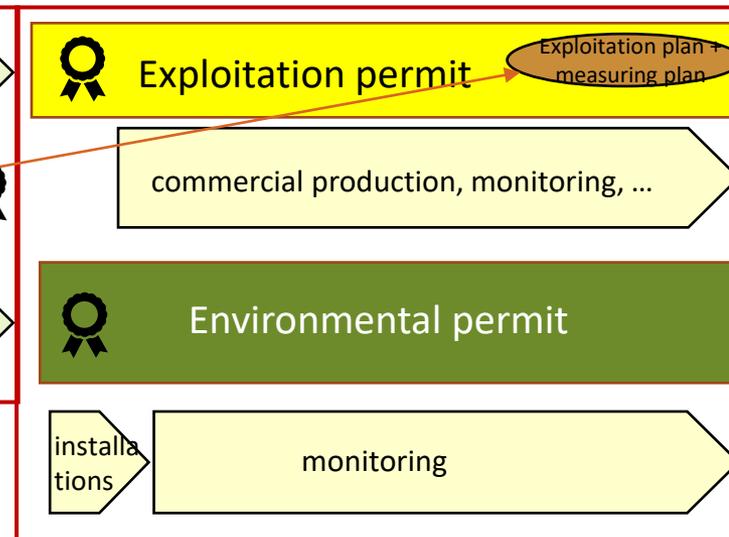
TIME →



## Confirmation & final plan



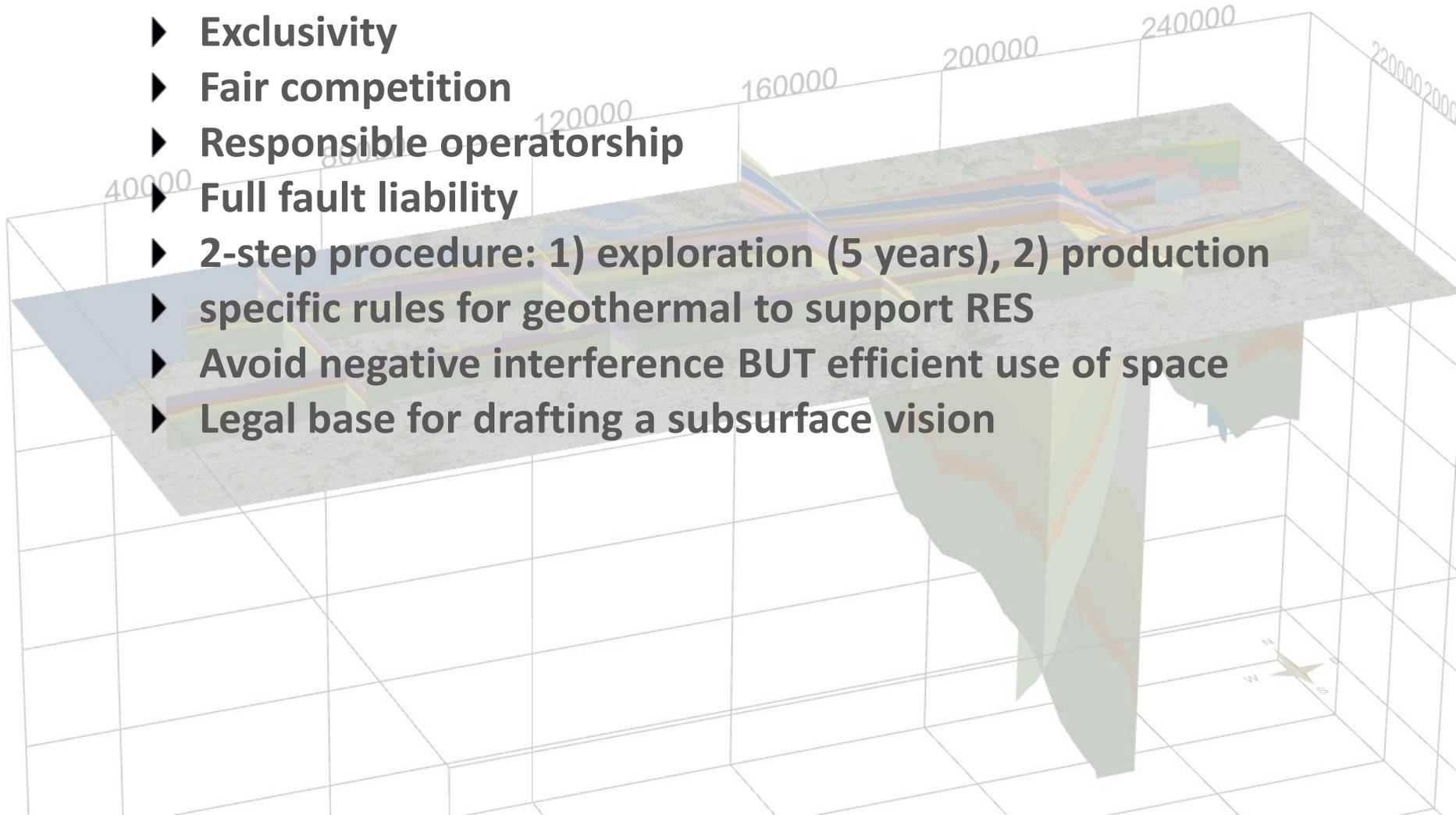
## Exploitation



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# Decree of the Deep Subsurface

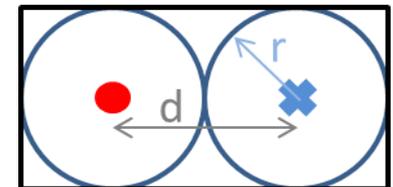
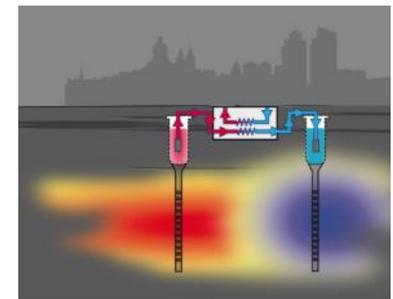
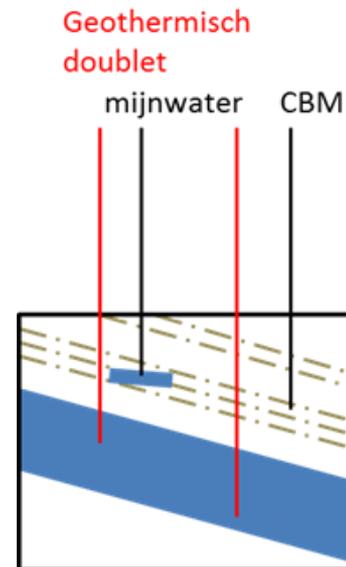
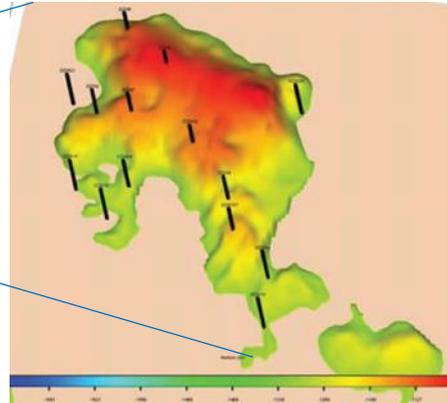
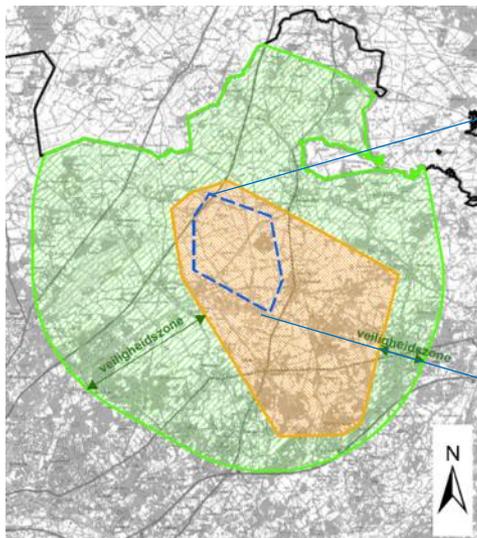
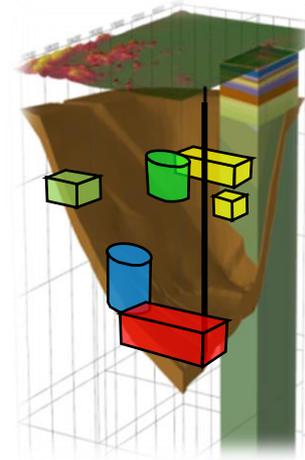
- ▶ Applicable for activities deeper than -500m TAW
- ▶ Exclusivity
- ▶ Fair competition
- ▶ Responsible operatorship
- ▶ Full fault liability
- ▶ 2-step procedure: 1) exploration (5 years), 2) production
- ▶ specific rules for geothermal to support RES
- ▶ Avoid negative interference BUT efficient use of space
- ▶ Legal base for drafting a subsurface vision



# Defining a 3D license volume

## ► Principles:

- Below -500m TAW
- 3D volume with clear depth limits (not complete column)
- Fit to geological conditions
- No overlap with existing license volumes
- Dynamic modelling to predict influence in space/time
- contain (hindering) influence ( $\neq$  zero influence) → **large enough**
- Efficient (planning perspective, no suboptimal fragmentation) → **small enough**
- Explore/exploit actually (NO non-functional zones, timing)



# Questions?

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