



Implementation of the CCS directive when geological storage options do not exist

Two case studies from Belgium



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&

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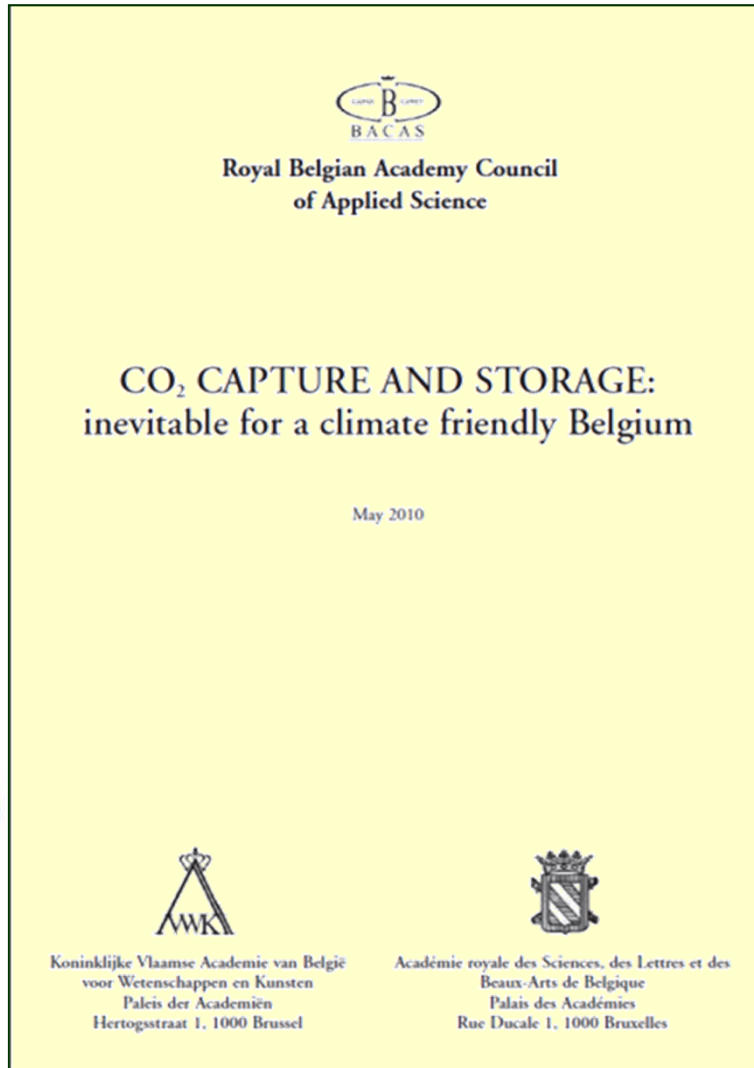


Preamble

- This presentation is about sharing particular experiences
- This presentation is **not** a plead against CCS
- This presentation is **not** a roadmap to avoid transposition



CCS is important, also for Belgium

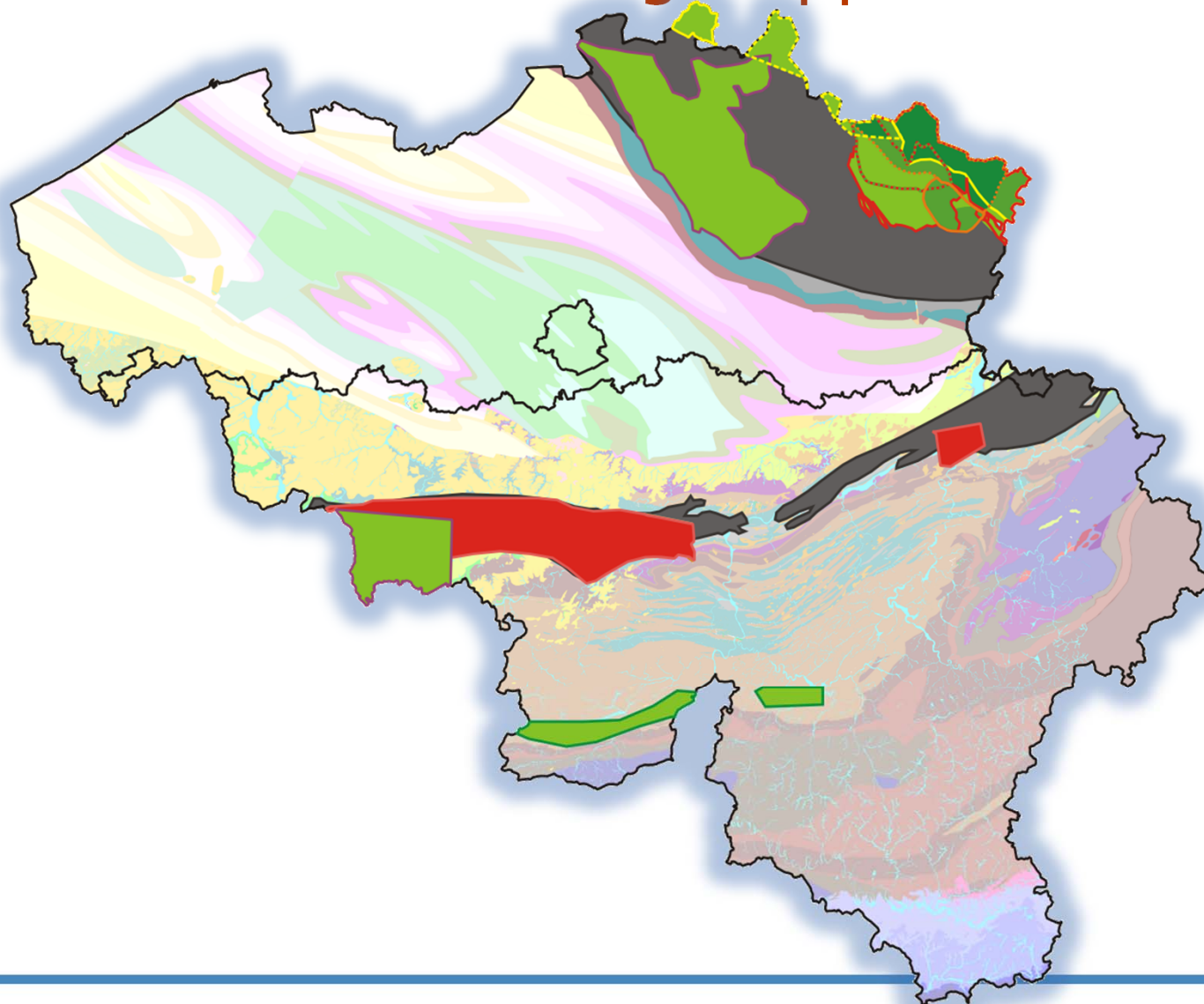


CO₂ Capture and Storage:
Inevitable for a climate friendly Belgium
(Piessens et al. 2010)

[www.kvab.be/downloads/stp/tw_BACAS
CO₂ capture and storage.pdf](http://www.kvab.be/downloads/stp/tw_BACAS_CO2_capture_and_storage.pdf)

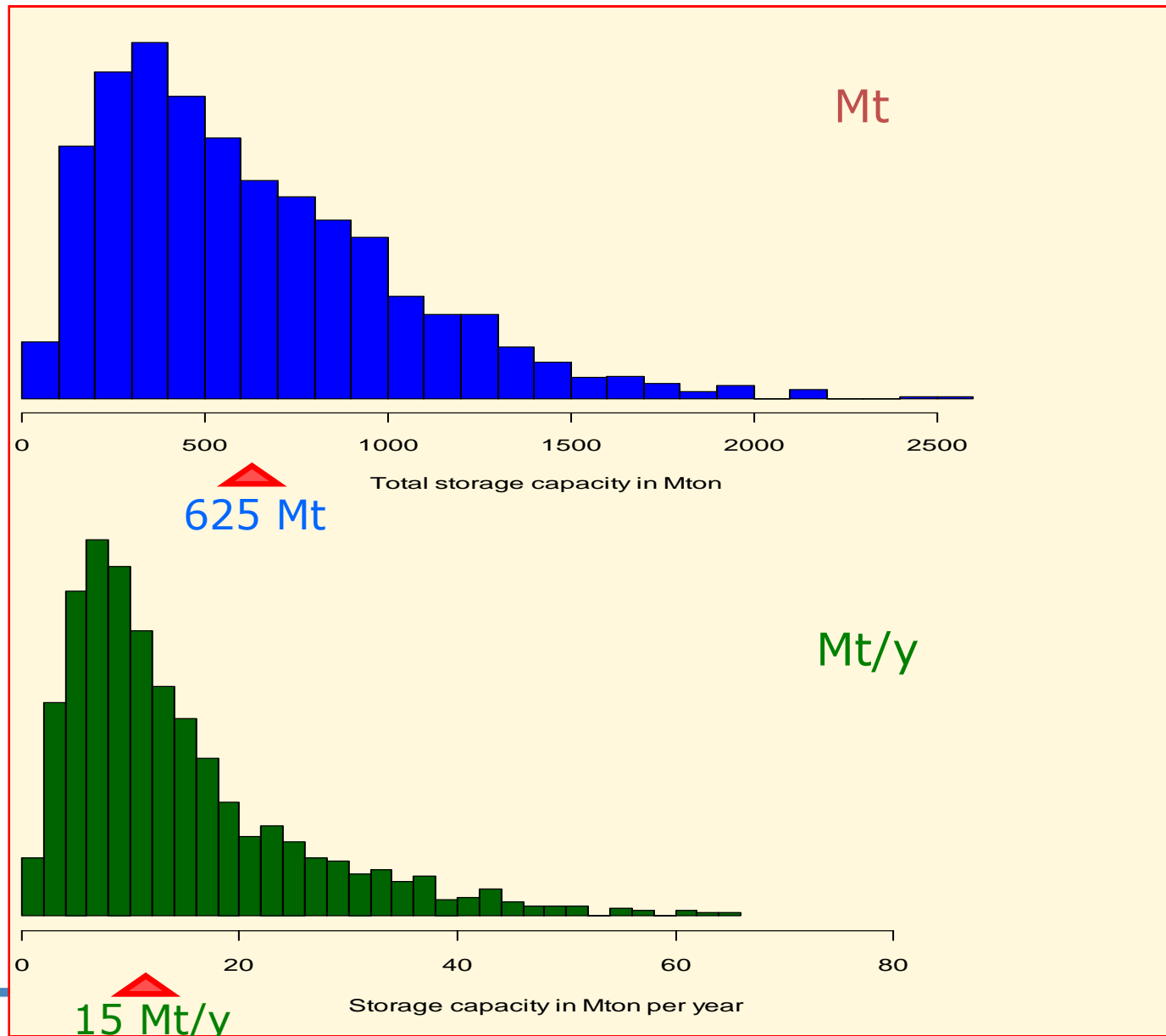
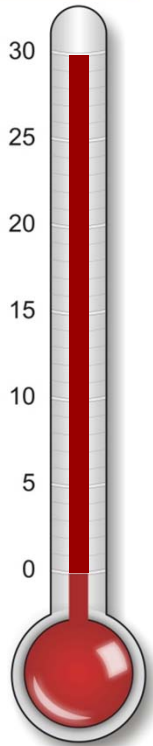


Belgian Geology in terms of Storage Opportunities

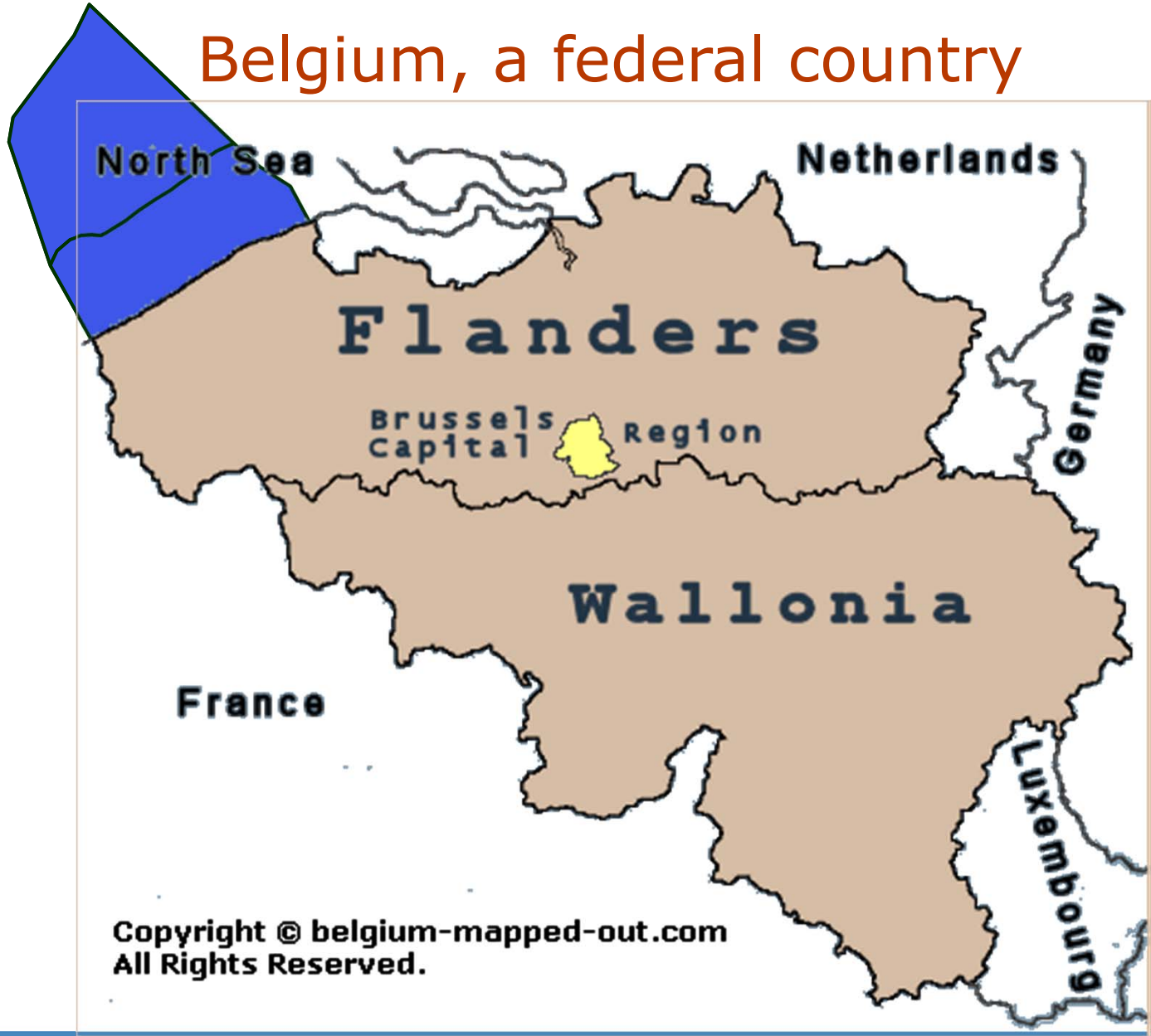


Total practical capacity of Belgium

Storage cost
(€/ton_{CO2})



Belgium, a federal country



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CCS Directive: allocation of powers in Belgium

- CCS powers (= 'environment') dispersed over federal authority + 3 regions
- *CO₂ capture* (art 31.2, 33, 37): regions/federal authorities
- *CO₂ transport* (art 21, 22, 24, 31.1, 35):
 - onshore: regions
 - offshore: federal authorities
- *CO₂ storage* (bulk):
 - onshore: regions
 - offshore: federal authorities



Conclusion: CCS Directive needs to be transposed 4 times

What needs to be demonstrated

Directive 2009/31/EC

- Article 1, paragraph 2: *The purpose of environmentally safe geological storage of CO₂ is permanent containment of CO₂ in such a way as to prevent and, where this is not possible, eliminate as far as possible negative effects and any risk to the environment and human health.*
- Article 4, paragraph 4: *A geological formation shall only be selected as a storage site, if under the proposed conditions of use there is no significant risk of leakage, and if no significant environmental or health risks exist.*



What needs to be demonstrated

Directive 2009/31/EC

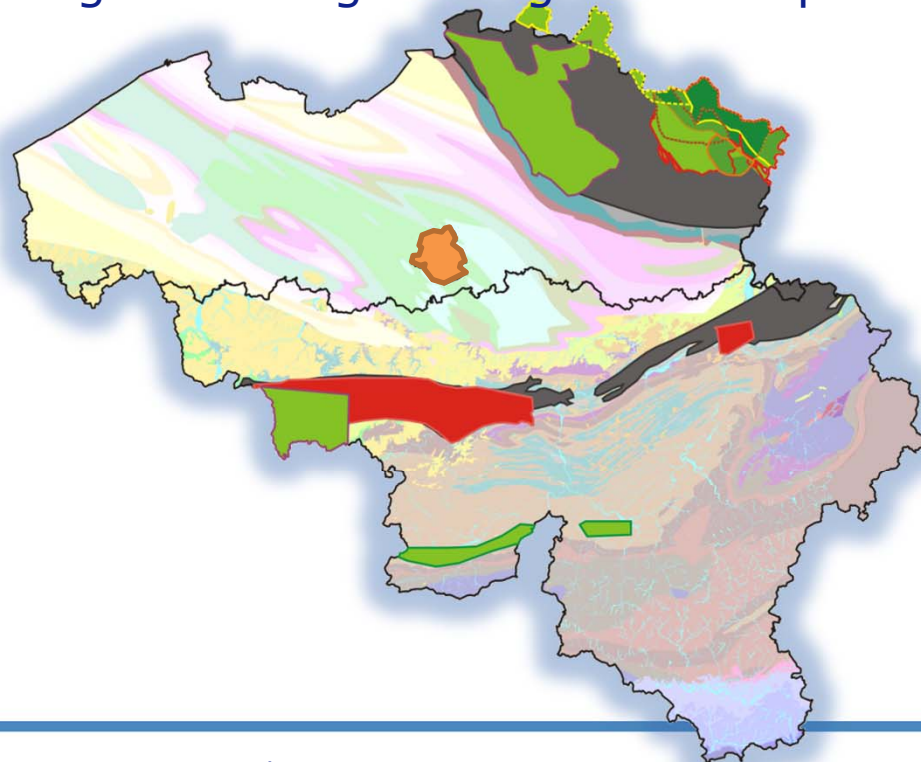
- Article 1, paragraph 2: *The purpose of environmentally safe geological storage of CO₂ is **permanent containment** of CO₂ in such a way as to prevent and, where this is not possible, eliminate as far as possible negative effects and any risk to the environment and human health.*
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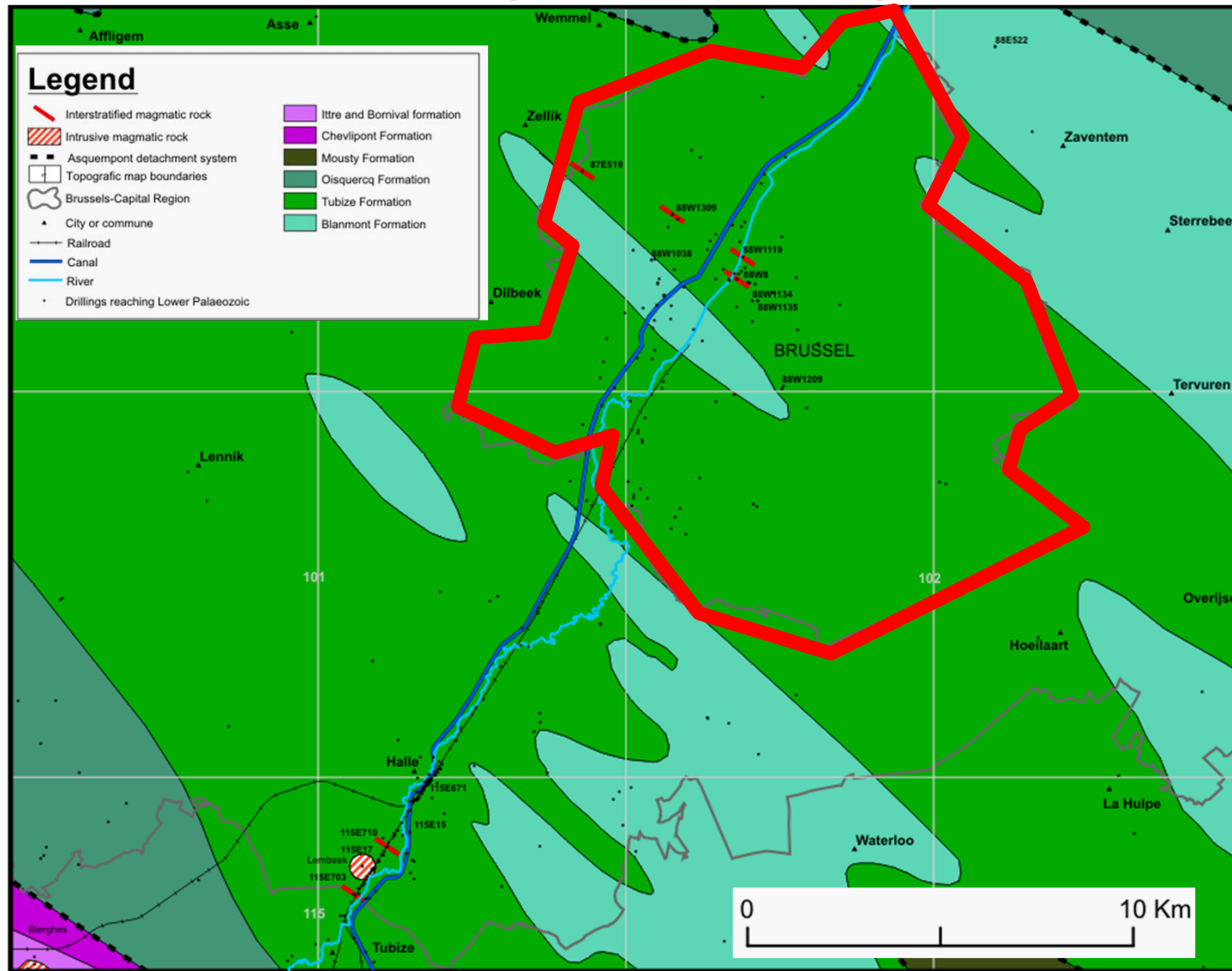
Brussels Capital Region

→ BCR:

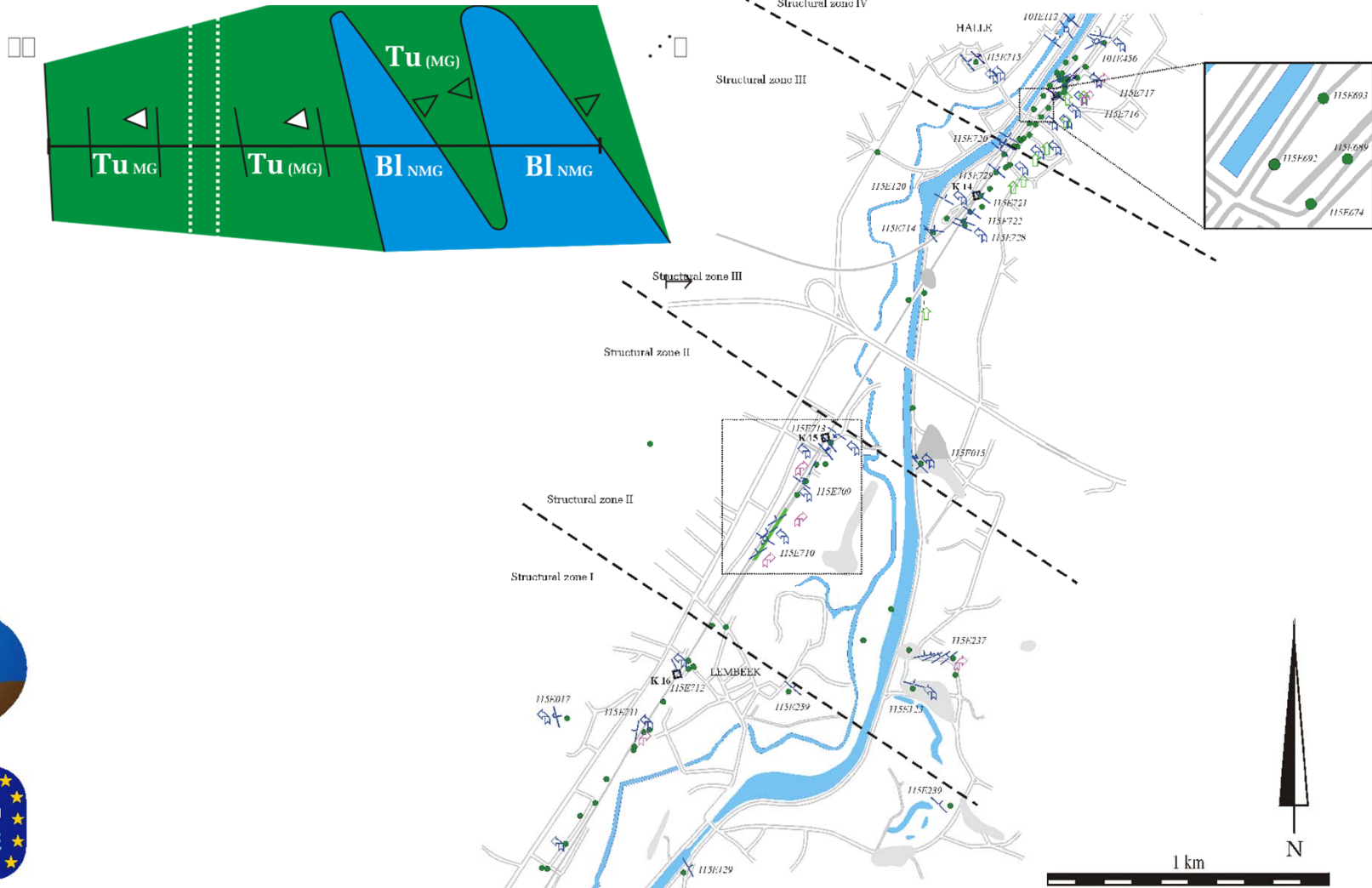
- Area: 162 km²
- Population ~1 000 000
- Geological Storage = Regional Competence



Geological Setting

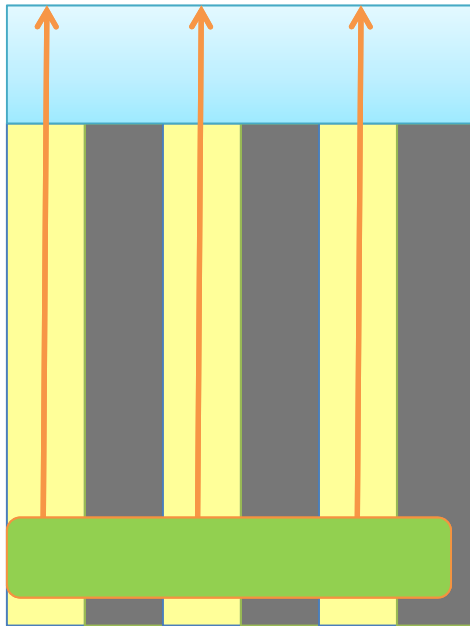


Argumentation



Argumentation

Aquifer storage option



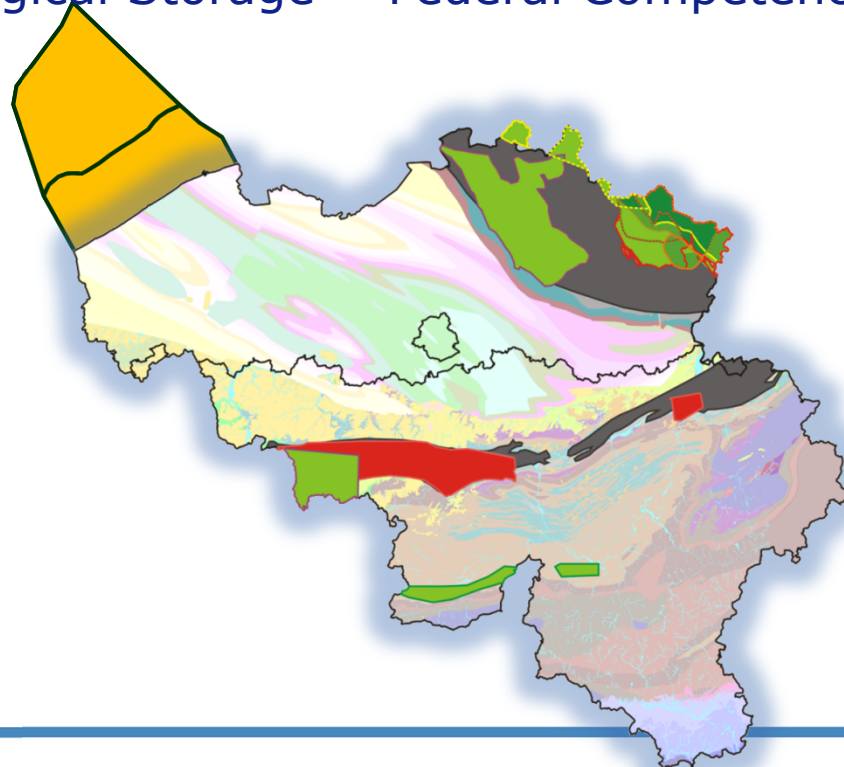
Other storage options

- No oil, no gas
- No coal
- No salt
- No storage sites for natural gas
- No mines, no caverns
- No mineralisation potential

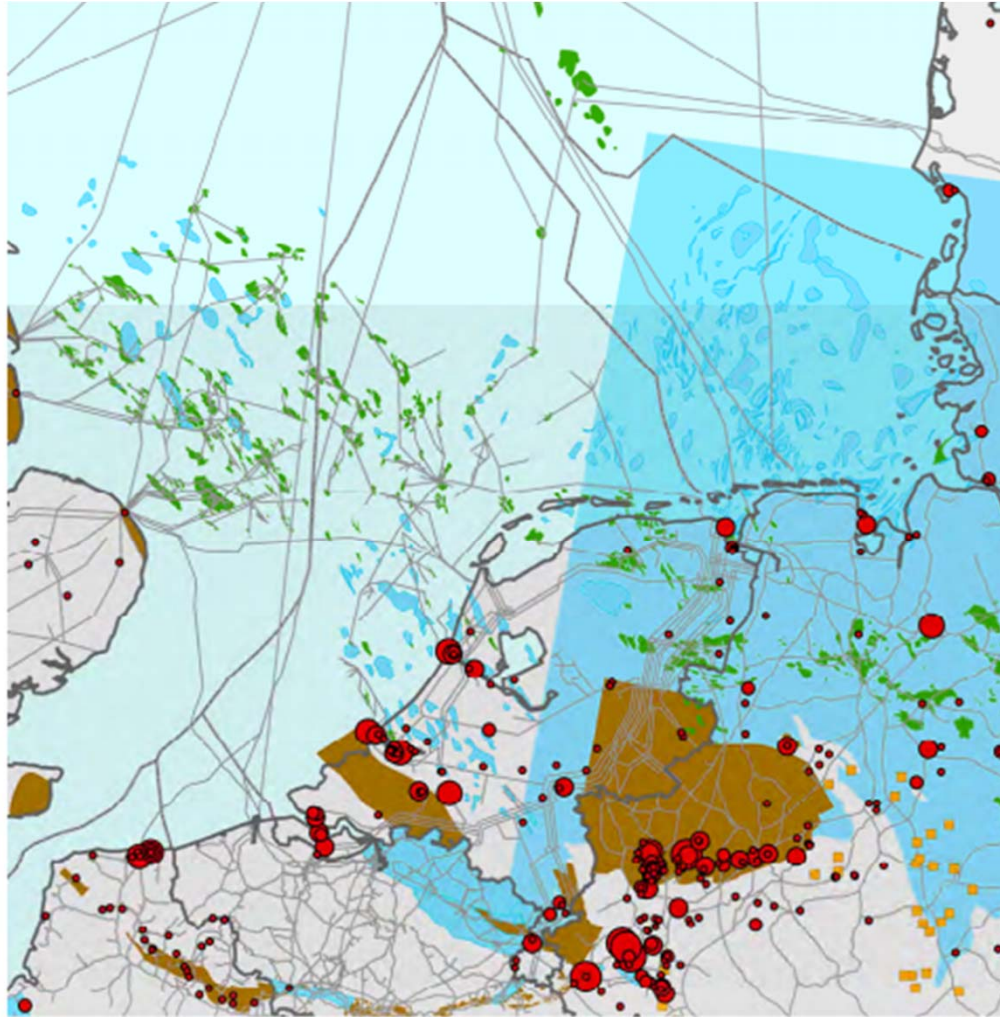


Belgian part of the North Sea

- North Sea territory:
 - Territorial Sea and Continental Shelf (or EEZ)
 - Area: 3454 km²
 - Geological Storage = Federal Competence



GeoCapacity reference



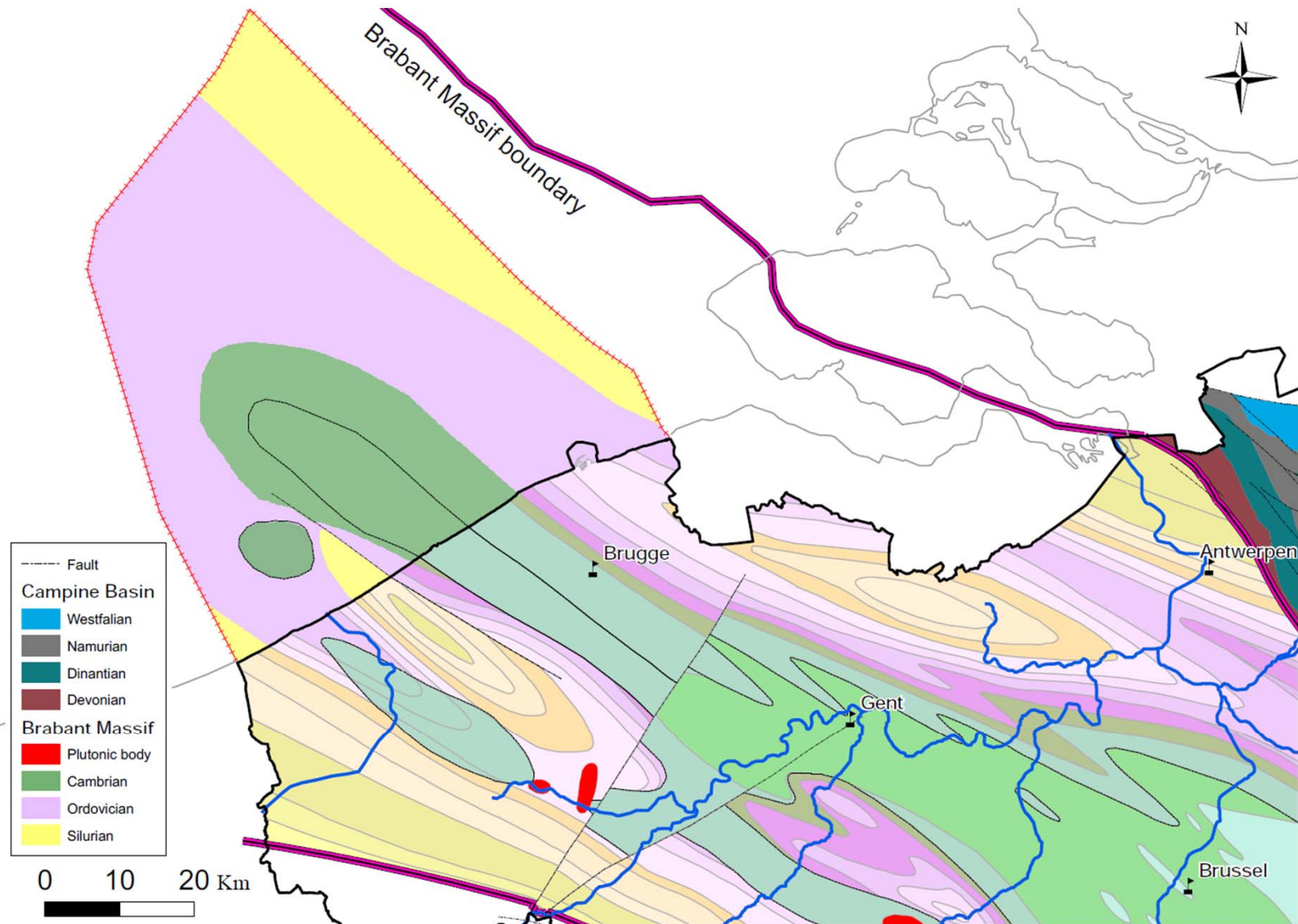
GeoCapacity maps of Sources & Sinks

<http://www.geology.cz/geocapacity>

Absence of storage capacity in reference studies is insufficient argumentation.



Geological Setting



Argumentation

- No oil, no gas
- No coal
- No salt
- No storage sites for natural gas
- No mines, no caverns
- No mineralisation potential

- Aquifers are only feasible storage scenario



Argumentation for Aquifers

**Preliminary
Results !**

- Conclusion: Straightforward
 - Apparent storage possibilities are absent

- Argumentation: Complex and lengthy
 - Extrapolated data
 - Larger area
 - Larger stratigraphic range
 - Range of structural and metamorphic setting



EU Feedback?

→ How will the EU (Commission) respond to these documents?

→ case law of the European Court of Justice



Case law of the European Court of Justice (1)

→ When is a Member State released from its obligation to transpose a Directive?

→ 1) **nonexistence of an activity in a MS?**

- C-339/87 [1990, Netherlands]: 'no such hunting means'
- C-214/98 [2000, Greece]: 'no slaughter of such animals'
- C-372/00 [2001, Ireland]: 'no high-speed rail system'
- C-441/00 [2002, UK]: 'no high-speed rail system in N-I'
- C-343/08 [2010, Czech Rep.]: 'no such pension systems'

→ CoJ: "The fact that an activity does not (yet) exist in a MS *cannot release* that MS from its obligation to transpose the Directive"



Case law of the European Court of Justice (2)

→ 2) geographical / geological reasons?

Case: C-420/85 [1987, Italy]

- 'absence of a network of (transboundary) inland waterways linking Italy to other MS'

→ CoJ: "Only where transposition is pointless for reasons of geography, transposition is not mandatory"

= The sole exception to the obligation to transpose



Outlooks

- If accepted,
then *only the provisions not directly related to storage*
need to be transposed for the Brussels Capital Region
and the North Sea
- If rejected,
then *the whole Directive* needs to be transposed



Conclusion

- Directive needs to be transposed, unless
 - Argumentation watertight
 - Feasible for small territories, with uniform/straightforward/well documented geology
 - Lack of information ≠ lack of opportunities

- Do not try to avoid transposition when:
 - Oil & gas reserves / production
 - Coal reserves / production
 - Natural gas storage sites
 - Or other (theoretical) capacity exist

- Do not use it to buy time
 - Do not abuse geology

