

ΟΙ ΥΔΡΟΓΟΝΑΝΘΡΑΚΕΣ ΣΤΟΝ ΑΙΩΝΑ ΤΗΣ ΕΝΕΡΓΕΙΑΚΗΣ ΜΕΤΑΒΑΣΗΣ

The Hydrocarbons in the Energy Transition Era

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Presentation Structure



Energy Transition, Hydrocarbons, EU goal and Greece

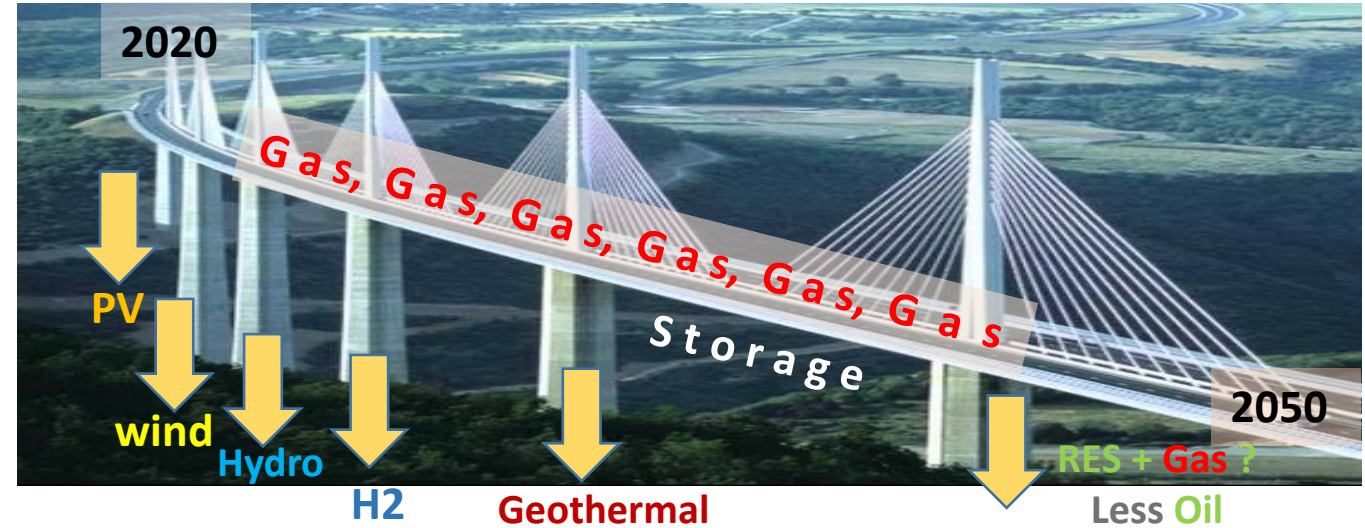

- Nature procedures prove that every transition has to be gradual and smooth, otherwise complicate than solve problems and situations. Sudden jumps (shifts) may be hazardous!
- The wheel is already there. We do not need to re-discover it as a country!
- What have all other European countries done? (Norway, UK, Netherlands, Spain, Italy, France...)
- Since we strongly depend on energy imports, Greece should take care of its own potential reserves
- Among the resources for energy production, hydrocarbons have not been investigated at all.
- A viable (sustainable) transition should go through an energy mix differentiation:



Our legacy



RES pillar

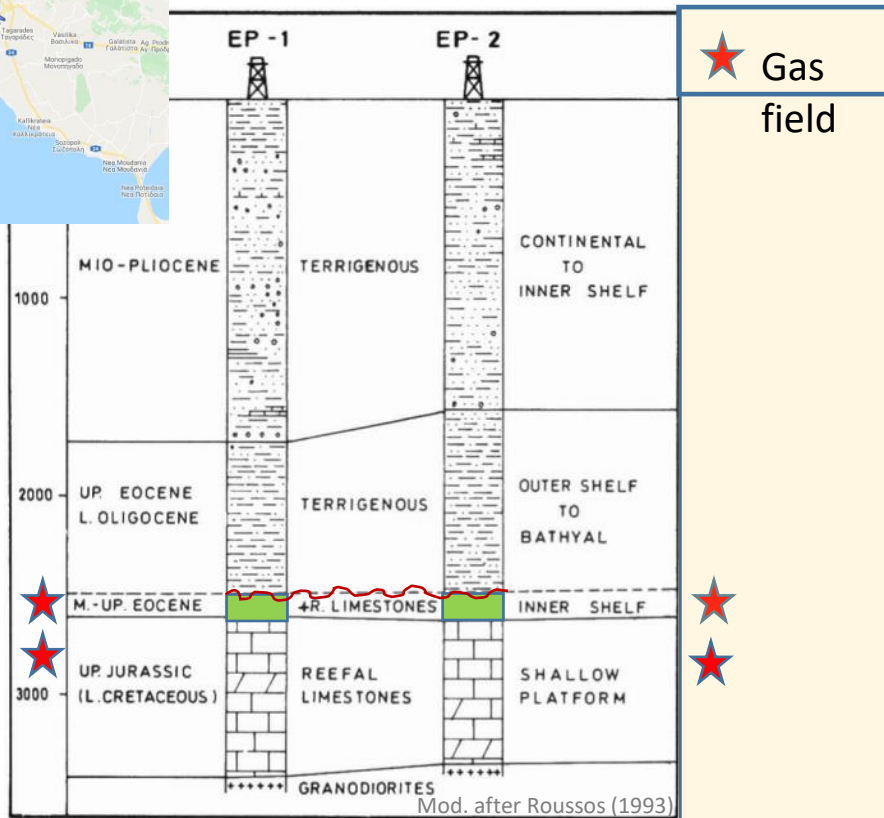
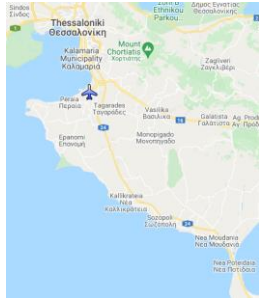


The future situation is a bridge with many pedestals, where each one will introduce a new form of RES, to the final desirable energy mix.

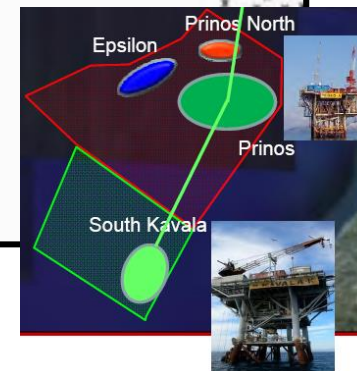
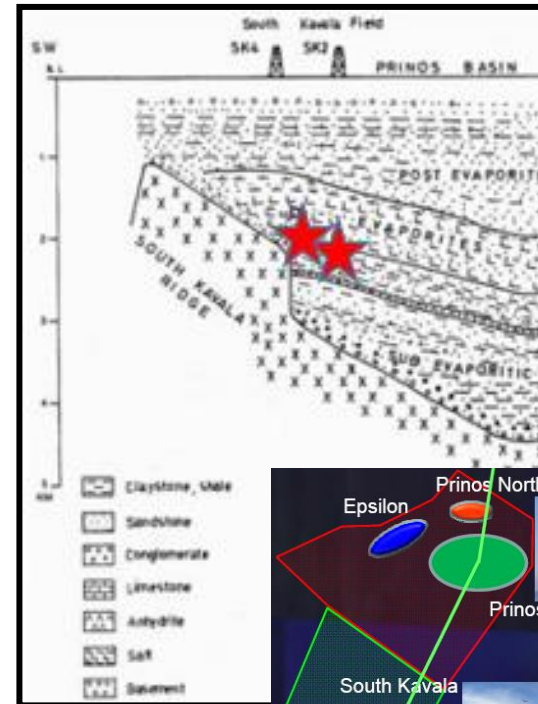
Although in the future (beyond 2050) we want an energy mix of 100% zero carbon, it is certain that **Gas** will be present in significant percentages as well.

Greece's Proven Gas Field-Cases

Epanomi



S. Kavala



The existing Gas fields, additional biogenic accumulations and geological indications for prospective sources combined with the (producing) analogues (Albania, Cyprus, Egypt, Turkey), *suggest that*

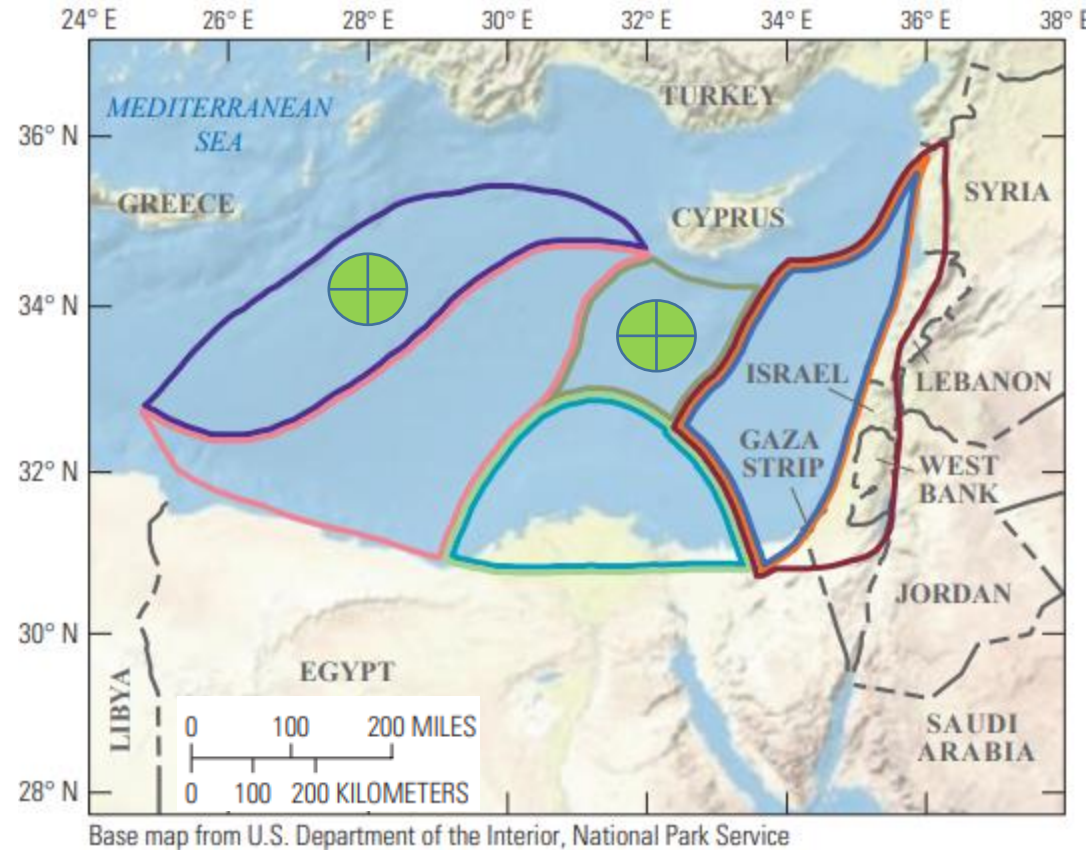
Greece has the potential and should be (further) explored for Gas.

East-Med: USGS Assessment 2021



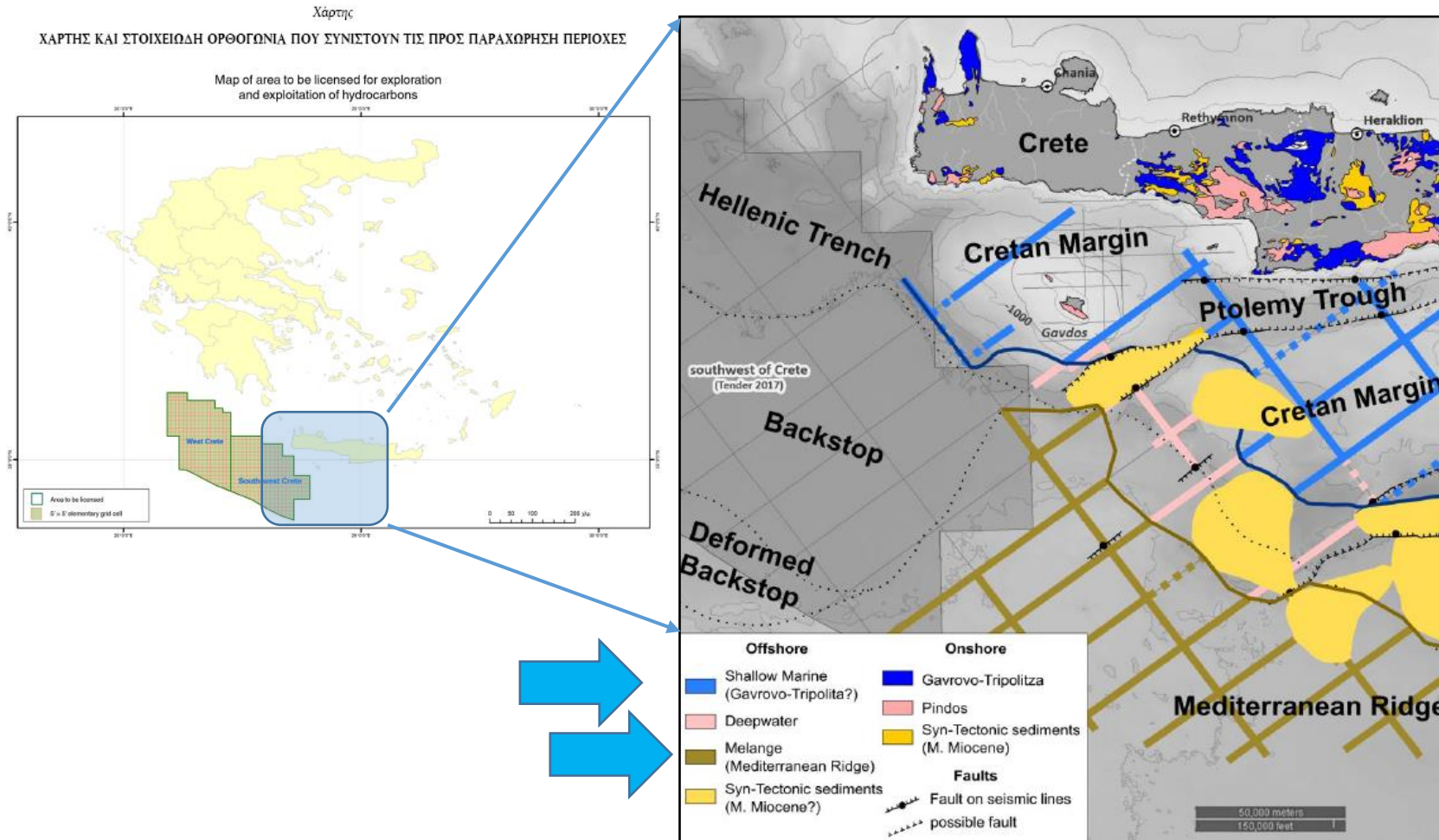
Assessment of Undiscovered Conventional oil and Gas resources (July, 2021)

Map showing location of eight
 conventional **Assessment Units**
(AUs) in the eastern
 Mediterranean area.
 Adjacent lines indicate a shared
 boundary at the outermost
 line.



| EXPLANATION | |
|---------------------------------------|---|
| — | Levantine Basin Mesozoic Reservoirs AU |
| — | Levantine Basin Sub-Salt Cenozoic Reservoirs AU |
| — | Levantine Basin Post-Salt Cenozoic Reservoirs AU |
| — | Eratosthenes Platform Reservoirs AU |
| — | Nile Delta Basin Mesozoic–Paleogene Reservoirs AU |
| — | Nile Delta Basin Neogene Reservoirs AU |
| — | Herodotus Basin Reservoirs AU |
| — | Mediterranean Ridge Reservoirs AU |

East-Med: HHRM Assessment 2019



At
southwest and west of Crete,
the combination of the

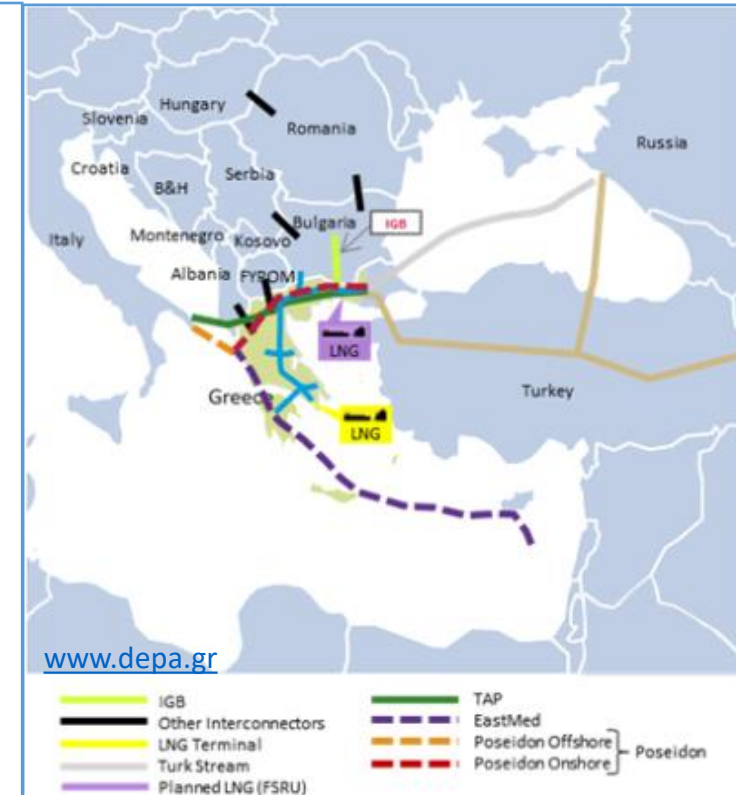
1. Mediterranean Ridge and
2. Shallow-water (platform) carbonates & reefs

create a unique opportunity
for potential gas resources
exploration of Zohr type
reservoirs!

GREECE: The real picture for Gas

A series of facts delivered by the EU strategy plan, including Greece, dictate the long-term prediction (decades) for the use of Natural Gas (N.G.)

- 1. New Investments of Ship-owners in LNG carriers**
- 2. Development of existed and future LNG Stations**
 - 1. Increase the Capacity of Revythoussa (Isl.)*
 - 2. FSRU Alexandroupolis (Port)*
 - 3. FSRU Volos (Port) + CNG*
 - 4. Corinth LNG Station*
- 3. Pipeline Construction**
 - 1. TAP + interconnections*
 - 2. IGB + Gas Distribution Network Expansion*
 - 3. Poseidon*
- 4. South Kavala Underground N.G. Storage**
- 5. EU – looking for new Geo-Storage locations**
- 6. Geostrategic-geopolitic status**



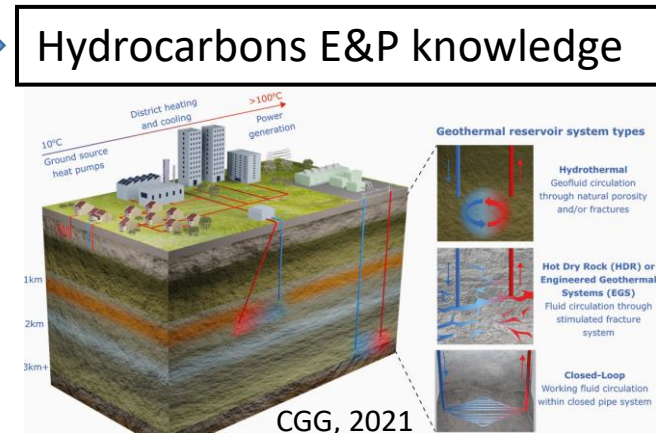
Energy Transition, Hydrocarbons Utilization (1)

Main Types of renewable energy production (infrastructures)

- PVs
- Hydros
- Wind farms
 - Onshore
 - **Offshore**
- Geothermal
 - Shallow
 - Deep**

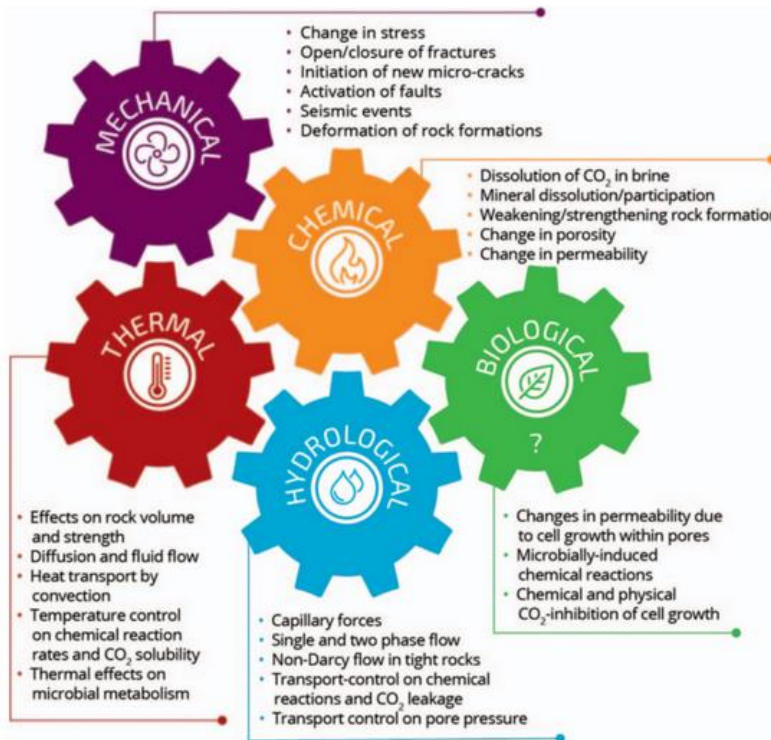


Marine Geotechnics
Seismic
Risk analysis
Subsea sliding
Old mass movements (strat.)
Shallow Methane pockets
Active faults
Cables route (submarine) geology

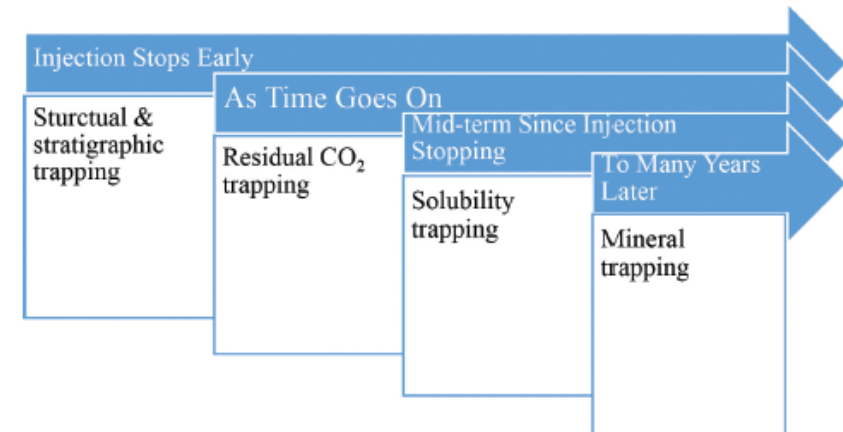
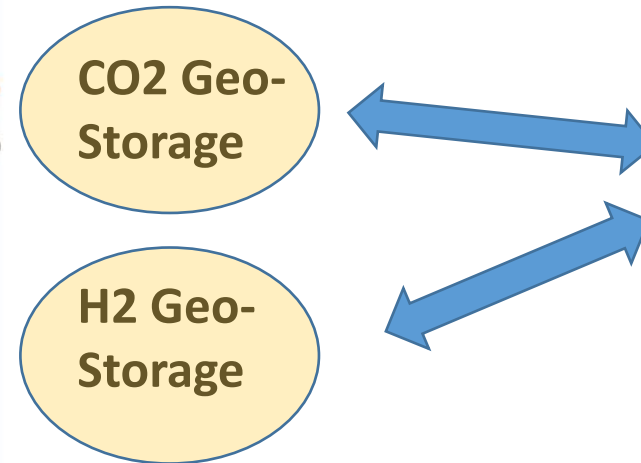


Reservoir simulation
Fluids flow interaction
Alterations / Temperatures
Pressures
Rock types
Well data

Energy Transition, Hydrocarbons Utilization (2)



Coupled processes at different spatial scales (Newell & Ilgen, 2019)



Moghanloo et al. (2017)

Summary

- **CO2 anthropogenic emissions** shift sharply the natural global warming (interglacial period) trend.
- The energy sector **transformation** has begun, but the transitional period to a carbon free Era will be gradual and will last for decades. **More Gas & RES** and less oil will constitute the energy mix proportion.
- Thereafter, the bet is how **to reduce emissions**, and all possible means should be in place for the challenge of controlling and mitigating the greenhouse effect.
- In this context, prioritization of **Gas exploration** and **CO2 Capture and Geo-Storage** is growing.
- **Geoscientists** with experience in hydrocarbons possess vast transferable skills and will constitute the basis to build a viable future.
- The **Institute of Petroleum Research** [Foundation of Research and Technology (IPR-FORTH)], can provide its services and technical experience for E&P, RES infrastructures and an innovative sustainable development.

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Σας ευχαριστώ για την προσοχή σας!



Thank you for your attention!

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