



The Energy Transition – EFG perspective

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Institute of Geologists of Ireland – 20th
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European Federation of Geologists at a glance



- The voice of the European geoscientists.
- 27 NAs representing 27 countries as members & >45K ind.mmbrs.
- Main aims are to:
 - contribute to a safer and more sustainable use of the natural environment;
 - protect and inform the public and
 - promote a more responsible exploitation of natural resources.
- Guidelines to achieve aims are **promotion of excellence in application of geology & creation of public awareness of the importance of geoscience for the society.**
- Awarding EurGeol title, recognized world-wide.





EFG Strategy 2019 - 2023



- Pan-European networking and cooperation
- International partnership



- Professional title accreditation (EurGeol, CP)
- Projects – *INFACT* (exploration, SLO), *Unexmin* (ended 09/19) & *Robominers* (robotics/exploitation), *Intermin*, *Engie* & *Proskills* (education), *Crowdthermal* & *Reflect* (hydrothermal)



- Communication & Dissemination activities (publications, e-news, e-letters, courses & WS, meetings, Mentoring programme, secondments etc.)



- 10 Panels of Experts





Challenges of the development...



WHERE THEY RIGHT?





EU Energy transition (1)



- EU accelerating the transition from brown to green economy → **energy transition**.



- In 2015, the European Commission launched the **Energy Union strategy** to:



1) Boost energy security;



2) Create a fully integrated internal energy market;

3) Improve energy efficiency;



4) Decarbonise the economy and

5) Support the research innovation and competitiveness.





EU Energy transition (2)



- The Energy Union strategy is based on the ratified Paris Agreement on climate, targeting an increase of the global temperature no higher than 1.5°C (Council, 2016, 2018).



- Member States required to draft 10-year National Energy & Climate Plans (NECPs) by the end of 2019 outlining how they will meet the new 2030 targets for renewable energy and for energy efficiency (European Commission, 2018a).

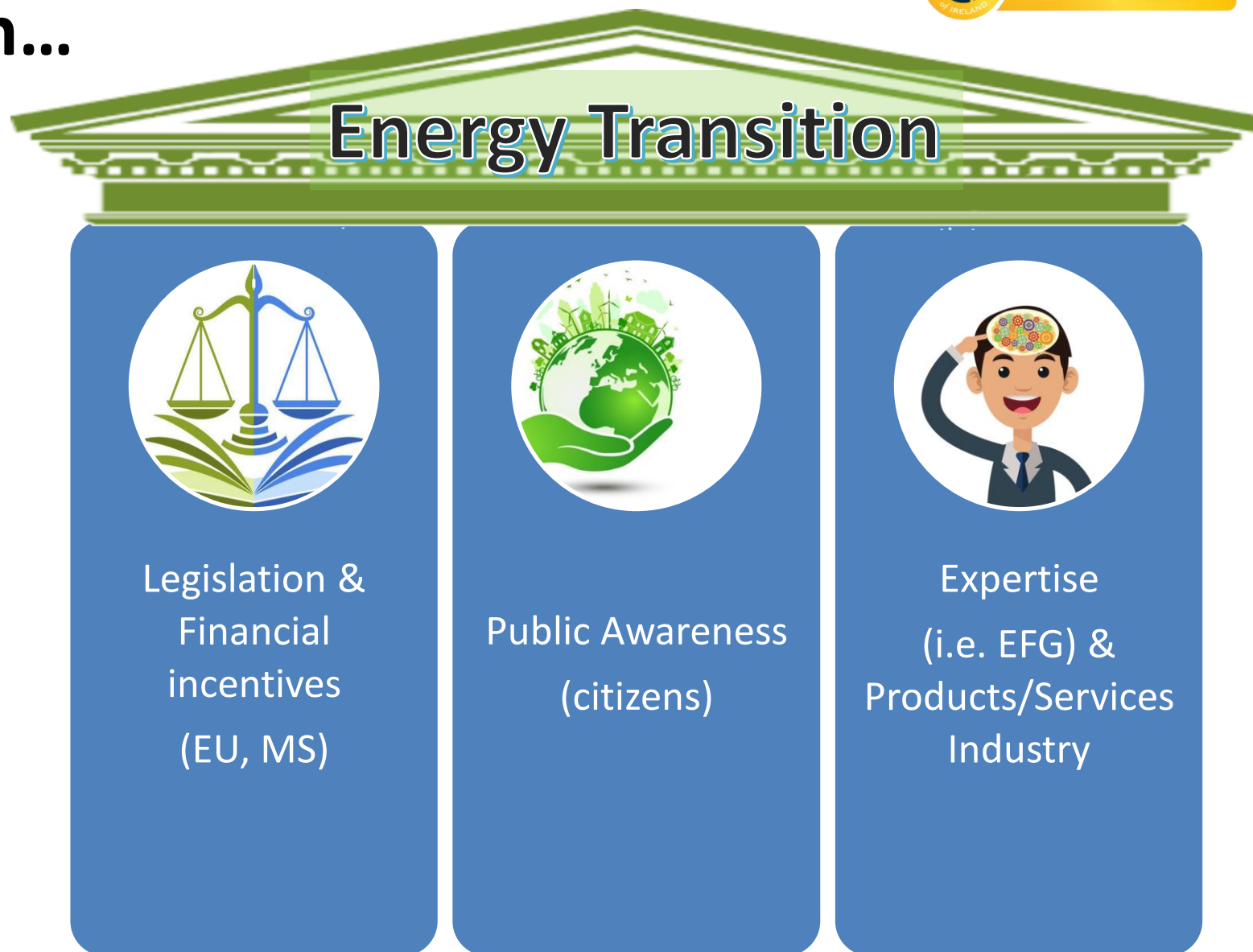




Energy Transition...



- ...is an integration of three pillars...
- ...where each pillar plays a quintessential role.





EFG's Position paper on Energy Transition (1)



- Based on the expertise that professional geologists (as individual members of EFG & members of Panels of Experts) provide, the EFG (2018, 2019) believes that part of the answer to meet the aforementioned Energy Union strategy's targets are:

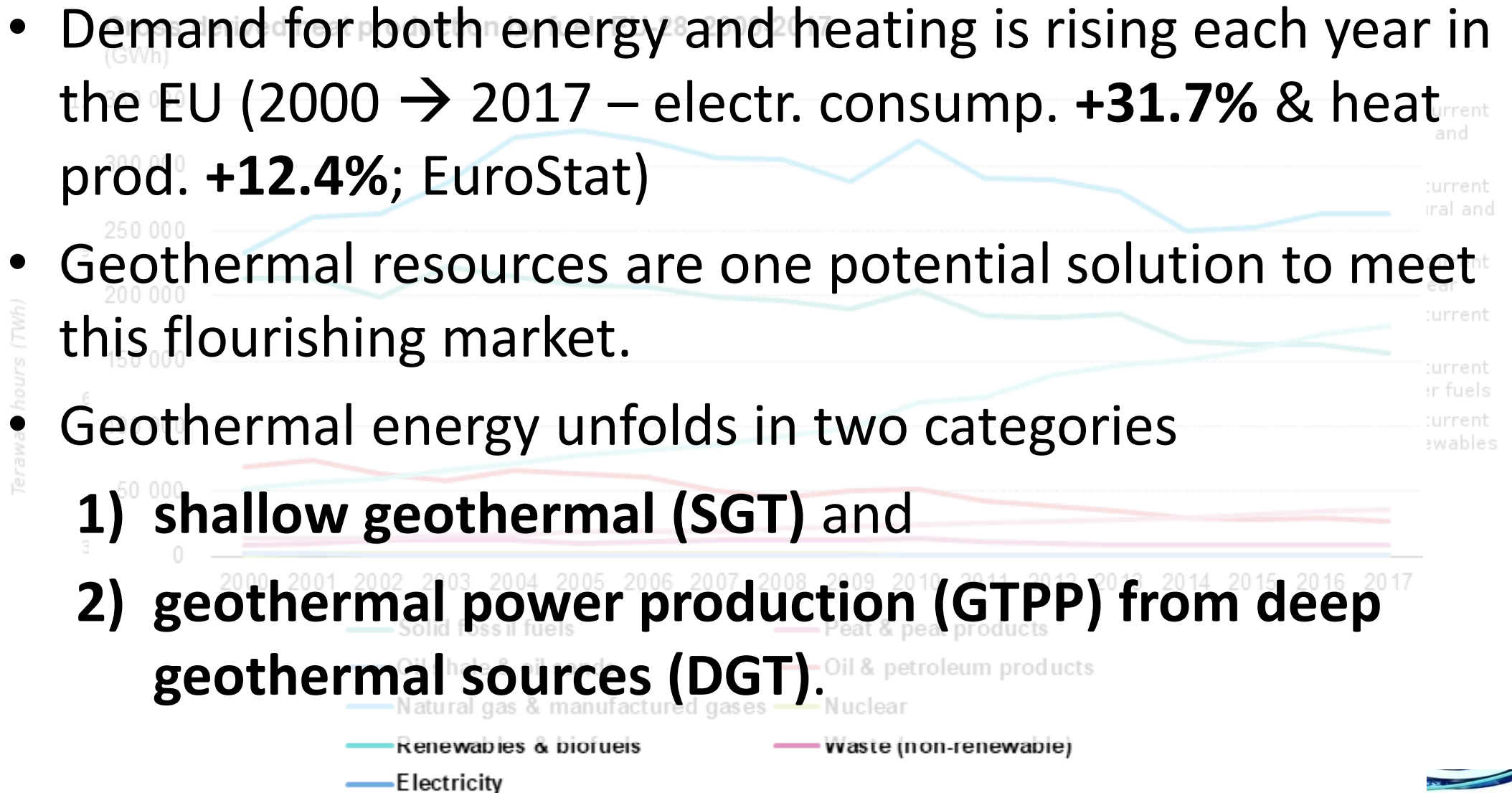
- 1) Shallow (SGT) and deep (DGT) geothermal energy;**
- 2) CO₂ capture, utilisation and sequestration (CCUS), and**
- 3) mineral extraction (including prior exploration activities).**



EFG's Position paper on Energy Transition (2)

1) Geothermal energy sources

- Demand for both energy and heating is rising each year in the EU (2000 → 2017 – electr. consump. **+31.7%** & heat prod. **+12.4%**; EuroStat)
- Geothermal resources are one potential solution to meet this flourishing market.
- Geothermal energy unfolds in two categories
 - 1) shallow geothermal (SGT) and
 - 2) geothermal power production (GTPP) from deep geothermal sources (DGT).

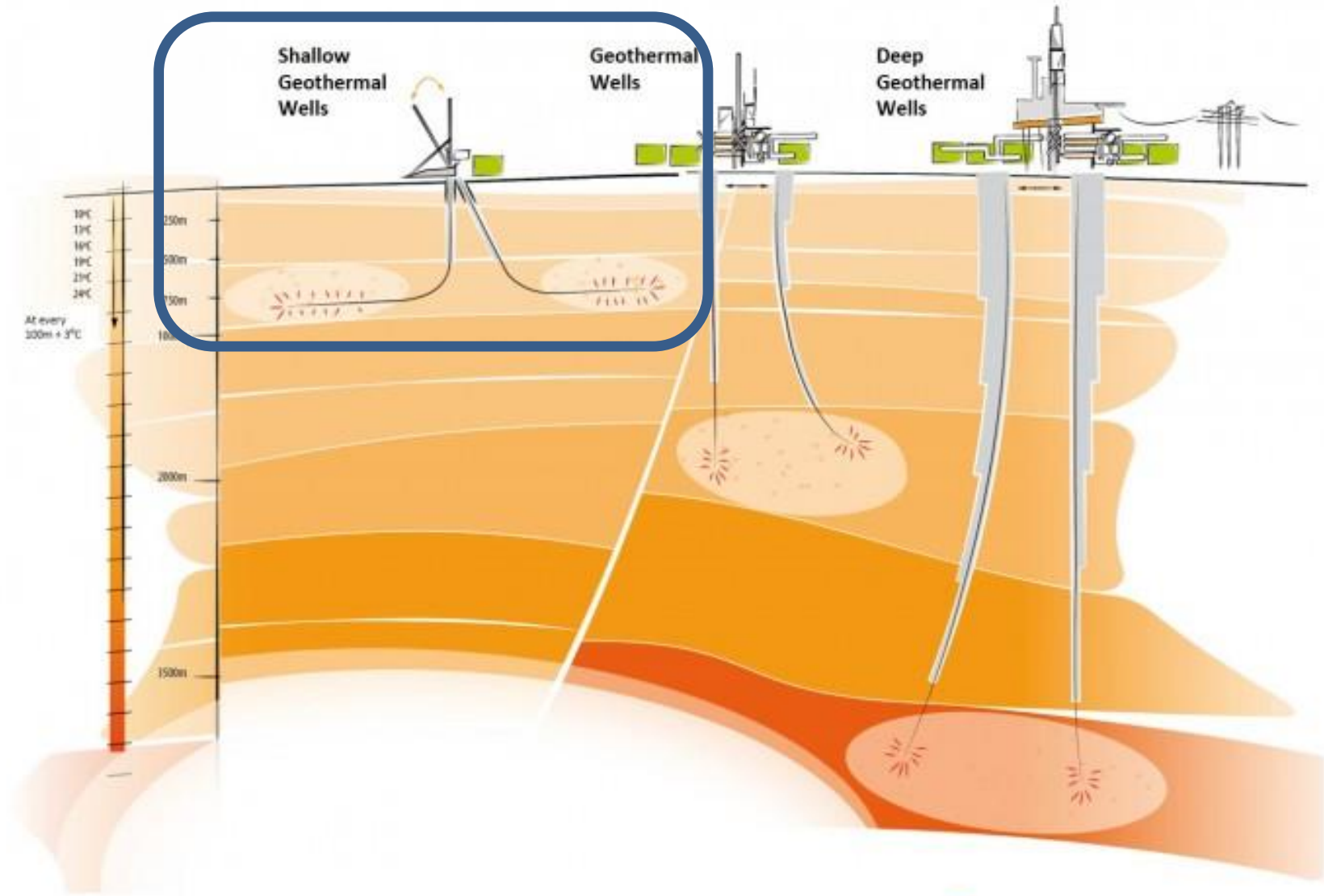




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EFG's Position paper on Energy Transition (4)

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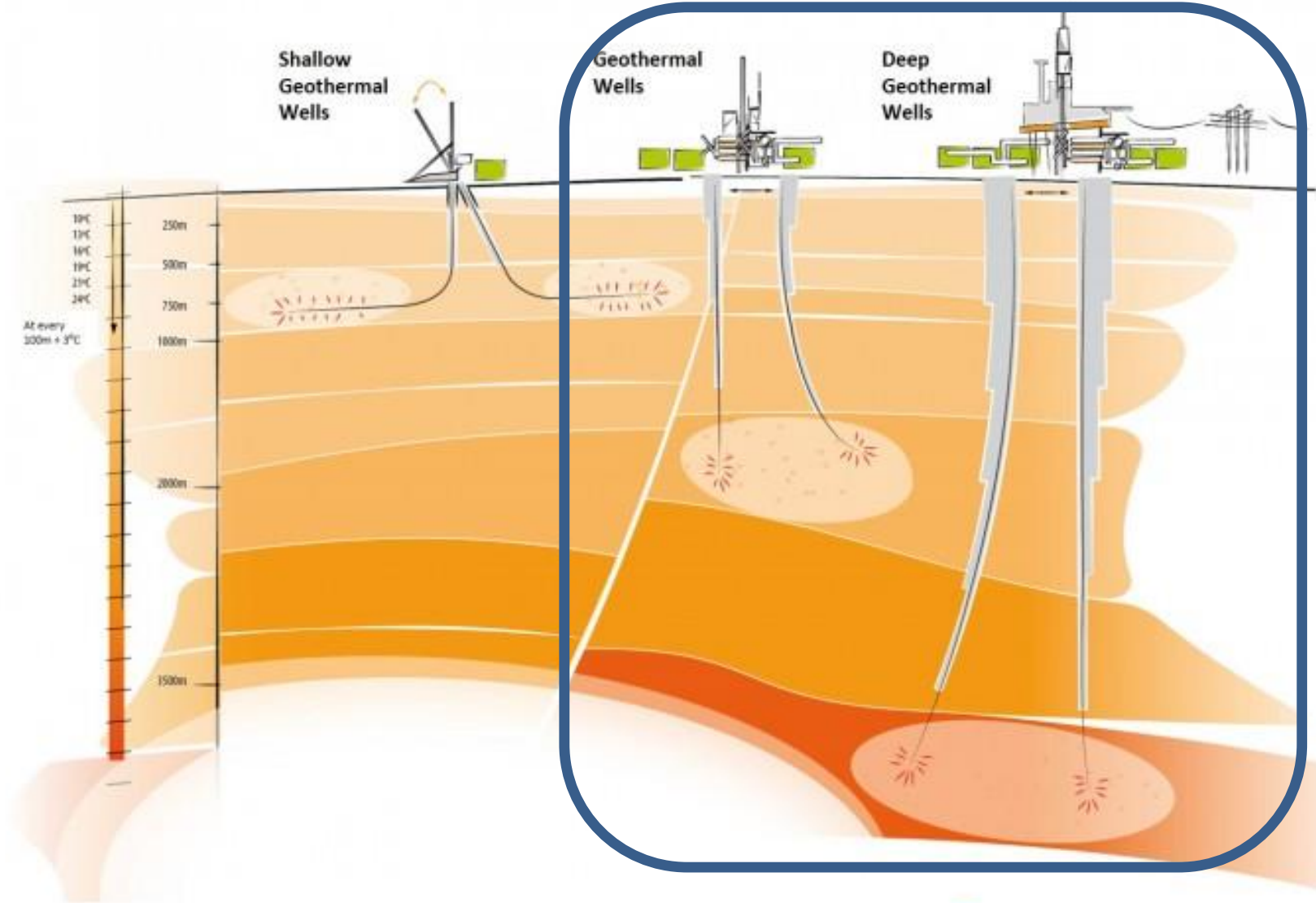
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EFG's Position paper on Energy Transition (5)



GTPP / DGT energy sources



- But...
- DGT exploitation requires a **longer exploration phase** for carrying out geological studies to identify the optimal place to drill.
- Longer phase of exploration and the long period of exploitation of deep geothermal boreholes → **mid/long-term solutions for the energy transition** (ADEME, 2017).





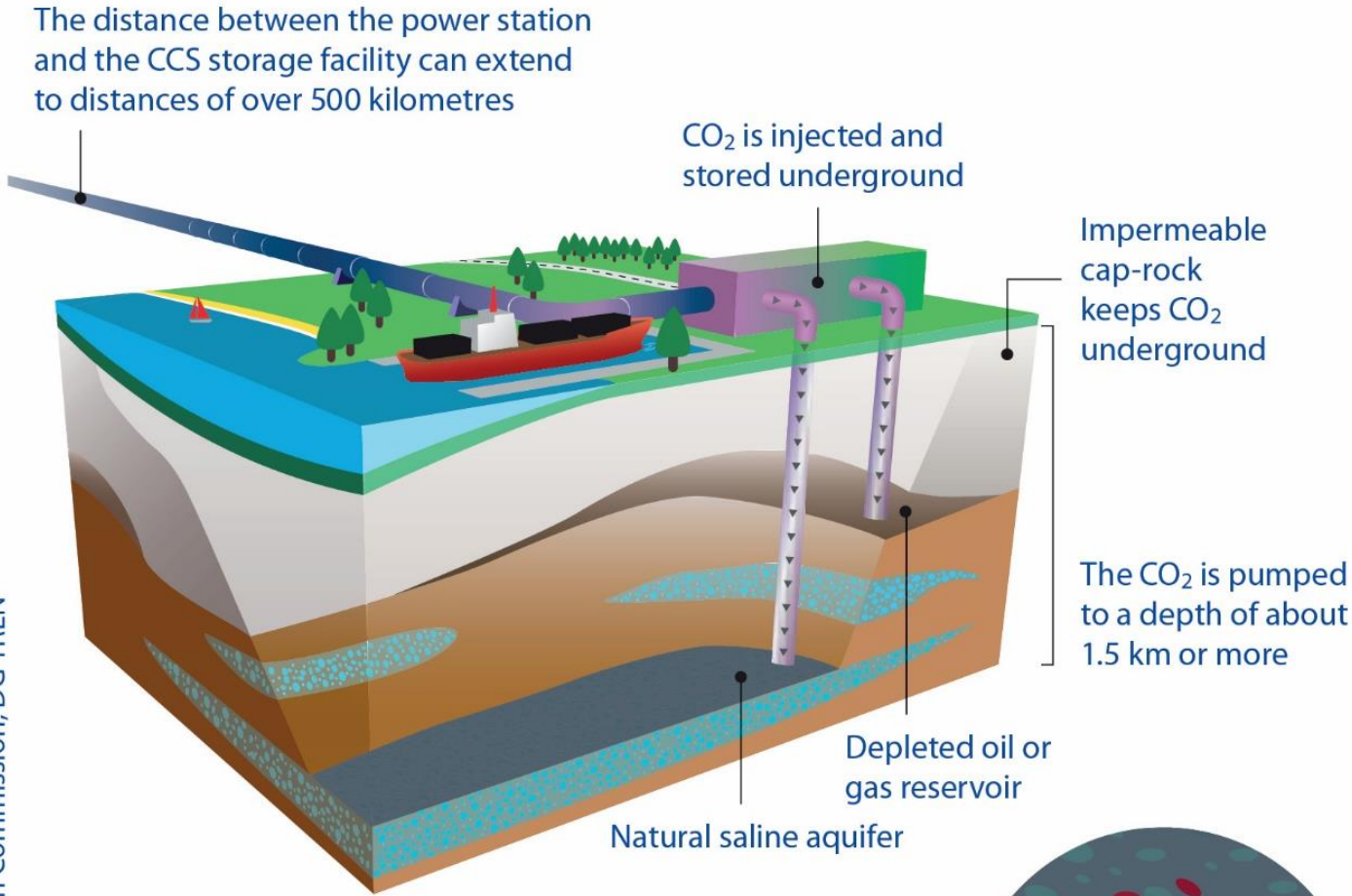
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2) CO2

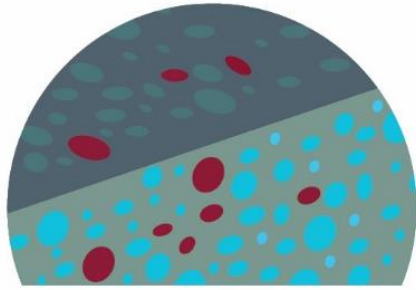
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Source: European Commission, DG TREN

Carbon Capture and Storage (CCS)



Inset right:
CO₂ becomes stabilised within the porous rock as it forms natural compounds with the surrounding brine and minerals



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at planning





EFG's Position paper on Energy Transition (7)



2) CO₂ capture, utilisation and sequestration (CCUS)



- Financial support needed for the first-of-a-kind CO₂ capture and storage projects, but examples in the USA show a sharp drop in costs for the projects after the first phase of exploration (EC, 2013).
- Increasing emission costs in the European Trading System that are more in line with active climate policy → economic outlook for widespread CCUS projects is optimistic (EU Parl., 2015).





EFG's Position paper on Energy Transition (8)



2) CO₂ capture, utilisation and sequestration (CCUS)

- Example – NL:
 - CO₂ capture and storage one of the necessary parts of the plan and as a short-term answer to fight climate change;
 - Drawback!! – geological factor – suitable geology and sufficiently explored to allow geological storage of CO₂.

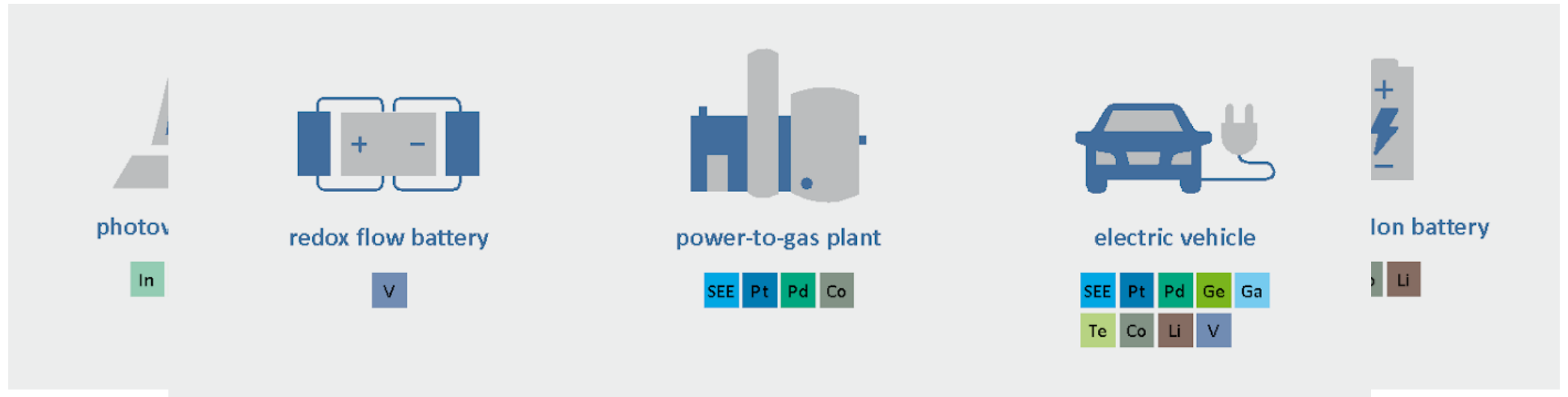




EFG's Position paper on Energy Transition (9)

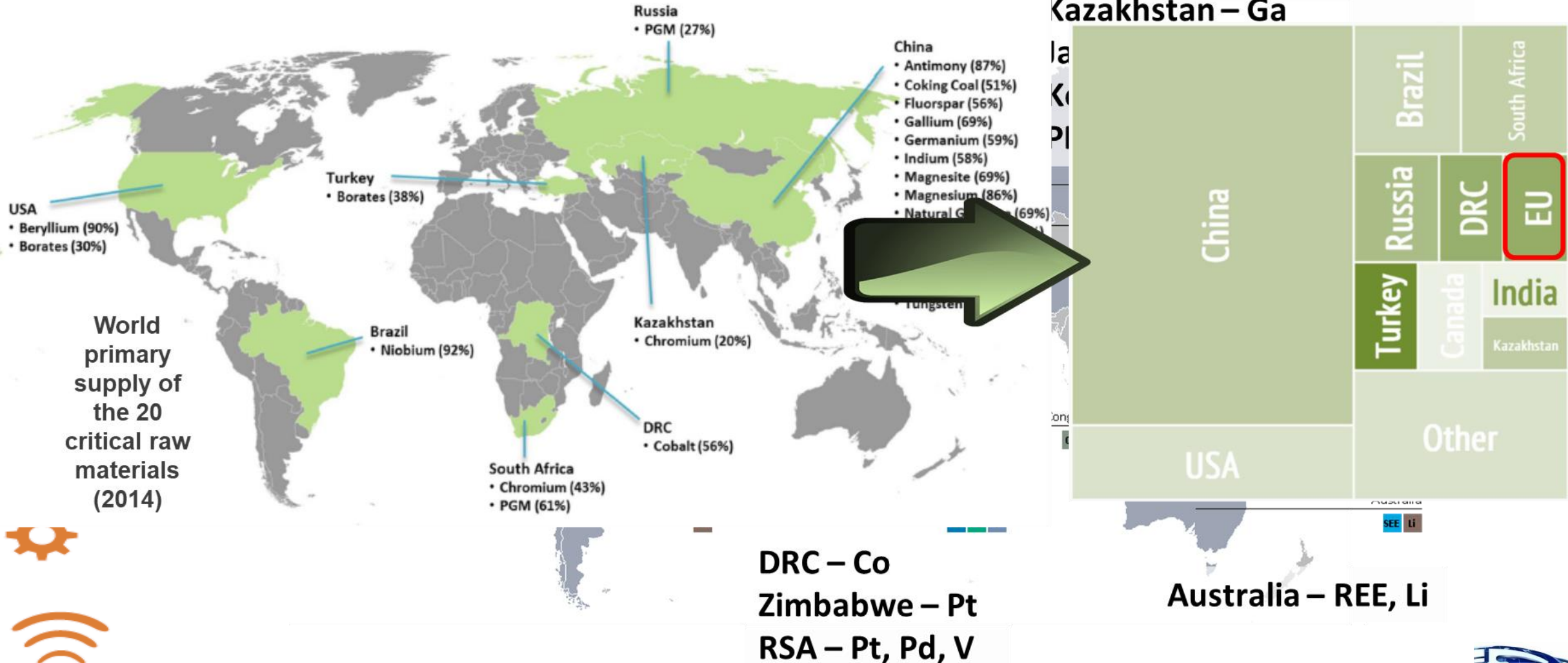
3) Mineral extraction

- Technologies that convert renewable energies (wind, solar and geothermal energy) into a useable and transferable form, i.e. electricity, require a **significant usage of minerals**.





EFG's Position paper on Energy Transition (10)



Source: <http://energiesysteme-zukunft.de>





EFG's Position paper on Energy Transition (11)



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3) Mineral extraction



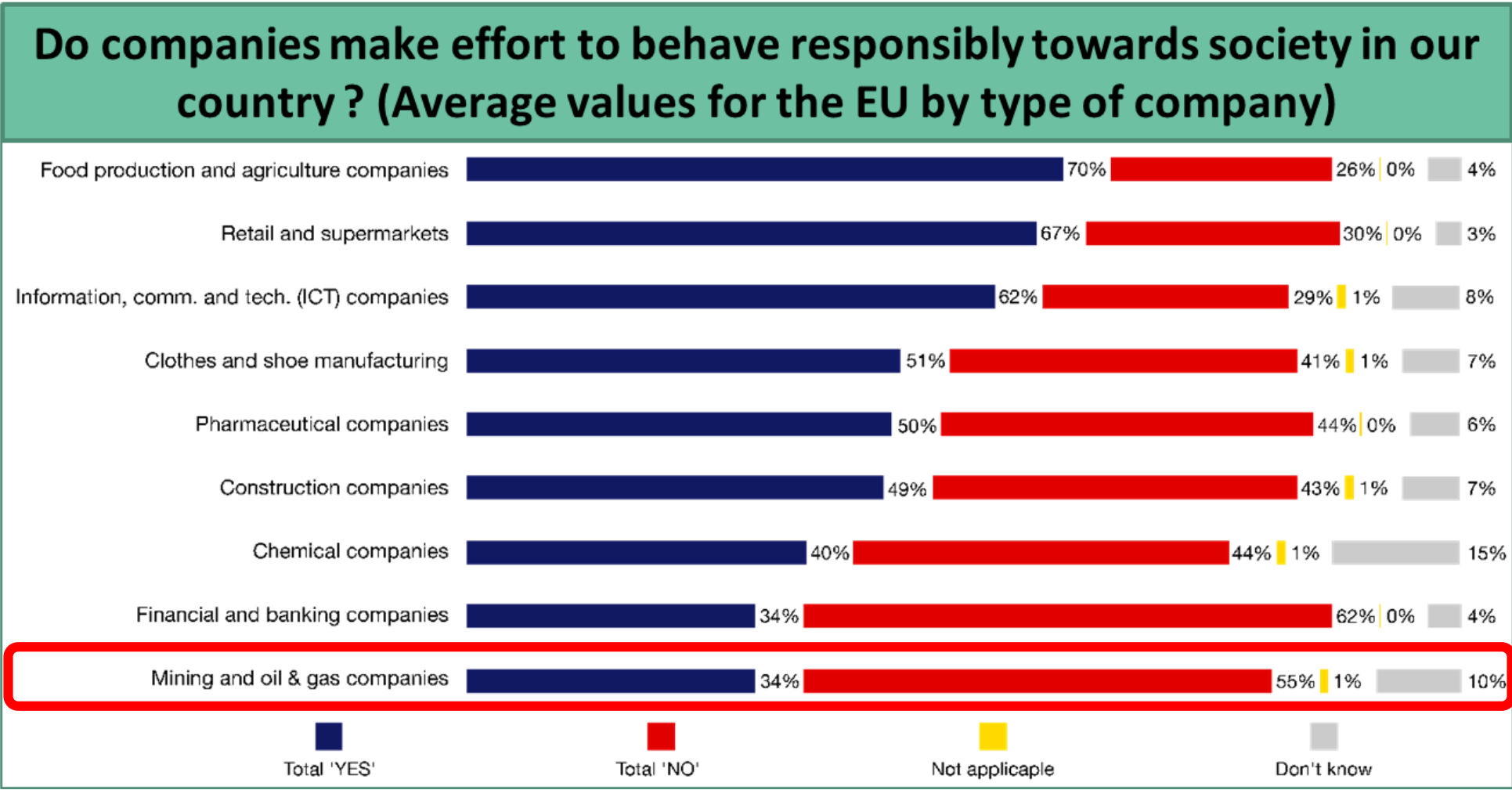
- The lack of mineral processing and refining capacity in Europe is a major constraint with political, economic, social and environmental risks.
- REE elements used in renewables sector are refined outside Europe (with lower environmental and social standards).
- In Europe, development of Li (and all other) extraction projects are hindered by social opposition and bureaucratic issues (EC 2008; Faure-Schuyer et al. 2018).





EFG's Position paper on Energy Transition (12)

Discrepancy between what EU citizens want and what they need
(Perception of Mining industry compared to other industries)





EFG's Position paper on Energy Transition (13)



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3) Mineral extraction



- For critical mineral deposits for the EU industry and key mineral deposits for meeting the goals of the energy transition →



- **Addressing the social acceptance (SLO),**



- **Educate public, and**



- **Addressing fair distribution of revenues** vertically (local, regional and EU level) and horizontally (across the value chains that benefit from the fair access to scarce/critical raw materials).





EFG's Position paper on Energy Transition (14)



3) Mineral extraction



- **EU defining & adopting RMS policy** capable of ensuring the sustainable extraction of the mineral raw materials that are necessary to meet the goals of the energy transition and the UN Paris Agreement on CC.
- **Standard EU legal framework** for land use, permitting, mining and quarrying, restoration and nature conservation.





EFG's Position paper on Energy Transition (15)



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3) Mineral extraction



- MS need advice and support on the **establishment of uniform governance procedures** that will ensure public participation and the fair distribution of revenues from minerals extraction.
- Holistic perspectives for **minimising negative environmental impacts and maximising the potential** of mineral deposits need to be supported and disseminated as best practice across Europe.





Conclusion



- Going back to the first slide... were the Pink Panther and his friend right? Is the development representing a threat to the modern society?
- YES, if we stick to the current „Brown economy“...
- NO, if we manage to successfully transit to the „Green economy“...





So, which path will we choose?



Thank U 4 your @10tion!

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