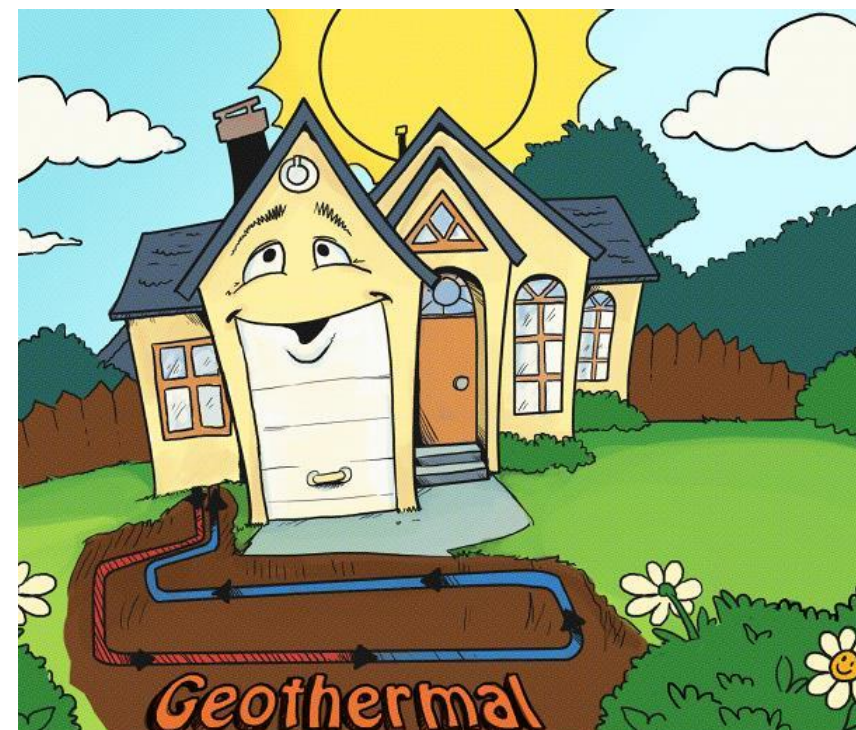


# GEOHERMAL ENERGY – THE HEAT BELOW OUR FEET

Heating and Cooling with the underground

Edith Haslinger  
Senior Scientist  
AIT Austrian Institute of Technology  
Center for Energy





WHY GEOTHERMAL IS A COOL FIELD TO WORK IN

# Everything began with... Rocks Nature





WHY GEOTHERMAL IS A COOL FIELD TO WORK IN

Everything began with...

Rocks

Nature



→ I became a Geologist and Geochemist  
and Soil Scientist! 😊



# WHY GEOTHERMAL?





# WHY GEOTHERMAL?



Foto: imago/CoverSpot (Quelle: www.handelsblatt.com)



ZDF



Reset.org



NASA Climate Change



Wiener Zeitung





# CLIMATE PROTECTION FOR THE FUTURE OF OUR PLANET



# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?



# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?



## Question time!

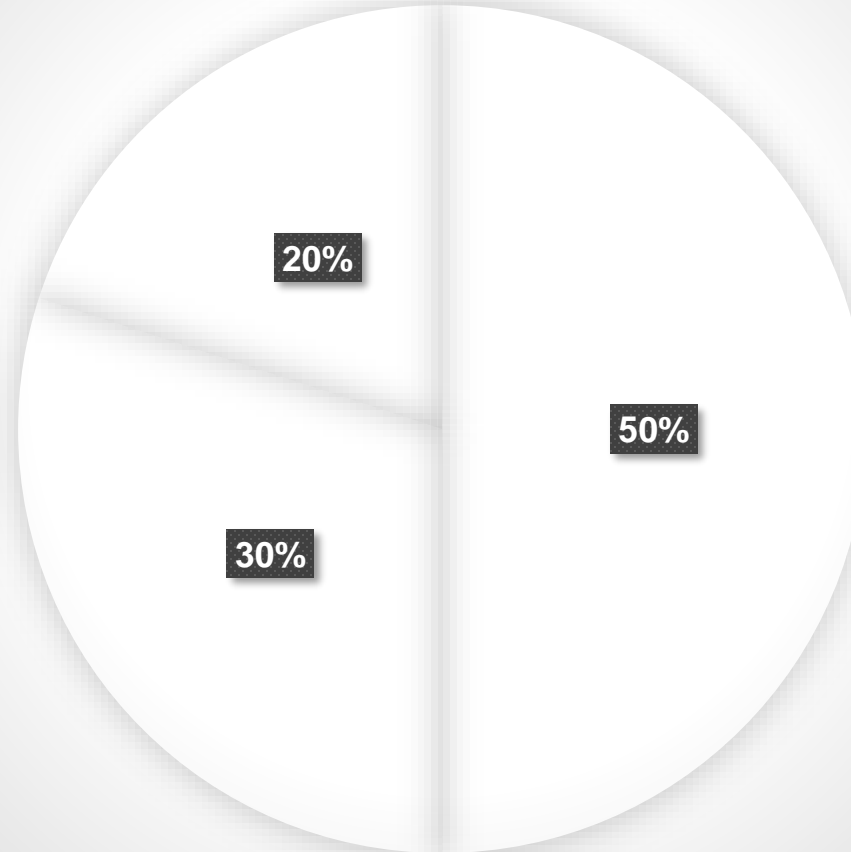
- **What kind of heating system do I have at home?**
- **How much energy does heating need in comparison to electricity and mobility?**





# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?

Final energy consumption in the EU

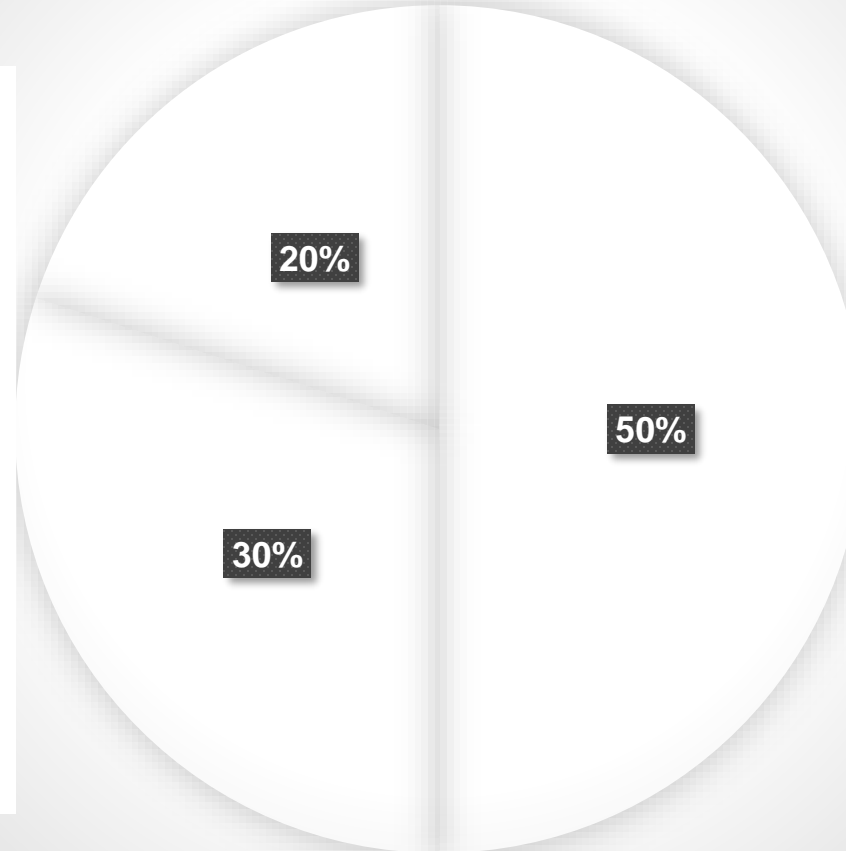


Final energy consumption is the energy consumed by end users, that means by us all!



# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?

## Final energy consumption in the EU



**Question time (again)!**

**How big are the shares of**

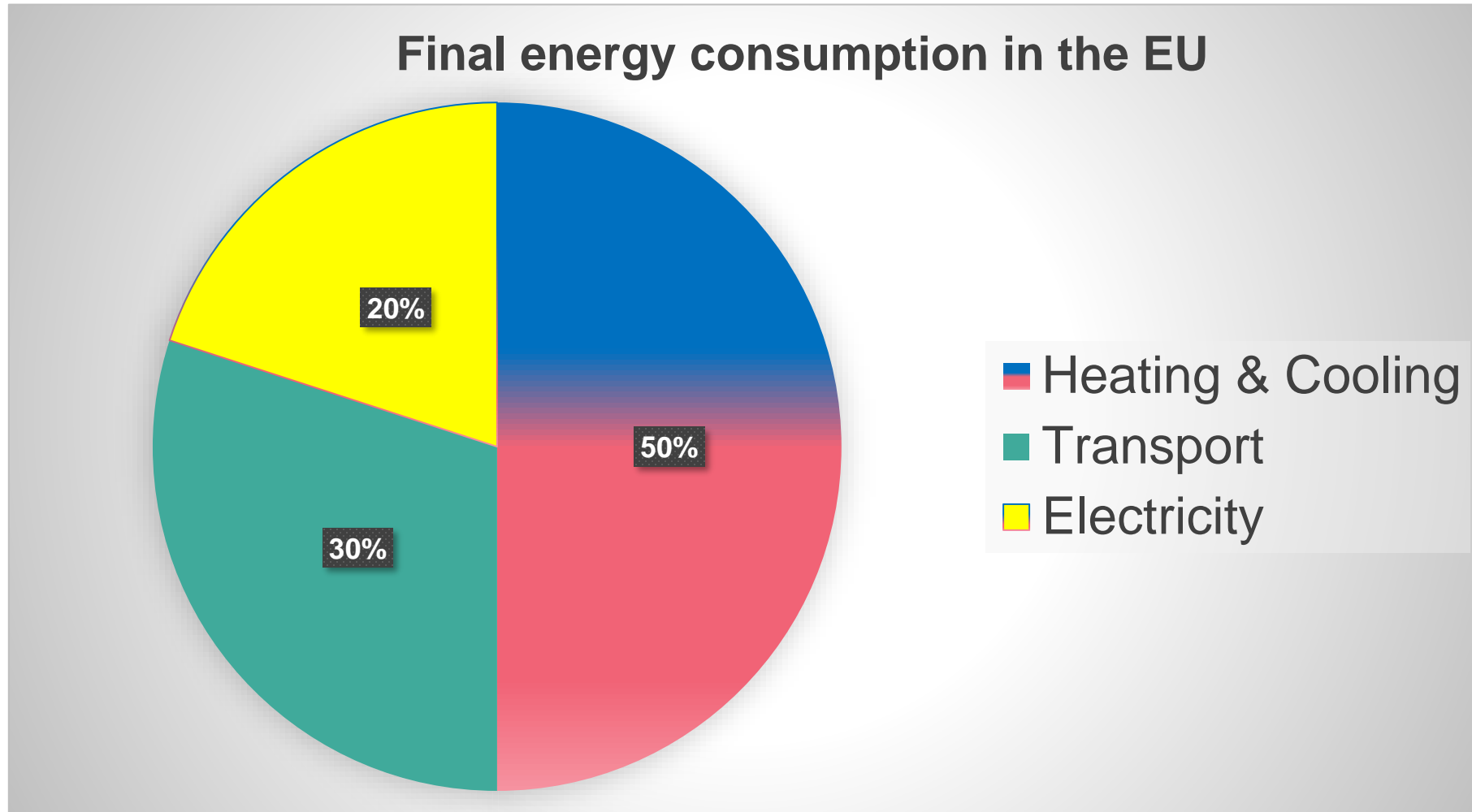
- **Heating & Cooling**
- **Electricity**
- **Transport**

**in the final energy consumption?**



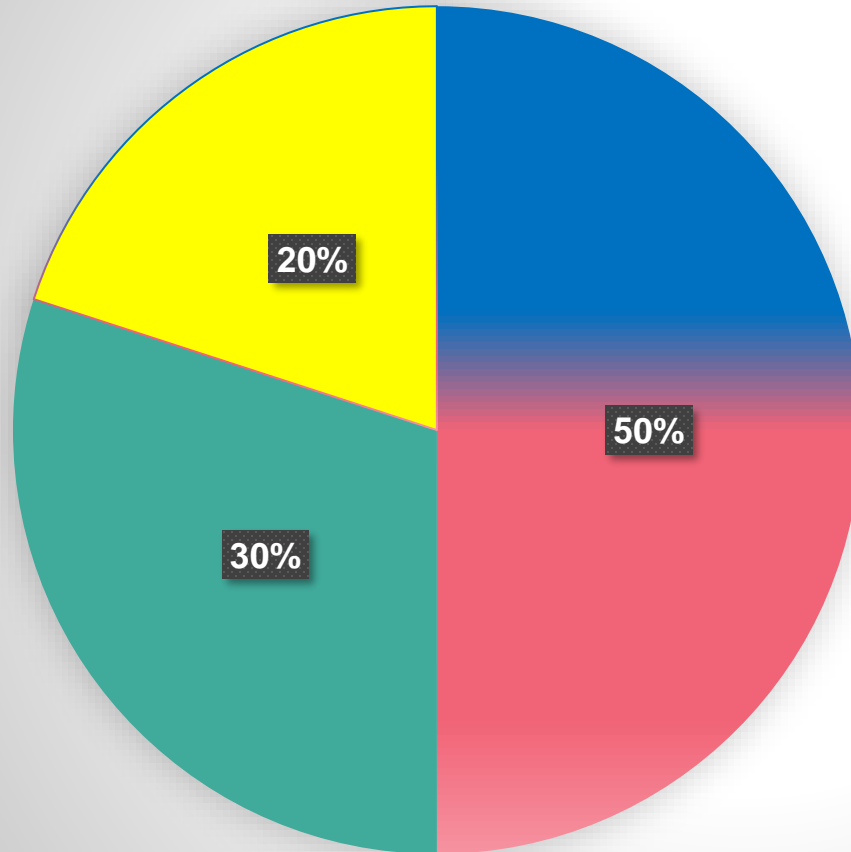


# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?



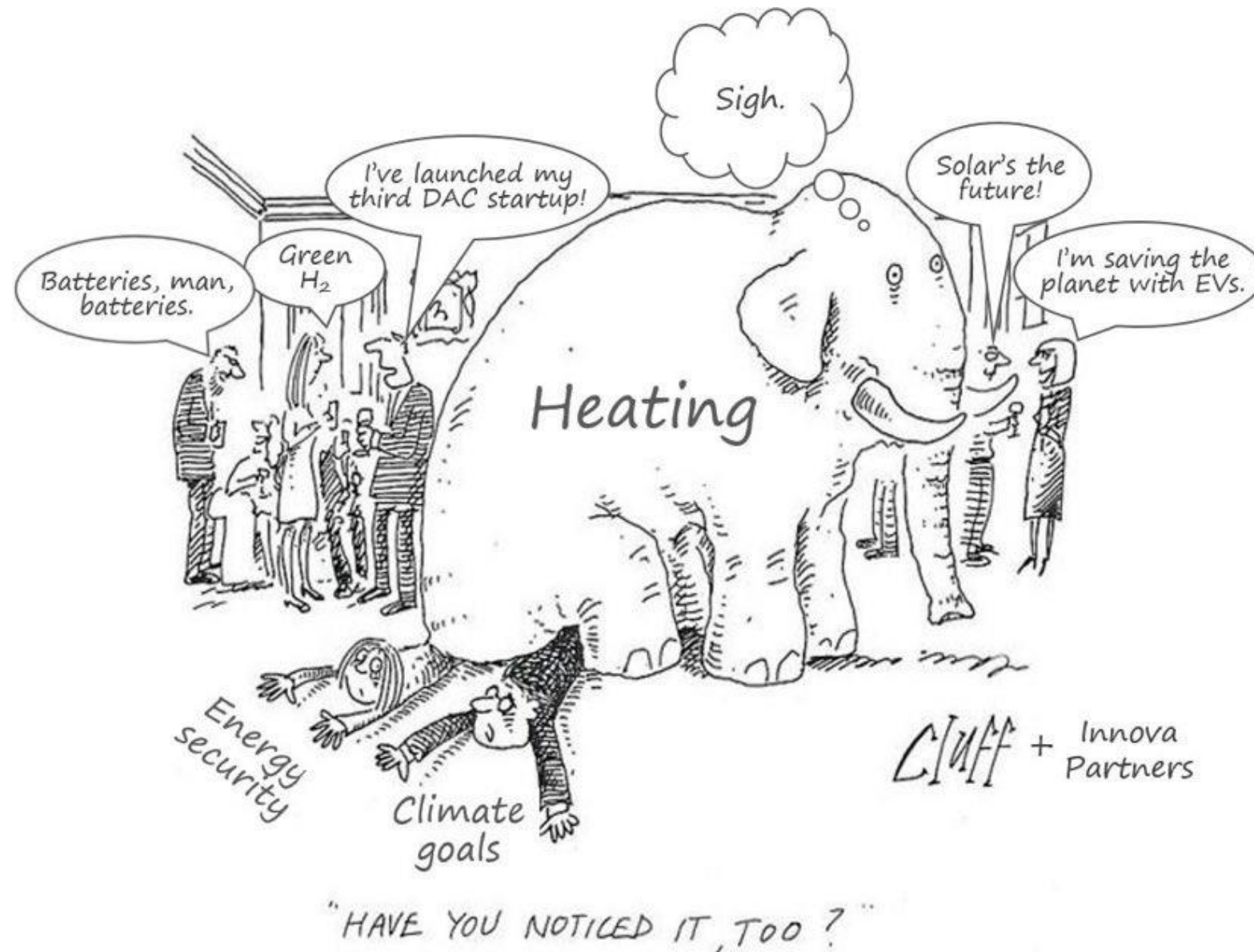
# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?

Final energy consumption in the EU

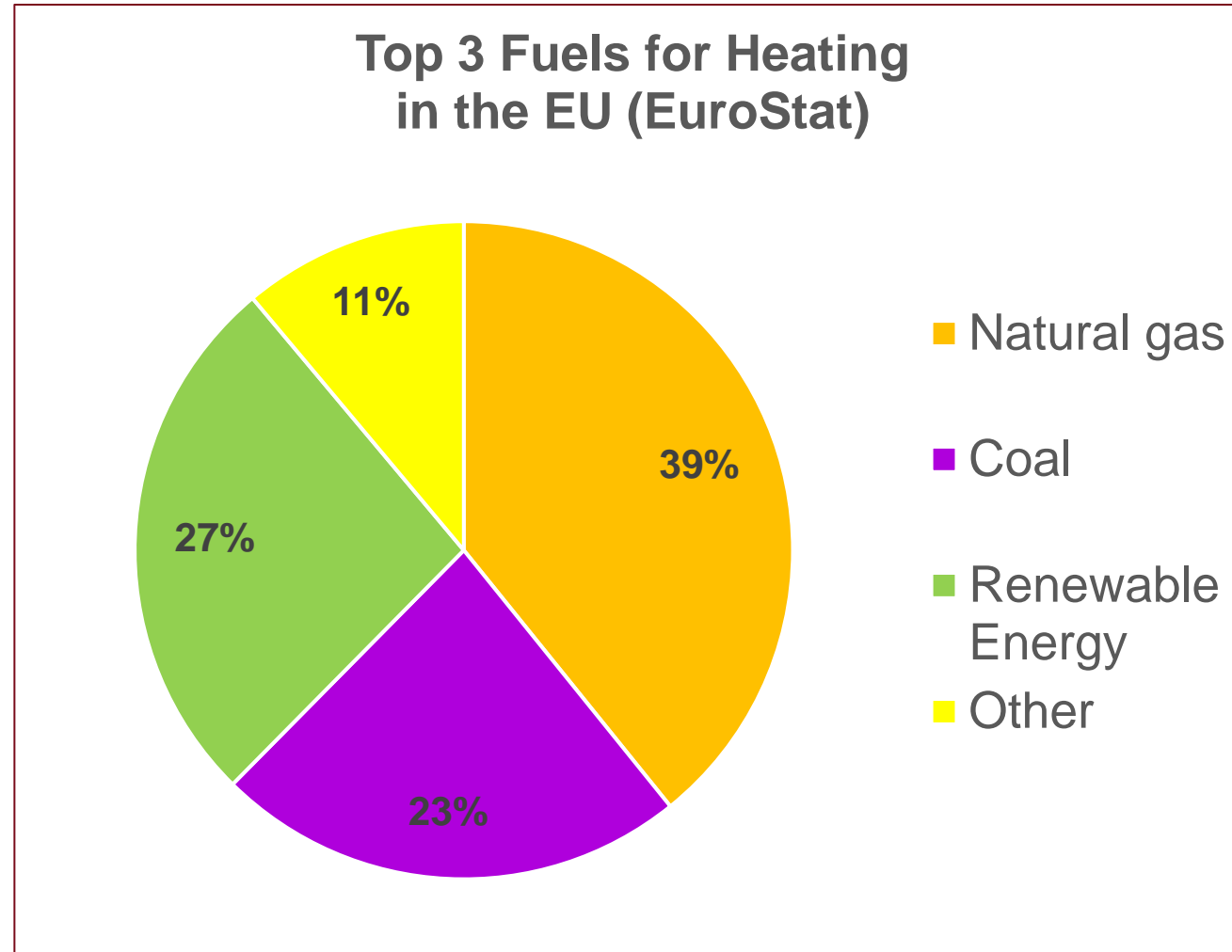




# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?

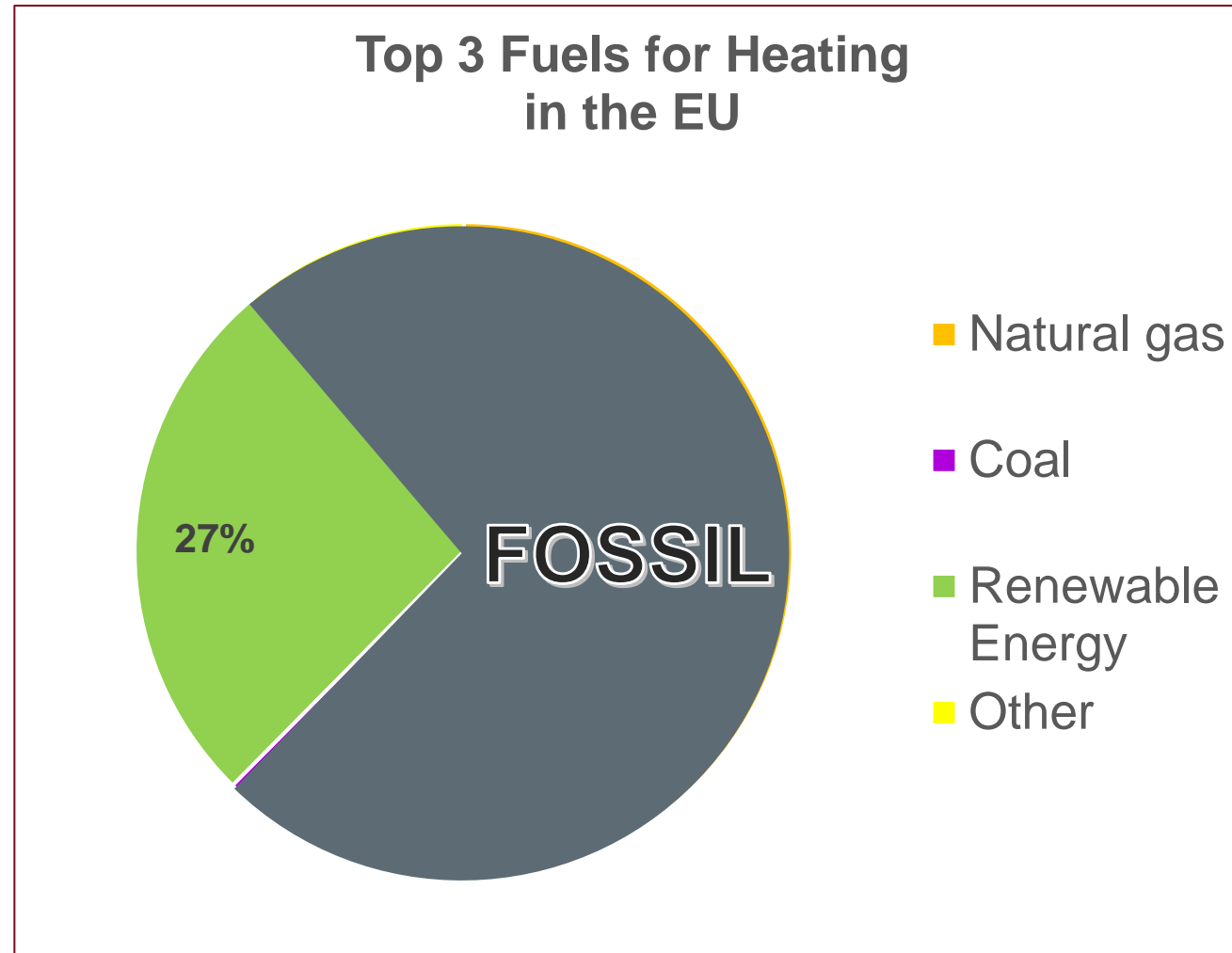


# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?

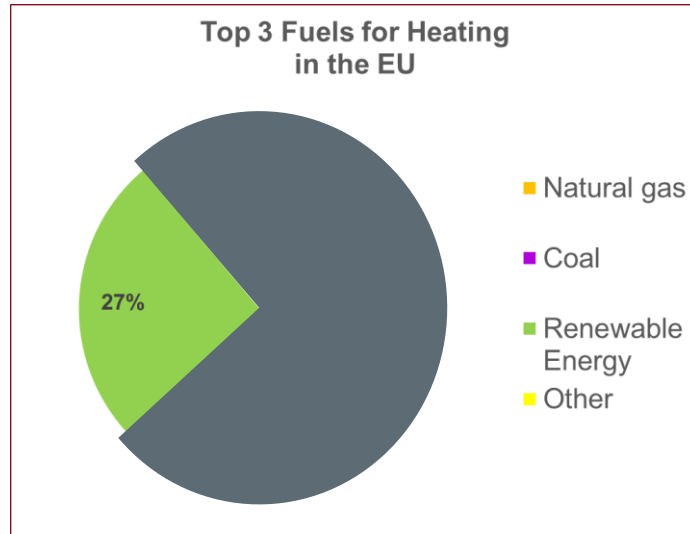




# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?



# WHAT DOES HEATING HAVE TO DO WITH THE CLIMATE?

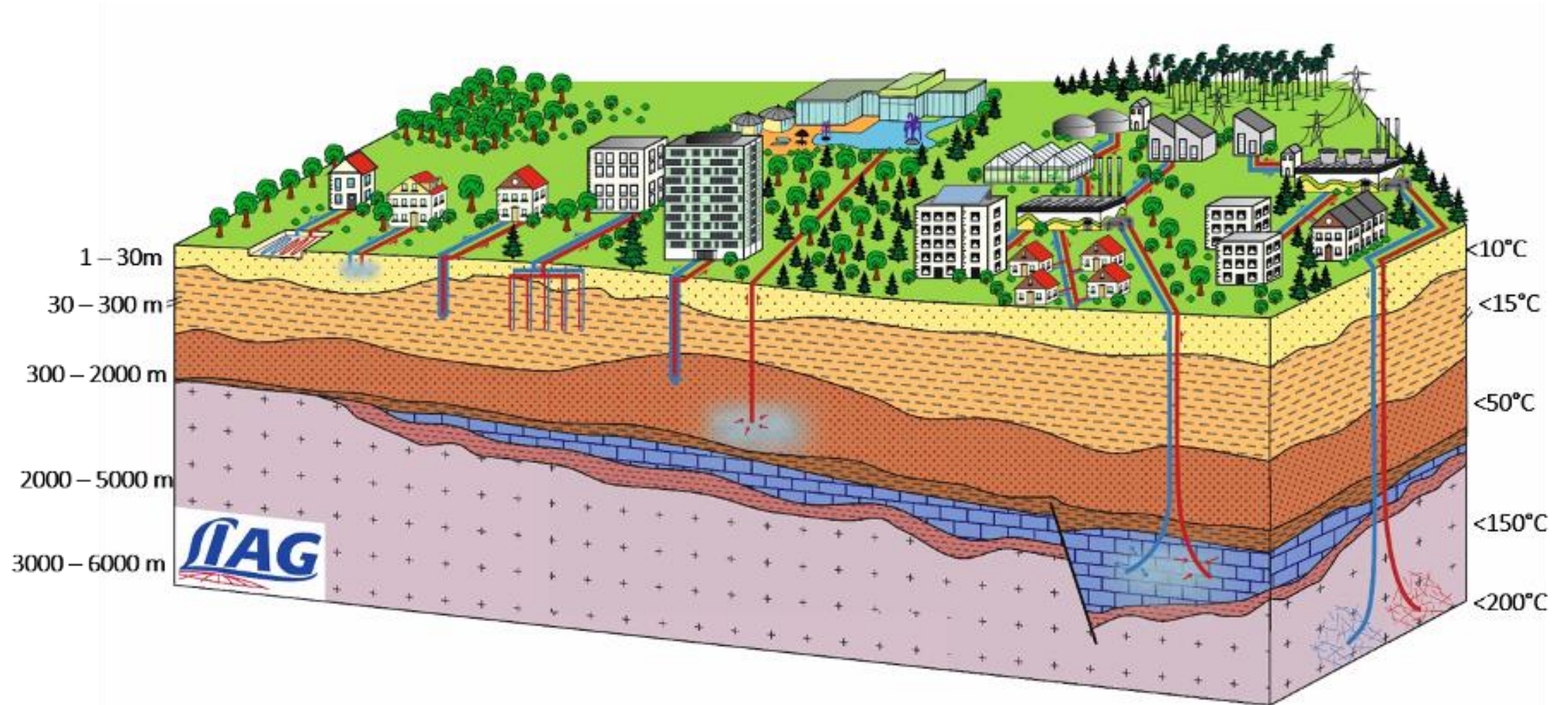


To reach our climate goals, we need an Energy Transition →

Energy Transition means also a Heat Transition!

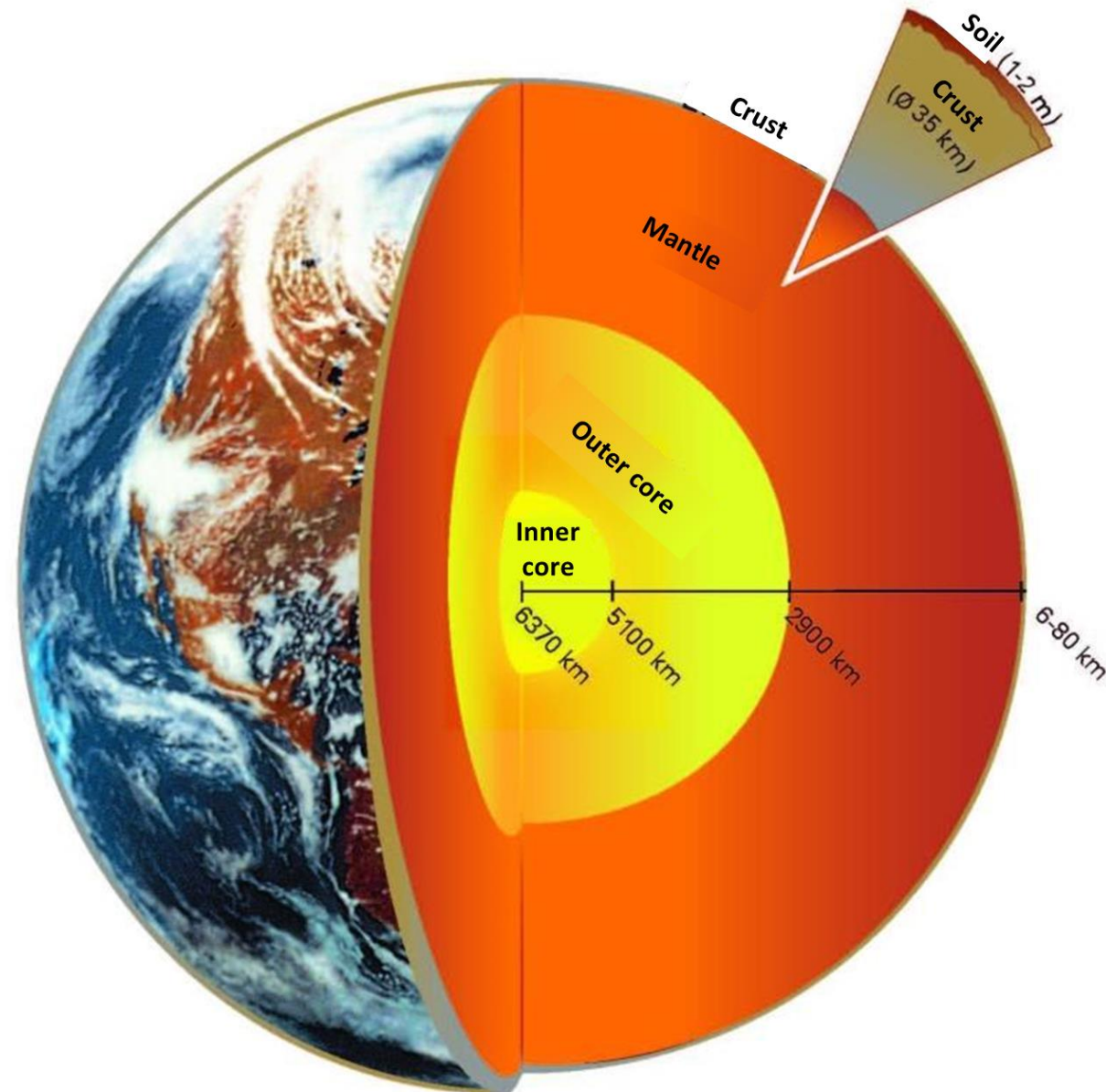


# GEO THERMAL ENERGY – RENEWABLE, NON-DEPLETABLE, AVAILABLE 24/7

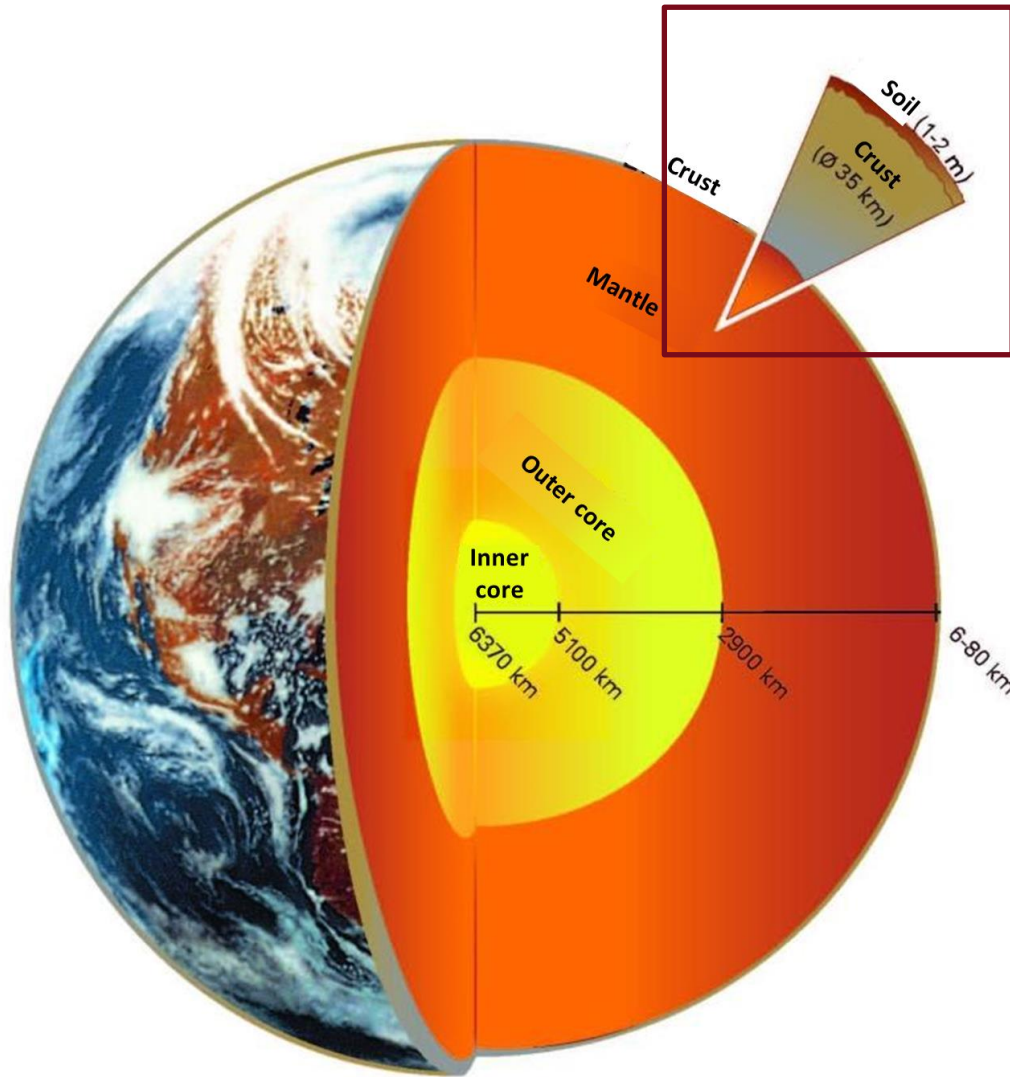




# HOW DOES GEOTHERMAL ENERGY WORK?



# HOW DOES GEOTHERMAL ENERGY WORK?



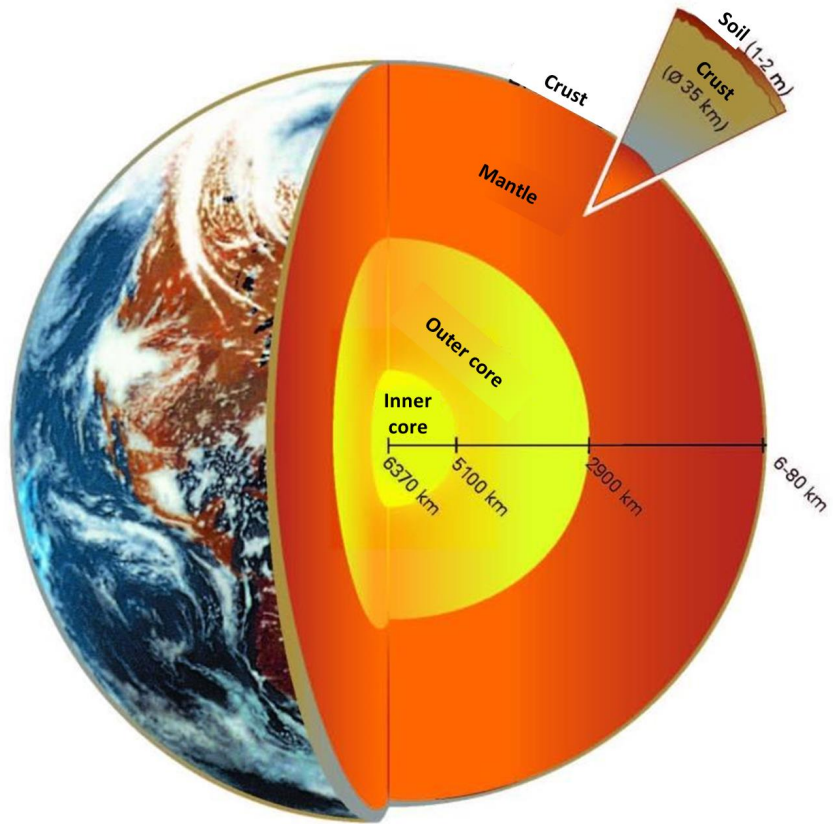
***99 % of the Earth are hotter than 1000 °C!***

***Temperature in the Earth's Core  
(6400 km depth): 4.000 - 7.000 °C***

***Upper Mantle: 450 – 1400 °C***



# HOW DEEP CAN WE DRILL?



## Question time!

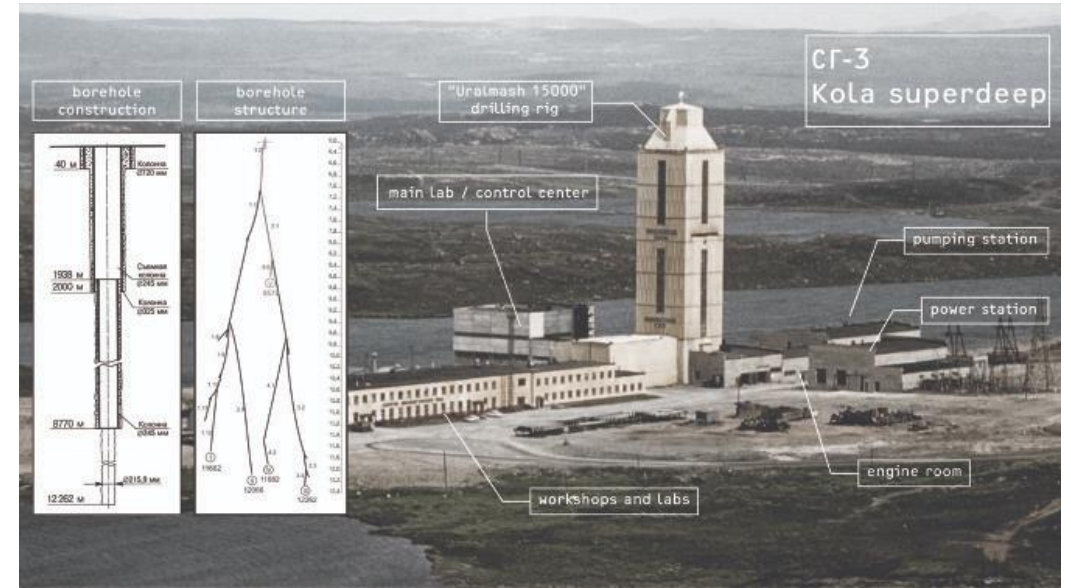
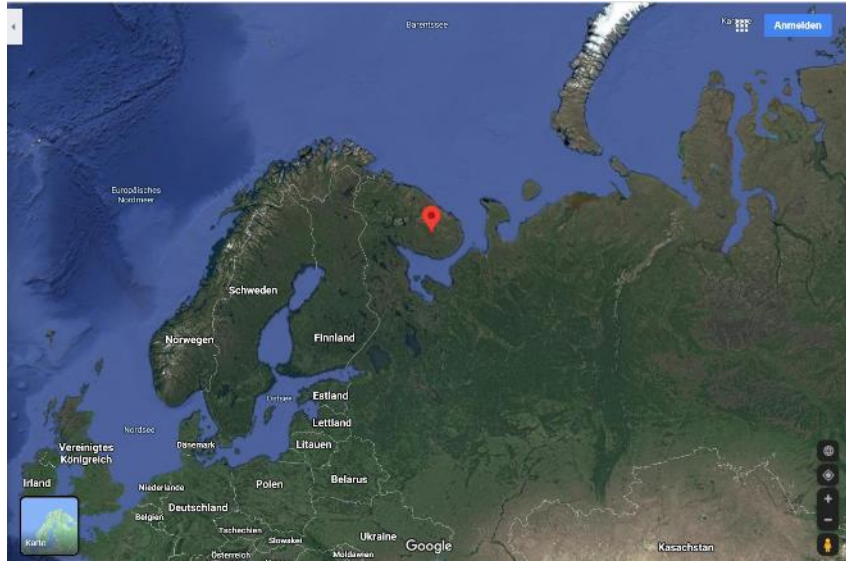
(How many questions can you fit into a 20 min. presentation?)

- How deep do you think is the deepest drilling on Earth?

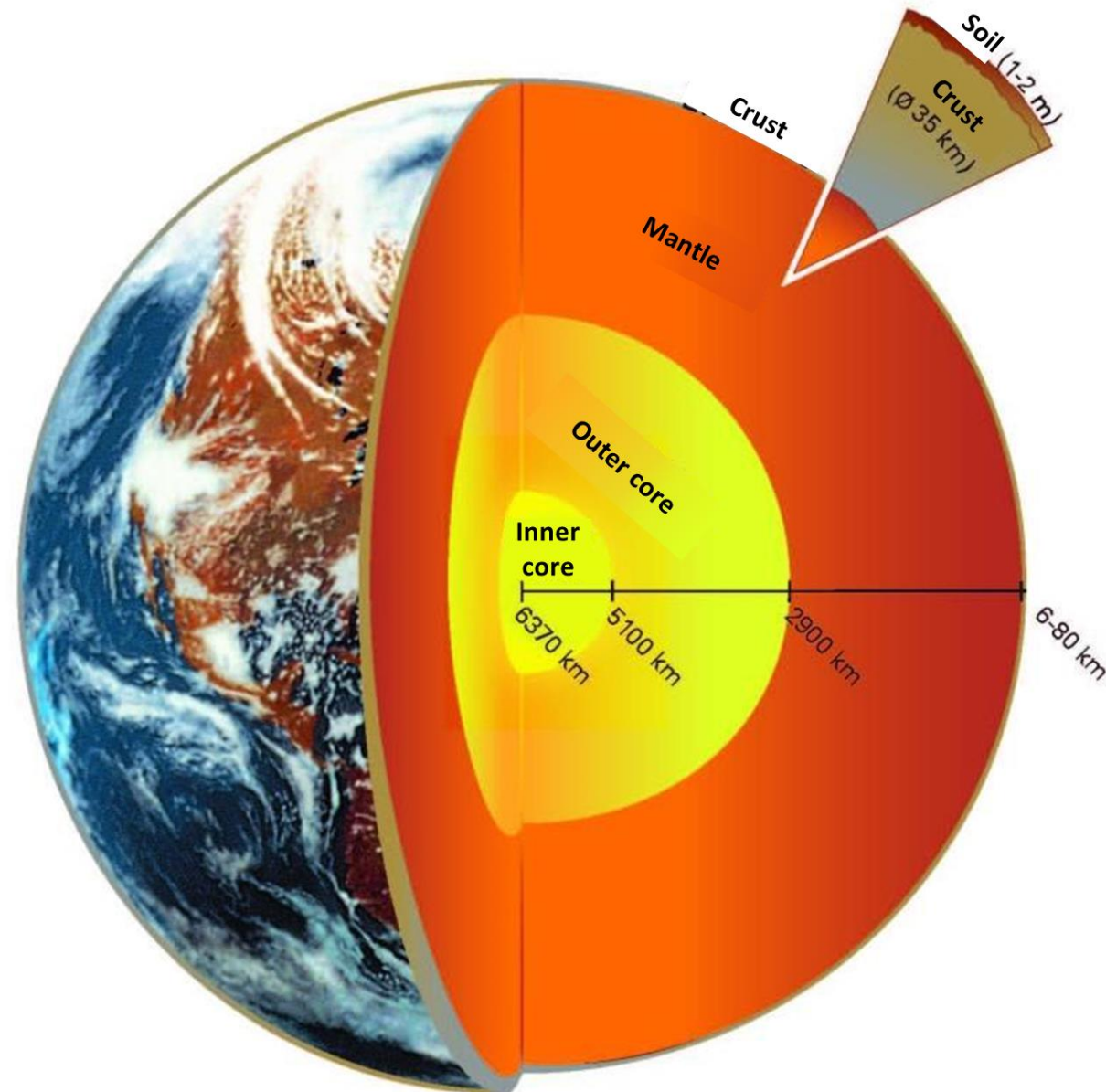




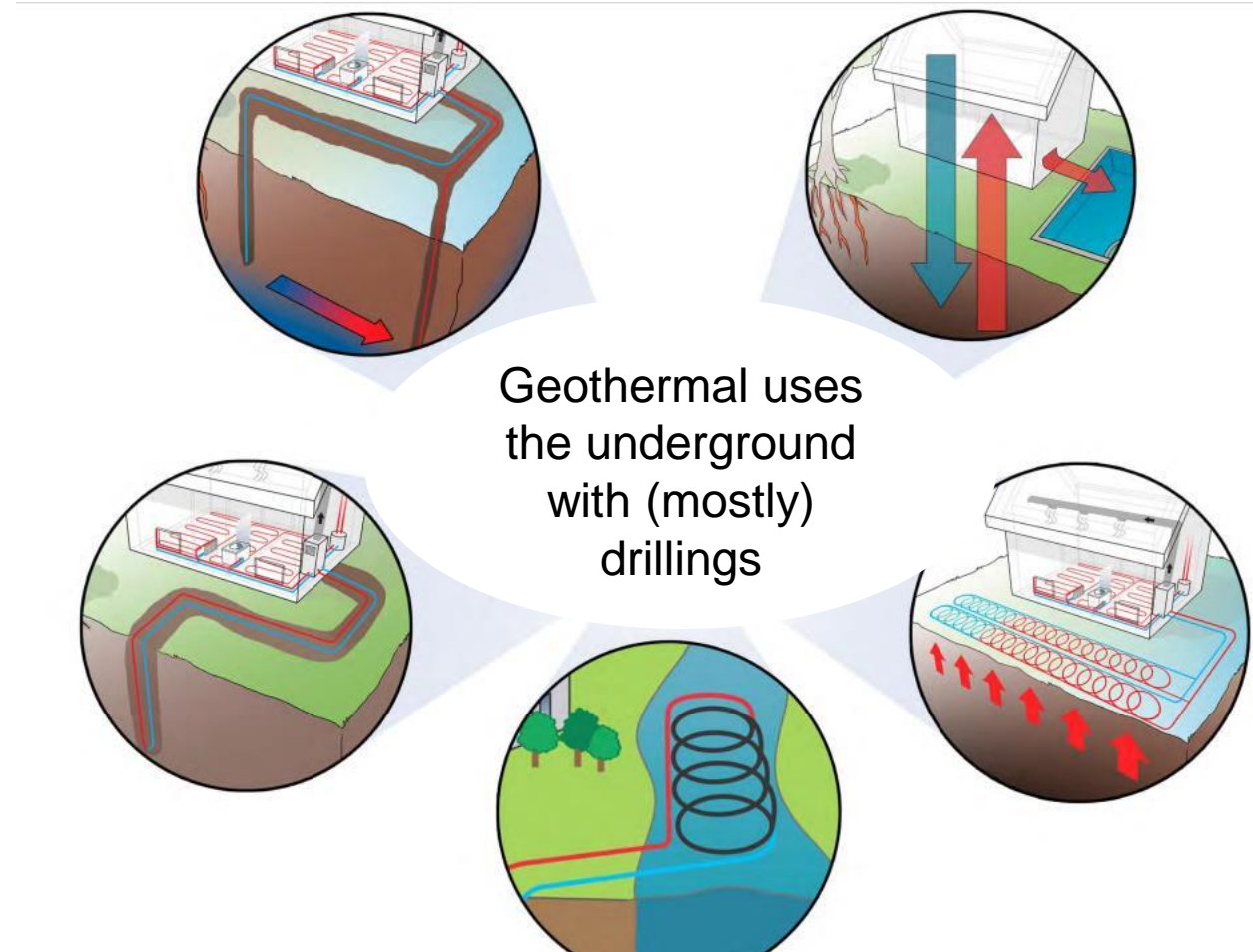
# THE WORLD'S DEEPEST BOREHOLE – KOLA PENINSULA



# HOW DEEP CAN WE DRILL?

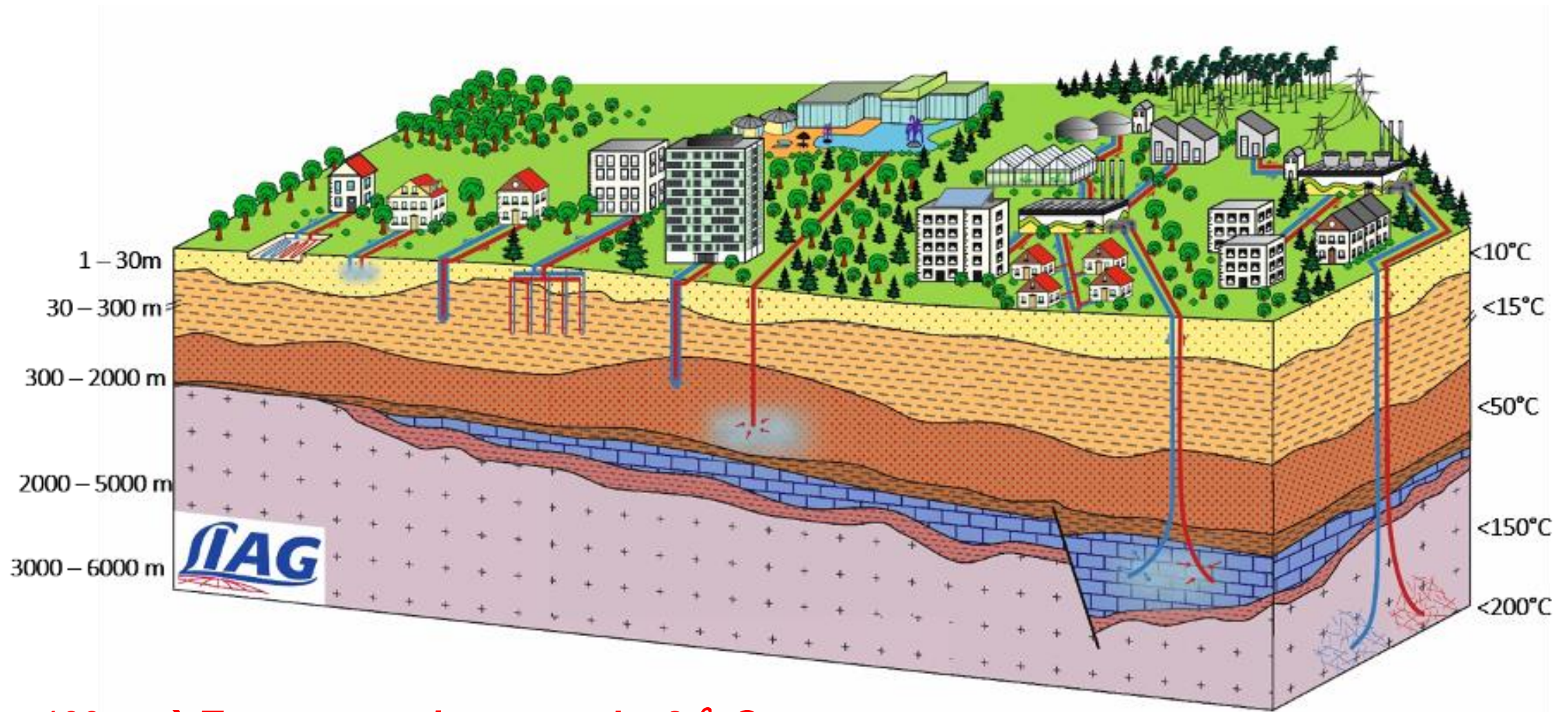


# HOW DOES GEOTHERMAL ENERGY WORK?





# HOW DOES GEOTHERMAL ENERGY WORK?



*Every 100 m → Temperature increases by 3 ° C*



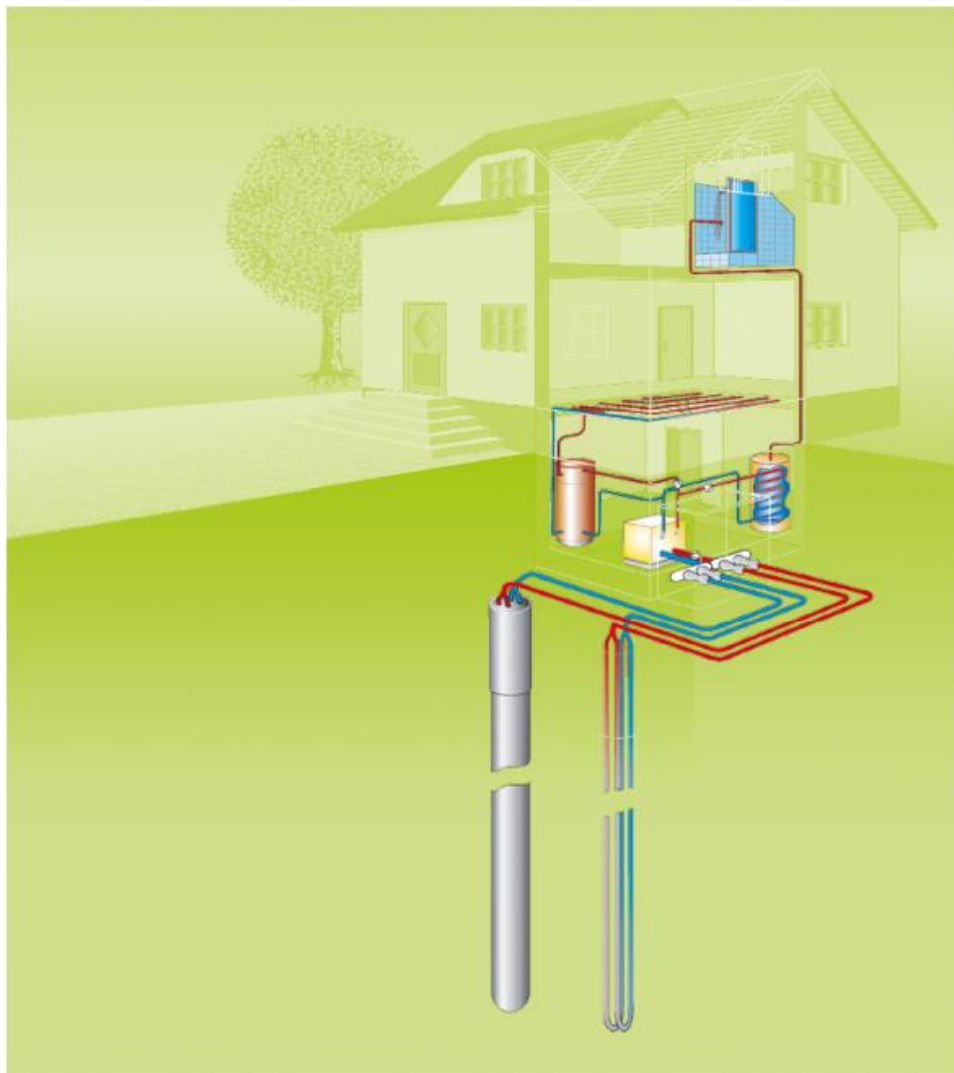


# HOW DOES GEOTHERMAL ENERGY WORK?





# HOW DOES GEOTHERMAL ENERGY WORK?



Bundesverband Wärmepumpe e.V.





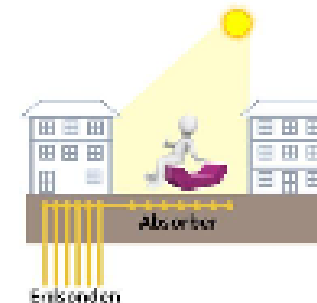
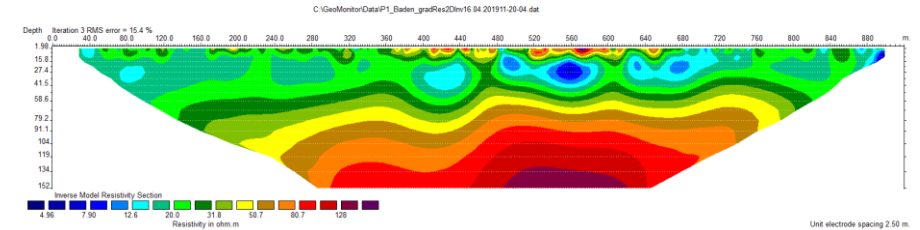
# WHY GEOTHERMAL IS A COOL FIELD TO WORK IN

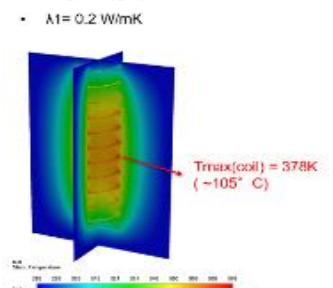
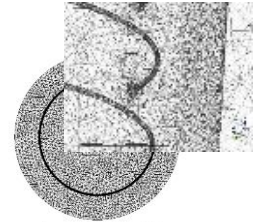
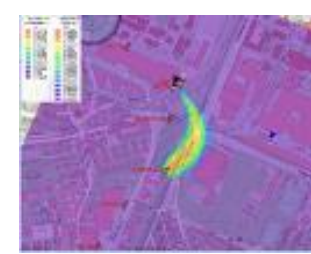
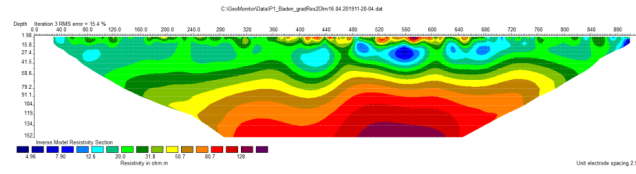
Because every day and every project is different!



# GEO THERMAL IS INTERDISCIPLINARY

- Geophysics
- (Hydro-)Geology
- Geo- and Hydrochemistry
- Energy Technology
- Engineering
- Drilling technology
- Social Sciences
- Law
- ...





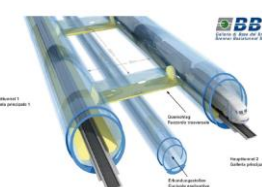
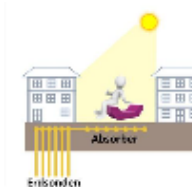
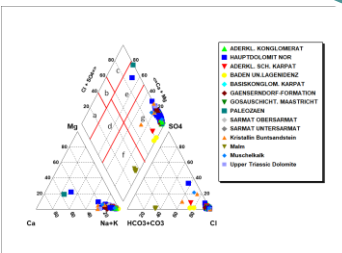
Site assessment for the use of geothermal energy and development of heating and cooling grids

Lab experiments and modelling for thermal use of underground incl. LT/HT-seasonal storage

**Geothermal energy @ AIT**

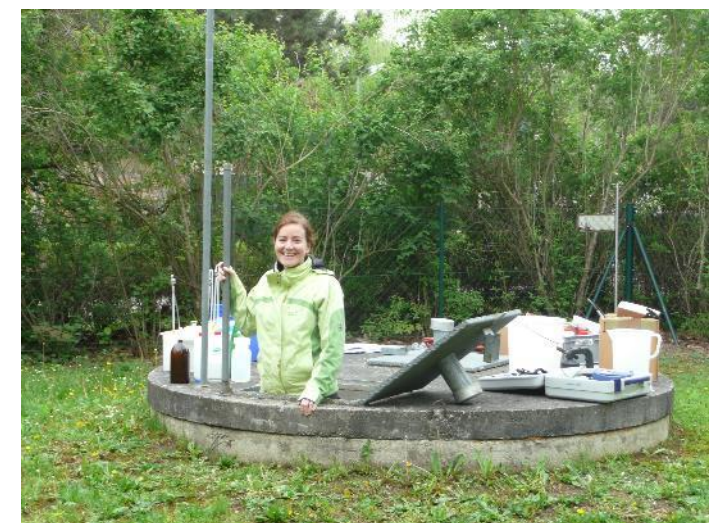
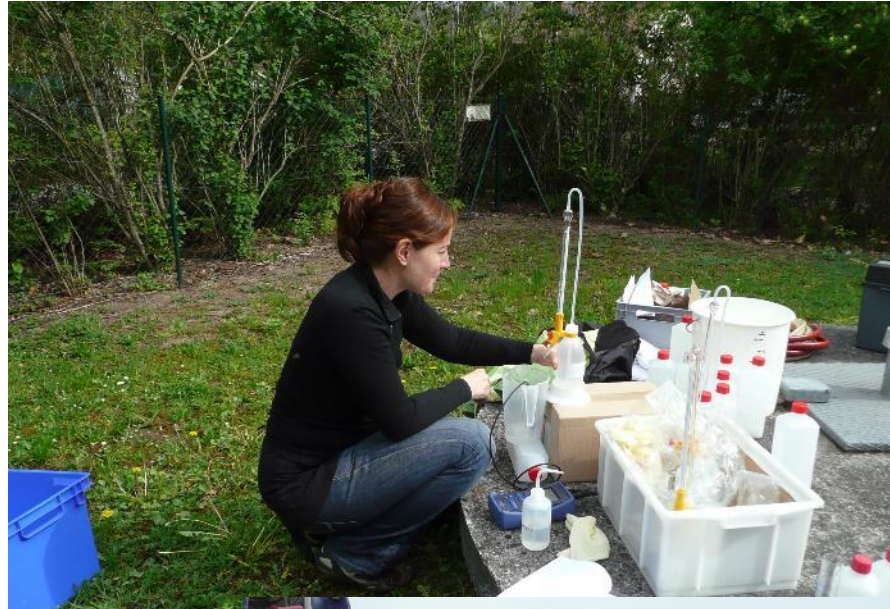
Assessment of geofluids in plants and components

Thermal use of infrastructure buildings (tunnels, roads...)





# WHY GEOTHERMAL IS A COOL FIELD TO WORK IN





# WHY GEOTHERMAL IS A COOL FIELD TO WORK IN



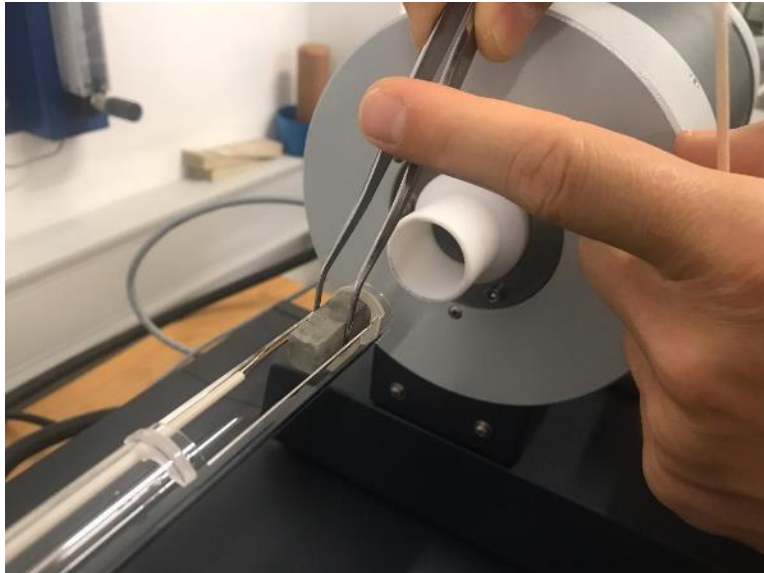


# WHY GEOTHERMAL IS A COOL FIELD TO WORK IN





# WHY GEOTHERMAL IS A COOL FIELD TO WORK IN



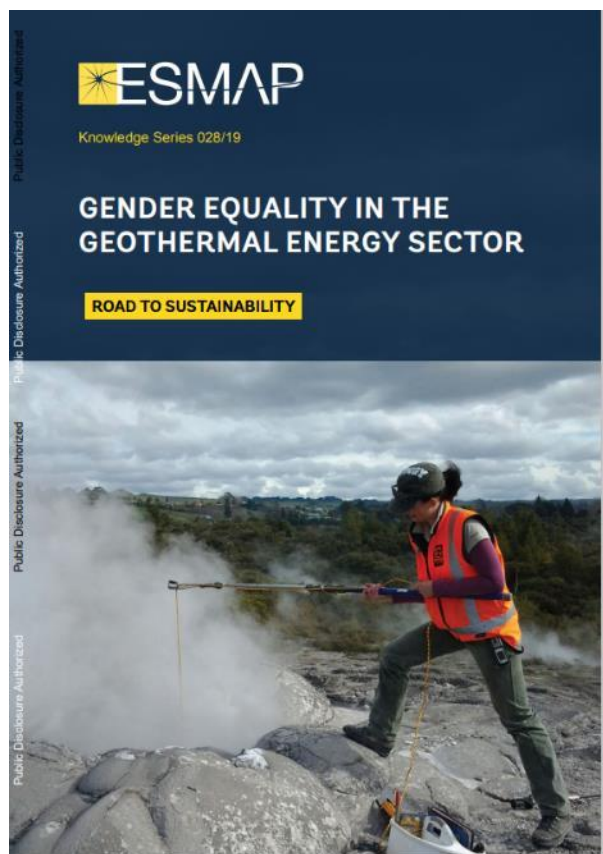


# MY MOTIVATION 😊



# GIRLS INTO GEOTHERMAL!

Edith Haslinger, [edith.haslinger@ait.ac.at](mailto:edith.haslinger@ait.ac.at)



## THANK YOU!

