Schweizerischer Erdbebendienst
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ETH zürich

# Supporting informed choices for deep geothermal projects

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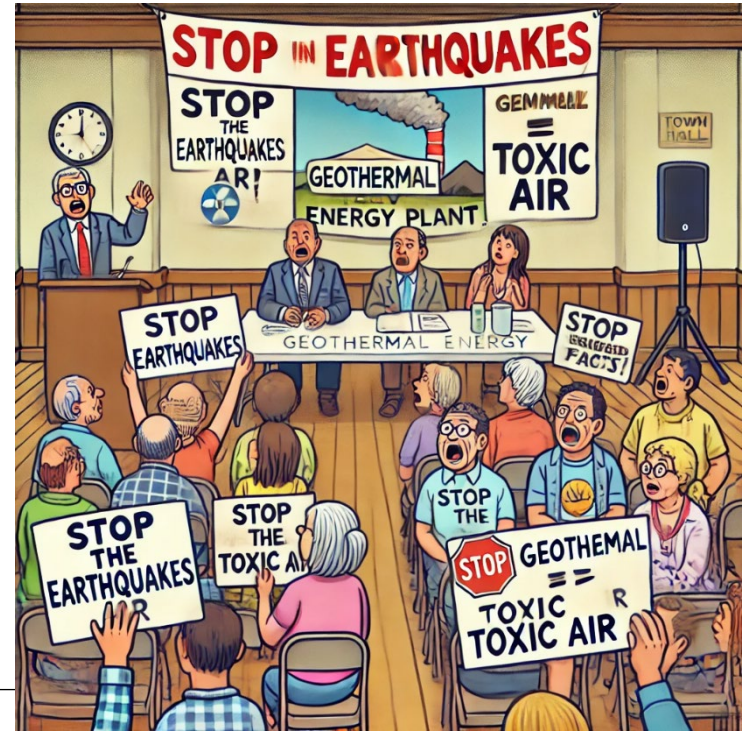
## What is an informed decision?

- Most likely an illusion…
- We all evaluate objects, situations, or interventions differently because of our…
  - experiences
  - education
  - peers
  - preferences
  - etc.
- And we all take (very) irrational choices depending on the perspective, e.g. playing lottery, buying expensive gear hoping that this would raise training motivation, avoiding the ice cream but drinking two glasses of wine.
- Nevertheless, we value unbiased, understandable and accessible information when it comes to decision-making.

**Opposing Renewable Energy Projects**: Communities resisting wind farms or geothermal plants due to exaggerated fears (e.g., health risks or property value concerns).

Example provided by ChatGPT

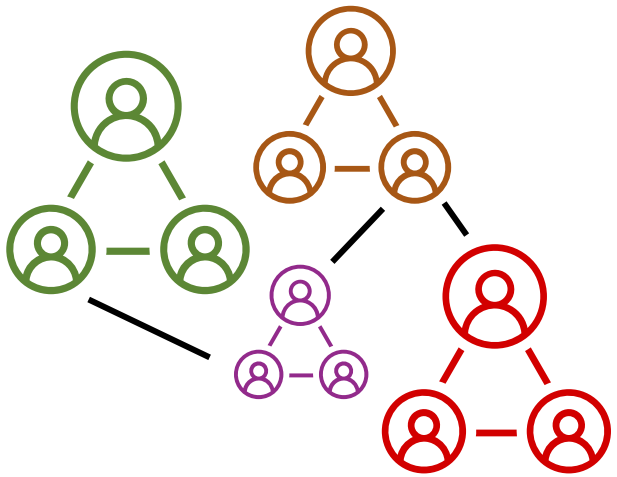


# Decisions in the context of geothermal projects

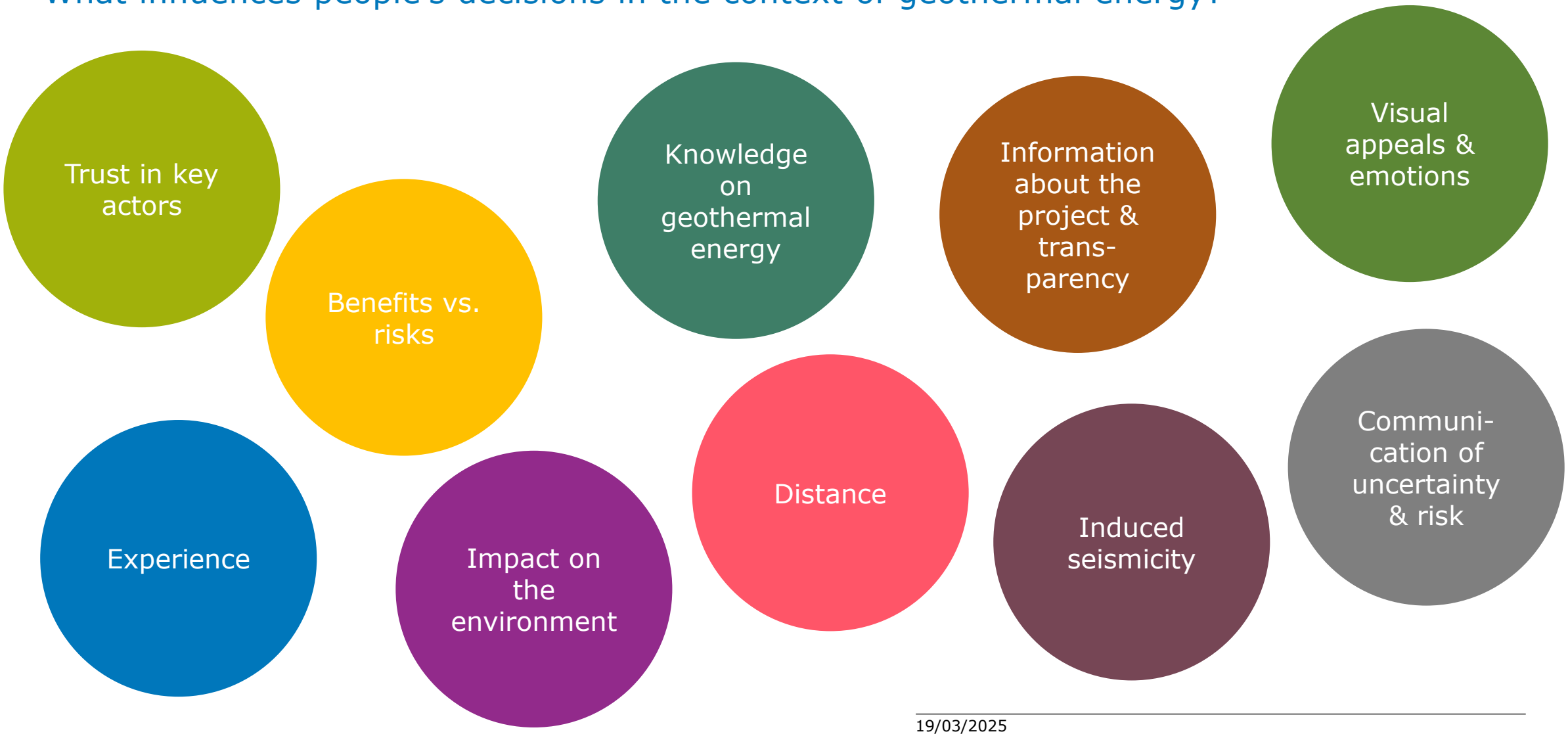
- Site selection
- Project governance
- Technology and design choices
- Risk assessment and management
- Public engagement

- Different stakeholders with varying needs, responsibilities and viewpoints.
- They all need information to take decisions.
- Some provide information to the others with different intentions.
- We focus on the role of scientific information provided by independent researchers or research institutions.

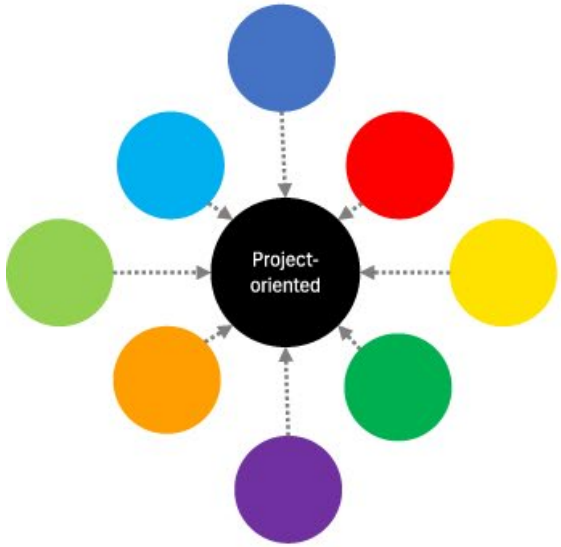
What is your role?



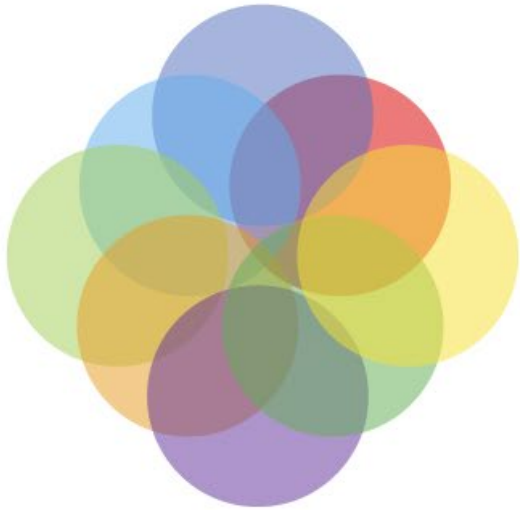
# What influences people's decisions in the context of geothermal energy?



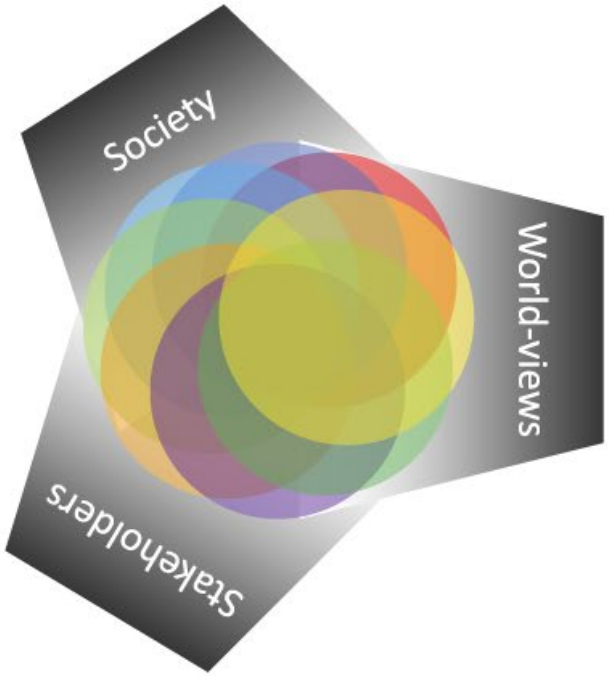
# We usually apply a transdisciplinary approach




multidisciplinary



interdisciplinary

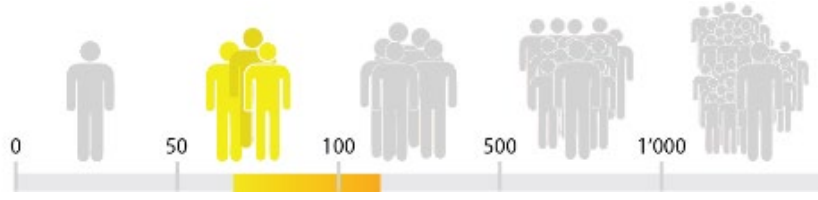


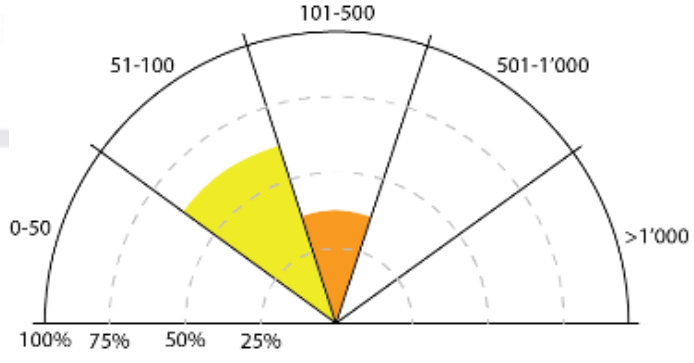

transdisciplinary

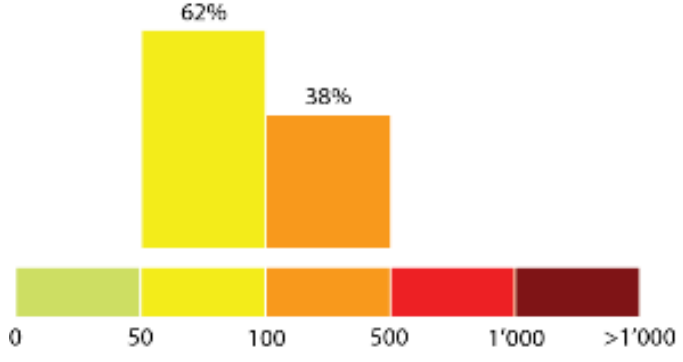
https://www.cambridge.org/core/journals/quantitative-plant-biology/article/convergence-and-transdisciplinary-teaching-in-quantitative-biology/E6051BE06AF8C86CB9135DA22541AF9F

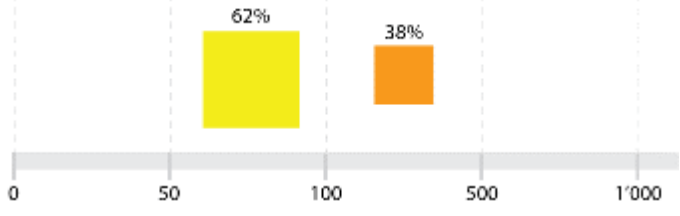
# An example on testing uncertainty communication

- You have a model that estimates the number of fatalities after an earthquake.
- The model has a lot of uncertainties.
- People are interested in the numbers.
- We want them to be aware of the uncertainties.



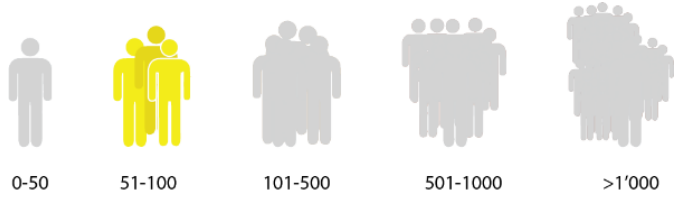



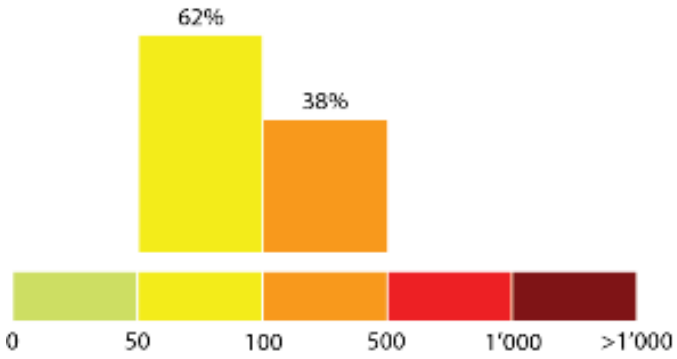


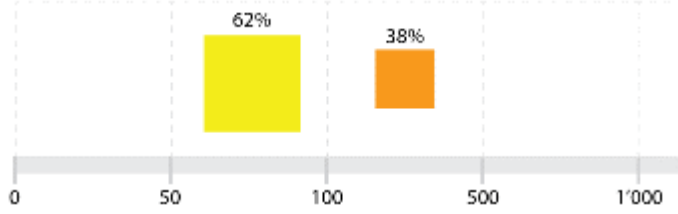



# Setup

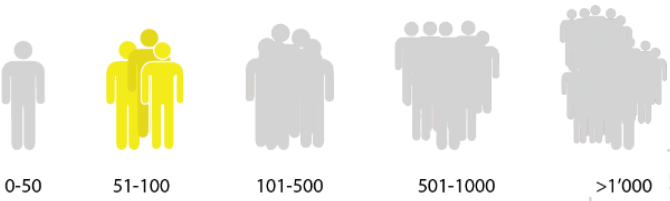
- Random assignment of participants to a format. Standardised statements to assess.
- Are the following statements correct or not?
  - No fatalities are expected.
  - The figures refer to confirmed fatalities.
  - It is impossible that this earthquake could cause 60 fatalities.
  - Exactly 50 fatalities are expected.
  - It is unlikely that the earthquake causes 500 or more fatalities.
  - It is possible that the estimate of the number of fatalities is incorrect and will have to be adjusted based on new data.
  - With a probability of about 60 percent, the earthquake claimed between 51 and 100 fatalities.
  - The data on fatalities are subject to uncertainties.
- We count and compare the number of correct answers.

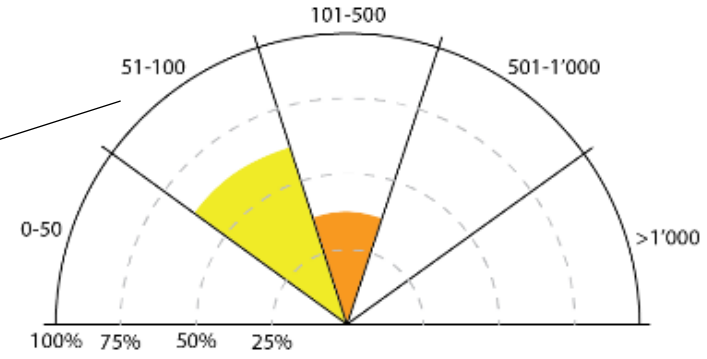


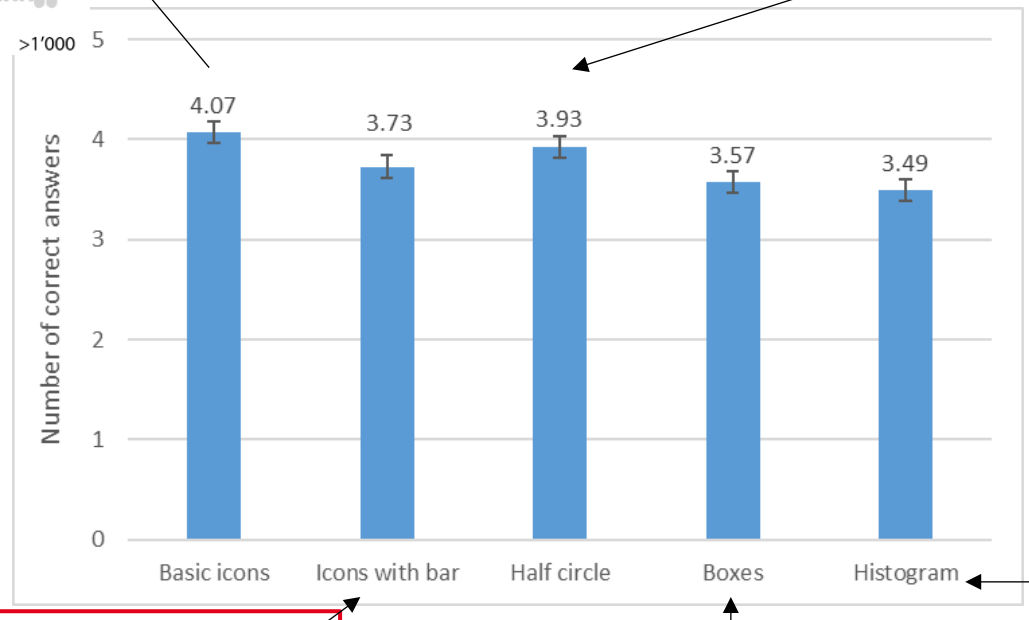



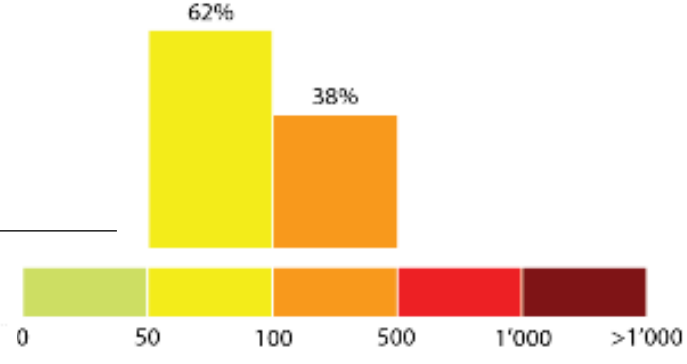



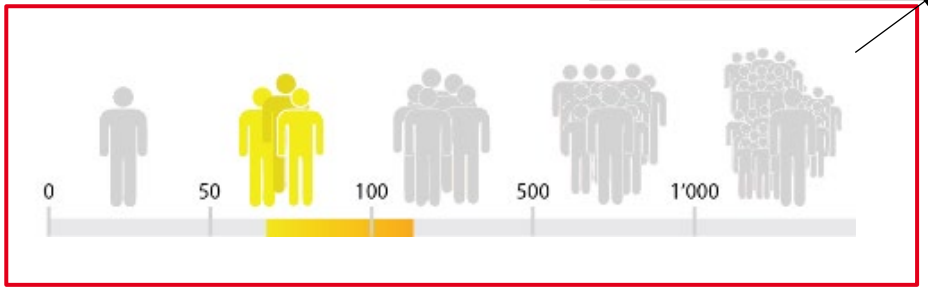
# What people understand best

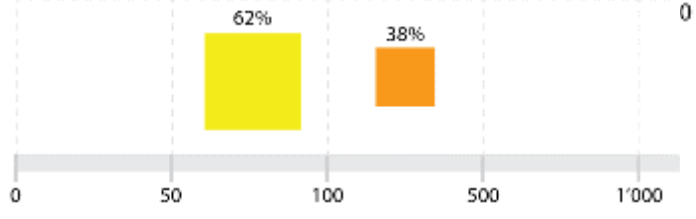


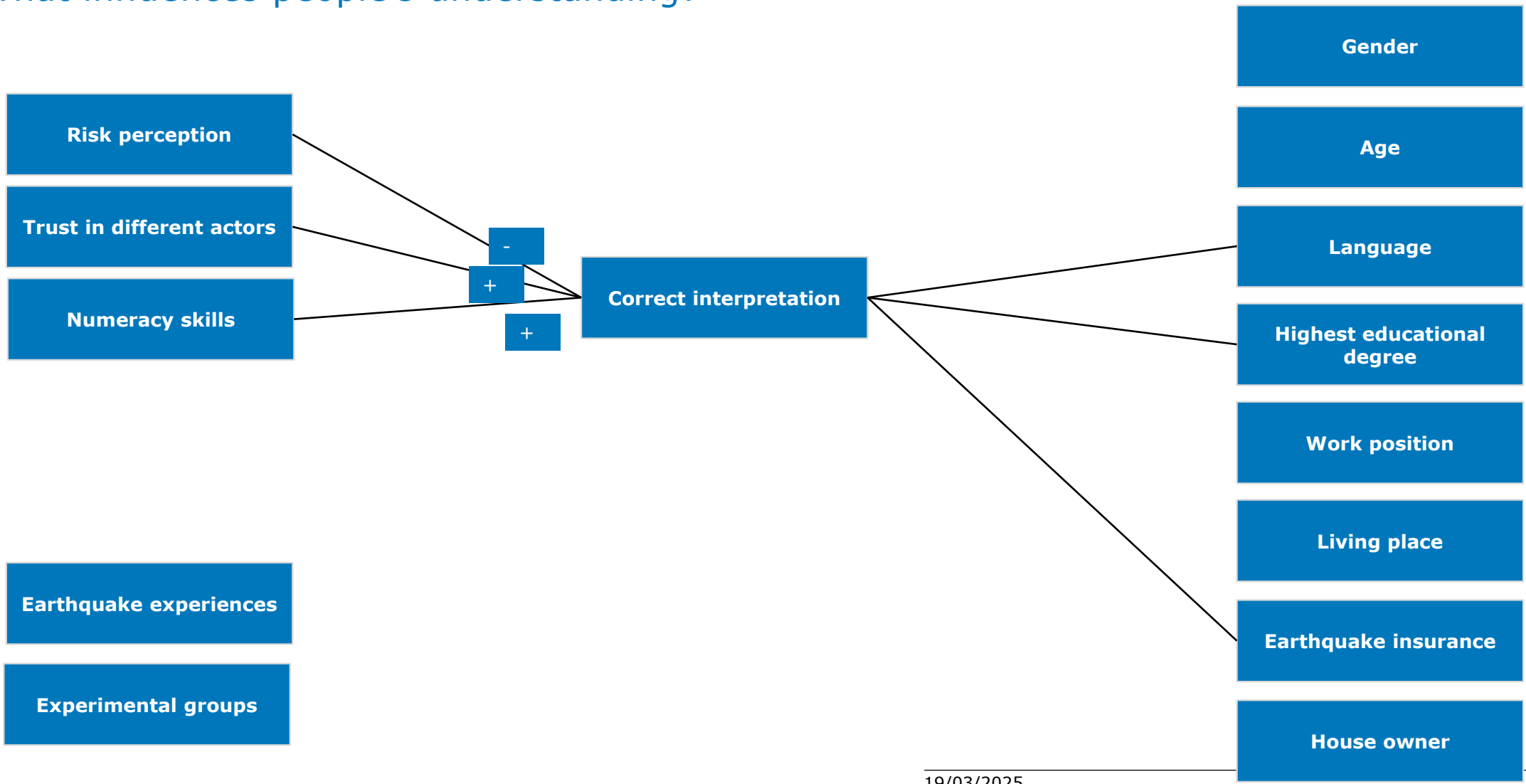



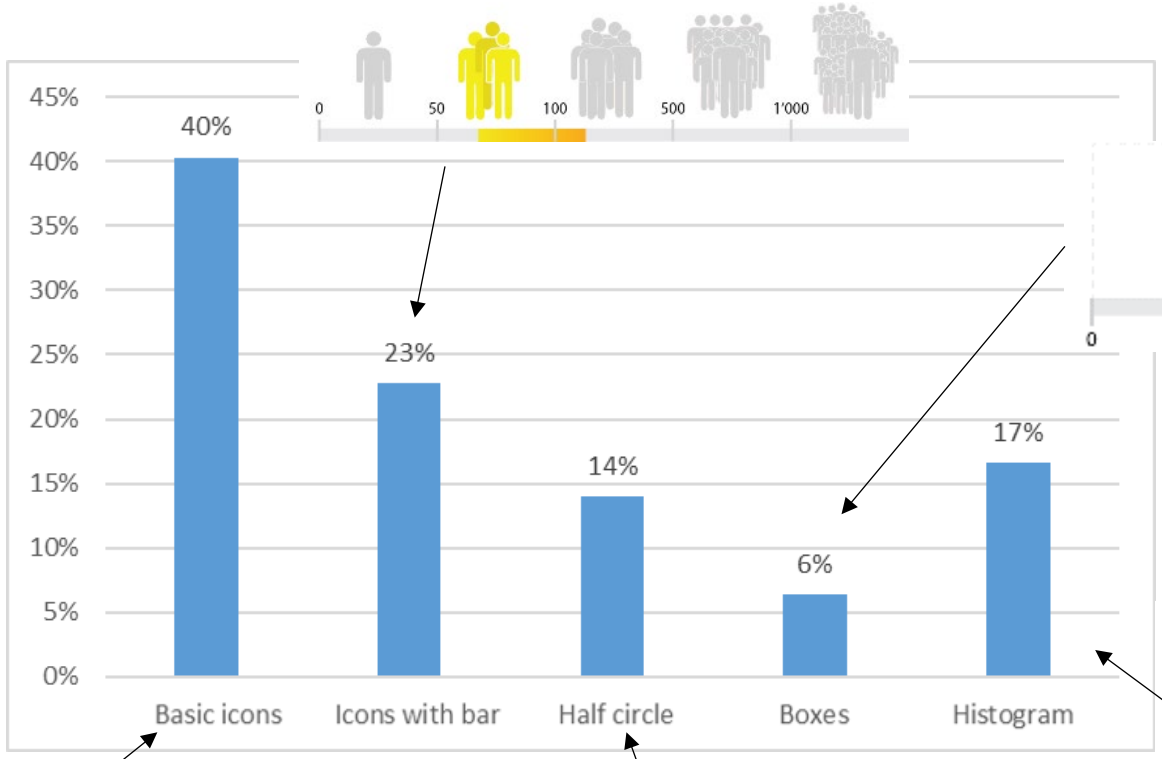



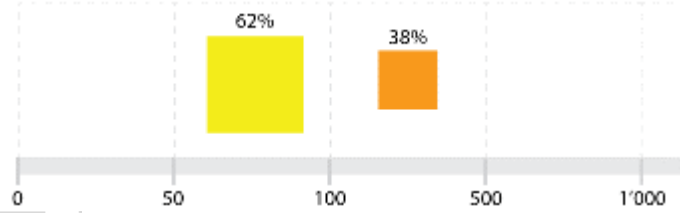



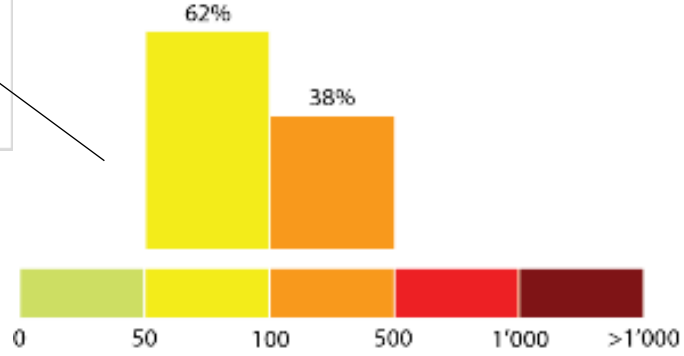
# What influences people's understanding?

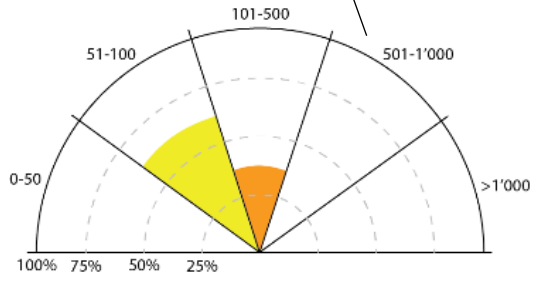


# And we are also interested in what people like best



# What is the focus in our upcoming work (within GeoHEAT & GeoTwins)?

Information materials

What does the Swiss population think and feel about deep geothermal energy? What are the most important concerns and benefits? Are there any common misconceptions?

➔ Representative online survey

Which arguments in favor of/against deep geothermal energy are perceived as relevant and useful by the population and how do they relate to the acceptance of deep geothermal energy projects?

➔ Online experiment (between- and within-subjects design)

How should the benefits and risks associated with geothermal energy (e.g., risk for induced seismicity) be communicated to ensure valid interpretation of the information?

➔ Online experiment (between-subjects design)

# What is the focus in our upcoming work (within GeoHEAT & GeoTwins)?

Decision-making processes

What are relevant stakeholders with regards to potential deep geothermal projects in the canton of Thurgau?

➔ Stakeholder mapping

What information do different stakeholders want and use to make decisions related to the site selection of geothermal projects?

➔ Focus groups

How do different stakeholders understand and make use of real-time and prospective process and damage estimations?

➔ Interviews/focus groups

## Differences matter

- It is not about unifying viewpoints or convincing people.
- It is about learning what makes complex information around geothermal projects understandable, accessible, and useful.
- And about identifying how different designs and formats influence the above as well as how they perceive the benefits and risk of deep geothermal projects.
- With the aim to support a contstructive dialogue.