On the challenges behind deep geothermal energy: ecological modernization or false solution? A comparative case studies between France and Switzerland

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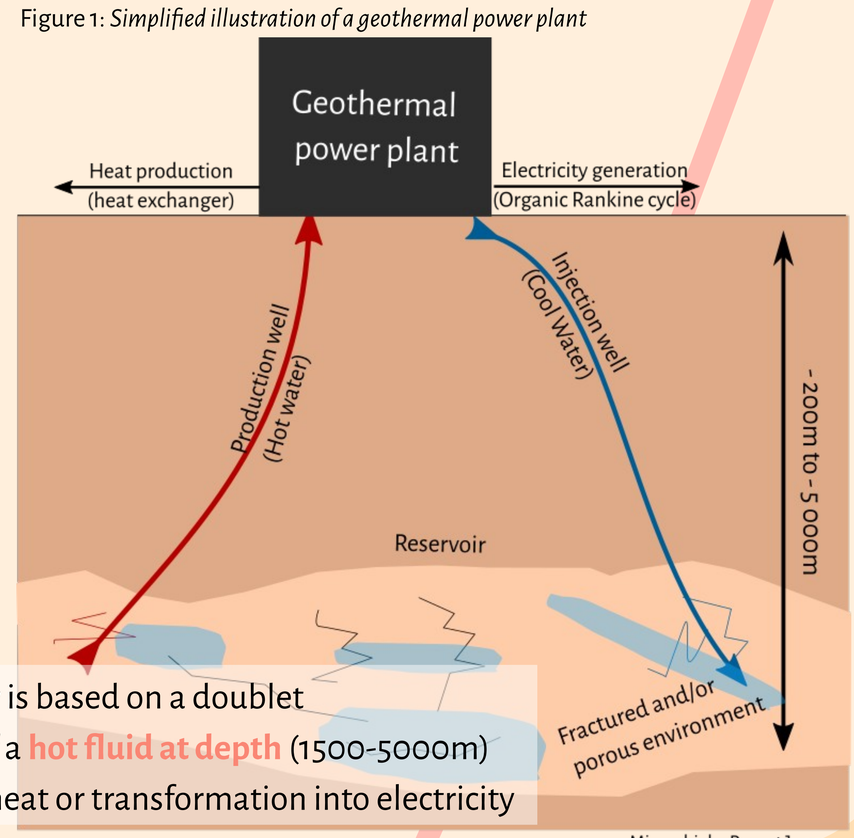
❶ Introduction

- **Energy transition**. Geothermal energy presented as unlimited, "green" and no intermittency energy.
- The technology has been **developed in sedimentary basins** (i.e. Paris Basin).
- But needs to adapt to **new geological environments**.
- We are interested in the **difficulties of deploying geothermal energy outside of favourable environments**

❷ How does deep geothermal energy work?

Figure 1: *Simplified illustration of a geothermal power plant*



- Technology is based on a doublet
- Recovery of a **hot fluid at depth** (1500-5000m)
- Use of the heat or transformation into electricity

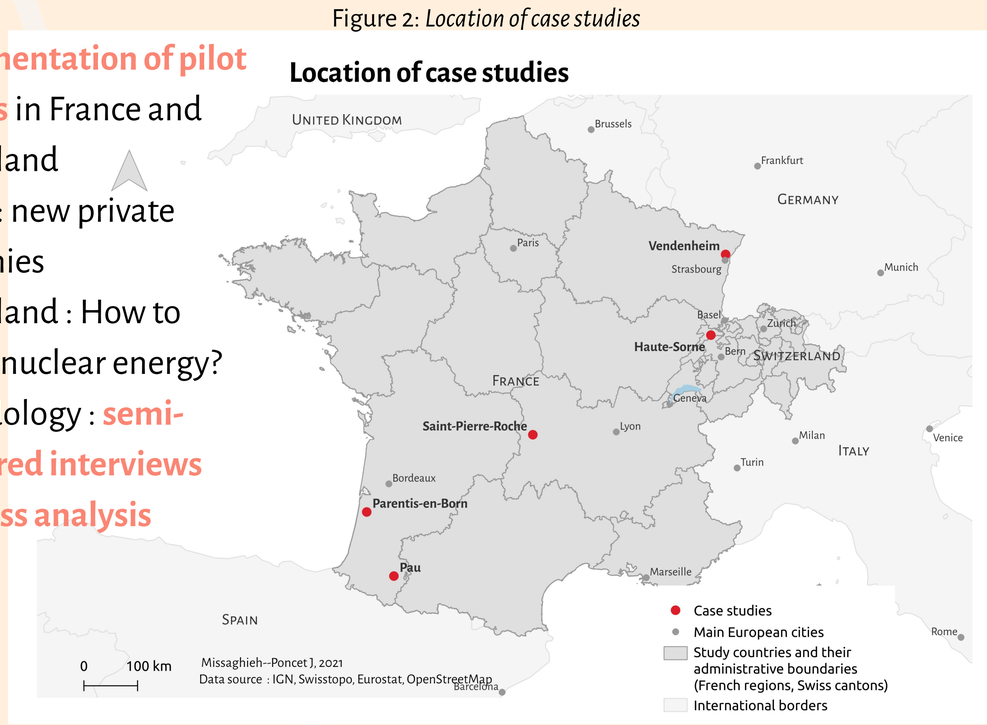
❸ Conceptual framework

- The **subsoil is becoming politicized** (Arnauld De Sartre, Chailleux 2021).
- **Verticalization territories**: Greater awareness of the subsoil's existence and the necessity to 'secure' against seismic risk (Bobbette, Donovan 2019).
- **Sociology of translation** (Callon 1986): help to understand the debates between different actors.

❹ Methodology and Fieldwork

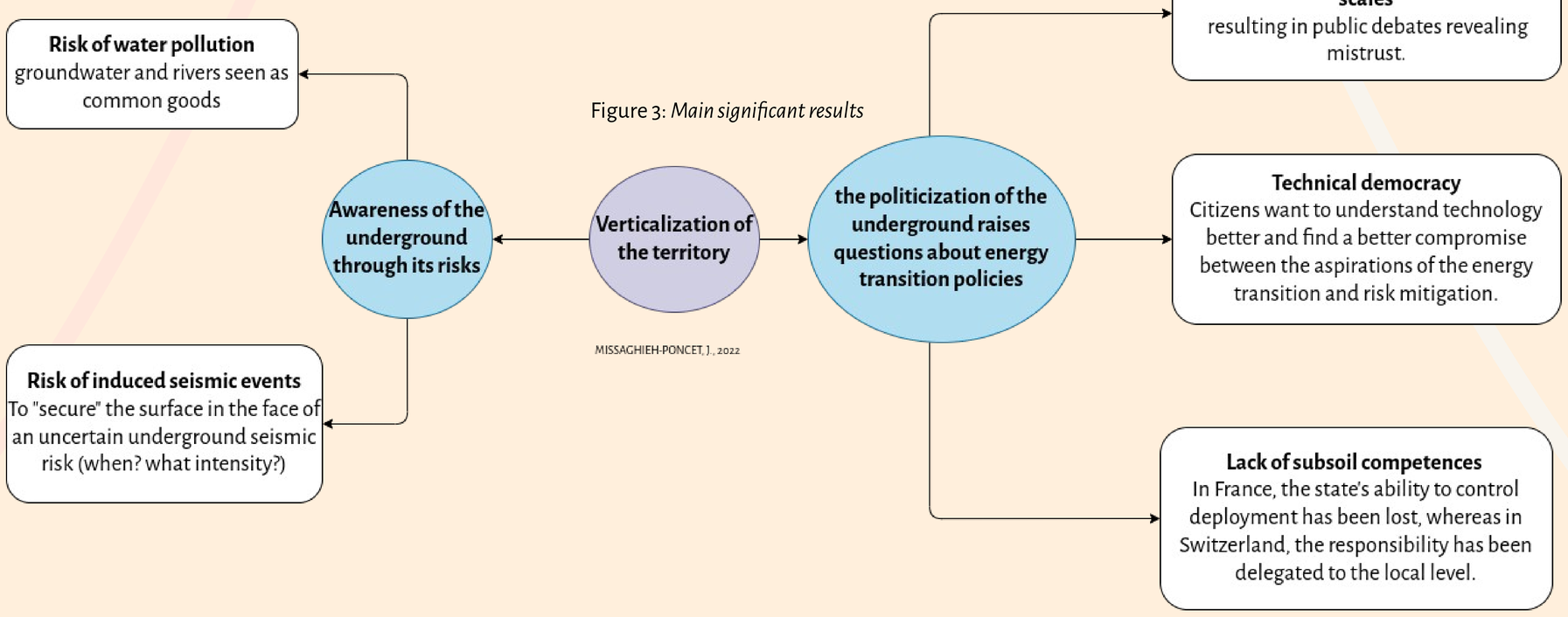
- **Implementation of pilot projects** in France and Switzerland
- France : new private companies
- Switzerland : How to replace nuclear energy?
- Methodology : **semi-structured interviews** and **press analysis**

Figure 2: *Location of case studies*



❺ Construction of a vertical territory

Figure 3: *Main significant results*



❻ Conclusions

- **Verticalization** : Geothermal energy has made it possible to integrate the issue of the subsoil into the political and public spheres.
- Debates on **energy transition policies**, sometimes questioning geothermal technology.
- Due to a **lack of good multi-level coordination**, a technology that is inadequately supported is weakened during crises.

References

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BOBBETTE, Adam et DONOVAN, Amy (éd.), 2019. Political Geology: Active Stratigraphies and the Making of Life. 1st ed. 2019. Cham : Springer International Publishing : Imprint: Palgrave Macmillan. ISBN 978-3-319-98189-5. 333.707
CALLON, Michel, 1986. Éléments pour une sociologie de la traduction: la domestication des coquilles saint-jacques et des marins-pêcheurs dans la baie de saint-Brieuc. L'Année sociologique (1940/1948-). 1986. Vol. 36, pp. 169-208.

For further information

Laboratory *Transitions énergétiques et environnementales* website: https://tree.univ-pau.fr/
Research project *Gouvernance élargie pour les filières d'ingénierie du sous-sol* website: https://www.gefiss.eu/
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