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Justin Missaghieh-Poncet

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

Justin Missaghieh--Poncet

justin.missaghieh-poncet@univ-pau.fr

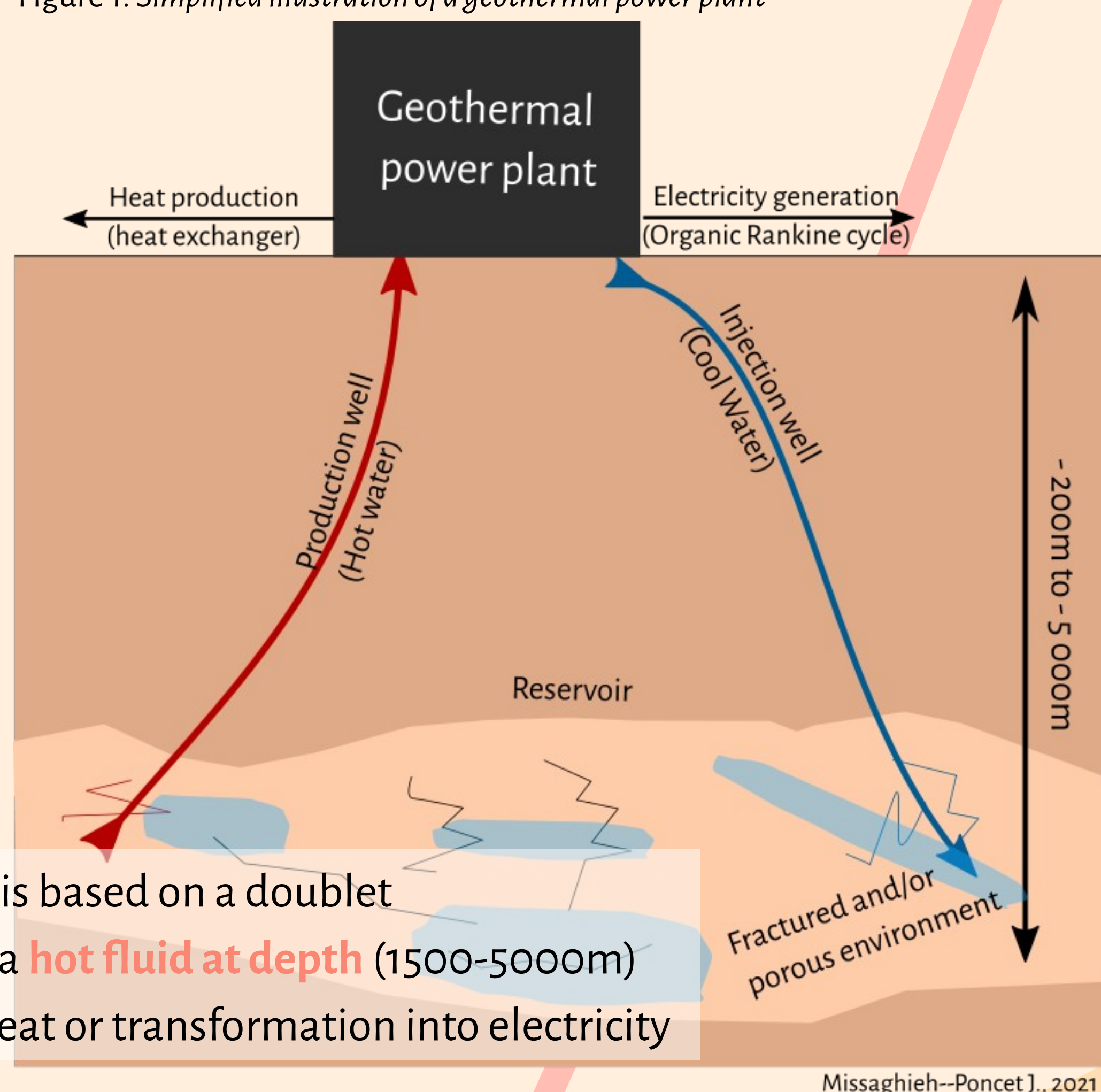
PhD student, Université de Pau et des Pays de l'Adour, E2S UPPA, CNRS, TREE, Pau, France

1 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**

2 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

3 CONCEPTUAL FRAMEWORK

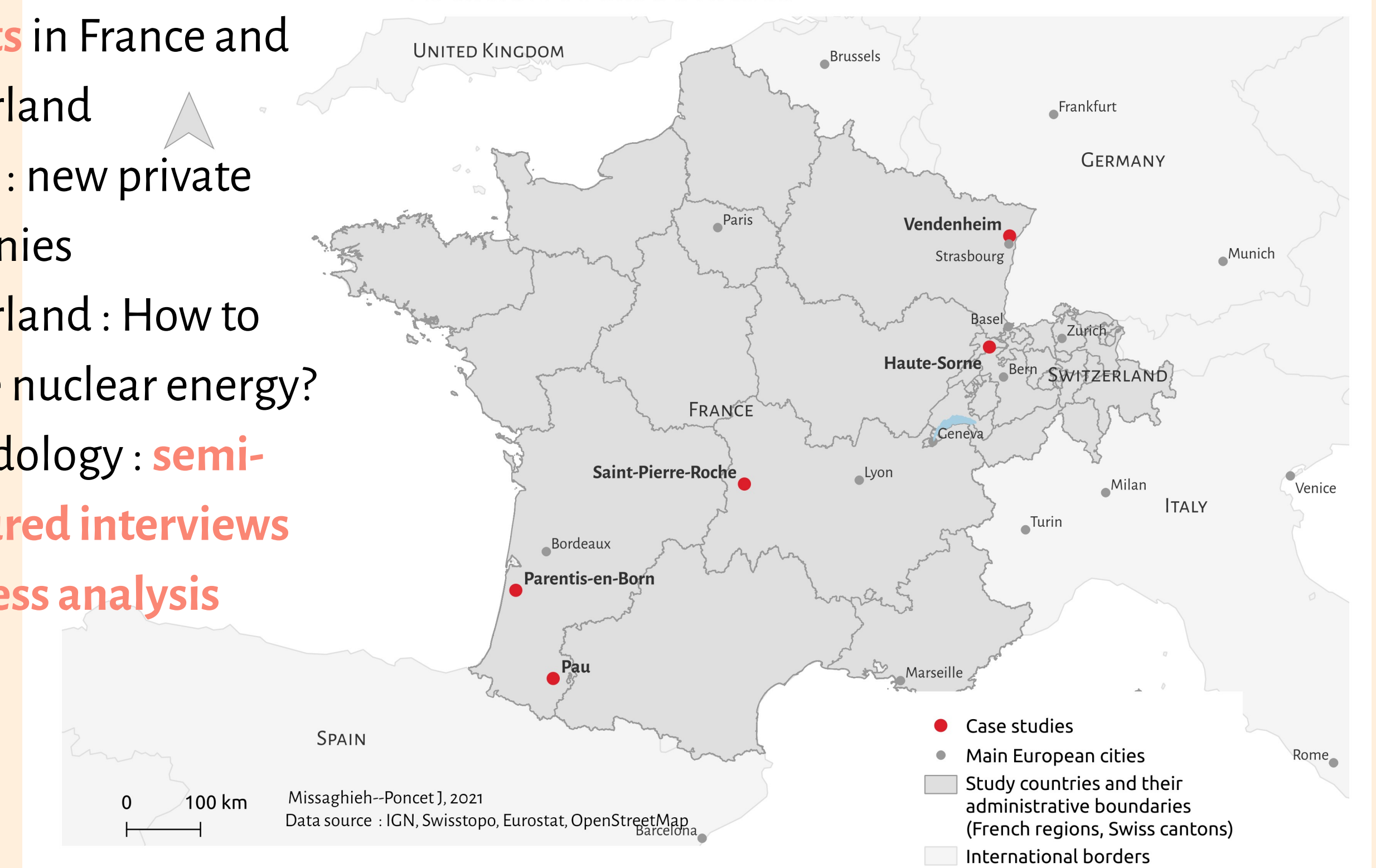
- The **subsoil is becoming politicized** (Arnauld De Sartre, Chailleux 2021).
- **Verticalization territories**: Greater awareness of the subsoil's existence and the necessity to 'secure' against seismic risk (Bobbette, Donovan 2019).
- **Sociology of translation** (Callon 1986): help to understand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

4 METHODOLOGY AND FIELDWORK

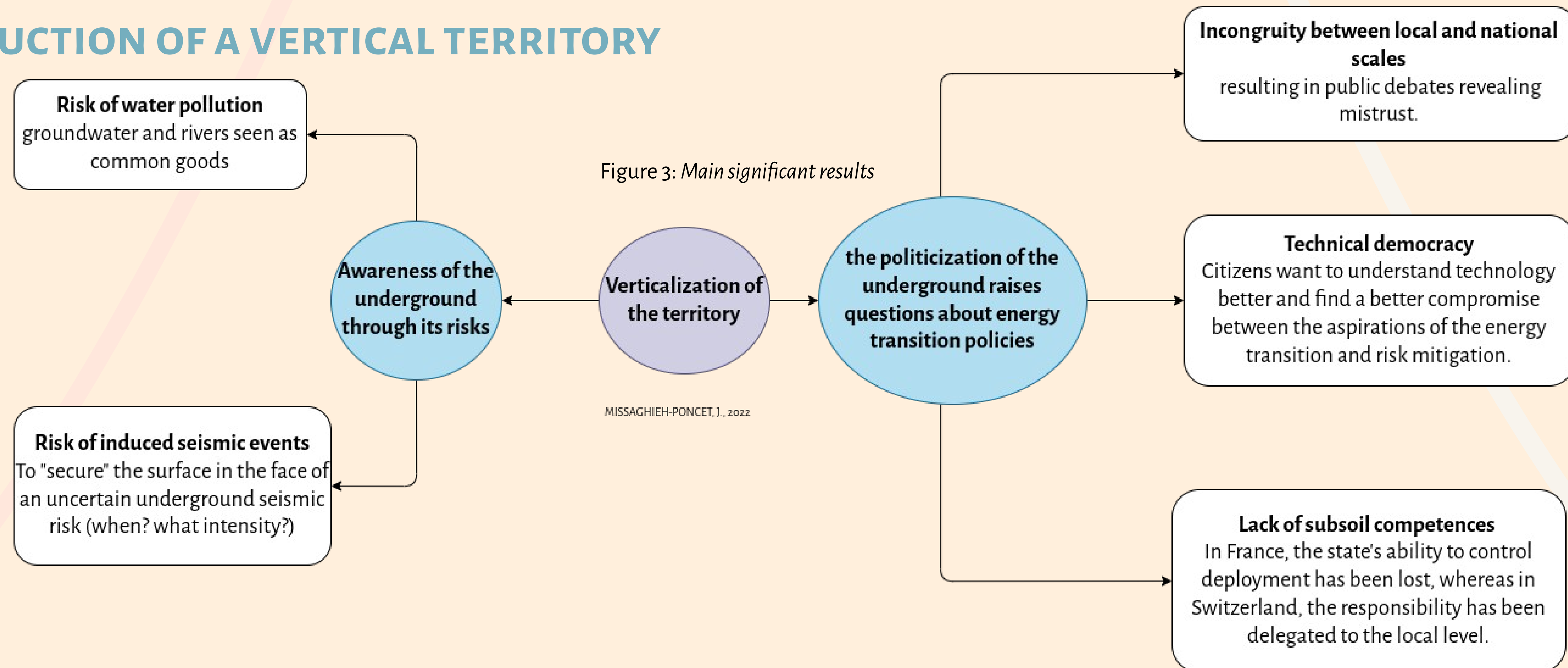
Figure 2: Location of case studies

- **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**

Location of case studies



5 CONSTRUCTION OF A VERTICAL TERRITORY



6 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.

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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/>
Please send an e-mail at justin.missaghieh-poncet@univ-pau.fr if you have any question or comment.

