



**HAL**  
open science

# Heat from the bowels of the earth: a political geology approach to the energy transition

Justin Missaghieh–Poncet

► **To cite this version:**

Justin Missaghieh–Poncet. Heat from the bowels of the earth: a political geology approach to the energy transition. UGI-IGU Paris 2022 - Le temps des géographes - Le congrès du Centenaire, Union Géographique Internationale-International Geographical Union, Comité National Français de Géographie, Jul 2022, Paris, France. hal-03727570

**HAL Id: hal-03727570**

**<https://univ-pau.hal.science/hal-03727570>**

Submitted on 19 Jul 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# La chaleur des entrailles de la terre : aborder la transition énergétique sous l'angle de la *political geology*

*Heat from the bowels of the earth: a political geology approach to the energy transition*

Justin Missaghieh--Poncet

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

UGI Paris 2022

19 juillet 2022



# Introduction: the energy transition, a driver for the relocation of energy

- The energy transition **relocates energy**
- It **mobilizes the subsurface** to produce decarbonized energy: i.e. deep geothermal energy
- But there is a **disruption of the power relationships** between the different actors:
  - Residents and energy: relocation of energy production with its externalities
  - Industrialists and territories: creation of **new risks** (seismic)
  - Political actors must position or **assume risks and govern technology** (Callon, Lascoumes, Barthe, 2001)
  - Industrialists and the government: the latter is required to **finance the advancement of an expensive technology**.



"Krafla Geothermal Power Plant" by ThinkGeoEnergy is licensed under CC BY 2.0.

# Introduction: Problematic and plan

**How does deep geothermal energy allow us to think about vertical territories?**

- I) *Political Geology*: when the subsurface becomes a political object
- II) History and principle of geothermal energy
- III) Field studies and methods
- IV) The construction of a vertical territory
- Conclusion

# I.A) *Political Geology*: when the subsurface becomes a political object

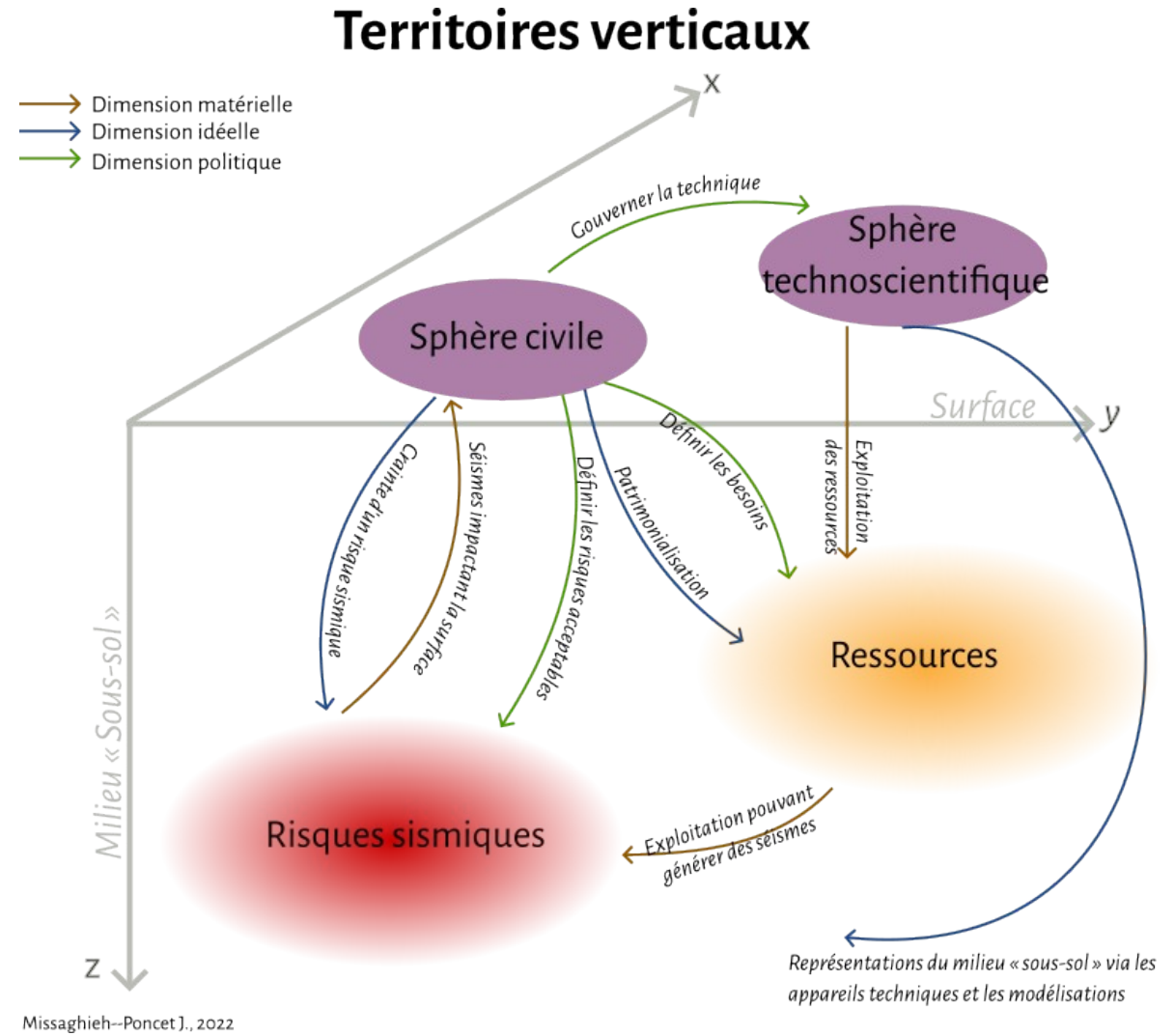
Addressing the **subsurface/political interaction** from the perspective of *political geology* (Bobette, Donovan 2019; Arnauld de Sartre, Chailleux, 2021)

- This interaction manifests itself through the **mobilization of geological layers**, their exploitation, transformation and destruction.
- Proposals of an approach linking the **material dimension of the subsurface and the social dimension** (public policies, production of knowledge, socio-technical construction):
- Material dimension: scientific knowledge marked by **uncertainty and use of technical equipment** to see and use the resources
- Ideal dimension: perceptions and **representations**, as well as **power games** around the subsurface.

# I.B) Geographisation of the field: the question of the verticalization of territories

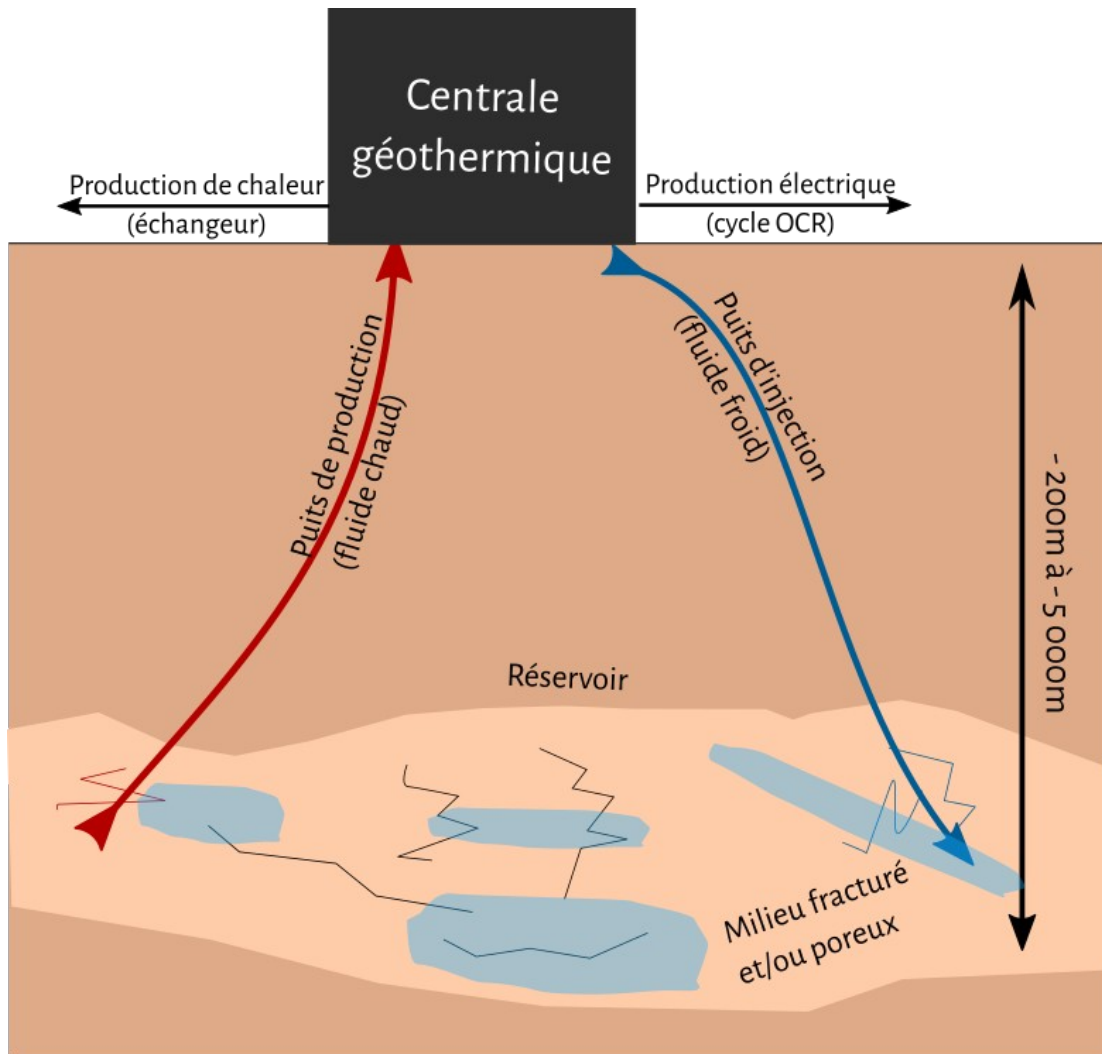
"Vertical territory" (Braun 2000 ; Elden 2013, Bobbette, Donovan 2019): **tilting the territory into three dimensions**, notably through the "securitization of volumes" (*ibid*, p. 119) → the strata and artefacts of the underground will influence the surface.

- Proposals to study these vertical territories according to Guy Di Méo's (1998) and Raffestin (2019) approach:
  - **Material**: the concrete reality, the materiality of the territory: the geological layers
  - **Ideal**: the representations that the different actors have
  - **Political**: how is the subsurface controlled and governed?





## II.A) Operating principle of deep geothermal energy



Missaghieh--Poncet], 2021

1. A first "production" well will **extract** a fluid at depth (2000-5000m), naturally heated by the subsurface.
2. This fluid will be used at the surface, via **heat exchangers**, to produce heat and electricity;
3. This fluid will then be **reinjected** into the subsurface through a second "injection" well

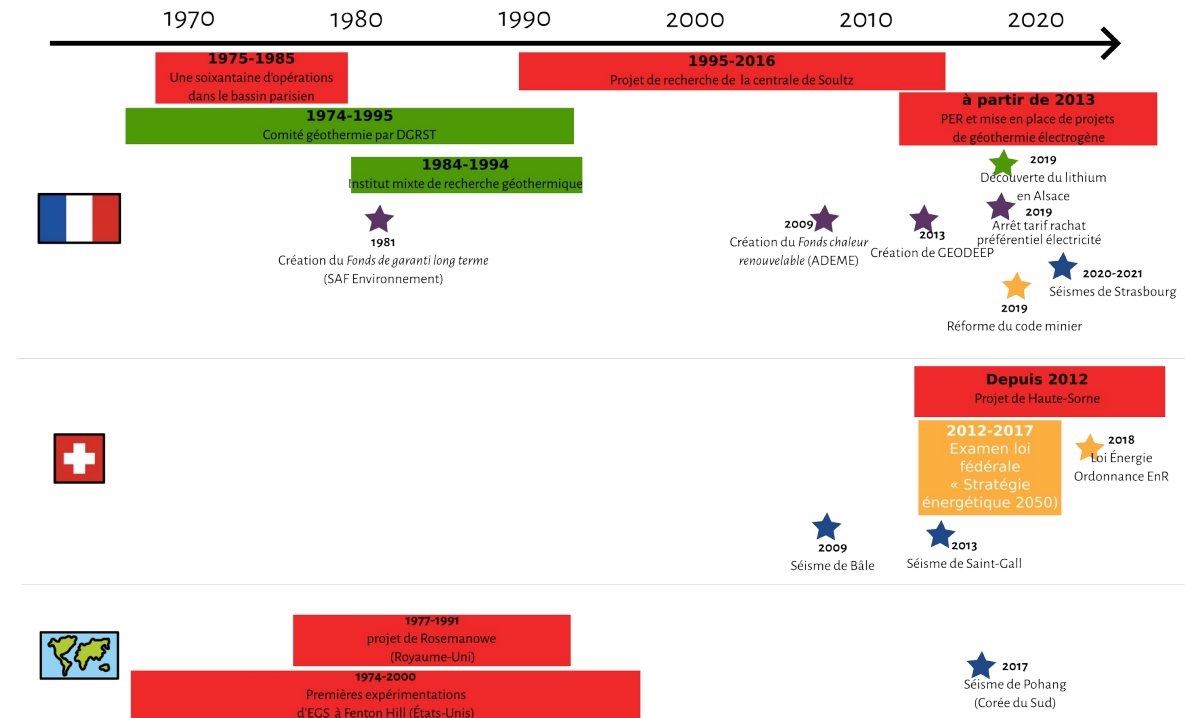
## II.B) History of its deployment in France and Switzerland

France:

- Development of geothermal energy in the **1970s** in the Paris Basin for **heating** purposes
- Return of the technology in **2013**, for **electricity production** (*Permis exclusif de recherche* granted)
- In **2019**, discovery of **lithium** in Alsace, reorienting industrial strategies

→ Switzerland:

- Willingness to change the energy mix, notably by **moving away from nuclear energy**, through the *Stratégie Énergétique 2050* in 2018
- **Financial support** from the federal government to **develop industrial pilots**





# III) Field studies: geothermal energy, revealing the construction of a vertical territory

## Localisation des terrains d'études



- Studying the development of geothermal energy **outside the Paris Basin**
- Saint-Pierre-Roche: context of crustal faults
- Vendenheim: faulted network of the Rhine basin
- Pau: closed loop pilot
- Haute-Sorne: horizontal wells
- Parentis-en-Born: covalorisation of heat from an oil exploitation
- Supported by new industrial operators or historical operators

### III) Methods: The choice of a qualitative approach

- Analysis of a local and national press review
- 35 Semi-structured interviews
  - **Industrials** (ÉS Géothermie, TLS Geothermics, Vermillon, Tom d'Aqui, Lithium de France, GeoEnergie, AFPD, Pôle Avenia)
  - **Public stakeholders** (New-Aquitaine Region, Pau Agglomeration, ADEME, DGEC, DGEC, IFPEN, BRGM, OFEN, Canton of Jura)
  - **Local representatives** (Eurométropole de Strasbourg)
  - **Academics** (UPPA, Swiss academic, EOST)
  - **Environmental and residents' associations** (Auvergne, Alsace)

## IV.A) The construction of a physical territory: the 'securing' of a seismic risk

→ Fear of a seismic risk leading to projects being stopped

- Awareness of the **need to "secure" the surface against an underground risk** by the inhabitants of a territory: petition to ban geothermal energy, setting up of dialogue bodies

→ Awareness of physical risks allows an awareness of the existence of the subsurface: it is not an inert medium, but a milieu with its own dynamics **influencing the surface.**

→ This awareness of the subsurface makes the relocation of energy tangible

Location	Year	Magnitude
Bâle (Switzerland)	2006	3,4
Saint-Gall (Switzerland)	2013	3,6
Pohang (South Korea)	2017	5,4
Strasbourg (France)	2020 2021	2 to 3,5

## IV.B) The construction of an ideal territory: the defence of a subsurface 'common good'



*Parentis oil pumping station.*  
© Plbcr / Wikimedia Commons, GFDL

→ Territorialization also involves an ideal perception of the subsurface, through the construction of a discourse showing the subsurface as a "**common good**" or a "**heritage**".

→ In Alsace, the opposition to geothermal energy was a reaction to **protect a "local common good"**, the largest water table in Europe, from the risks of pollution

→ In Parentis, oil exploitation dates back to the 1950s (Di Méo, Houtmann 1973; Enjalbert 1957), and **presented as a heritage object** by the oil operator

→ Beyond a material territory, **the representations and the patrimonialization of the subsurface territorialize the subsurface environment.**

## IV.C) The construction of a political territory: the dissemination of knowledge in the political and civic spheres and for a governance of the subsurface

- Positioning of elected representatives and citizens to **define an acceptable risk and govern the technique** (Callon, Lascoumes, Barthe 2001)
- Setting up of a commission in Alsace following the earthquakes, in order to define the types of geothermal energy that are acceptable, with **regard to the challenges of energy transition**
- The issue of **disseminating knowledge** about the subsurface in order to understand how it works also came up. Some spoke of "**citizen counter-expertise**".
- There is a desire to "**govern**" the **subsurface** through the issue of risk management and to define acceptable risks



# Conclusion: for a geography in volume

- *Political Geology* **redefines the relationship of a territory with its subsurface**, through material, ideal and political dimensions
- The relocation of energy is **raising awareness of the risks** among the population
- **Multiscale reconfiguration**: what acceptable risks, what governance, what financing, what uses of the subsurface?



Thank you for your attention  
[justin.missaghieh-poncet@univ-pau.fr](mailto:justin.missaghieh-poncet@univ-pau.fr)