

Early Career Franco-German
Workshop on energy geography
📍 Mulhouse – October 2023

Presentation of my thesis:

Development of deep geothermal energy in mainland France and French-speaking Switzerland

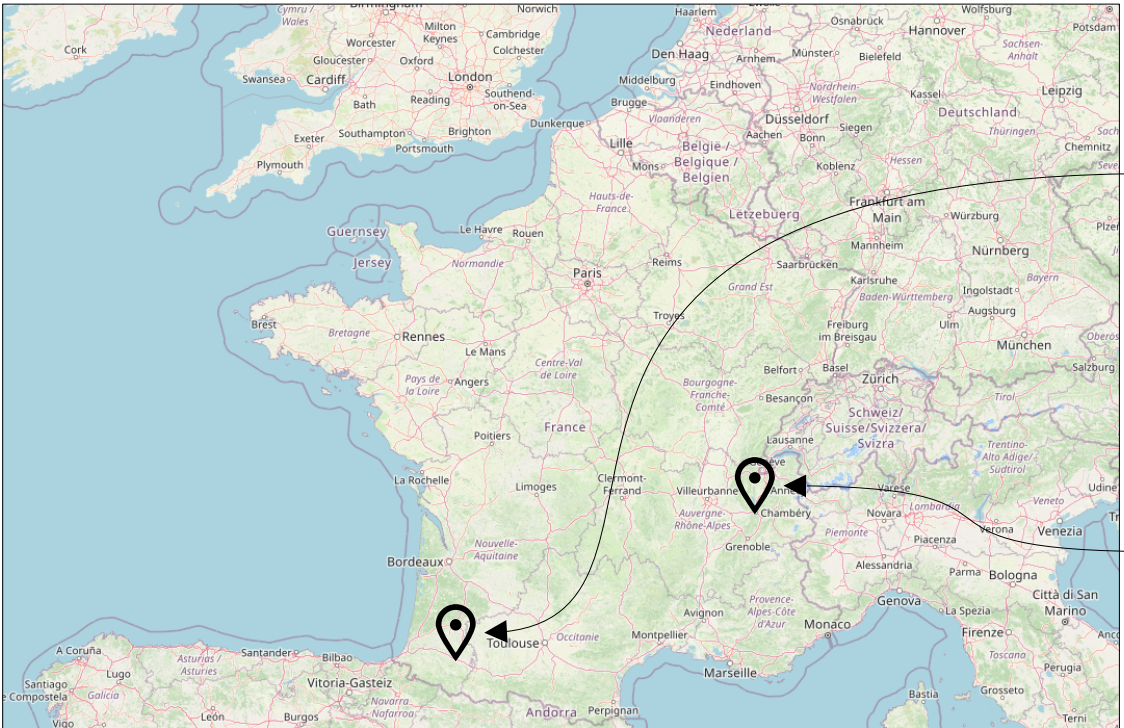
JUSTIN MISSAGHIEH--PONCET

PhD in Geography

Contact: justin.missaghieh-poncet@univ-smb.fr

Personal page: <https://justin.missaghiehponcet.eu>

ABOUT ME



November 2019 – May 2023
PhD Student in geography
at TREE laboratory (Pau)



September 2023 – February 2024
Post-doctoral researcher
at EDYTEM laboratory (Chambéry)



Outline

- Research question
- Research project
- Object
- Fieldwork
- Concepts
- Methodology
- Results
- Perspectives

RESEARCH QUESTION

How geothermal energy politicize subsurface in energy transition context?

1970's energy crisis: geothermal energy has been developing in Paris Basin (district heating) → successful, first renewable energy in Paris Region

2013-2019: energy transition: renewable electricity → lot of failure, a lack of social acceptability or something else?

THÈSE
UNIVERSITÉ DE PAU ET DES PAYS DE L'ADOUR
École doctorale 481 Sciences Sociales et Humanités

Présentée et soutenue le 25 mai 2023
par Justin MISSAGHIEH-PONCET

pour obtenir le grade de docteur
de l'université de Pau et des Pays de l'Adour
Spécialité : Géographie

AUX FRONTIÈRES DE LA GÉOTHERMIE PROFONDE :
L'ÉMERGENCE DU MILIEU « SOUS-SOL » DANS UN CONTEXTE DE
TRANSITION ÉNERGÉTIQUE

PRÉSIDENTE
Christine BOUISSET
Professeure des universités / Université de Pau et des Pays de l'Adour

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Michel DESHAIES
Laurence ROCHER
Professeur des universités / Université de Lorraine
Maître de conférences (HDR) / Université Lumière Lyon 2

EXAMINATEURS
Marie FORGET
Olivier LABUSSIÈRE
Maître de conférences / Université Savoie Mont-Blanc
Chargé de recherche CNRS / Université Grenoble-Alpes

DIRECTEUR
Xavier ARNAULD DE SARTRE
Directeur de recherche CNRS / Université de Pau et des Pays de l'Adour



<https://theses.hal.science/tel-04171215>

GÉFISS : MULTIDISCIPLINARY RESEARCH PROJECT

Project partners



⇒ ANR Project (2018-2022)

⇒ Build a knowledge base of governance in the field of subsurface engineering

⇒ Multidisciplinary team (social sciences, earth sciences, consultation, industry)

Industry sponsors



<https://www.gefiss.eu/>

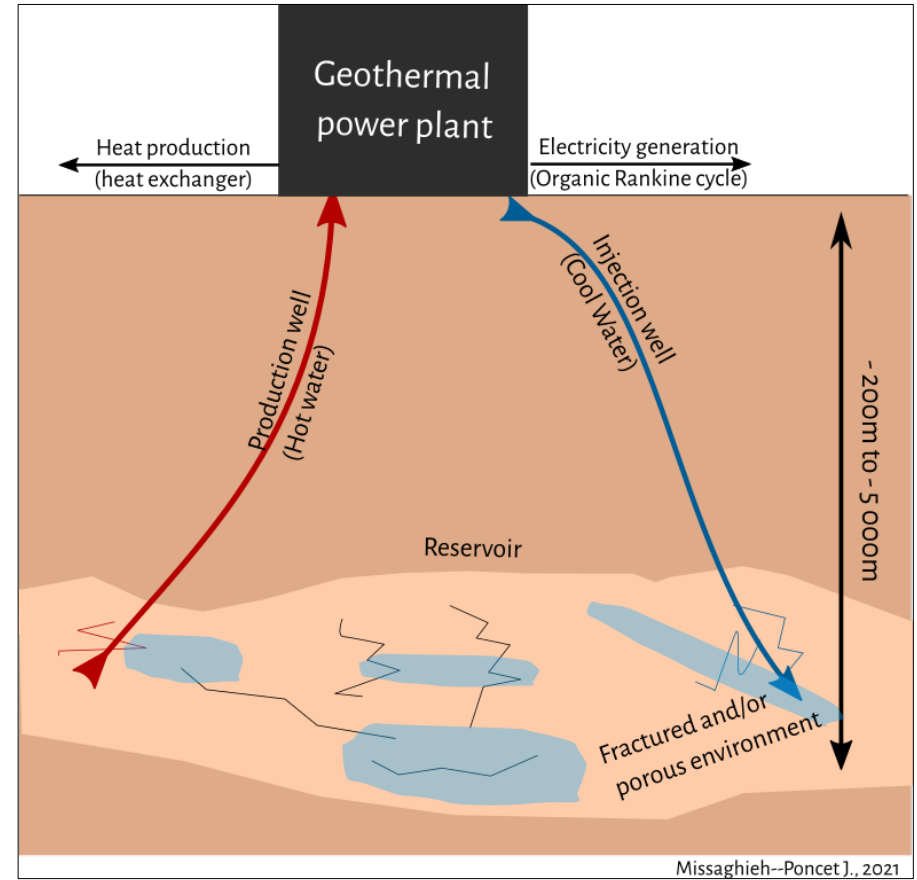
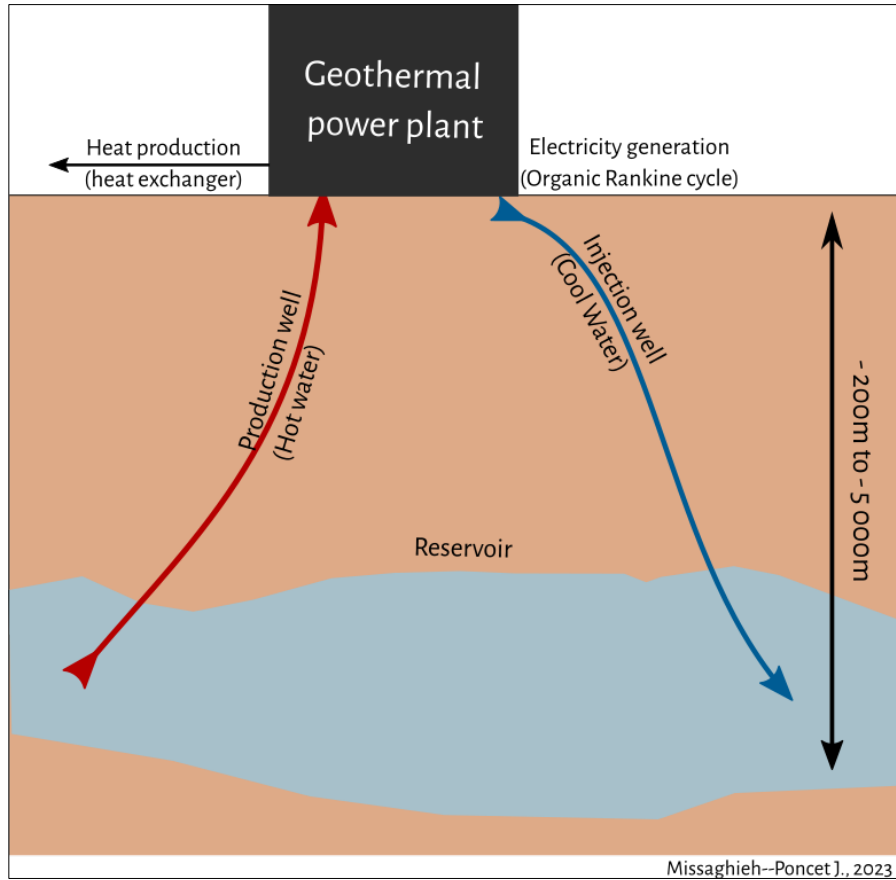
GÉFISS : MULTIDISCIPLINARY RESEARCH PROJECT

Research partnerships with companies: Reconciling scientific and industrial expectations?

Industrial expectations	Academic expectations
<ul style="list-style-type: none">- Bringing together a wide range of stakeholders (SHS, STEM, industry, administration, etc.)- To have a methodology for getting projects "accepted" and "getting people involved". <p>⇒ Operational response</p>	<ul style="list-style-type: none">- Produce an understanding of the world using the scientific method, make knowledge- Doctoral student: acquiring a scientific approach and validating a diploma <p>⇒ Conceptual response</p>

- **Asserting your position as a researcher**: we're not here to do social engineering
- **Deconstruct** industrialists' preconceptions (social acceptability)
- Take a **reflective stance on the relationship of the social sciences and society**, particularly in the current context.

HOW GEOTHERMAL ENERGY WORK?

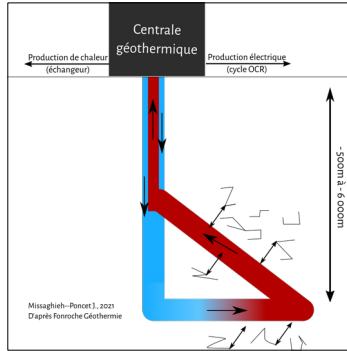


FIELDWORK

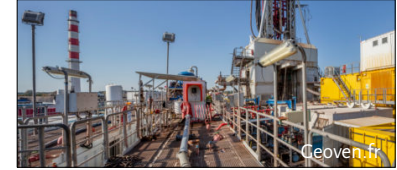
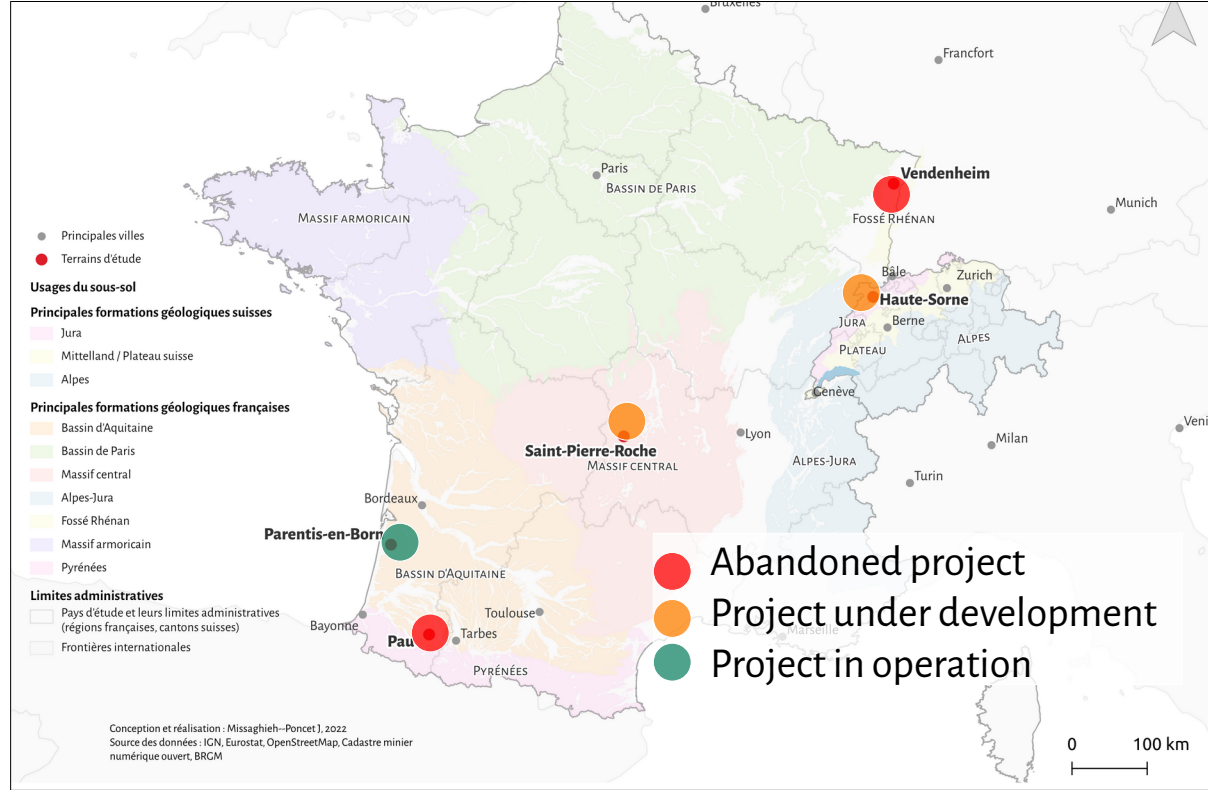


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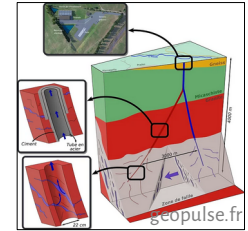
Parentis: Heat from an oil farm used to power tomato greenhouses



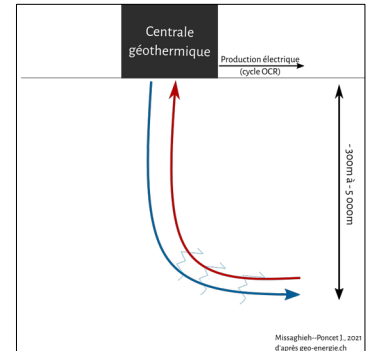
Pau: Use a monowell



Vendenheim: EGS case use



Saint-Pierre: Use crustal faults



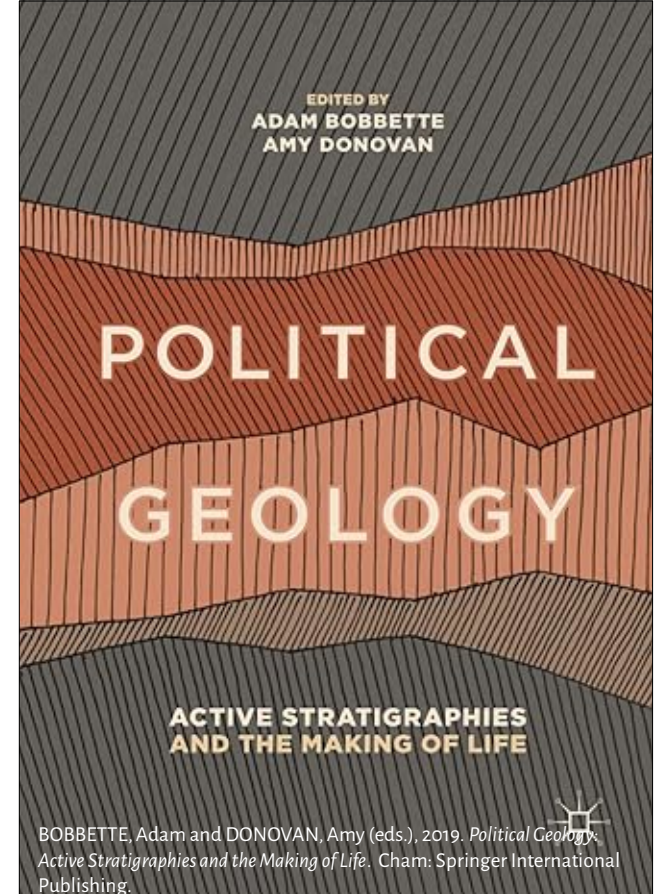
Haute-Sorne: Use horizontal drains

CONCEPTUAL FRAMEWORK

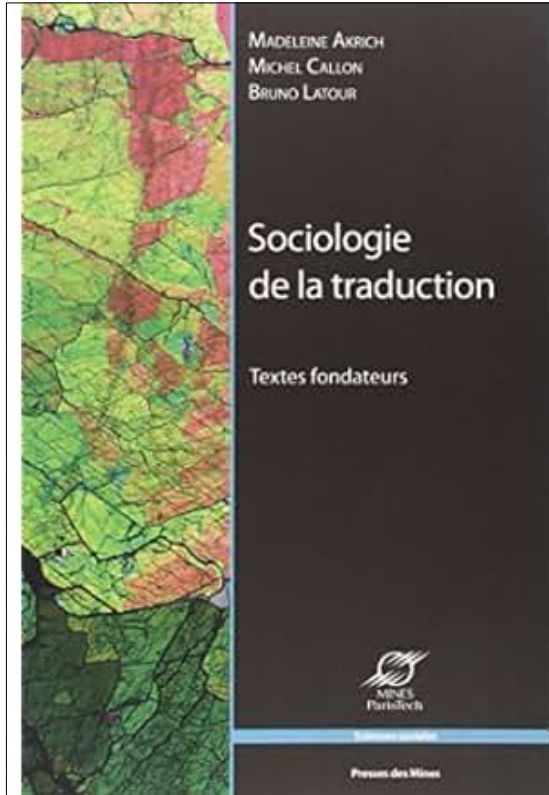
Political Geology

→ *Geological problems are politics problems* : resources use and control

→ Vertical territories = *subsurface is the extension of the surface* : analysis of a physical, ideal and political perspective.



CONCEPTUAL FRAMEWORK



AKRICH, Madeleine, CALLON, Michel and LATOUR, Bruno (eds.), 2006. *Sociologie de la traduction: Textes fondateurs*. Presses des Mines.

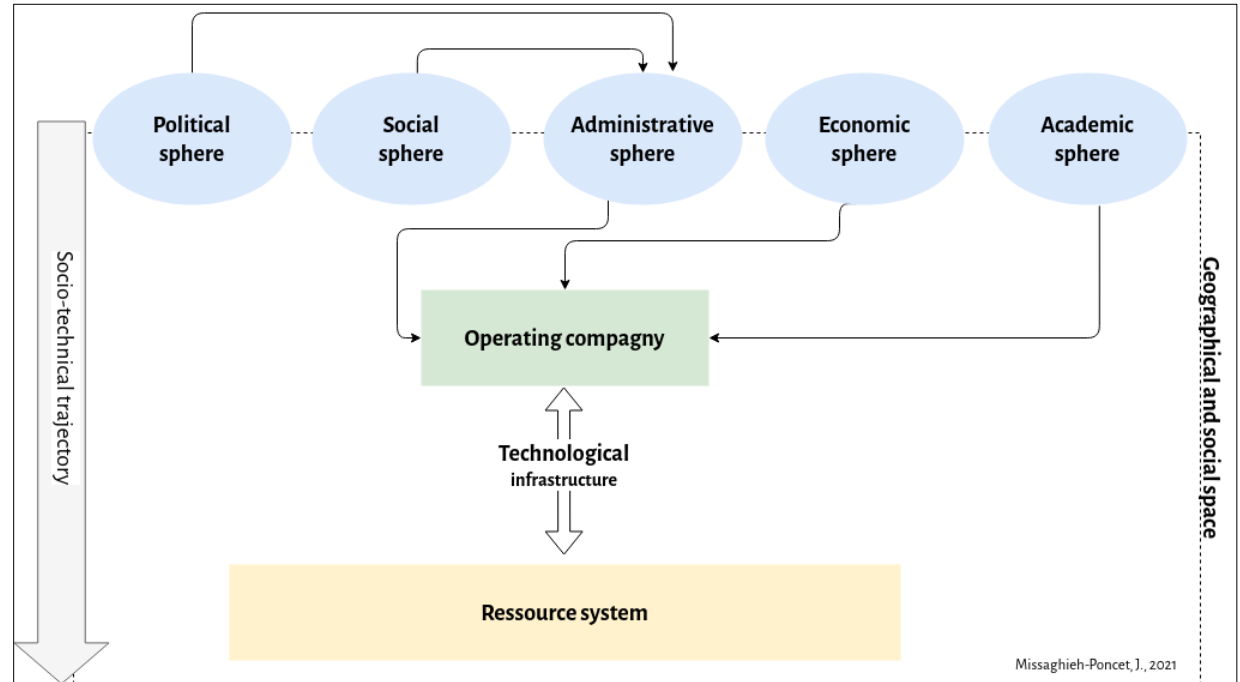
Sciences and Technology Studies

- Technological innovation is the result of **co-evolution** between technical choices and social facts
- Controversies reveal power relationships between stakeholders
- **Technology is political**

CONCEPTUAL FRAMEWORK

A socio-technical system proposal

Geothermal energy as a combination of technical objects, stakeholders and a political and geological context

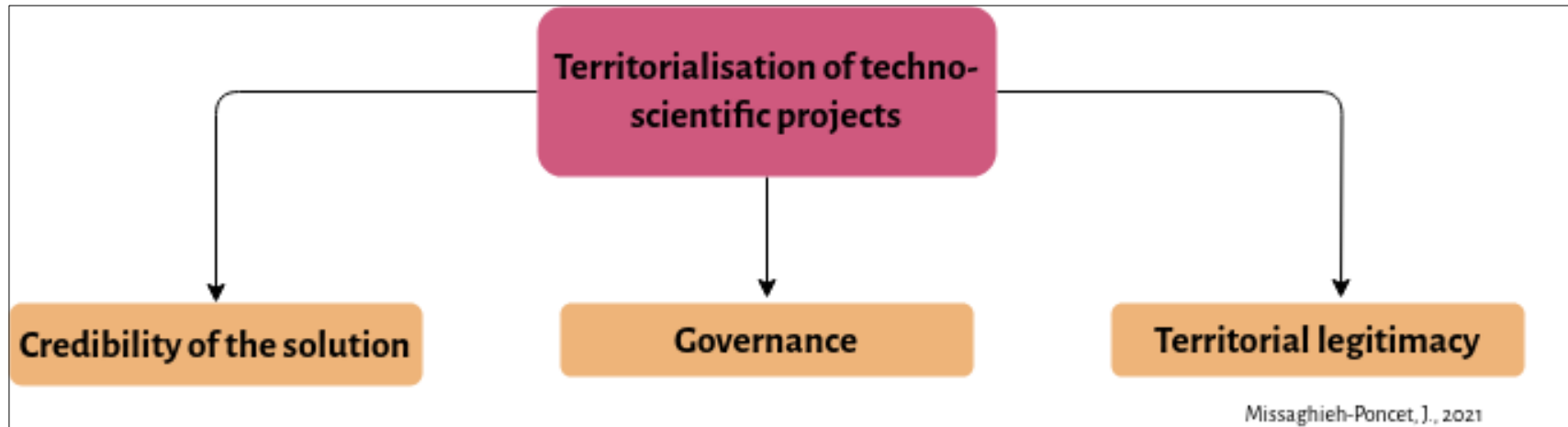


Missaghieh-Poncet, J., 2021

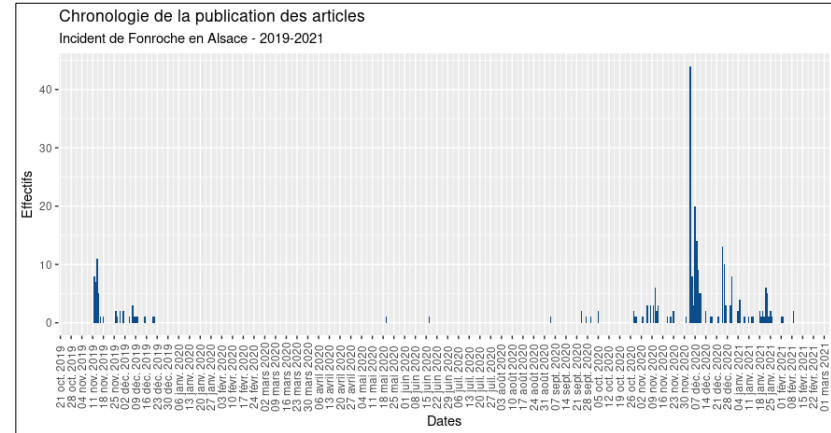
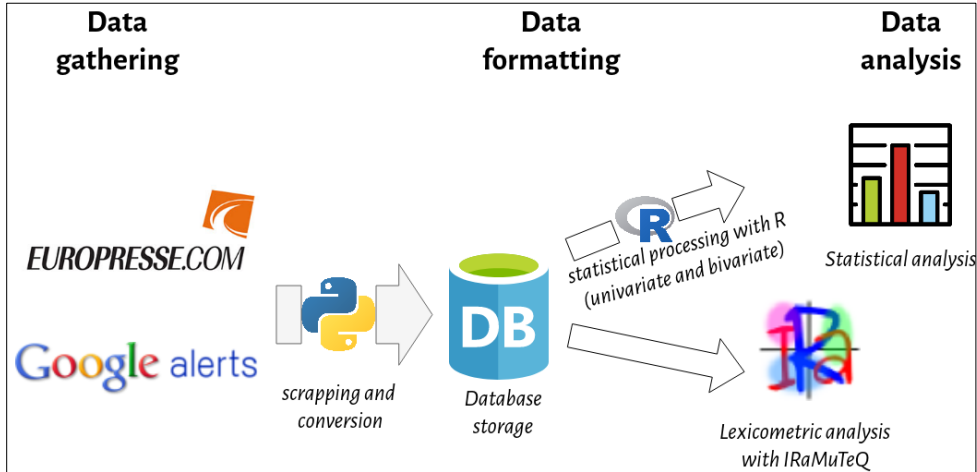
CONCEPTUAL FRAMEWORK

Territorialization of geothermal energy

- Credibility: economic and technical aspect
- Governance: stakeholders
- Legitimacy: fitting a project into a context

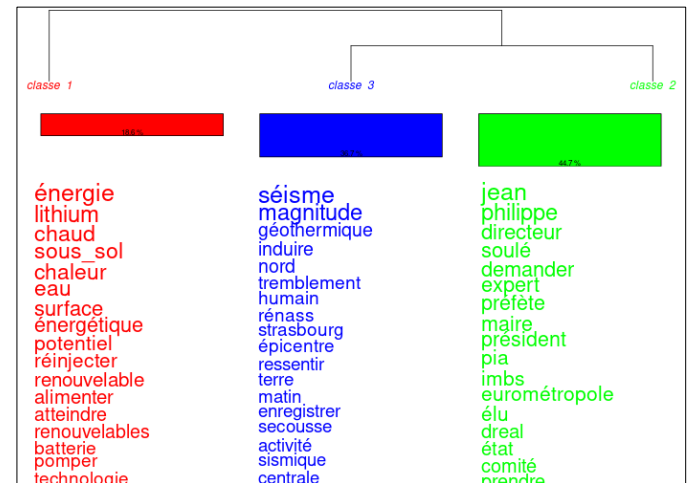


METHODOLOGY



Press analysis

- 1,314 press articles
- Quantitative analysis (who publishes and when)
- Lexicometric analysis to obtain "semantic worlds" (Iramuteq)



Dendrogram

METHODOLOGY



Public enquiry for the Pau project

Grey literature

Understanding the support and controversies surrounding geothermal energy

- Technical reports (expert reports on earthquakes, etc.)
- Administrative documents (public enquiries, local climate plans)
- Arguments for or against geothermal energy produced by the various stakeholders

MAIN RESULTS



French lithium production from geothermal energy

1. Social acceptability is only part of the problem

While there have been controversies, projects have been stopped for technical or safety reasons.

2. The technical-economic model is not stable outside Paris Basin

Exploration and exploitation are expensive and uncertain.

Electricity is not competitive, heat production is limited to local use, lithium production is R&D.

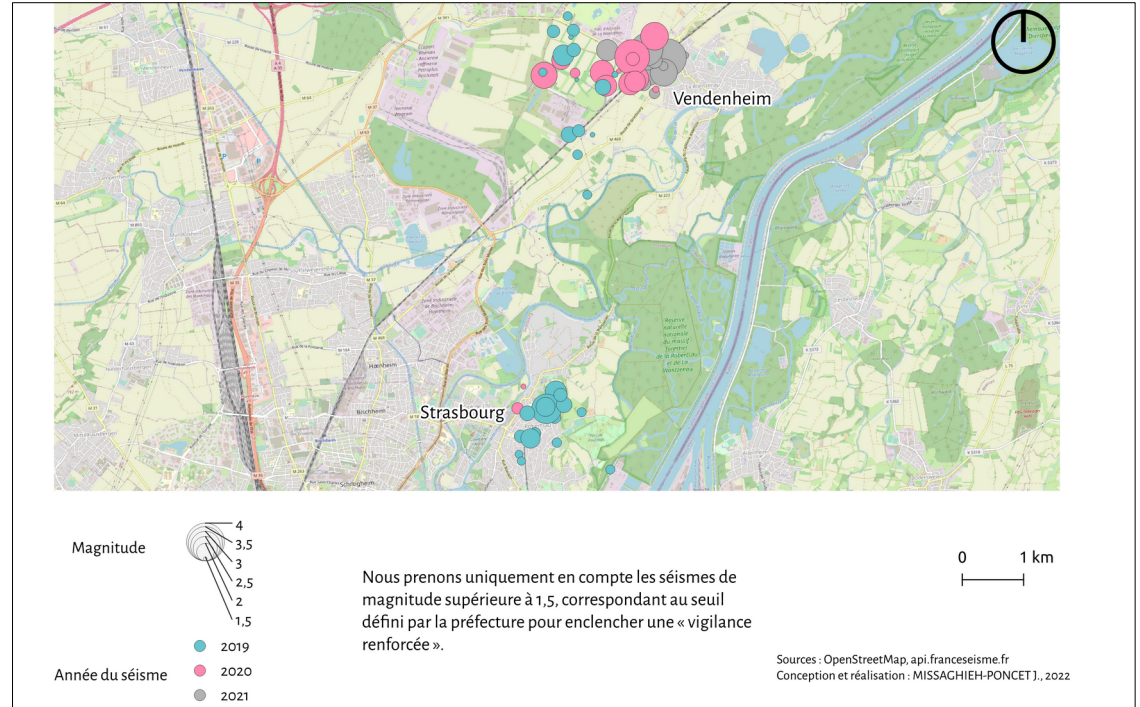
MAIN RESULTS

3. The subsurface is poorly managed by the State.

Strasbourg Earthquakes: Préfecture for not having sufficiently monitored the data transmitted by the operator, and therefore for not playing its role as mining police.

4. Vertical territories are being built up, but incompletely

The earthquakes in Alsace were an opportunity for the public to become more aware of the subsurface, through media debates on their use, and where associations sought to understand the mechanisms of earthquakes → PUNCTUAL EXPERIMENT



Strasbourg Earthquakes (2019-2021)

NOW: POSTDOCTORAL RESEARCH



Lithium mining project at Echassières (Auvergne).
Wikimedia.org

- Works on debate about lithium mining projects in Europe
- Calculate social acceptability by creating social risk index
- Understand politicization of subsurface in other contexts and technology

CONTACT DETAILS FOR FURTHER EXCHANGE

Justin.missaghieh-poncet@univ-smb.fr
<https://justin.missaghiehponcet.eu>