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How to govern deep geothermal projects? Political, environmental, and scientific issues involved in the debates related to the Strasbourg earthquakes (2019-2021)

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ABSTRACT

In 2019-2021 several earthquakes linked to a drilling site located north of the Strasbourg Eurometropolis (Alsace, France) led to significant changes in the policies and discourses of the stakeholders, elected officials, industrialists, prefecture, residents' associations. In December 2020, the prefecture enacted an ordinance to halt all operations on the incriminated site and a moratorium on all such projects near Strasbourg. Our paper analyzes these changes, using the media and the consultation mechanisms as our research field. First, we analyze the changes that have taken place in the institutional space and identify the associated communication issues. Second, we analyze how these reconfigurations are reflected in the narratives of the mainstream local media. Third, we analyze the reaction of the public through an analysis of the comments that appeared in social media (Facebook and Twitter) in reaction to posts by the main actors of the debate on geothermal energy. In conclusion, we propose some reflections on the way the public uptake social media in comparison with traditional media.

1. INTRODUCTION

In 2019, two deep geothermal power plants using the Enhanced Geothermal System (EGS) were under construction in Strasbourg Eurometropolis, Alsace, France. Despite significant opposition voiced as early as 2014 (Chavot et al. 2018), the operators behind these projects had the support of the public authorities and of Strasbourg Eurometropolis. However, in November 2019, several earthquakes of a magnitude (M_{lv}) greater than 2, and in June 2021, an earthquake of $M_{lv}=3.9$, disrupted the industrial and political consensus. The earthquakes, caused by the work carried out by operator A (Op. A) at a deep geothermal site located north of Strasbourg Eurometropolis, significantly modified the policies and discourses of the stakeholders, i.e., elected

officials, industrialists, the prefecture, and residents' associations. In 2020, in response to pressure from the mayors of the towns that were affected, the prefecture announced a halt to Op. A and a moratorium on all projects close to Strasbourg. Shortly after, it established an expert committee to shed light on the origin of the earthquakes and to reassess the risks induced by Alsatian geothermal projects. In 2021, Strasbourg Eurometropolis created an information and evaluation mission to discuss the governance of deep geothermal projects. Scientists, associations, and citizens were invited to join the discussions.

Our paper analyzes these changes using the media and the consultation mechanisms as our research field. Our corpus is composed of articles published in the regional press between June 2016 and June 2021; a selection of texts disseminated in and on social media; verbatim recordings and minutes of the information and evaluation mission meetings and of meetings of the prefectural monitoring committees. We assume that each stakeholder perceives, defines, and prioritizes risks, often in very different ways and that the solutions envisaged as well as the stakeholders' mode of engagement in communication and consultation reflect the interests they are defending.

2. BACKGROUND: ACCEPTABILITY, TRANSPARENCY AND EXPERTISE

The deep geothermal energy projects in Strasbourg Eurometropolis have received wide media coverage since 2014 for two main reasons. First, most projects have been contested by residents, and operators and local authorities have often used the media to reinforce their communication campaigns aimed at achieving the social acceptability of the projects. Second, since 2019, the projects have been widely debated in the public arena due to the occurrence of several seismic events.

The first arguments against deep geothermal projects emerged in autumn 2014, a few months before legal public inquiries were organized by the prefecture. Residents' associations viewed deep geothermal energy

as a risky and non-mature technology, imposed on the population with little benefit to the community. Seismic risk was mentioned by residents, a risk related to operations specific to EGS technology that residents compared to hydraulic fracking. Following the legal public inquiries, the prefecture granted three drilling permits. The operators and Strasbourg Eurometropolis then started a social acceptability campaign, which was often relayed by the media (Chavot et al. 2021). The projects are under the control of the prefecture. The creation of site monitoring committees in which operators, the prefecture, scientists, associations and elected representatives are invited to participate aimed to provide the necessary transparency concerning the progress of the projects. Site monitoring committee meetings were often followed by press releases organized by the operators or the prefecture.

The first boreholes were drilled in 2017 and 2018, in Vendenheim, in the north of Strasbourg Eurometropolis, by Op. A and in the south by operator B. The consultations between operators, representatives of Strasbourg Eurometropolis and the municipalities hosting the projects held at that time led to gradual acceptance of the projects. Strasbourg Eurometropolis described a "geothermal ecosystem" in which communities, operators and scientists collaborate on projects that will benefit the entire community and contribute to the energy transition.

The first sequence of felt earthquakes that occurred in November 2019 in the vicinity of the Vendenheim project, located north of Strasbourg Eurometropolis, barely affected the consensus. Work stopped but the prefecture and Strasbourg Eurometropolis were initially quite skeptical about the alleged link between the earthquakes and geothermal projects (according to a site monitoring committee meeting held on December 12, 2019 and a Strasbourg Eurometropolis meeting on November 29, 2019). They pointed to the fact that the epicenter was 5 km from the wellhead and dismissed the opinion of scientists, claiming that they were too quick to label the earthquake as induced by a geothermal project (Chavot et al. in press). A third party expertise was then enlisted by the prefecture, which proposed, among other recommendations, a "tracing test" to determine the path of the water in the rock. Op. A started the test in September 2020.

Several seismic sequences with magnitudes reaching $M_{lv}=2.7$ occurred between October 27 and November 11, 2020. As a result, arguments against geothermal energy resurfaced during site monitoring committee meetings, first by the residents' associations and then by the mayors of municipalities bordering the projects. In response, the representatives of the prefecture tried to relativize the seismic events by the fact that natural seismicity exists in Alsace and that any geothermal project will cause micro-seismicity. However, the mayors questioned the relevance of geothermal energy and underlined the difficulty they faced defending geothermal energy when confronted with the concerns

of their inhabitants. When the prefecture failed to respond, they decided to alert national media.

The M_{lv} 3.6 magnitude earthquake on December 4, 2020 marked a major turning point. The prefecture and Strasbourg Eurometropolis grasped the urgency of the situation. At a site monitoring committee meeting (December 9, 2020), the prefect endorsed the demands of the town councils. She announced the publication of a decree calling a definitive halt to the work carried out by Op. A and a moratorium on the other projects. Shortly afterwards, the prefecture created an expert committee to shed light on the origin of these earthquakes and to reassess the risks of the projects. For its part, Strasbourg Eurometropolis was also aware of the urgency to communicate and on December 11, organized a live Facebook meeting during which operators, scientists, associations, and elected officials debated for almost two hours. At the same time, it set up an information and evaluation mission to debate the geothermal energy issue and Strasbourg Eurometropolis' plans for the energy transition.

During these successive movements, residents' associations, as well as Strasbourg scientists, tended to occupy a more central place than previously in exchanges with the prefecture and Strasbourg Eurometropolis. The decision-making process seemed to be more open, as associations, scientists and mayors were invited to participate in site monitoring committee and information and evaluation mission meetings. In what follows, we analyze how the media reported on these changes, and the reaction of residents on social media.

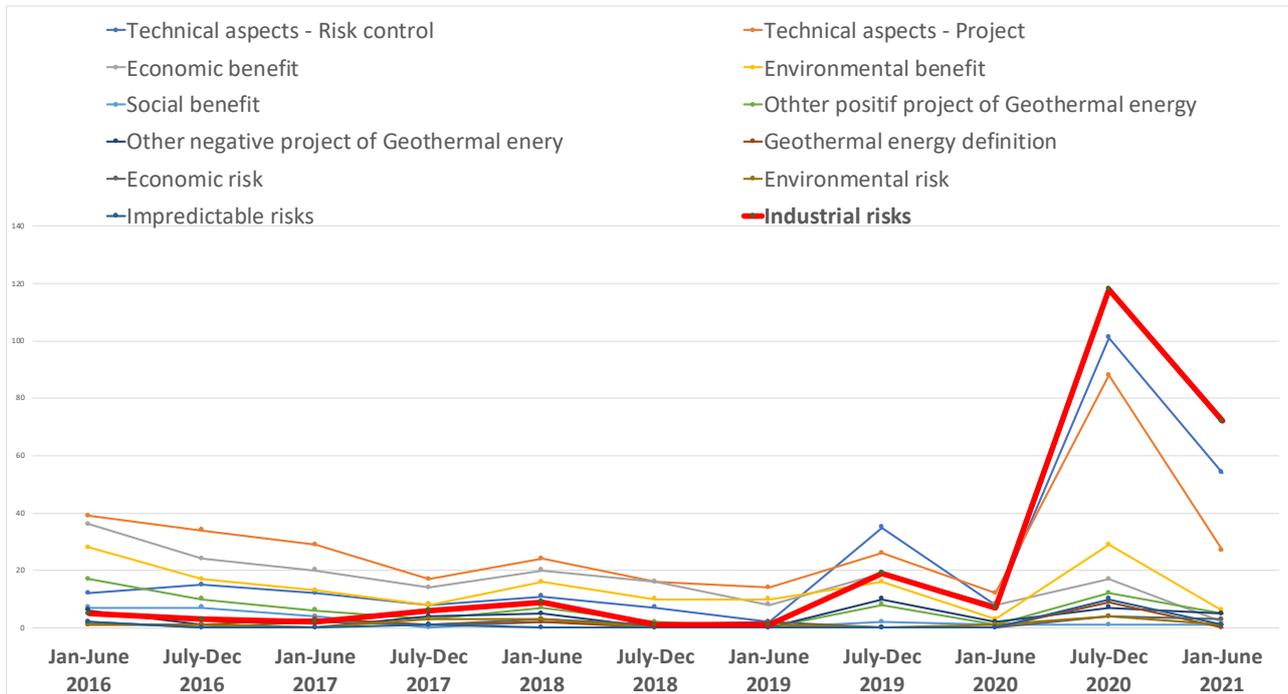
3. CHANGES IN NARRATIVES IN LOCAL DAILY NEWSPAPERS

To analyze how the media adapted their discourse to the changes that have taken place in institutions we used a corpus of 803 articles published in the regional Alsatian press between January 2016 and June 2021. Each article was coded according to the angles and viewpoints put forward by the media, their sources, and the use of different argumentation frameworks. For the purpose of this article, we searched for all publications in which the theme "industrial risks" was covered. Although the risk was mentioned in a few publications in the period 2016-2019, it was only after the first earthquake in November 2019, that the theme received massive coverage in the local press (fig. 1). We used this sub-corpus of 389 articles to analyze changes in the discourse of actors (operators, local institutions, scientists, the prefecture) as they appeared in Alsatian newspaper articles. Content analysis was performed using Atlas.TI v.9 software.

The analysis clearly revealed changes in press discourses that echoed changes in the governance of the geothermal projects. In addition, the media tended to construct narratives by emphasizing opposition between different categories of actors. Indeed, it was as if the earthquakes had created conflicts between scientists and operators, but also between

municipalities located close to the geothermal projects and local authorities.

Figure 1: Occurrence of the different coded themes per year in the local press (*Dernières Nouvelles d'Alsace* and *L'Alsace*), January 2016 to June 2021

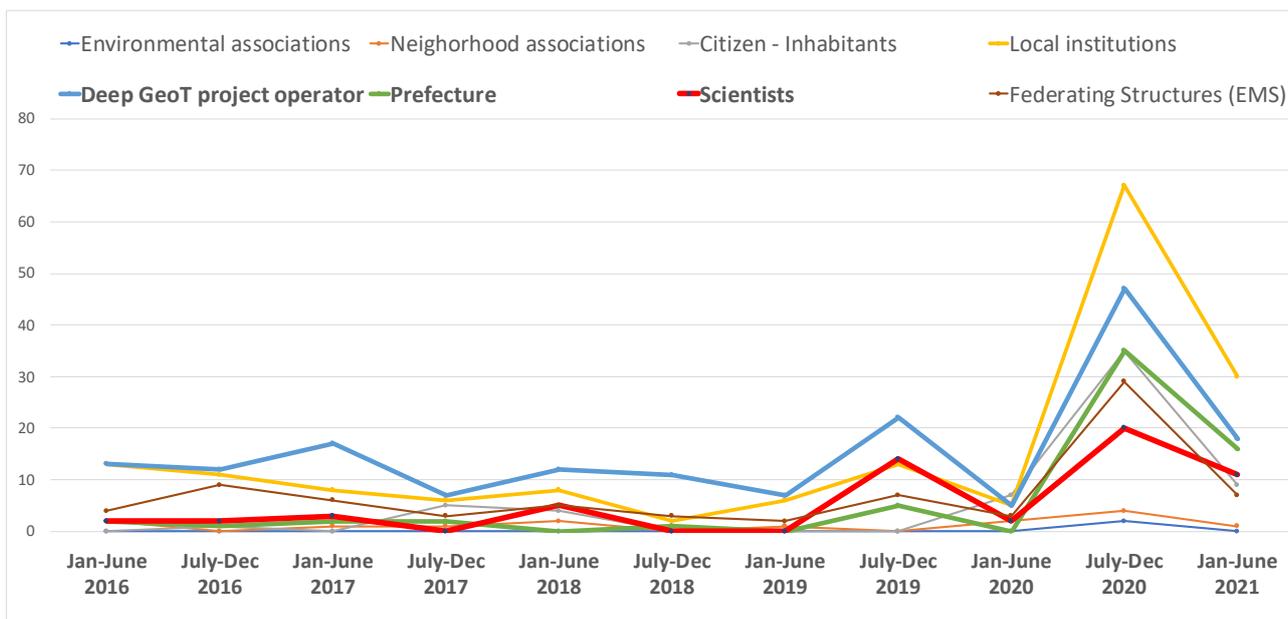


3.1. A new allocation of roles between scientists and industry

The first major change concerned the relationships between scientists and operators. In the period prior to the first seismic event, scientists were rarely used as sources by the local media (Serrano et. al 2020).

Operators were presented as the main actors of geothermal projects. They appeared in the media as geothermal experts, defending the maturity of the discipline, reassuring the audience that deep geothermal projects are safe and will benefit the whole community (Chavot et al. in press).

Figure 2: Occurrence of sources quoted by the local daily press, January 2016 - June 2021



This changed after the first seismic event in November 2019. Scientists became more visible in the local press (fig. 2). They were portrayed as being responsible for identifying the origin of earthquakes. In particular, the national seismic surveillance network (French acronym ReNaSS) was systematically used as a source to corroborate the induced nature of an earthquake. Although ReNaSS statements after the first seismic event were widely contested by other stakeholders, the ReNaSS gained notoriety in 2020 and 2021 with the multiplication of seismic events, as shown in this *Dernières Nouvelles d'Alsace* report following a 3.4 earthquake event: “The ReNaSS [...] promptly began to analyze the data recorded this Friday at 7:33 p.m., confirming an induced earthquake, i.e. generated by human activity, in the area of the drilling site located north of Strasbourg” (*Dernières Nouvelles d'Alsace*, January 23, 2021).

The portrayal of the operators in the local press changes with the crisis from that of experts who dismissed the scientists' statements to that of presumed guilty parties who had to prove they had acted in accordance with the prefecture's instructions.

- After the first earthquake in November 2019, they were quoted as refuting the induced origin of this seismic event and stating that the risks are under control: “For us, the [...] report is based on hasty assertions and conclusions that do not serve public opinion since the facts have not yet been determined.” (*Dernières Nouvelles d'Alsace*, November 28, 2019).
- In 2020, Op. A began to admit its responsibility, but stated that the origins of the earthquake could be linked to the execution of the tracer test: “All the [seismic] events of October and November are the result of the tracing tests requested by the prefecture [...]”, emphasized [...the] CEO of [Op. A], without wanting to deny its responsibility as an operator” (*Dernières Nouvelles d'Alsace*, November 19, 2020). The press also highlighted the company's desire to communicate transparently with the public.
- In 2021, when it was attacked by the prefecture for not having respected its commitments, the operator stated that it had not committed any errors: “we did not drill deeper without informing the DREAL [prefecture monitoring service] in due time”, affirmed [CEO of Op. A], raising his voice almost imperceptibly. [...] “At no time did we exceed [the limit of] 100 bars of pressure” (*Dernières Nouvelles d'Alsace*, January 5, 2021).

3.2. Pressure from mayors and changing attitudes of the prefecture and Strasbourg Eurometropolis toward deep geothermal projects

This change in narratives involving operators needs to be considered in relation to the way the media portrayed other stakeholders, which appeared in a very evolving context. In 2020, earthquakes succeeded one another

and increased in intensity, and the mayors of the affected communes became increasingly adamant that the prefecture should take appropriate measures.

Before 2020, only a few elected officials from municipalities located near geothermal projects appeared in the media (coded as local institutions in fig. 2), in which their opposition to geothermal energy was dramatized. This was notably the case of the town hall of Oberhausbergen, which kept up the pressure to such an extent that no drilling could be done to the west of Strasbourg Eurometropolis.

In autumn 2020, following the succession of earthquakes, a new wave of opposition to geothermal energy emerged in the north of Strasbourg Eurometropolis, and their arguments were widely reported in the press. In this context, the elected officials were presented by the Alsatian press as the spokespersons of the inhabitants who no longer want geothermal energy. In 2020, the press reports on the increasing commitment of these peri-urban municipalities: “the mayors of Reichstett, La Wantzenau and Vendenheim who are calling for ‘clear information from the decision-makers on the future of this site’, and in particular from the State which [...] gave [Op. A] authorization to operate this site despite the unfavorable opinions of the two municipal councils” (*Dernières Nouvelles d'Alsace*, November 12, 2020).

However, pressure from the mayors, as reported by the Alsatian newspapers, apparently attracted little attention from Strasbourg Eurometropolis and the prefecture. Until December 2020, representatives of the EMS rarely spoke to the media, except to reiterate their strong support for deep geothermal projects. Although the earthquake of November 2019 did impact their enthusiasm, Strasbourg Eurometropolis retain geothermal energy in its energy plan until 2021.

The viewpoint of the prefecture, which is generally considered to be the police of geothermal projects, was particularly scrutinized by the media in the period 2019-2021. In 2019, local daily newspapers quoted the prefecture's announcement of the temporary suspension of geothermal drilling in the north of Strasbourg Eurometropolis. But the prefecture continued to support the project and encouraged Op. A to proceed with the tracing test in early 2020. Their support continued until December 2020, despite the fact the test induced several seismic events. In November 2020, the prefecture told the media that seismic activities were due to rock adjustment and underlined the fact that “during test phases, deep geothermal energy systematically generates seismicity” (*L'Alsace*, November 12, 2020). The seismic event of December 4 put an end to this support. The local press announced: on Monday, December 7, “the prefect of Bas-Rhin, [...], signed a decree which puts a definitive end to the activity of Geoven, the geothermal power plant of [Op. A] located in the Vendenheim area” (*Dernières Nouvelles d'Alsace*, December 9, 2020).

The prefecture justified its decision by its desire to ensure the safety of the inhabitants.

From then on, while the prefecture maintained its position and tried to prove that the industrialist had proceeded wrongly, the local press spotlighted the opposition between Strasbourg Eurometropolis and the communes affected by the seismic events. It was as if, in the media narrative, Strasbourg Eurometropolis continued to support geothermal energy.

- A few days after the December earthquake, the press announced the creation of an information and evaluation mission by Strasbourg Eurometropolis and relayed the words of the Strasbourg Eurometropolis representatives who underlined the interest of this renewable energy: “Geothermal energy has existed for several years in the Eurometropolis and has had successful results, with different operators, different basements, different techniques”, recalled the President of the Eurometropolis, [...], who admitted that “the earthquake of November 2019 whose intensity was 3.2, raised questions in everyone’s mind” (*Dernières Nouvelles d’Alsace*, December 5, 2020).
- In 2021, when the information and evaluation mission began its work, the press highlighted the commitment of the Strasbourg Eurometropolis to guarantee the reliability of the information provided to the public: “the president of Strasbourg Eurometropolis, emphasizes that she is ‘in close contact with the prefect and [Op. A] to guarantee that ‘the information is sent to all the mayors of the municipalities concerned’” (*Dernières Nouvelles d’Alsace*, January 24, 2021). “There is an urgent need to understand, to provide the widest possible information on the subject in respect of the people who are currently victims” (*Dernières Nouvelles d’Alsace*, January 30, 2021).

At the same time, the media portrayed the efforts of the municipalities to obtain reparations and to put an end to geothermal projects: “the mayor persists in her request for classification as a natural disaster, even if the seismic events are induced”; “during the next municipal council on January 27, the mayor will put to a vote a motion to reject deep geothermal energy in the reservoir impacting the territory” (*Dernières Nouvelles d’Alsace*, January 19, 2021). And the daily press also relayed the arguments of the mayors in the form of warnings addressed to Strasbourg Eurometropolis and the prefecture: “If the moratorium is lifted tomorrow, I think something will happen on the ground, there will be demonstrations, a movement like in Oberhausbergen. We are also in contact with the collective ‘Geothermal energy in Eckbo, No Thanks’” (*Dernières Nouvelles d’Alsace*, January 24, 2021). In so doing, the media highlighted local elected officials’ mistrust in the operators and the prefecture.

To sum up, the Alsatian newspapers dealt with the controversy based on the words of the main

stakeholders, the common thread being the search for those responsible. Now, we look at citizens' reactions to the seismic events and the ensuing controversy, as they appeared in social media.

4. HOW DID CITIZENS REACT TO STAKEHOLDERS' DISCOURSE? SOCIAL MEDIA CORPUS

The main interest of an analysis of social media in the context of geothermal energy in Alsace is to understand their uses and their possible impacts on the development of a local controversy. To this end, we first examined how stakeholders use the social media and then how citizens and residents interacted with it.

4.1. Methodological approach

We collected the posts published in Facebook and Twitter by operators, residents' associations and environmental associations, local institutions, elected representatives and the media. Several key dates were chosen, including the start of drilling, the dates of the main earthquakes, and the prefectural decision to stop the Op. A project. In the second stage, we collected comments during the three days that followed each date using Facepager software. The analysis was performed by the free software Iramuteq. This software classifies comments according to the proximity of the lexical elements that they contain. It constructs classes that integrate sets of comments that contain the same types of words (Sebbah et al. 2018). In the process, words contained in the comments are lemmatized (i.e. verbs are reduced to the infinitive, nouns to the singular and adjectives to the masculine singular) and only the full forms (nouns, adjectives, verbs and adverbs) are processed. This approach does not take into account smiles or retweets.

4.2. Analysis of activity on social media

For the purpose of this study, we selected 43 actors and 10 key dates, that led to the retrieval of 308 publications related to geothermal energy in Alsace. Seventy percent of these publications came from Facebook.

Table 1: Distribution of publications per category of stakeholder

Corpus	Total of posts	Posts on Facebook	Posts on Twitter
Operators	4	0	4
Associations	76	76	0
local Institutions	43	32	11
Media	185	109	76

Table 1 shows that the actors engage with social media in different ways. The media themselves use social media platforms to extend the audience of their printed and broadcast editions. Apart from the media, associations and institutions were the most widely represented in our corpus of publications. It should be noted that whereas operators are generally pretty visible

in the mainstream media, they are almost invisible on social media platforms.

The temporality is also interesting. We noted a massive investment in social media starting on November 12, 2019, the date of the first major earthquake in Strasbourg Eurometropolis. Peak publications were concentrated around the dates seismic events occurred: in fact, 90% of the publications were distributed around these dates.

Table 2: Breakdown of comments according to the category of stakeholder

Corpus	Total comments	Facebook comments	Twitter comments
Operators	2	0	2
Associations	147	147	0
Institutions	1026	991	35
Media	20419	20206	213

Based on this corpus of publications, we collected 21,594 comments. Facebook accounted for 98.8% of them and Twitter only 1.2% (tab. 2). This disparity may be explained by the localized nature of this controversy. Indeed, Twitter is a platform for actors with a major interest in national politics, and who are generally embedded in the journalistic and political space (Boydjian 2016). In contrast, Facebook facilitates the

creation of communities who engage in exchanges related to shared concerns, which may or may not be locally based (Pasquier 2018).

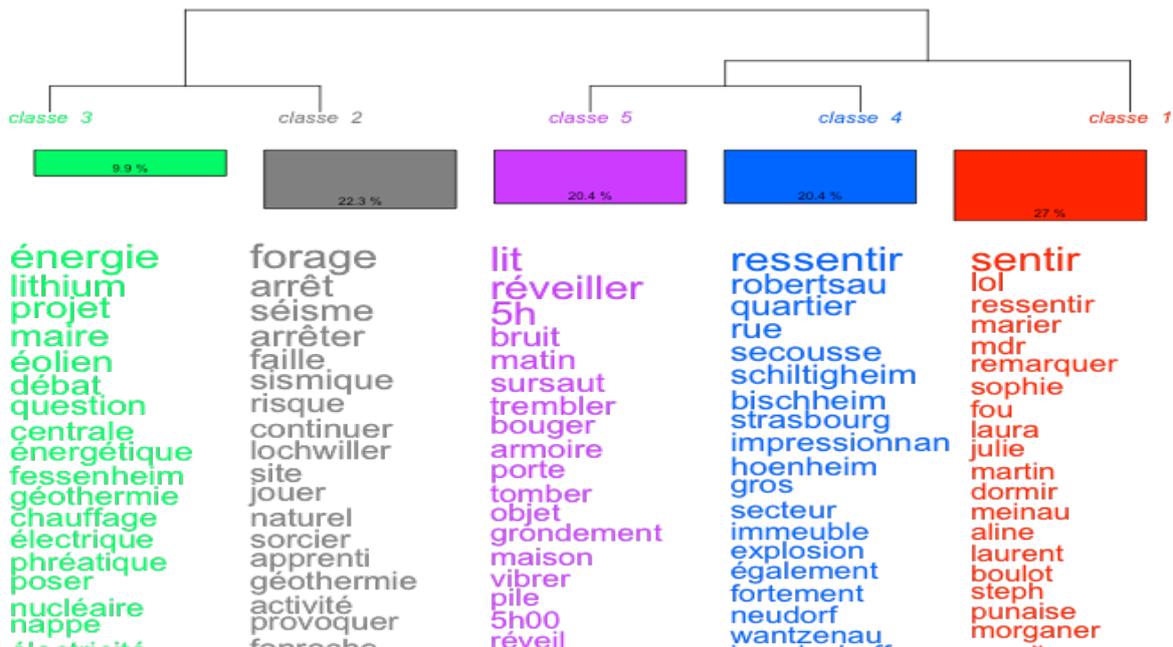
Once again, the media corpus predominated, accounting for 94.6% of all comments. However, despite a low level of publication, local institutions posts generated more comments (4.7%) than posts by associations (0.7%). The predominance of comments related to the media corpus can be explained by the weight of the followers of local media publications. In this context, the regional daily *Dernières Nouvelles d'Alsace* accounted for 26% of the comments retrieved, the highest percentage of all the actors we identified.

Like the publications, the peaks in comments corresponded to the seismic events, with the notable exception of the numerous comments that appeared during on December 11, 2020 corresponding to a Facebook live on geothermal energy organized by Strasbourg Eurometropolis.

4.3. Lexicometric analysis of comments

The analysis of all comments made using Iramuteq software led to the construction of five classes (fig. 3). These classes are grouped in two frames: the *Reaction* frame (classes 1,4,5) and the *Controversy* frame (Classes 2, 3).

Figure 3: Dendrogram of speech classes of comments



4.3.1. The reaction frame

This frame corresponds to an emotional register that appears in reaction to publications referring to seismic events. It integrates personal experiences of the events, like: “The walls and furniture shook and it was very intense for a very long time”; “very strong sensation this morning – I woke up at 5 am”; “It was

unbelievable. I thought everything was going to collapse, it felt really strong! I woke up up with a start!

The most recurrent full forms of discourse items are “Ressentir” (feel), “Sentir” (sense), or “Réveiller” (wake up). Three classes of speech are part of this Reaction frame and represent 68% of the comments. Discourse classes four and five integrate lexicon

describing the event from a personal/intimate point of view. The discourse may be either descriptive (Class 4, with items like “lit” (bed), “réveiller” (wake up), “5h” (5 o’clock), “bruit” (noise) or refer to geographical locations (class 5, with items like “quartier” (neighborhood), “Strasbourg”). Class 1 discourses in this framing of Reaction stand for lexical practices exclusive to social media, with the appearance of slang terms, such as “lol” and first names.

The reaction frame is over-represented in the commentary of mainstream regional media, such as the TV channel *France 3 Alsace*, and reached its peak with the Mlv 3.9 earthquake on June 26, 2021, the most powerful of all the seismic sequences.

4.3.2. Controversy frame

The Controversy frame represented 32% of the comments and grouped terms related to the geothermal projects in Alsace. The words “Géothermie” (geothermal energy), “Forage” (drilling), or “faille” (fault) were some of the most frequently used technical vocabulary. For instance: “they are waiting for a village to be partially destroyed, for victims caused by drilling, it should stop and our authorities should stop taking inhabitants for fools”; “Alsace is located on an unstable fault and drilling doesn’t help maintain stability”.

This frame was very common among the comments reacting to publications by local institutions, in particular the Facebook live organized by Strasbourg Eurometropolis, when technical aspects of geothermal energy projects were discussed. It was also present in the comments related to publications by independent media, such as the online journal *Rue89 Strasbourg*, which published several articles on the development of geothermal energy in Alsace.

Nevertheless, even if the specific language of the geothermal energy is present, other words attest to opposition to the projects, with words such as “stop” (arrêt), “risky” (risqué), “sorcerer’s apprentices” (apprentis sorciers). This shows a rupture with the formulas used at the beginning of the controversy, when the public enquiries were organized in 2015. Indeed, the ‘maturity of geothermal energy’ (Serrano et al. 2019) was no longer mentioned, in either publications or comments, when it could have been a way to deepen the knowledge on risks. It is as if the earthquakes created a new dynamic argument, and marginalized the notion of maturity. Instead, the comments insist on an immediate halt to geothermal projects and power plants around Strasbourg.

5. CONCLUSION

The operators, Strasbourg Eurometropolis and local institutions (town halls) used the mainstream media, especially the *Dernières Nouvelles d’Alsace*, to increase social acceptance of the project since 2014. Indeed, for a long time, these actors, mainly the operators, benefited from a favorable discourse environment in the mainstream media. But the occurrence of several seismic sequences in 2019-2021

changed the picture. Scientists, who were previously rarely present in the media coverage of geothermal energy, were called on more often by journalists and were also accorded a new role: they attested to the induced nature of the earthquakes, and thus played a role in identifying those responsible for the events. In parallel, the operators and the relevance of the projects were progressively being called into question in the media narrative.

In the context of the geothermal debate, engagement on social media is quite recent, whether by “classic” actors (institutions, associations) or Internet users. It started with the first earthquake felt in Strasbourg on November 12, 2019, and thereafter comments were mainly posted on social media publications related to seismic events. In this context, with 70% of the publications and 98% of the comments, Facebook was by far the most widely used platform, which could be related to the localized aspect of the controversy.

Unlike in traditional media, local institutions and associations present themselves on social media: there is no journalist as an intermediary. It is interesting to note that operators have not engaged in social media. Here, they only exist through local media publications. They maintain a strategy focused on classic relations with the press, which gives them visibility in the mainstream media. This strategy allows them to avoid negative comments from Internet users and to preserve their image in the local territory and beyond, despite the seismic events.

Several remarks can be made regarding mainstream and social media audiences. Firstly, we found that on social media, audiences react more strongly to *Dernières Nouvelles d’Alsace* publications than to those of other actors. This suggests that agenda setting is more or less the same for social media and *Dernières Nouvelles d’Alsace* audiences. However, social media allow the public to uptake the issue, express their feelings and give their opinion directly. In addition, there is usually very little public reaction on the web pages of newspapers, whereas the same topics on Facebook generate significant engagement. This engagement is facilitated by the fact that social media users have a feeling of being part of a community. Indeed, social media have a legitimizing effect on their public, due to the number and similarity of reactions.

This dynamic brings out new dimensions in the discourse on deep geothermal energy. The public engages as direct witnesses of the earthquakes and talks about their feelings. Indeed, as we saw in the lexicometric analysis, 68% of the corpus of comments are related to a personal experience of the earthquake often disconnected from the controversial issues.

Finally, media more inclined towards investigative journalism than *Dernières Nouvelles d’Alsace* are present on social media, like the *Rue 89 Strasbourg*, which has been following the development of geothermal projects for several years. We noted that specific publications in this type of media (as well as

the Facebook live organized by Strasbourg Eurometropolis) led to other types of comments, sometimes in a frame that reflects strong opposition to geothermal projects. These comments on Facebook show that the public can take over the media sphere to contribute their thoughts and opinions, and thus contribute to the debate on deep geothermal energy in a more or less constructive way.

However, for the time being, the new legitimacy the publics are giving themselves is limited to the sphere of social media. Indeed, publics only appear on the margins in the semi-open consultation spaces established by the prefecture and Strasbourg Eurometropolis.

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