

## Introduction: what is fracking a case of? Theoretical lessons from European case studies

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# INTRODUCTION

## What is Fracking a Case of? Theoretical Lessons from European Case Studies

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When we started to plan this special issue, shale gas extraction and hydraulic fracturing (“fracking”) as a technology and its related social conflicts seemed to be—except in very few countries, such as the United States—an environmental issue in a state of “fading away,” while still being of historical interest. However, things changed after Russia’s full-scale invasion of Ukraine in February 2022. Beyond creating immense human suffering and massive destruction of Ukraine’s infrastructures, the invasion has affected, and is affecting, distant countries, their peoples, and economies around the world, in various ways. One major issue at stake is the effect on energy markets and energy mixes in European countries, where strong dependencies on Russian fuels exist. Energy prices have skyrocketed, and several European governments (especially, Germany) had to reconsider their past politics of energy supply and transition. The war, so to speak, has unexpectedly opened a new window of opportunity for re-evaluating shale gas as a player in the energy transition (Teuffer 2022). This is mainly due to economic questions regarding energy prices, and political questions regarding energy autonomy and mixes.

Even before the war officially started, new and old voices had been increasingly asking for a new discussion of shale gas extraction in Europe (Deutscher Bundestag 2021; Mincewicz 2021; Jehle 2022). This was a consequence of increasing energy prices, especially for coal and gas, which made shale gas extraction appear again as an economically profitable business. As this process needs considerable investments in infrastructure, it is only interesting for economic actors if there is a chance to realize expected profits in the energy markets. Such an outcome depends on many factors: size and accessibility of deposits, environmental laws, evaluation of risks, social impacts, etc. Most of these elements do not come into play as “bare facts,” but are constituted via

discursive meaning-making, as results of discursive struggles between actors with different interests and engagements.

Among the discursive dimensions of shale gas politics, what Stefan Aykut and Lucile Maertens (2021) called the general “climatization of global politics” plays a major role. On the one hand, the climate crisis urges governments to phase out fossil fuels—witness also the 11 countries coming together to form the Beyond Oil and Gas Alliance (BOGA) at COP26 (Conference of the Parties; 26th UN Climate Change Conference) in Glasgow, Scotland in 2021. On the other hand, incumbent fossil fuel industries, especially in countries that heavily depend on the revenues from those fuels, have been pushing back against the need to phase them out (Kabukuru 2021). Gas appears to be the most controversial fossil fuel, much more so than coal and oil, on whose phase-out there seems to be a broader consensus. Gas is seen by many as the principal alternative to coal and oil, and the only energy source that could allow both keeping current levels of consumption in the Global North and achieving a better “climate-change profile,” at least until the transition to renewables is achieved. In addition, in July 2022, the European Parliament accepted the proposal to include gas (and nuclear) among the environmentally sustainable energy sources, much to the dismay of European green parties and environmental activists (European Parliament 2022). For others, though, expanding the use of gas is a way to slow down urgently needed transformations, by keeping the fossil industry alive while delaying the undertaking of radical measures to combat climate change. It is not surprising, therefore, that in the first decade of the twenty-first century, when a new technique for the extraction of gas started to become widespread in the United States, some welcomed it, while others fought against its application. Today, the United States is the most prominent player in shale gas production, and because of the Russian-Ukrainian war, it could even access new markets in Europe because governments are faced with unexpected gas reductions by Russian companies (Sheppard et al. 2022).

However, back in the first decade of the twenty-first century, the United States was not the only area where shale gas extraction technology—known as hydraulic fracturing or “fracking”—was to be applied. Conflicts about shale gas as an energy resource and fracking as an appropriate extraction technology surfaced, and rapidly increased, in Europe too, and multiplied over the early 2010s. Precisely at the time when the United States was going through a major shale gas boom, however, the outcome of a projected shale gas revolution was deceiving expectations in Europe. By the end of that decade, while some

European countries were still favorable to shale gas exploration, others had opted for moratoria or even renounced it entirely for reasons as varied as environmental and health risks, economic unprofitability, and technological or geological hindrances. Thus, in the second half of the 2010s, industrial retreat from promoting shale gas and its related technology has decreased public concern around fracking. Nevertheless, given ongoing concerns on climate change, energy transition, and security, interest in shale gas might rekindle in the future. It is telling that in June 2021 the final report of the German national expert commission on shale gas related environmental and health risks—established by the federal government in 2017—concluded that there is no scientific evidence for major risks if this technology is used correctly according to the current standards. The report, therefore, stated that policymakers should carefully reconsider shale gas extraction in Germany—including other aspects beyond the concrete questions of risk.

The situation at the beginning of the decade was quite diverse across countries. Local protests, documentary movies, the engagement of non-governmental organizations brought controversies around fracking concerning air pollution, water and soil contamination, climate change, noise, traffic, and changes in land use into the public sphere. But reactions have been heterogeneous. While countries like Poland approved legislation to favor shale gas exploration and production, others, like France, chose to renounce exploration in the face of emerging local conflicts; still others, like Germany, also experienced a period of local conflicts, in the meantime charging scientific bodies to conduct evaluation studies as grounds for final political decision-making. While the scientific literature on environmental hazards of unconventional resource extraction grows (Cooper et al. 2016; Costa et al. 2017; Hays et al. 2017; Cotton et al. 2018; Malin et al. 2019), a comprehensive regulation system of hydraulic fracturing is still missing in the European context (McGowan 2014; Reins 2017; Tawonezvi 2017; Van de Graaf et al. 2018). The formation of chemical compounds and the occurrence of hardly predictable ecological processes above and below the ground are challenging current scientific methods to the point that grasping the multilayered interactions and long-term consequences of those processes for human health and nature is becoming a whole separate field of research, relevant to institutions' environmental and industrial management. There might well be some new dimensions of risks, generated by networks linked together in complex ways, and defined by Dirk Helbing as "hyper-risks" (2013) that are difficult to understand using current environmental risk assessments.

Over the last decade, social science research has analyzed conflicts around fracking in both national case studies and in cross-country research designs (Weible et al. 2016; Steger and Drehabl 2018; Dokshin 2021; Szolucha 2021). Discussions relate to diverse trajectories and issues in shale gas and fracking discourses, local conflicts, and concrete policies, with different disciplinary foci, using a variety of conceptual tools, accounting for differences, interrelations, and similarities across countries (Jaspal and Nerlich 2013; Jaspal et al. 2014; Mercado et al. 2014; Cotton 2015; Lis and Stankiewicz 2017; Metze 2017; Cantoni et al. 2018; Lis 2020). Works have highlighted hydraulic fracturing from an interpretive policy analysis perspective and, for example, pointed toward deficits in public involvement in shale gas projects (Dodge and Metze 2017; Evensen 2018; Aczel et al. 2022). All these contributions have presented a diversified picture of the controversies related to fracking and shale gas. However, most of this research has concentrated on case studies without addressing broader theoretical questions. The present issue aims to fill this gap by asking: What are shale gas and fracking (and the conflicts surrounding them) cases of, beyond their specific scale-dependent unfolding and concern?

This question leads to broader ones, related not only to fracking but to ecological conflicts and social impacts, whether in discourse studies, interpretive policy analysis, or other related perspectives. It can, in reference to our case at hand, be further specified in a series of more concrete sub-questions such as:

- What conclusions can we draw from the abundant research literature on shale gas and fracking? What is exemplary about this research topic for other energy problems?
- What can we learn from the study of shale gas and fracking conflicts with respect to discursive processes, the formulation of environmental problems and regulations, democracy and expertise issues, and other relevant topics in the disciplines and contexts studied by the authors?
- Are conflicts over shale gas and fracking just a further example of conflicts over risk-taking? Do they represent a policy turn? Are there new elements that make those cases different from others?
- How do these cases apply to theorizations formulated in environmental studies, such as ecological modernization, sustainable transition, risk society, ecological justification, or other concepts related to social structuration?

This issue of *Nature + Culture* will not provide comprehensive answers to those questions, but we hope it will stimulate debate around them. So let us just explore this idea of “What is X a case of?” in relation to Ulrich Beck’s work on risk society (1992), ecological politics (1995), reflexive modernization (Beck et al. 1994), reinvention of politics (Beck 1996), and world risk society (1998). In these works, Beck’s concept of “risk” pointed to the social (conflictual) dynamics of anticipation of unintended side effects (*Nebenfolgen*) in cases of emerging (or established) technologies. Beck especially insisted on the role of not knowing about possible future side effects, the politics of evidence-making and proof, and the core importance of (scientific) knowledge production in all kinds of claim-making activities in concrete matters of concern. Reflexive modernization already referred to the idea that “modern” technological progress, exploitation of natural resources, and even the distinction between nature and culture/society no longer proceed in a state of ongoing self-evidence. Rather, these phenomena become fundamentally politicized and themes for struggles that go beyond classical conflict structures of capitalist-industrialist societies. Beck has elaborated on these concepts from the mid-1980s to the early 2000s, and they still appear to be fruitful in framing current environmental conflicts, such as those around shale gas. So, should we consider conflicts about fracking as evidence for the now-established “routines” of risk society and for its “normalization”? What does that mean in concrete terms of institutional infrastructures and procedures for dealing with “risky cases”? How do these differ from earlier instances of the government of risk? How do they differ between countries? Do we rather need to leave the concept of risk society behind and instead ask what other concept might better suit our current states of “eco-governmentality” (see Lemke 2021, Darier 1999, Lascoumes 1994)?

In formulating these questions, we rejoin observations made by Sina Leipold and colleagues (2019) in relation to the last 25 years of environmental discourse studies. While these scholars underline the impressive range of discourse-analytical case studies on environmental issues around the globe, they nevertheless point to some major neglected issues, such as how to sum up what we can learn from all these case studies about the current state of ecological conflicts, policies, and politics, as well as the general processes of discursive structuration, or the diagnosis of our current (global, international, national) condition. Starting from this, our purpose is to contribute to both an empirically grounded and theoretically reflected understanding of the diverse and

complex ways in which modern societies shape their energy paths, environmental policies, and ultimately their relationship to nature.

The present special issue has its origin in a multidisciplinary workshop held at the university of Augsburg in November 2018 on the topic: What is fracking a case of? The workshop's discussions led to a call for papers addressing the issues raised, with backgrounds in discourse studies about fracking conflicts in different countries. In the following section, we introduce the four contributions included in this issue. Each of them addresses our main research question using a different theoretical framework, although all are embedded in discourse studies and based on different country-related case studies.

## **Content of this issue**

Focusing on France, Sébastien Chailleux and Philippe Zittoun's contribution provides insight into the political and administrative pathway that was to lead first to a moratorium and then to the ban of fracking in the country. While published research on France has generally focused on the controversy over fracking in public debates, as well as on legislative and regulatory aspects related to the possibility of using fracking, little has been said about the period before shale gas became a political issue in the agenda in 2011. The authors refer to that period as characterized by a "regime of invisibility": a regime that prevented shale gas from reaching the systemic (public) and institutional (governmental) agendas while it was already being discussed within the administration. Chailleux and Zittoun represent the regime of invisibility as having three main features: first, cadastral bureaucratic organization defining the exclusive missions and expertise of specific administrative services, thus fragmenting the topic into manageable parts and granting great autonomy to the dedicated administrative service. Second, derived from the cadastral organization are the asymmetrical relations between policymakers at the top of the pyramid and expert agents at the bottom. While expert agents gain autonomy from their domination over specific topics, the side-effect of such autonomy is relative invisibility from their hierarchy. Lastly, an expert regime of feasibility is implemented: to impose their domination over specific topics, actors from the administrative service develop practices to keep non-expert actors from intervening over their perimeter of action.

In the case of shale gas, the domination exerted by the service is based on technical and legal knowledge about geology and mining



regulation, which determines what is feasible and what is not. This regime of invisibility, the authors argue, contributed to defining shale gas as a non-problem. Chailleux and Zittoun describe the specific course taken by the fracking debate in France, and how shale gas was first considered a non-problem, to then become a controversial subject in both the public and political sphere. The concept of regime of invisibility that the authors propose thus refers to the diverse and complex regulatory and discursive practices that led to the emergence of a public debate on energy issues.

Laurence Williams's contribution draws from a rich body of publications on the shale gas case in the UK. The author exemplifies the different uses of the term "frame" and its subtle variations and relations to other notions such as "storylines" that have emerged in describing the diverse process in the British shale gas debate. By operationalizing his and Benjamin Sovacool's (2019) "integrative approach" to frames and storylines, Williams recommends employing framing to cover the more coarse-grain level of "selection and salience" and reserving storylines for more fine-grain intricate linguistic devices. This conceptual discussion offers insights into the role of language in the construction, contestation, and closure of environmental problems. Furthermore, Williams's study discusses what the fracking case tells us about the contemporary challenges facing the "discursive establishment of credibility" around a particular environmental policy position (such as fracking as climate-friendly technology or shale gas as a bridging fuel) and, despite that, the enduring power of "win-win" ecological modernist thinking. He argues that, up until the UK moratorium on fracking passed in 2019, the discursive contest over shale development had shown little sign of the creative use of language in building new coalitions, achieving discursive dominance, and leading to problem closure; instead, these discursive devices seemed to be more frequently implicated in creating contrasting understandings of shale development. Williams states that this was in part because of the lack of discursive power of both the technical and narrative forms of evidence and argumentation utilized by both sides in this largely anticipatory policy controversy. Through this nuanced analysis, the author shows the complex interplay of values such as economic growth and environmental protection in shale gas debates, and how they are simplified and to some extent disguised in types of environmental thinking (such as austere, restraint-based or hedonistic, "business as usual," and "win-win" modes of thinking).

The local protests in southeastern Poland (especially in the village of Żurawlów) play the central role in the case study analyzed by



Wit Hubert and Aleksandra Wagner. The authors deal with the current question of whether social media used by local protestors can influence the mainstream media landscape in contemporary environmental debates. By describing the weakness of Polish media that marginalizes perspectives from activists, locals, and NGOs, and more often replicates opinions of politicians and businesses, the study investigates the ability of social media to influence broader public energy controversies. Their media analysis, including Aleksandra Wagner's preliminary work on printed media and an additional Facebook data set, elaborates on the notion of public and social spaces, inspired by Jürgen Habermas's (1989, 1996) ideas. The authors propose an analysis based on the three dimensions of "social": namely, communication, cognition, and cooperation. They conclude that the Żurawłów case and its manifesting protests on social media were often characterized by emotional communication, expressed in the form of exclamations, irony, deprecation, and labeling of the supporters of shale gas technologies. They also show the mythopoetic value of the Żurawłów "epic" narrative. From the perspective of participants, the protest in the village delivered the desired effects, as their targeted gas company, Chevron, ultimately decided to leave Poland. "The myth of the heroic Polish farmers"—they conclude—"has entered the global collection of identity narratives and supported mobilizing environmental movements" (Hubert and Wagner, this issue). With respect to the consequences of mythopoesis, Hubert and Wagner show that these were not particularly significant at the national level. Besides, the protest itself did not result in the generation of alternative narratives by the protestors; its accessibility to people not directly interested in the case of Żurawłów remained minimal; and Facebook content was not incorporated into the process of constructing knowledge about shale.

Finally, in their comparative study of shale gas media debates and expert evaluations in Germany and Poland, Claudia Foltyn, Reiner Keller, and Matthias S. Klaes draw upon the Sociology of Knowledge Approach to Discourse (SKAD) (Keller 2011a, 2011b; Keller et al. 2018), which addresses discursive conflicts as social relations of knowledge and knowing, and politics of knowledge and knowing, including the multiple ways of evidence building and deconstruction of evidences, and the interplay between actors, articulations, knowledge making, and political or moral evaluation. Their contribution here uses the concept of argumentation clusters, that is, ensembles of major re-occurring statements relating to technological risks and environmental problems, to discuss the core justification patterns against and for shale gas extraction

in both countries. The authors relate their discussion to the general debate that emerged in the 1990s in French sociology concerning the question of a “new environmental/ecological/green justification order” that enters social disputes. According to the French school of sociology of justification and critique,<sup>1</sup> in the context of conflicts or uncertainty about the distribution and hierarchization of evaluations and its consequences, social actors refer to general normative patterns of orientation in order to justify their respective standpoints. Luc Boltanski and Laurent Thévenot (2006) referred to such patterns as “economies of worth,” and originally identified six such economies: civic, market, industrial, fame, domestic, and project/network. This was soon followed up by discussions about a possibly new emerging “green order.” Drawing on these discussions, Foltyn, Keller, and Klaes identify several ecological justification orders looming over the “fracking horizon,” but (still) within a compromise with or enclosed in more “traditional” orders of worth.

## **What Is Fracking a Case Of?**

One way of summing up the contributions to this issue is the identification of a most typical trajectory of fracking conflicts, which is realized in empirical variations differing from country to country and depending on the local, regional, national, and international situatedness of concrete cases. The idea of such a trajectory very much corresponds to the ideas suggested by Francis Chateauraynaud in his work on “sociological ballistics” (2011), inspired by US-pragmatist sociology and its ideas about the public careers of social problems. The four presented articles share several parallels: (1) the (in-)visibility, secrecy, and transparency of political, administrative, and industrial activities; (2) the role of language and framing in shale gas controversies; (3) the public and social arenas of fracking discourses and their attention-seeking in different media; and (4) the variety of ecological values used in everyday disputes about fracking and shale gas and their institutional establishment/social ordering.

In general, it can be argued that these elements are found with high frequency in much of the existing literature on fracking. Wanting to summarize narratives accumulated over a decade of research on the subject, these typically begin with the “discovery” of a fracking-related event (a drilling or permitting procedure) by a single whistleblower and/or a group of local actors, and the communication of that event to the public through the media. However, such a narrative beginning is in fact

not the first step, but just an event with some pre-history. As shown by Chailleur and Zittoun (this issue), it rather occurs following a series of exchanges in the political-economic underbelly during the invisibility regime. It is only at the end of this regime that exploration companies receive the necessary authorizations to proceed.

Then, in the face of public awareness, a struggle begins between different discursive positionings (e.g., pro/contra), articulated and supported by the multiple parties involved. At this stage, the proponents of the various framing and storylines seek, using stylistic features of the different economies of worth, to assert the predominance of a regime of justification or to pre-establish some compromise between different regimes (industrial, security, ecological, etc.) mobilizing economic, social, expert knowledge and media capital at their disposal. Generally, during the struggle between conflictual discursive meaning making, a reduction in argumentative complexity and a discursive polarization occurs, which gives media effectiveness to the positions of *tour court* opponents and *tout court* defenders, suppressing the intermediate positions. The battle between frames is articulated by discourse coalitions that go beyond simple oppositions, relating, for example, economic, political, scientific, and civil society actors on all sides of the conflict. This is usually paralleled by a contestation of fracking activity at multiple geographic and political levels, which if, on the one hand, contributes to discursive polarization, on the other hand allows opponents to not only defer the moment of the start of exploration activities but also form a wealth of technical and legal knowledge to oppose the promoters of fracking.

In the case of fracking in Europe, a set of different conditions—geological, economic, social, political, and mediated by discourses—have led, in the short and medium-term, to the suspension or end of shale gas exploration projects, which, as indicated at the beginning of this Introduction, see some re-evaluation today. This *de facto* moratorium, from a narrative point of view, had different meanings depending on the different institutional configurations in the controversy: for the activists of the various anti-fracking campaigns, it meant the victory of their resistance to industrial projects and the recognition of the importance of environmental values that they defended. For the gas industry, it represented a defeat of the industrial value economy, at least in the short term, but not indefinite renunciation of research activities. For political actors, it might have been a success in generating votes, an ambivalent result between balancing climate change and energy supply, or just a loss of a big opportunity, among other things.

This description of a basic trajectory with variations can be generalized only to the European context, where the sociotechnical and economic imaginary represented by fracking arose and declined within a few years. One of the limits of this special issue is, in fact, geographical: although, initially, we tried to include non-European and non-North American contexts, it was not possible to overcome this problem. The four cases contained in this issue are therefore all European: it goes without saying that the inclusion of other political and geographical contexts would have helped to not only differentiate the schematization of narratives just reported but also enrich the ideas of conceptualizing what fracking is a case of.

A second reflection refers to the risk society concept briefly presented above and considers shale gas extraction and fracking as cases for the normal institutional routines of risk societies today. Here fracking is represented as a controversial technology that, while enabling the solution of energy security issues, multiplies further problems of pollution, climate change, as well as problems in the management of local water, chemicals, soil, and waste that can have a direct, indirect, immediate, or delayed effect on human health and environmental systems. Not unlike other extractive activities, fracking also triggers social mobilization to different degrees. As typically occurs in the routines of risk societies, this can be either dealt with by existing institutional devices (expert and counter-expert bodies, environmental regulations and laws, health impact assessments, property rights, citizen involvement via technologies of participation, etc.) or, in some cases, lead to regulatory and device innovations. To consider this the routines of risk society refers to the idea that evidence for or against harmful side effects has become business as usual wherever new infrastructure is designed, planned, and implemented. Viewed from a risk society perspective, it is striking that the institutional routines of risk society so far have not managed to assuage local protests and conflict. As a result, fracking controversies have exposed a deficit in the democratic management of industrial procedures when they have been found to have detrimental effects on affected communities. This is not unprecedented when one thinks of the cases of nuclear power in France (Topçu 2013) or Germany (Radkau 1983; for both countries: Nelkin and Pollak 1982)—but such dynamics have rarely been analyzed at such a broad geographic level in the oil and gas industry.

Unlike the case of nuclear power, the gas wells where fracking has been applied or planned are spread over much larger areas than those on which nuclear power plants are built; as a result, a much

larger number of people could be affected. Another factor contributing to explain the breadth of mobilizations is the relative “simplicity” of shale gas extraction technologies (regarding time schedules for planning, construction, and exploitation) compared to nuclear technologies. That potentially made the technology applicable in any territory where geological conditions were deemed favorable: from Argentina to Algeria, to the United States and China. These are, of course, geographical areas and states with markedly different political regimes, but as earlier research on fracking and the contributions to this issue show, there are substantial differences in regulation even between European countries (Reins 2017). Of particular interest here for further research on the routines of risk societies could be a deeper inquiry in the “cosmopolitan,” country-crossing role and dynamics of social media in movement mobilizations across borders, the role of a diverse kind of “materiality”: for example, existence and accessibility of resources, use and measurability of (potentially harmful) substances, or the potential reach (in terms of time-related, population-related, and geographical extension) of unintended negative (harm, pollution) and intended positive (energy supply) effects.

Still referring to the risk society concept, one could even wonder what institutional lessons have been learned against the background of up to six decades of environmental conflicts. This is especially relevant in relation to concepts such as ecological modernization (Mol et al. 2009) or sustainable societies (Keller 1999; Neckel 2017), which promote new social progresses in dealing with environmental affairs but seem to neglect the issues of risk and uncertainty raised by Beck. Here, we might consider the struggles around fracking as indicating a “return of a past future”: that is, the return to a situation where the technological promise hinged on the lack of major risks. This is because fracking can be seen as a very traditional case of “disclosure politics” (Kinchy and Schaffer 2018). The core of the shale gas controversies lies in the dynamics between hidden and revealed information (such as contents of fluids and their amount and effects, climate impacts of energy technologies, but also information contained in parliamentary and think tank reports), unconfirmed or yet unknown effects, hierarchized knowledge orders not accessible by everyone. It also lies in the problematic concentration of established ways of communication of knowledge (science, media, political forums, NGO-led events). Over a decade of studies on the production of ignorance in risk societies (see above) has shown that industrial interests, supported by part of the body politic, will seek to maintain secrecy about the potentially

harmful consequences of their products, or create artificial uncertainty about those consequences. To these ends, these actors will, as has been shown in the case of tobacco production and climate skepticism (Oreskes and Conway 2010), sometimes even fund scientific and parascientific organizations capable of producing evidence to maintain such uncertainty. Once the harmful effects—for the environment or human health—come to light, industrial interests will defend their actions through litigation, relying on the trade secret narrative or claiming that, at the time their products were marketed, the exact effects were not known.

Third, fracking is a case of enactment of time-space structuration, in Anthony Giddens's (1984, 1985) terms. Here we see two major dimensions. The first one relates to the concept of "sociotechnical imaginaries" (Jasanoff and Kim 2015). As shown by articles in this issue and by Roberto Cantoni and colleagues (2018), the media in each country where the shale gas narrative has taken hold have supported or rejected this energy source by referring to idiosyncratic regimes of technoscientific promise, grounded in historical, political, cultural economic, and environmental elements. That being said, common lines can be identified among the frames created by the media in each country: the securitarian narrative about the need to extract shale gas wherever there was the possibility, also to achieve a significant degree of energy independence; the economic narrative, linked to some extent to the securitarian one, about the possibilities of benefiting the state budget by exporting gas and also deriving benefits from the export of technical know-how; and the environmental narratives (in the plural), focused on the possible deleterious consequences of the application of fracking on the environment and human health, as well as on the disempowerment of affected populations from decision-making processes, but also to the idea of using shale gas as a "helper" in energy transition and fighting climate change.

Closely related to this time-related dimension of "futuring," we see fracking as a case of intertemporal politics involving issues of intergenerational justice—that is, anticipating today's actions not only with a view to the immediate environment and human health but to the long-term unfolding of global warming, energy conditions, and the well-being and safety of future generations. In the last 150 years, fossil fuels have been the basis of Western society; the consequences of this use—especially since the 1950s with the birth and development of the petrochemical industry and with the increasing amounts of fossil fuels used in the world—are already visible today in terms of the phenome-

non of global warming and the related climate crisis. The consequences of this phenomenon will be increasingly evident in the coming decades, and will lead to significant systemic changes, among which the most obvious is that relating to climate refugees (change already underway today, due to the desertification of some areas of the planet, and the consequent impossibility to practice agricultural activities; increasingly frequent extreme climate events). It is therefore necessary to reflect on the trade-off between the economic gains derived from the continued use of these (and other) sources of energy and the impacts on the present and future ecosystem.

These are all avenues for further debate, which cannot be elaborated further here. There might be many more. We hope that the readers of this special issue will find some interest and value in the idea that social sciences research on “environmental affairs” should not just deal with issues of an applied sciences perspective or the routines of case study production. Do not get us wrong: this all is important and valuable work to do. But we should attempt, from time to time, and in all modesty, to step back, take a wider view and ask: “What are we doing here? What is this case a case for?” even when we disagree about the (always temporary) answers.

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## Note

1. This school of thought has much theoretical ground in common with the “economics of convention” approach and with the “new French pragmatic sociology” school.

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