

Make it loud and simple: Coalition politics and problem framing in the French policy process of hydraulic fracturing

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Abstract

Based on a case study and media content analysis, we rely on insights from the advocacy coalition framework and from the narrative policy framework to conduct a congruence analysis of the French politics of hydraulic fracturing (2010-2017). Despite the lobbying of a resourceful coalition of pro-fracturing policy actors and their strategy of active participation in various professional forums, hydraulic fracturing was partially banned in 2011 and completely prohibited in 2017. Our results relate this ban to the stronger repetition of a simpler framing of the policy problem by the members of the anti-fracturing coalition. In other words, coalition members willing to transform their policy beliefs into concrete decisions should frame them into loud and simple policy narratives. These findings call for further articulation between the narrative policy framework and the advocacy coalition framework to account for narratives as the essence of strategies that advocacy coalitions develop for influencing policy processes.

Keywords

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INTRODUCTION

Hydraulic fracturing is an exploitation technique for unconventional hydrocarbons such as shale oil and gas. According to the 2013 US Energy Information Administration data, there are approximately 118 billion barrels of shale oil and 727 trillion cubic feet of shale gas in the French soil, making France the country with the largest shale deposit in Europe (Energy Information Administration, 2013, attachment A-2). Starting in December 2010, hydraulic fracturing has become a policy issue, following massive mobilization against this technique. In 2010-2011, a heterogeneous social movement of opposition put pressure on the public authorities to ban hydraulic fracturing, which occurred in July 2011. This made France the first country to forbid this technique, although in principle, experimental extraction techniques were still allowed. In January 2017, shale gas exploration was forbidden. Since December 2017, all stimulation techniques have been prohibited and the end of hydrocarbon exploitation has been planned for 2040 (following the so-called 'Hulot' law). In this article, we conduct a congruence analysis of collective action by the policy actors involved in the French politics of hydraulic fracturing based on a case study and media content analysis.

Hydraulic fracturing is controversial because it offers benefits and involves risks at the same time. The benefits are mainly economic. In a nutshell, hydraulic fracturing makes new sources of hydrocarbons accessible to the industry while contributing to job creation and public finances (through taxes). Environmental and health risks are related to the potential damage

to aquifers, trucks and water tankers going back and forth to exploitation sites, polluting additives mixed to water, plus they are related to the contribution of hydraulic fracturing to the development of the carbon industry and its impact on climate change. While the benefits and risks related to hydraulic fracturing are similar around the world, most countries with significant deposits of unconventional hydrocarbons allow it (e.g., the U.S.) while France has banned it.

In this article, we combine the Advocacy Coalition Framework (ACF: Jenkins-Smith et al., 2018; Sabatier & Jenkins-Smith, 1993) with concepts from the Narrative Policy Framework (NPF: Jones et al., 2014; Shanahan et al., 2011b) to account for the French policy process on hydraulic fracturing. The ACF conceptualizes policy processes as political struggles among policy actors organized in advocacy coalitions within a policy subsystem. The ACF is a conceptual platform for three theories of policy processes: a theory of policy learning looking at the cognitive and social dynamics of policy actors maintaining or revising their beliefs and preferences toward policy issues and solutions; a theory of collective action looking at the structure and action of coalition members to transform the policy preferences that 'glue' those members to each other into concrete policy decisions; and, finally, a theory of policy change based on a mix of learning processes, collective action, and external or internal shocks. In the French politics of hydraulic fracturing, an advocacy coalition composed of business representatives militates with some of the scientists, public officials and politicians in favor of hydraulic fracturing. A second coalition of NGOs and citizens fights against hydraulic fracturing with other scientists, officials and politicians.

The policy changes resulting from this political struggle have been relatively counter-intuitive. It could have been expected that the pro-fracturing coalition would win because its members

are more powerful (political resources) and participated more actively in the debates organized by the French authorities within several politico-administrative committees. Instead, public policies have been increasingly restrictive toward hydraulic fracturing, even long after the large-scale diffusion of Gasland, a documentary demonstrating the negative consequences of hydraulic fracturing in 2010. At the end of the day, France is one of the only countries in the world with significant deposits of unconventional hydrocarbons in which hydraulic fracturing was banned as result of successful activism (Evensen, 2018). From this perspective, the case studied in this article is empirically ‘critical’ and theoretically ‘deviant’ (Flyvberg, 2006), which makes it a good case for highlighting the reasons for the failure of the pro-fracturing coalition.

Based on a congruence analysis, we interpret this success as a result of a successful strategy of problem framing by the anti-fracturing coalition. This outcome supports the findings of previous research combining advocacy coalitions and policy narratives (e.g., Nohrstedt, 2011; Yordy et al., 2019). We contribute to this research by specifying how frames linking problems to solutions, in policy narratives, should be presented to the general public and to the decision-makers in order to convince them. We also complement existing research on the politics of hydraulic fracturing that applies the ACF to different institutional settings (Heikkilä et al., 2019) with a study applying different theories to one institutional setting. Empirically speaking, this study refines the idea that policy actors involved in the French politics of hydraulic fracturing relied on ‘strategic ignorance’ (Chailleux, 2019) and articulates this idea with coalition dynamics. We start with a presentation of the concepts and theory supporting our argument before turning to the methods and results. We conclude with a discussion and an agenda for future research.

CONCEPTS AND THEORY

In this section, we present two theoretical approaches to policy processes. On the one hand, the ACF (Jenkins-Smith et al., 2018; Sabatier & Jenkins-Smith, 1993) accounts for policy changes in policy subsystems with a mix of policy learning, collective action, and external or internal shocks. On the other hand, the NPF (Jones et al., 2014; Jones & McBeth, 2010, Shanahan et al., 2011b) provides a key contribution to the ACF in relating, through framing, coalition beliefs and policy change.

ACF LENSES ON POLICY PROCESSES AND POLICY CHANGE

The ACF (Jenkins-Smith et al., 2018; Sabatier & Jenkins-Smith, 1993) conceptualizes policy processes as political struggles among coalitions of policy actors involved in a given policy subsystem. At the collective level, a policy subsystem is a set of ‘actors from various public and private organizations who are actively concerned with a policy problem or issue such as air pollution control, and who regularly seek to influence public policy in that domain’ (Sabatier & Jenkins-Smith, 1999, p. 119). An advocacy coalition is composed of actors from various organizations at different levels of government. They share a set of normative and causal beliefs and show a nontrivial degree of coordination over time to implement strategies to transform their beliefs into concrete policy decisions.

At the individual level, each policy actor holds a belief system composed of three strata. The first stratum contains ‘deep core’ beliefs which are personal philosophical precepts that are very broad in scope (e.g., ‘I believe that justice is an important value’). The second stratum is

represented by 'policy core' beliefs that are precepts specific to one subsystem. They can be factual (e.g., 'I believe that this policy option increases the degree of justice among population groups') or normative (e.g., 'I believe that this policy option is better than others'). In the third stratum, the 'secondary' beliefs are more specific. They concern particular administrative rules, budgetary allocations, program performance, etc. (e.g., 'I believe that this administrative decision facilitates the implementation of my preferred policy option').

One important objective of the ACF is to explain policy change, which is defined as 'fluctuations in the dominant belief systems (i.e., those incorporated into public policy)' (Sabatier, 1987, p. 682). Consistent with the depiction of actors' belief systems, policy changes are 'major' when they concern the policy core aspects of a governmental program, whereas policy changes are 'minor' when they concern the secondary aspects (Sabatier, 1998). Policy change can result from changes in policy actors' beliefs and preferences—a causal mechanism of 'belief updating' called 'policy learning'. Policy learning, possibly as part of a negotiation process between coalitions, can also be fostered by the participation of their members in 'professional forums' or 'issue-based intermediary organizations where diverse types of political and societal actors repeatedly interact' (Fischer & Leifeld, 2015, p. 363). Policy forums succeed in compromising antagonistic policy positions especially when they are representative of all coalitions and focus on empirical issues rather than on ideological values (Sabatier & Weible, 2007).

Beyond learning, policy actors can hold political resources such as personnel (coalition members holding key positions in the subsystem), money, information (about policy problems and solutions), public opinion (which can sway the decisions of elected officials), mobilizable troops (members of the attentive public that can be engaged in political activities), or coalition

leadership (Sabatier & Weible, 2007). They use those resources to coordinate political actions or strategies within advocacy coalitions to become 'dominant' and to impose their understanding of policy problems and their preferred policy solutions on other coalitions.

Finally, major 'shifts in the core attributes of the subsystem' (or 'shocks') are typical causes of policy learning and policy change (e.g., a legal shift or a shift in the distribution of natural resources: Weible et al., 2009, p. 124). Shocks are 'internal' (rather than 'external') when they are related to the political activity of the subsystem members and, for this reason, directly question the belief system of one of the coalitions (e.g., a nuclear disaster for pro-nuclear advocacy coalitions). Overall, the ACF explains policy change within policy subsystems with a mix of policy learning, collective action and external factors.

POLICY NARRATIVES AS TRANSLATION OF COALITION BELIEFS IN POLITICAL ACTION

The NPF (Jones et al., 2014; Jones & McBeth, 2010, Shanahan et al., 2011b) develops a research agenda about how narrative tactics influence public opinion and policymakers. Policy narratives are constructed stories. They are public formulations of policy beliefs (Shanahan et al., 2011a). Policy narratives tell a good story about the nature of policy problems and the most appropriate solutions that would allow to tackle them. Policy narratives do not tell the whole story, but are crafted to provoke emotion and gain support: 'groups will heresthetically employ policy narratives to manipulate the composition of political coalitions for their strategic benefit' (Jones & McBeth, 2010, p. 345). The narratives of actors and coalitions are approached in terms of political strategies. Their aim is to influence public opinion and policymakers in favor of particular policy preferences (Jones & McBeth, 2010, Shanahan et al.,

2011b): 'ultimately, it should be possible to test the connection between how narratives impact aggregate public opinion and how (or whether) that public opinion impacts elite and institutional decision' (Jones & McBeth, 2010, p. 346). Advocacy coalitions deploy strategies of message diffusion either to targeted audiences or to the broader public in order to influence public opinion, convince policymakers, and provoke policy change (or maintain status quo).

The integration of NPF insights with the ACF allows to fill the gap between policy beliefs and political strategy. Policy narratives can be strategically used by advocacy coalitions to vehicle their beliefs (e.g., in the medias: Hirsch et al. 2010) and, in turn, influence decisions by policymakers. Through framing or the selection of information, they turn out beliefs in simple stories made for persuasion: 'whereas the ACF identifies beliefs as the causal driver for political behavior, in the NPF, we dissect this idea into finer elements to better understand how policy narratives contain beliefs, mobilize citizens, strategically deploy scientific information in the pursuit of policy positions, and influence public opinion' (Shanahan et al., 2011b, p. 540). Policy narratives are the messages carried on in the campaigns that advocacy coalitions launch and use in their search for political support. They are 'at once the window to and the essence of coalition political strategy' (Shanahan et al., 2011b, p. 552). NPF scholars first promoted their framework to identify actors' beliefs and the oppositions between competing coalitions through discourses (Crow et al., 2017; Jones and McBeth, 2010). Then, they moved on the impact of policy narratives on public opinion. For example, in an experiment on the impact of media statements, Shanahan et al. (2011a) show that policy narratives influence public opinion. Policy narratives both 'preach to the choir', i.e., they increase the intensity of already existing opinions, and 'convert' audiences that held different policy beliefs.

The influence of policy narratives on public opinion also questions their impact on policy change (Jones & McBeth, 2010; Shanahan et al., 2013). According to Hajer (1993), once a policy story becomes dominant, it will drive policy change (Jones and McBeth, 2010). Baumgartner and Mahoney (2008) do not share this statement as they observe that a framing that becomes majoritarian in public opinion does not necessarily change the position of policymakers (see also Daviter, 2011). NPF scholars tend to defend the first position in believing that ‘the power of a good story is likely to shape subsystem policy learning and outcomes, regardless of the available scientific information’ (Shanahan et al., 2011b, p. 548). In other words, NPF insights relate policy beliefs to coalition strategies and policy change and thus address an important criticism to the ACF (Nohrstedt, 2011).

FRAMING NARRATIVES TO CHANGE POLICIES

How should coalition members frame policy narratives in such a way that they will be successful in promoting their own policy solution? Coalitional glue and the distribution of cost and benefits have already been pointed out by existing research on policy narratives. First, coalitional glue questions the quality and persuasiveness of policy narratives within an advocacy coalition with three attributes: their stability, strength, and cohesion (Shanahan et al., 2011b). Coalitional glue in policy narratives appears to be more important than objectivity or scientific relevance. Stability means that the coalition should always stick to the initial causal story. Narratives are strong when all groups are supporting their belief with determination and avoid relativist discourses or nuanced opinions. Cohesion means that the prioritization among beliefs is the same between all groups in a coalition. Thus, the coalitional glue is high when the coalition is not distracted by internal disagreement about the framing

of the problem or the preferred solution: ‘advocacy coalitions with policy narratives that contain higher levels of coalitional glue (coalition stability, strength, and intra-coalition cohesion) will more likely influence policy outcomes’ (Shanahan et al., 2011b, p. 548; see Yordy et al., 2019).

Second, the success of policy narratives in orienting policy change is related to their ability to frame costs and benefits: ‘winning narratives tend to diffuse the benefits and concentrate the costs of a particular solution while losing narratives tend to concentrate the benefits and diffuse the costs of a particular policy solution’ (Crow et al, 2017, p. 642; see also McBeth et al., 2007). Policy actors in their discourse attribute the benefits and costs of a particular solution to different segments of society. In their role of victims, they will tend to show that the solution they contest is a cost for all and the benefits concentrated on a few, while their solution would only be harmful to the villains and beneficial to all. In a position of heroes, the solution they provide will be costless or concentrated on a few (e.g. the drillers will pay for environmental prevention and compensate environmental losses), while the benefits will be shared by the whole society (e.g. in terms of employments rates and economic growth). The perception of risk is a kind of problem framing that highlights the redistributive effects of the policy solution. For example, in the case of hydraulic fracturing, the problem will be framed as a series of risks (environmental, health, etc.) and benefits (economic growth, employment, energy security, etc). Each coalition frames the problems in highlighting specific risks and benefits. In their confrontation of statements, they will engage each other directly or indirectly (Yordy et al., 2019).

The present research concentrates on the way coalitions frame policy problems. To frame, in turn, is ‘to select some aspects of a perceived reality and make them more salient (...), in such

a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation' (Entman, 1993, p. 52). For example, energy can be considered an economic issue where the assessment of users' and producers' interests leads to recommendations regarding the amount and modalities of energy distribution, a political issue in which recommendations regarding supply depend on considerations related to foreign policy, or an environmental issue involving recommendations that depend on the externalities of the energy sector.

We focus on two patterns of problem framing by advocacy coalitions. First, advocacy coalitions should repeatedly assert their framing of the policy problem. Problem frames repeatedly presented to the general public by the members of one coalition are more likely to influence concrete policy changes than the frames presented by their policy competitors. It is worthwhile to note that a similar argument has already been made by Junk and Rasmussen (2019). However, their empirical evidence did not allow them to confirm their hypothesis.

Second, advocacy coalitions should privilege simple problem framing as a lever of policy change. Simple frames are those of coalitions which focus on few aspects of the policy problem to demonstrate the redistribute effects of their preferred policy solution. Simple problem frames are more appropriate for convincing the general public which is not an expert in specific policy domains such as hydraulic fracturing. To understand such complex policy problems, the general public heavily relies on heuristics, i.e., 'strateg(ies) that ignore(s) part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods' (Gigerenzer & Gaissmaier, 2011, p. 454). To opt for a supportive or resistant attitude toward complex policies, in a context of limited time and ability to understand all aspects of the problem, the general public will privilege simple arguments over

complex ones. Simple arguments, in turn, are more likely to convince policymakers that coalition members hold consensual policy views shared by the general public – a political resource of advocacy coalitions, according to the ACF (Sabatier & Weible, 2007).

METHODS

THE CONGRUENCE ANALYSIS OF A CRITICAL AND DEVIANT CASE

We conduct a ‘congruence analysis’ (Blatter & Haverland, 2012) of the French policy process of hydraulic fracturing. This approach involves the articulation of theoretical accounts from different approaches in a specific case. In this study, complementary accounts of policy processes based on shocks, collective action and learning in the ACF, on the one hand, and on framing in the NPF, on the other hand, are combined.

The French policy process of hydraulic fracturing is theoretically ‘deviant’ and empirically ‘critical’. In case-study research, ‘deviant cases’ lead to unusual outcomes while ‘critical cases’ are those that allow ‘to achieve information that permits logical deductions of the type, “If this is (not) valid for this case, then it applies to all (no)” ’ (Flyvberg, 2006, p. 230). There are democratic countries in the world in which shale gas or oil will most likely never represent a significant source of energy (e.g., Estonia or Finland: Schovsbo et al., 2017). In contrast, there are countries with significant sources of shale gas or oil in which allowing or forbidding hydraulic fracturing is really pivotal (Weible et al., 2016). In the U.S., for example, most states with significant reserves of unconventional hydrocarbons (e.g., Colorado, Pennsylvania, Texas, & Wyoming) still allow hydraulic fracturing despite public debates (Heikkila & Weible, 2016). The same holds for Canada (Lachapelle et al., 2018). In Europe, Poland ‘is expected to have

the largest shale gas deposits in Europe' and the public authorities issued up to 113 exploitation licenses (Lis & Stankiewicz, 2017, p. 54). There are, of course, some institutional settings in which a long-term moratorium or a ban have been applied but with a persistent controversy (e.g., New York in The U.S. or Victoria in Australia: Dodge & Lee, 2017; Luke et al., 2018). In France, in contrast, hydraulic fracturing has been banned as a result of successful opposition and activism and the framing dispute seems largely over (Chailleux & Moyson, 2016). Hence, France is an excellent case to examine what factors explain the unusual success of the anti-fracturing coalition, which similar coalitions missed to succeed in other countries with significant reserves of unconventional hydrocarbons. In other words, what worked in France for this coalition should probably work for similar coalitions in other countries.

DATA COLLECTION AND ANALYSIS

This case study relies on an analysis of a rich mix of semi-structured interviews, documents, and newspaper articles. To examine the attributes, resources and strategies of the advocacy coalitions, as well as the external and internal shocks to the policy subsystem, we relied on 24 interviews conducted between 2012 and 2014 with key policy actors, such as civil servants from the central administration, scientists from universities and research centers affiliated with the central administration, as well as delegates from citizens' collectives and environmental associations. The list of organizations in which interviews were conducted is presented in Appendix A. In order to map the advocacy coalitions, we gave our interviewees a list of arguments related to unconventional hydrocarbons and hydraulic fracturing retrieved from newspaper articles on this topic (see Appendix B, questions 1 to 5). We also asked questions about coordination among policy actors (see Appendix B, questions 6 to 10). The

other questions were related to the resources and strategies of advocacy coalitions, external and internal shocks, etc. (see Appendix B, questions 11 to 18). The national government and parliament mandated, at different steps of the policy process, four committees to discuss several issues related to shale hydrocarbon extraction and hydraulic fracturing. To assess the discussions and participation of coalition members in these ‘professional forums’, we also examined the committee meeting proceedings (Bellec et al., 2012; Durville et al., 2012; Gonnot & Martin, 2011; Lenoir & Bataille, 2013; Tuot, 2013).

In complement, we conducted a media content analysis (e.g., Olofsson et al., 2018). The statements made by various policy actors in French newspaper articles between January 1st, 2010, and January 31st, 2017ⁱ, were also coded. Eight newspapers were selected. Three of them are regional newspapers from the French regions concerned with hydraulic fracturing (i.e., the South East and Greater Paris): Midi Libre, La Provence and Le Parisien. The five others are the most read national newspapers: Le Figaro, Le Monde, Libération, Les Échos and La Croix. The articles were collected from the newspapers using the Europresse database and the following keywords searched for in the full text: ‘(gaz+ | pétrole+) de schiste+’ OR ‘fracturation hydraulique’ OR ‘hydraulic fracturing’ OR ‘hydrocarbure de roche-mère’ OR ‘(gaz | pétrole) & non-conventionnel’ AND ‘France’. Editorials, opinions pieces, or letters to the editor were excluded. Hydraulic fracturing had to be the main issue discussed in the article. Articles on hydraulic fracturing that were focused on countries other than France were also rejected.

The selection process resulted in a list of 254 articles. Regional newspapers represent 120 articles, while 134 articles come from national newspapers. A total of 1510 statements about hydraulic fracturing made by 317 different policy actors were coded. Twenty newspaper

articles were coded by two of the authors: only minor differences emerged, which led to some clarifications in the coding scheme for the next articles that were then coded separately. The average number of statements per actor between January 2010 and January 2017 equals 4.5. The statements were made by representatives of national executives and legislative bodies (22.4%), representatives from industry (17.4%), local government officials (14%) and representatives from citizen associations (14%). The other actors were scientists and researchers, representatives from regional governments, and actors from supranational or international organizations active in the French policy subsystem on hydraulic fracturing.

We used the media data to assess the policy core beliefs of subsystem members. We distinguished pro-fracturing statements (+1), anti-fracturing statements (-1) and neutral/mixed statements (0). The policy process (April 2010 – January 2017) was subdivided into fourteen periods of one semester. If a policy actor expressed different positions during the same semester, the mean of these statements was calculated. The spectrum of positions ranging from -1 to 1 was divided according to the rule of three: the actor was considered pro-fracturing if the average score was between 1 and .33 excluded, as neutral between .33 included and -.33 included, and as anti-fracturing between -.33 excluded and -1.

Based on this measurement of the actors' policy core beliefs regarding hydraulic fracturing, we deduced which advocacy coalition they belonged to. Obviously, we do not have explicit empirical evidence that all actors represented in the media coordinated their actions with each other. However, the interviews provided evidence about coordination patterns among coalition members. In turn, we noted a perfect convergence between actors' opinions identified in the interviews and the opinion of the same actors represented in the media analysis as well. In other words, while we operationalized advocacy coalitions with interviews,

we looked at ‘belief coalitions’ (Nohrstedt, 2008; Zafonte & Sabatier, 2004) in the newspapers, but the evidence points to the empirical convergence of both categories.

The repetition and simplicity of the problem frames used by policy actors to talk about hydraulic fracturing were also examined based on the media data. We looked at ‘equivalence’ frames which involve the presentation of similar information in different ways (e.g., opportunities versus risks or gains versus losses: De Bruycker, 2017) and allow the comparison of problem frames across interest groups or coalitions. Statements highlighting risks were distinguished from statements highlighting the benefits of hydraulic fracturing. Within each of these two categories, we distinguished three sets of information about the risks and benefits of hydraulic fracturing. First, economic frames focused on the risks and benefits of hydraulic fracturing for the systemic patterns in the economy, such as energy supply or sectoral activities (e.g., tourism or transport) at the national or regional level. Second, social frames focused on the risks and benefits of hydraulic fracturing for individuals, for example (un)employment. Finally, environmental frames focused on the risks and benefits of hydraulic fracturing for natural and human ecology. The coding categories and guidelines, together with examples, are presented in Appendix C.

ANALYSIS

Hydraulic fracturing became a policy issue in France at the end of 2010. Prior to 2011, policies regulating the exploration of hydrocarbon resources were relatively favorable to oil and gas companies. We distinguish two major policy changes between January 2010 and January 2017. The first occurred in March 2010. The Minister of the Environment issued three first

shale gas exploration licenses enabling the exploration of shale gas resources in the southeast of France based on hydraulic fracturingⁱⁱ. The second major policy change occurred in July 2011. The French parliament passed the 'Jacob Bill' prohibiting the exploitation of hydraulic fracturing in France, and the licenses previously issued were withdrawn. The experimental exploration of shale gas was still allowed.

In January 2017, the Subsurface Mineral Rights Reform passed in the National Assembly forbade the exploration and exploitation of shale gas and oil. While this reform was never promulgated, in December 2017, the Minister of the Environment Nicolas Hulot, TV reporter and figurehead of French environmental organizations, submitted a legislative project to organize the end of the exploitation, exploration and scientific research on all hydrocarbons (even though existing concessions will be allowed until 2040)ⁱⁱⁱ. In the next two sections, we conduct a congruence analysis of this policy process based on theoretical approaches of policy processes: the advocacy coalition framework and the narrative policy framework, with a focus on problem framing.

COALITION POLITICS

The ACF accounts for policy processes with a mix of collective action, external or internal shocks, and policy learning. The three first shale gas exploration licenses using hydraulic fracturing issued in March 2010 did not attract the attention of elected officials. At the end of 2010, however, an anti-fracturing coalition of elected officials, as well as various groups of citizens and environmental associations, emerged. The coalition included several local and regional communities affected by these permits, green politicians, and hundreds of citizens' groups.

The wide diffusion of the documentary Gasland depicting the negative consequences of the exploitation of shale gas in the United States (Adlesic et al., 2010) can be interpreted as an internal shock. They became a public problem only when they were interpreted as local threats regarding identifiable landmarks:

“I think that people stepped into the breach when they became aware that they were concerned at the local level; that their landmark was affected. People strongly reacted because of that. Especially here, they aspired to a rather preserved area: being subjected to industry is not the objective; otherwise, they would not have come and lived in Lozère. They are very angry about that.” (Collectif Causses Méjean, 2012)^{iv}

Gasland helped strengthen the mobilization and put fracking at the forefront of the public debate. This mobilization resulted in protests involving thousands of people (Terral, 2012). The arguments used by this coalition were not confined to a mere ‘Not In My BackYard’ or NIMBY approach but addressed the much broader issues of ecology, public health and transparency. Transparency was a major issue for local officials who opposed both to legal procedures which did not included them and to an industrial project unfit to existing policy orientations at the departmental or municipal level:

“It is straightforward: just about everything related to hydraulic fracturing is opposed to the interests of the the Hérault Department. Our strategy, today, is an economic strategy focused on tourism, especially green tourism of discoveries and hiking trails. Frankly, the fracking economy is quite the opposite of our departmental vision.” (General Council of Hérault, 2012)^v

To assert these arguments, the anti-fracturing policy actors could rely on a strong mobilization of some citizen associations and on the public opinion, as well as on the information provided by several committed scientists (e.g., sociologists or environmentalists). In contrast, they had

no money and, with the exception of some sympathetic elected politicians in the parliament, they had no allies holding key decision-making positions in the French political system at that moment of the policy process. Nevertheless, the issue of hydraulic fracturing was put not only on the political agenda of the parliament and the government but also on the agenda of various administrative services or agencies and interest groups dealing with hydrocarbon exploitation. The proponents of shale gas were unprepared and disorganized and, for these reasons, were not able to resist the critiques based on classical party politics, when hydraulic fracturing entered the parliament (Chailleux et al., 2018).

Ultimately, the parliamentary bill nr. 2011-835 (the 'Jacob' bill) prohibiting the exploitation/exploration of unconventional hydrocarbons but allowing experimentations on techniques alternative to hydraulic fracturing was passed in June 2011 and signed on July 13th, 2011. Accordingly, in October 2011, the government canceled the three controversial licenses.

In the second half of 2011, a pro-fracturing coalition emerged in response to the ban. The coalition was composed of the few early supporters of commercial exploitation and some later supporters who stressed the importance of exploration and experimentation. In addition to some gas and oil companies, the main advocates of the exploration of shale resources belonged to the organizations that provide specific expertise on these topics (e.g., several geologists). This coalition not only materialized through shared policy beliefs on fracturing but also through a more or less coordinated strategy of lobbying and participation in several politico-administrative committees created by civil servants and/or elected officials, which we interpret as policy forums (Fischer & Leifeld, 2015; Sabatier & Weible, 2007).

The government and parliament created three main politico-administrative committees to have discussions with stakeholders about fracturing. First, a joint-session committee of the

General Council of Industry, Energy, and Technologies (CGIET) and the General Council of the Environment and Sustainable Development (CGEDD) submitted its final report in February 2012 (Bellec et al., 2012; Durville et al., 2012). The CGIET is a committee of the Ministry of Economy, while the CGEDD is a committee of the Ministry of the Environment. Second, a parliamentary information committee coordinated by the Representatives Gonnot and Martin was established in March 2011. Third, in November 2012, the Parliamentary Committee for the Assessment of Scientific and Technological Choices (*Office Parlementaire d'Evaluation des Choix Scientifiques et Technologiques* or OPECST) was mandated by the parliament to assess alternative techniques for exploiting shale hydrocarbons. The OPECST is composed of 36 representatives and senators, supported by a Scientific Council of Researchers.

Overall, the conclusions that came out of the work of these successive committees clearly evolved over time. The distrust in shale hydrocarbons decreased, even though all attempts to reopen the debate failed. The perception of this industry by subsystem members, especially members from political and regulatory agencies, became increasingly positive. For example, the final report of the CGIET-CGEDD committee acknowledged the potential risks of hydraulic fracturing and the lack of impact studies but advised the government to leave the door open for 'cleaner' innovations and a more sustainable development of hydraulic fracturing. In comparison, the OPECST concluded that 'hydraulic fracturing has made important progresses (...). This is a technology, admittedly industrial and risky, but mastered and reasonably usable in a developed country with high environmental requirements' (Lenoir & Bataille, 2013, p. 9).

This evolution is consistent with the coordination efforts made by the pro-fracturing coalition: the reports demonstrate that its members participated in the works of the three politico-administrative committees more intensively (they participated more in the meetings, had

more input, etc.) than the members of the anti-fracturing coalition. This may be related to the membership of the two coalitions and their resources: the pro-fracturing coalition was composed of structured interest groups that had important financial resources and strong connections with civil servants whereas the membership of the anti-fracturing coalition was newer and composed of many unpaid advocates who had lower financial resources and weaker connections with the public administration.

Despite the importance of the politico-administrative committees on hydraulic fracturing and unconventional hydrocarbons, their conclusions did not exert a significant influence on policy change. This can be related with disputes among the members of the French government – e.g., in June 2012, Minister Bricq left the government after declarations against oil permits in Guyana – as well as to a decrease of the mobilization in the general public:

“You should know that the issue, today, is a Subsurface Mineral Rights Reform, which has been claimed from the start. (...) Despite that there is a demobilization and that pressure is slow for now, everyone seems aware, at the regional level as well as at the national level, that there are potentially judicial backlashes from companies which were granted exploration rights” (Regional Council of Rhône Alpes, 2012)^{vi}

In August 2012, the Prime Minister Ayrault claimed that the debate was not closed. In July 2013, the President Hollande repeated his strong opposition to hydraulic fracturing and the willingness of the Minister of Industrial Recovery, Arnaud Montebourg, to create a national company for shale gas. Following disagreements with other members of the government, especially the Minister of the Environment, Ségolène Royal, Minister Montebourg left the government some days before the leaking of a report that demonstrated the profitability of

propane fracturing. However, despite this politico-administrative inclination toward hydraulic fracturing, a policy status quo (Jacob bill) persisted, and in 2017, the exploitation and exploration of all hydrocarbons was forbidden in France.

As far as policy learning is concerned, based on the analysis of the actors who made more than one statement in the media, the data suggest that only 18 (5.7%) policy actors changed their mind about hydraulic fracturing a total of 28 times, 50% of them belonging to public agencies. While the number of changes per period is relatively small, approximately 25% of them occurred in the period between April 2013 and September 2013, which was a year of intense research activity within the OPECST. Higher belief change during this period is consistent with the ACF expectation that policy actors learn more when policy dialogue is higher among subsystem members within professional forums (Sabatier & Weible, 2007). To be complete, it should be noticed that the nature of the public issue also evolved over time, with hydraulic fracturing being part of the larger concerns about energy transition:

“At the General Council, we were required to organize the ‘energy convention’ where we set the issue at the level of Ardèche, in November 2011: what do we consume? What do we produce and what future do we want? (...) We thought that we could not be in a ‘no’ policy only, without asking the question of the energy future, with two avenues: producing green energy in Ardèche and trying to consume less.” (General Council of Ardèche, 2012)^{vii}

In the final analysis, however, the low number of belief changes as well as the weakness of these changes—which are also consistent with ACF research (e.g., Moyson, 2017)—suggest that policy learning may not be considered an important factor of policy change.

Overall, coalition dynamics within the French politics of hydraulic fracturing are consistent with ACF expectations. Internal shocks such as the diffusion of the Gasland documentary exerted a significant influence on the formation of coalitions. Similarly, the ACF skepticism about policy actors' propensity to change their policy beliefs over time was confirmed. Finally, the pro-fracturing policy actors relied on their resources to coordinate their lobbying and their participation in the professional forums. However, despite the assets of the pro-fracturing policy actors, not only hydraulic fracturing but also the exploitation and exploration of all hydrocarbons was buried between 2010 and 2017.

PROBLEM FRAMING BY COALITIONS

To explain the success of the anti-fracturing coalition, we turn our attention to problem framing in policy narratives. The literature review suggests that simple, regularly repeated problem frames should be successful at influencing policy processes.

Repetition – Did the anti-fracturing policy actors repeat their policy narrative more often than the pro-fracturing actors? To answer this question, we compare the number of media statements by the members of each coalition in Figure 1. We distinguish the first period of time between the first and second major policy changes (March 2010 – July 2011) from the second period of time after the second policy change (July 2011 – December 2017).

[Figure 1 about here]

The policy process starts with a predominance of the pro-fracturing arguments, in line with the room traditionally given to the oil industry in the French media and the absence of opposition to this industry at this time. In the second half of 2010, the anti-fracturing coalition

emerges, together with a growing level of media activity. Arguments against fracturing dominate over other arguments until April 2013. Until this month, between 28 and 53 anti-fracturing statements are made per period (up to 70.5% of all statements). In contrast, between 11 and 29 pro-fracturing statements are made per period (barely exceeding 40% of all statements). Such a predominance of the anti-fracturing arguments is consistent with the victory of the anti-fracturing coalition in prohibiting the use of hydraulic fracturing to exploit unconventional hydrocarbons through the Jacob Bill, as well as with the inability of the pro-fracturing coalition to reverse this ban in the next months.

Generally, the number of pro-fracturing and anti-fracturing statements varied together. Two common peaks may be observed. Between October 2010 and April 2011, a total of 77 actors express a statement (only 19 in the previous period), which aligns with the emergence of the fracking controversy, the grassroots mobilization against fracturing and the first debates on the future Jacob Bill prohibiting the use of hydraulic fracturing. The level of activity of the actors subsequently falls back in the following semester before gradually increasing from semester to semester and reaching a second peak between April 2013 and September 2013. This increase matches the periods of intense policy dialogue in dedicated politico-administrative committees (professional forums) and ends with the publication of the preliminary outputs of this dialogue: the Galois report on the French economy and competitiveness and the intermediary conclusions of the OPECST committee.

Starting in October 2013, however, the respective number of pro-fracturing and anti-fracturing statements becomes more balanced, with periods of time characterized by a slight predominance of the pro-fracturing arguments (e.g., October 2013 – March 2014) and periods of time characterized by a slight predominance of the anti-fracturing arguments (e.g., April

2014 – September 2014). This relatively predominant presence of pro-fracturing arguments in the media is consistent with the stronger participation of the pro-fracturing coalition members in the politico-administrative committees. The last periods of time were characterized by a decrease and stabilization of the mobilization as well as a relative rise in the neutral coalition (18.2% of the statements between October 2016 and December 2017). Overall, the anti-fracturing coalition members were clearly louder than the pro-fracturing policy actors in framing the policy problem, which supports the idea that repetition is an effective political strategy.

Simplicity – Did the anti-fracturing policy actors repeat a simpler problem frame than the pro-fracturing actors? We examine simplicity by looking at the number of media statements with respect to the risks and benefits of hydraulic fracturing, as shown in Figure 2 and Figure 3.

[Figure 2 about here]

[Figure 3 about here]

Generally, we note important variations in the number of statements made by the two coalitions regarding the risks and benefits of hydraulic fracturing over time. These variations are in line with the analysis in Figure 1: overall, the anti-fracturing coalition made more statements regarding the risks and benefits than the pro-fracturing coalition, but we observe two common peaks between October 2010 and April 2011 as well between April 2013 and September 2013. More specifically, economic benefits, environmental/health risks, and attempts to minimize the risk stand out from the crowd. Environmental/health risks are mostly invoked by anti-fracturing coalition members, whereas the minimization of risks and the economic benefits of hydraulic fracturing are mostly mentioned by the pro-fracturing coalition.

More fundamentally, the numbers suggest that the anti-fracturing coalition relied on a simpler frame than the pro-fracturing coalition: the first coalition focused on only one category of arguments—those pointing to the environmental/health risks of hydraulic fracturing; in contrast, the second coalition tended to present two categories of arguments—the economic benefits of hydraulic fracturing and the social risks of its prohibition. Such a comparison is robust, because we looked at similar categories of arguments for the actors in both coalitions, i.e., we relied on ‘equivalence frames’ (De Bruycker, 2017).

DISCUSSION AND CONCLUSIONS

The ACF conceptualizes policy processes as political struggles between coalitions of policy actors whose aim is to transform their policy beliefs and preferences into concrete policies (Jenkins-Smith et al., 2018; Sabatier & Jenkins-Smith, 1993). Beyond perturbations external to the subsystem (external shocks, e.g., a natural disaster), according to the ACF, policy change mostly happens when the members of the most powerful coalition use their resources to coordinate political strategies (collective action) or when they revise their beliefs (policy learning).

According to the NPF (Jones et al., 2014; Shanahan et al., 2011b), coalition members are also more susceptible to transform their policy beliefs when they tell a ‘good’ story which describes and causally relates the policy issue to their preferred solutions by identifying ‘villains’ who are responsible for the policy problem, ‘victims’ who suffer from this problem because of the villains, and ‘heroes’ who can solve the problem with the solution. According to existing studies, policy narratives are more convincing when they suggest that coalitions are stable,

strong, and cohesive around the story (Shanahan et al., 2011b; Yordy et al., 2019). They should also be framed in such a way to identify few costs and many benefits for the victims, and the other way around (Crow et al, 2017; McBeth et al., 2007). In this research, we have looked at the effect of the simplicity and repetition of problem framing.

We have combined these theoretical accounts of policy change in the congruence analysis (Blatter & Haverland, 2012) of the French policy process of hydraulic fracturing, which opposed an advocacy coalition of pro-fracturing business representatives, scientists, public officials and politicians to a coalition of NGO representatives and citizens fighting against fracturing together with several other scientists, officials and politicians.

Our findings suggest, according to the qualitative data, that the anti-fracturing coalition and the pro-fracturing coalition had and used different types of political resources, but those data do not allow to conclude that one coalition was clearly more resourceful than the other. Furthermore, the media data suggest that the policy beliefs and preferences supported by the coalitions did not change very much over time (i.e., there was no policy learning). Nevertheless, the policy changes limited and then prohibited hydraulic fracturing over time, consecrating the position of the anti-fracturing coalition. Hence, the repetition of a simpler problem frame by the anti-fracturing coalition – i.e., numerous media statements that focused on a stable and limited set of potential risks of hydraulic fracturing – appeared to be a more effective strategy for influencing the policy process than the diffusion of more complex problem frames by the pro-fracturing coalition – i.e., rarer media statements that focused on various potential benefits of fracturing. In a nutshell, while the ACF provides a fair account the politics of hydraulic fracturing in France, NPF insights have been useful to show that some

strategies prove more effective than others to frame coalition beliefs in a convincing narrative about policy problems.

Theoretically speaking, these findings imply that policy narratives can be conceptualized as a strategy of advocacy coalitions to frame their policy beliefs. This framing strategy of coupling policy problems and solutions through narratives involves the use of political resources such as information and public opinion and theoretically relates policy beliefs and policy change, especially when other ACF accounts, such as shocks and political resources, do not suffice alone to explain policy change. Further, our findings suggest that there are patterns of problem framing – i.e., simplicity and repetition – that account for the efficacy of this strategy, which contributes to existing research articulating ACF and NPF approaches to policy processes (e.g., Shanahan et al., 2011b; Yordy et al., 2019).

That said, we are aware that an articulation of the ACF with the NPF does not fully elucidate policy processes. For example, complementary accounts of the French policy process of hydraulic fracturing could result from the application of the ‘policy feedback’ theory (Béland, 2010; Pierson, 1993) which suggests that policy at time 3 can result from the influence of policy change at time 1 on politics and policymaking at time 2. The mobilization of pro-fracturing coalition members, after the prohibition of hydraulic fracturing in 2011, could certainly be interpreted from this perspective as some form of ‘interest group mobilization’ following policy change (Béland & Schlager, 2010). Other examples could be provided: the point is that, while some theories account for some policy processes more adequately than others, multiple lenses are always necessary (Weible, 2018). In the same vein, multiple strategies of theoretical development coexist: consistent with Cairney (2013)’s call for flexible solutions, we have presented a ‘synthesis’ involving the production of one theory about

problem framing by advocacy coalitions based on ‘complementary’ insights from the ACF and the NPF. In doing so, however, we have run the risk of applying each theory more superficially: for example, we did not rely on NPF notions such as the ‘plot’, ‘characters’, and ‘moral’ of policy narratives. Other strategies are possible, such as using ‘contradictory’ insights from different theories before choosing one over the other (Cairney, 2013).

Methodologically speaking, this study combined the qualitative analysis of interviews and documents to examine coalition politics and policy change, with media coding to examine policy learning and problem framing. While this methodological approach addresses the need for more longitudinal research in the study of the political and social dimensions of hydraulic fracturing (Evensen, 2018), three limitations can be identified. First, we did not operationalize the causal mechanisms (King et al., 1994; Tilly, 2001) between the evolution of policy frames, policy learning, and policy changes. This means that only the theoretical rationale of the research is supposed to explain the relations that we observed in the empirical analysis. Future studies could address this issue with specific interview questions looking at policy frames as explicit strategies of coalitions members or at policy change as the result of these strategies, as well as with new research designs involving, for example, comparisons between policy processes.

Second, the media statements analyzed in this research have been valid and robust indicators of frame repetition and simplicity. However, the expansion of coalitions could also be a factor policy change, because larger coalitions can be more resourceful (i.e., more mobilizable troops, information, money etc.) to impose their beliefs in the subsystem, independently from the way they frame and narrate them. Unfortunately, whether a policy actor speaks in the media at time *t* does not mean that he or she is politically active at this moment. Further,

media statements do not tell anything about how long this actor keep thinking the same way and what he or she believe at time $t+1$ (i.e., he or she could hold different beliefs without stating anything in the medias). In other words, media statements are not fair indicators of coalition expansion or shrinkage. That said, this limitation is bidirectional (policy actors could be politically active when they speak to the media, at time t ; similarly, they could hold similar beliefs at time $t+1$ without new media statement).

Third, our results can be subject to media biases. The number of statements made by policy actors in favor or against hydraulic fracturing could have been influenced by some sort of a professional code that may prompt journalists to interview people whose statements fit in with their willingness to present either one side or a balanced view of the story (see Trumbo et al., 1998). Similarly, the geography could influence the representation of the interviewees in the media data, which possibly materializes in the high representation of public officials (in Paris) compared to the low representation of citizen associations (in the regions). Framing repetition could also be an indication of media attention toward the policy issue of hydraulic fracturing (Yanovitsky, 2012). This limitation, however, has been balanced with two strengths of our methodological approach. On the one hand, our congruence analysis (Blatter & Haverland, 2012) explicitly assessed two sets hypotheses pointing to different theoretical directions, complementing existing studies on the politics of hydraulic fracturing that focus on the ACF to compare different institutional settings (Heikkila et al., 2019). On the other hand, a large number of different newspapers were coded over a long period of time, which suggests that biases have been, at the very least, very much attenuated.

Empirically speaking, this study overlooked some institutional factors of policy change that were pinpointed by the interviews conducted with policy actors. For example, in 2011, the

authority on hydraulic fracturing was transferred from the Ministry (and Minister) of Industry to the Ministry (and Minister) of the Environment. The Ministry of Industry mostly includes 'Corps des Mines' engineers, geologists and other experts with stronger connections to the oil/gas industry. The Ministry of the Environment, in contrast, is mostly composed of 'Corps des Ponts' engineers, who have more opportunities to speak with citizen associations and grassroots movements. This transfer of authority most likely facilitated the policy changes burying hydraulic fracturing. In addition, it should be noted that the Minister of Industry Besson was a defector of the socialist party whereas the Minister of Environment Koscuisko-Morizet was the spokesperson of candidate Sarkozy during the campaign, which suggests that this transfer of authority was already a 'political' signal on hydraulic fracturing (see also Zittoun & Chailleux, forthcoming). An alternative interpretation of these facts is that the members of the anti-fracturing coalition were successful at progressively expanding their political resources, especially allies with the legal authority to make policy decisions consistent with their views. Generally speaking, there is no empirical evidence that the framing strategies had stronger effects on the French policy process of hydraulic fracturing than other strategies or factors, such as the role of the Government or the Constitutional Court in maintaining the ban (Jolly, 2013).

This discussion suggests several avenues for future research. First, the empirical analysis presented in this article suggests that some resources (e.g., money and 'mobilizable troops': Sabatier & Weible, 2007) prove as effective as other resources (e.g., public opinion or information) in some contexts. This raises the double challenge of 'develop(ing) a hierarchy of coalition resources' (Jenkins-Smith et al., 2018) but also of assessing what ways are more effective than others for using each of these resources. Indeed, a 'bad' use of crucial resources

could be less helpful for influencing policies than the ‘good’ use of more peripheral resources, which brings us back to the importance of strategies.

Second, the design of the research presented in this article did not allow us to clearly isolate repetition and simplicity as a narrative strategy of coalitions, from other accounts of problem framing such as media biases. To further integrate policy narratives with the advocacy coalition framework, we need to understand whether (and when) problem framing is a rational strategy of coordinated advocacy coalitions or the result of an implicit process of information selection by uncoordinated representatives of ‘belief coalitions’ (Nohrstedt, 2008; Zafonte & Sabatier, 2004). In other words, future studies should examine the ‘face’ of framing displayed by coalitions in narrating their stories (Baumgartner & Mahoney, 2008).

Third, “coalitional glue” as well as a convincing presentation of costs and benefits have already been pinpointed by previous research as patterns of policy narratives that foster their influence on policy change (Crow et al, 2017; McBeth et al., 2007; Shanahan et al., 2011b; Yordy et al., 2019). While the simplicity and repetition of problem framing point to different aspects of policy narratives, the four notions are partly related. For example, the repetition of the risks related to hydraulic fracturing could suggest that the policy narrative of the anti-fracturing actors was strong and stable. Similarly, simpler problem framing was probably more effective at pointing to the costs of hydraulic fracturing. In other words, future research should look into the theoretical relations between the patterns of convincing policy narratives.

Fourth, future studies should further refine the theoretical paths between coalition politics, problem framing through policy narratives, and policy change. Methodologically, this involves the collection of individual-level data that relate policy learning and policy framing by the same individuals. This also involves the use of methods that provide more robust assessments

of the relations between coalition politics and policy narratives over time, such as process tracing and longitudinal analyses. Lobbying research could inspire ACF and NPF researchers in both respects (see, e.g., Junk & Rasmussen, 2019).

Fifth, while the institutional insights provided by the interviewees were consistent with the findings reported in this study, we call for future research that would combine our actor-centered approach to the French politics of hydraulic fracturing with organizational or institutional analyses. In this way, new hypotheses relating, for example, institutional centralization with the effects of problem framing, could be explored.

Based on the study of the French politics of hydraulic fracturing, this article has shown that there are more or less effective strategies for advocacy coalitions to tell ‘good’ stories that frame causality between policy problems and their preferred solutions. While complex arguments can prove useful within professional forums, repeating simpler problem frames seems more effective when communicating with a more general group of subsystem members or with the general public through media. In other words, we suggest that policy practitioners who want to influence policy decisions should make their arguments loud and simple.

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APPENDIX A – INTERVIEWS

Civil servants

Service of oil and gas (BEPH), Ministry of the Environment (2014)

National Institute for Industrial Environment and Risks (INERIS) (2012)

General Council of Mines, Ministry of the Industry (2014)

Members of national and local parliaments as well as mayors

Municipality of Lagorce (2012)

General Council of Hérault (2012)

General Council of Ardèche (2012)

Socialist Party at the National Assembly (2012)

Regional Council of Rhône-Alpes (2012)

Academics

School for Advanced Studies in the Social Sciences (EHESS) (2014)

ESG Management School (2014)

Montpellier University (2013 and 2014)

Members of citizens' associations and collectives

Amicale des foreurs (2012)

Oil and gas professional association (2012)

No Fracking France (2013)

Collectif Causses-Méjean (2012 and 2013)

Collectif de Lodève (2012)

Collectif Lot-et-Garonne (2012)

Collectif 07 (2012)

Non au gaz de schiste Permis de Cahors (2012)

Members of oil companies

Total (2012)

APPENDIX B – INTERVIEW GUIDE

Questions related to policy beliefs and coordination within advocacy coalitions

1. What does your organization represent (legitimacy, values, group)?
2. Which policies do your organization aim to influence (topic and the geographic and functional scope)?
3. What are the policy positions defended by your organization on shale hydrocarbons and hydraulic fracturing?
4. What do you think about shale hydrocarbons and hydraulic fracturing? What do you think about the ban on hydraulic fracturing?
5. What do you think about the following arguments?
 - a. Environmental arguments on water contamination, air pollution, etc.
 - b. Technological arguments on the uncertainty surrounding extraction techniques, the treatment of water, etc.
 - c. Legal arguments on the noncompliance with the environmental code, the Kyoto protocol, etc.
 - d. Social arguments related to the deterioration of landscapes, the negative impact on tourism and agriculture, etc.
 - e. Health arguments on the risks of cancers and diseases resulting from water and air pollution.
6. How do you situate your organization with regard to the other stakeholders in the policy on shale hydrocarbons?
7. How would you situate the policy position of your organization with respect to the position of the government?

8. What are the relations of your organization with other organizations advocating similar policy positions?
9. What are the relations of your organization to the other organizations advocating different policy positions?
10. How do you feel that your policy arguments and actions are considered by your allies, opponents, officials, and politicians?

Questions related to factors of policy change (coalition resources and strategies, external and internal shocks, etc.)

11. What are the sources of information that you used to inform your policy position on shale hydrocarbons and hydraulic fracturing? Did you use scientific sources?
12. What are the resources used by your organization to influence policies (financial, human, etc.)?
13. What types of initiatives did your organization take to relay its arguments and defend its policy position?
14. Did your organization: (A) organize demonstrations? (B) organize symbolic actions? (C) formulate public stances? (which media?) (D) organize legal action? (E) take up lobbying? (F) negotiate with other policymakers?
15. What were the three political actions of your organization that had the most important impact on the policy process?
16. How would you describe your relation to the media?

17. What are the aspects of the economic, social, and political context that facilitated or impeded your political strategy? What were the opportunities? What were the constraints?
18. What does your organization expect from the central administration, the government and the parliament in the coming months? What does your organization plan to do?

APPENDIX C – MEDIA CONTENT ANALYSIS: CODING CATEGORIES, GUIDELINES, AND EXAMPLES

Coding category	Coding guidelines	Coding example
POLICY CORE BELIEFS (anti-fracturing, neutral/mixed, pro-fracturing)		
Anti-fracturing	The actor is quoted in the article as being in opposition to hydraulic fracturing (or oil and gas development that uses hydraulic fracturing), or the article describes the actor's actions in a way that makes it clear that the actor is opposed. An "opposing" quote could come in the form of stating that hydraulic fracturing is harmful to the environment, the public, the economy, climate change, etc., or that the actor wants to see hydraulic fracturing, or oil and gas development that uses hydraulic fracturing, banned, stopped, or suspended. Opposing "actions" would be identified if the article's author talks about an actor as trying to stop or limit hydraulic fracturing (e.g. by protesting at a public event, by testifying on problems related to hydraulic fracturing), or talks about the actor collaborating with other organizations that are taking these actions.	"Il est absolument irresponsable de la part de décideurs parlementaires d'envisager de poursuivre dans une voie qui a déjà démontré ses failles dans les pays qui ont expérimenté la fracturation" ["hydraulic fracturing has already demonstrated its weaknesses in the states which experimented it : representatives willing to allow it nevertheless are absolutely irresponsible"] (Article ID = LI-001 ; Article date = 2013-06-07 ; Article source = Libération ; Actor name = Elisabeth Bourgue ; Organization name = No Fracking France)
Neutral/mixed	The actor is reported with a neutral or mixed pro/anti position on hydraulic fracturing. For example, if a policymaker is described or quoted as taking a position that "more evidence is needed about the costs and benefits before passing a law" then it is clear that the policymaker has a neutral position (rather than "no position"). Alternatively, if someone is quoted in one part of the article as saying "I'm concerned about the risks of hydraulic fracturing" and then later quoted as saying "but the economic benefits to our state are high", then this person takes a mixed position.	"Sauf surprise, au regard des auditions d'experts organisées par cet organisme, le rapport devrait conclure à l'absence de techniques alternatives. Des brevets sont déposés, des recherches sont en cours notamment aux États-Unis et en Chine, mais aucune autre technique n'est aujourd'hui disponible et en mesure d'être mise en œuvre demain" ["Barring surprises, given the experts' interviews that the organization conducted, the report should conclude that alternative techniques are nonexistent. Patterns are filed, research is being conducted, notably in the US and China, but no other technique is currently available and ready to be executed."] (Article ID = LC-001 ; Article date = 2013-06-06 ; Article source = La Croix ; Actor name = Gilles Pijaudier-Cabot ; Organization name = Université de Pau)

Pro-fracturing	The actor is quoted in the article as being supportive of hydraulic fracturing (or oil and gas development that uses hydraulic fracturing), or if the article describes the actor's actions in a way that makes it clear that the actor is in support of hydraulic fracturing. A "supportive" stance can come in the form of stating that hydraulic fracturing is good or beneficial for the economy, jobs, energy security (or something else), or that the actor wants to see hydraulic fracturing developed or expanded, or it may be a quote that argues against someone who opposes hydraulic fracturing. Supportive "actions" can be identified if the article's author talks about an actor engaging in drilling or hydraulic fracturing wells, investing in fracking businesses, collaborating with the oil and gas industry on researching fracking technologies, exploring a shale formation, taking actions that represent support (e.g. testifying in a public hearing that hydraulic fracturing is beneficial, safe, or "good" in some way), etc. Supportive actions or quotes can also be in relation to technology that is part of the overall oil and gas development process (not just hydraulic fracturing alone). Supportive stances could also be related to the regulatory framework. For example, if a government official is proposing policy related to encouraging hydraulic fracturing. However, coders will be careful not to infer a supportive position if no other information is provided about the stance of the actor or if the policy itself is mixed, for example if regulations are being adopted that would curb hydraulic fracturing.	"Le député PS Christian Bataille et le sénateur UMP Jean-Claude Lenoir, tous deux membres de l'Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST), ont publié hier un rapport d'étape dans lequel ils défendent une exploitation « maîtrisée » du gaz de schiste." ["The PS representative Christian Bataille and UMP senator Jean-Claude Lenoir, both members of the Parliamentary office for scientific and technological choices (OPECST), published yesterday an intermediary report supporting a « controlled » use of hydraulic fracturing."] (Article ID = LI-001 ; Article date = 2013-06-07 ; Article source = Libération ; Actor name = Christian Bataille ; Organization name = National Parliament & Government)
FRAMING OF HYDRAULIC FRACTURING (risk and benefits)		
Social risk	The actor states a position suggesting that he/she believes hydraulic fracturing to have social risks. Statements about how hydraulic fracturing displaces communities, fragments social capital, disrupts traditional ways of life, encroaches on tribal lands, perceived as a public nuisance etc. are considered examples of social risk. Issues regarding dust and transportation are likely to be social risks.	"Cette industrie n'est pas viable économiquement, crée peu d'emplois, dévalue les prix de l'immobilier et ne fera pas baisser la facture de gaz des ménages." ["This industry is not sustainable economically, creates few jobs, devalue the real estate market and will not lower the gas bills of households."] (Article ID = LPR-003 ; Article date = 2013-06-07 ; Article source = La Provence ; Actor name = Benoît Hartman ; Organization name = France Nature Environnement)
Environmental/health risk	The actor states a position suggesting that he/she believes hydraulic fracturing to have environmental risks. Statements about how hydraulic fracturing can result in contamination of groundwater or surface water, lead to earthquakes, affect biodiversity/displace species etc are	"En France, depuis la loi du 13 juillet 2011, dont l'initiative revient à l'ancienne majorité UMP, la fracturation hydraulique est interdite en raison de ses conséquences - controversées - sur l'environnement." ["In France, since the adoption of the law of July 13th 2011, initiated by the former UMP majority, fracking is

	considered examples of environmental risk. Public health issues associated with hydraulic fracturing should be included.	forbidden due to its controversial consequences on the environment.”] (Article ID = LM-001 ; Article date = 2013-06-08 ; Article source = Le Monde ; Actor name = Majorité parlementaire UMP (2011) ; Organization name = Political Parties)
Economic risk	The actor states a position suggesting that he/she believes hydraulic fracturing to have economic risks. Statements about how hydraulic fracturing disrupts regional economies, negatively affects tourism, favors concentration of income in favor of corporations, or sucks up public resources that could be used in other sectors (health, education, etc.) are considered examples of economic risk.	“De même, les évaluations en termes de créations d'emplois demeurent fragiles. Il ne faut pas s'illusionner, cette industrie ne créera pas des milliers d'emplois directs” [“Likewise, the evaluations regarding job creation remain weak. It is unlikely that this industry will create thousands of direct jobs.”] (Article ID = LC-002 ; Article date = 2014-02-17 ; Article source = La Croix ; Actor name = Bruno Courme ; Organization name = Total)
Social benefit	The actor states a position suggesting that he/she believes hydraulic fracturing to have social benefits. Statements about how hydraulic fracturing brings communities together, increases social capital (“we’ve built schools, libraries”) etc. are considered examples of social benefits.	“On n'a pas le choix, c'est la crise, ne passons pas à côté de ce trésor. Regardez le miracle américain, son million d'emplois créés, les prix du gaz quatre fois moindres, la compétitivité, l'indépendance énergétique...” [“There is no choice, there is a crisis, we should not miss this opportunity. Look at the American miracle, its million of new jobs, the gas prices which are four times lower, the competitiveness, the energy independence...”] (Article ID = LI-005 ; Article date = 2013-07-12 ; Article source = Libération ; Actor name = Jean-Louis Schilansky ; Organization name = Union française des industries pétrolières)
Environmental/health benefit	The actor states a position suggesting that he/she believes hydraulic fracturing to have environmental benefits or that hydraulic fracturing is “safe” for the environment.	“Le gaz de schiste peut être une bonne nouvelle s'il se substitue au charbon », estime l'économiste Jean-Charles Hourcade. En effet, la combustion du gaz, pour produire par exemple de l'électricité, émet deux fois moins de CO2 que le charbon.” [“Hydraulic fracturing can be good news if it is a substitute for coal, says economist Jean-Charles Hourcade. Indeed, the gas combustion for producing electricity releases two times less CO2 than coal.”] (Article ID = LC-002 ; Article date = 2014-02-17 ; Article source = La Croix ; Actor name = Jean-Charles Hourcade ; Organization name = Centre National de la Recherche Scientifique - CNRS)
Environmental risk minimization	The actor minimizes environmental risks of hydraulic fracturing. Statements that suggest that the environmental risks of hydraulic fracturing are exaggerated are considered examples of environmental risk minimization.	“Les cas de pollution recensés à l'étranger sont probablement la conséquence d'une gestion défectueuse de l'eau en surface ou de puits de mauvaise qualité », tranchent Bataille et Lenoir.” [“Instances of pollution reported abroad probably are the consequence of a faulty management of the surface water or of

		poor quality wells, conclude Bataille and Lenoir.”] (Article ID = LI-001 ; Article date = 2013-06-07 ; Article source = Libération ; Actor name = Christian Bataille ; Organization name = National Parliament & Government)
Economic benefit	The actor states a position suggesting that he/she believes hydraulic fracturing to have economic benefits. Statements about how hydraulic fracturing favors jobs creation, opens new economic opportunities, injects money in local communities, improves the financial health of local and regional-level governments etc. are considered examples of economic benefit.	“Le texte pointe aussi les avantages économiques liés à l'exploitation souhaitable des huiles et gaz de schiste en France : la relance de la compétitivité grâce à la baisse du prix du gaz à prévoir dans l'Hexagone, et la création attendue de 100 000 emplois, selon les chiffres du cabinet privé SIA Conseil.” [“The text also highlights the economic benefits of a desirable exploitation of shale oil and gas, i.e.: the recovery of competitiveness thanks to the expected drop in prices of the gas in France, as well as the foreseen creation of 100 000 jobs, according to the numbers of the private firm SIA Conseil.”] (Article ID = LM-001 ; Article date = 2013-06-08 ; Article source = Le Monde ; Actor name = Christian Bataille ; Organization name = National Parliament & Government)

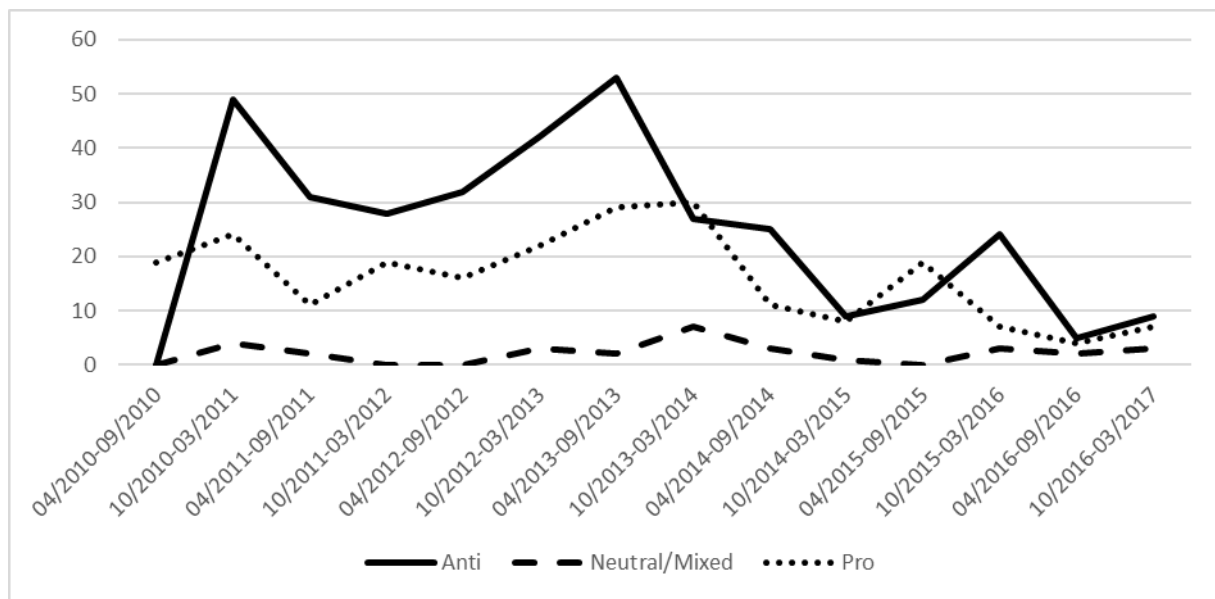


FIGURE 1. NUMBER OF MEDIA STATEMENTS REGARDING HYDRAULIC FRACTURING PER COALITION PER PERIOD OF TIME

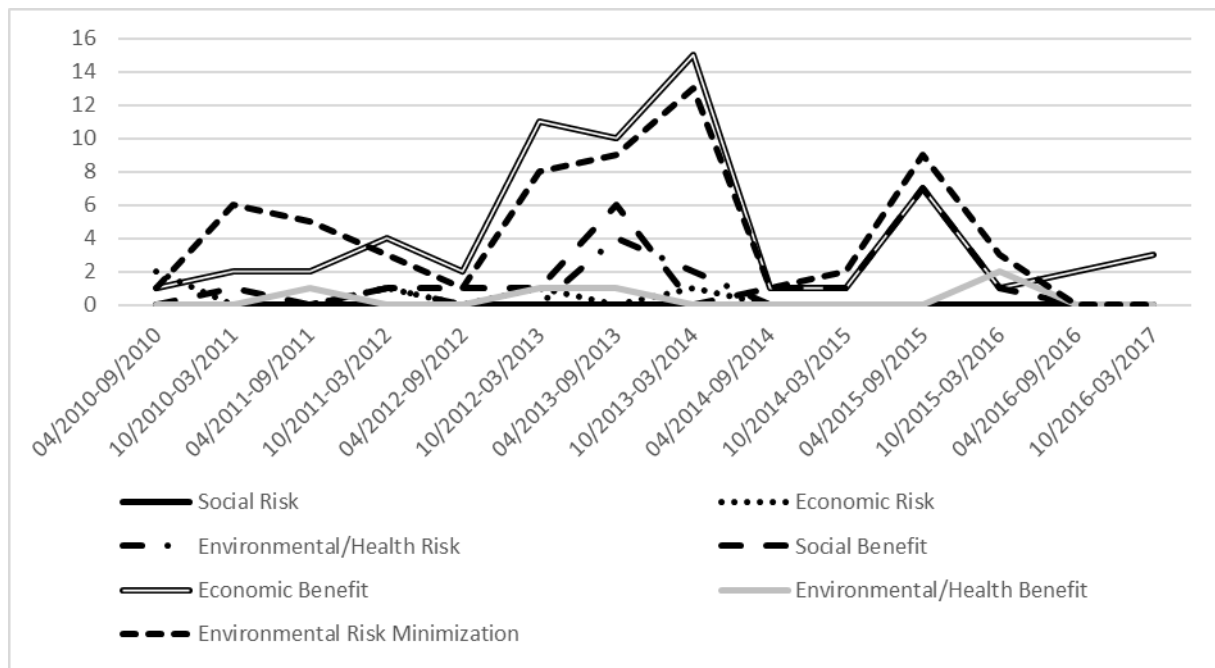


FIGURE 2. NUMBER OF MEDIA STATEMENTS ON THE RISKS/BENEFITS OF HYDRAULIC FRACTURING BY PRO-FRACTURING COALITION MEMBERS

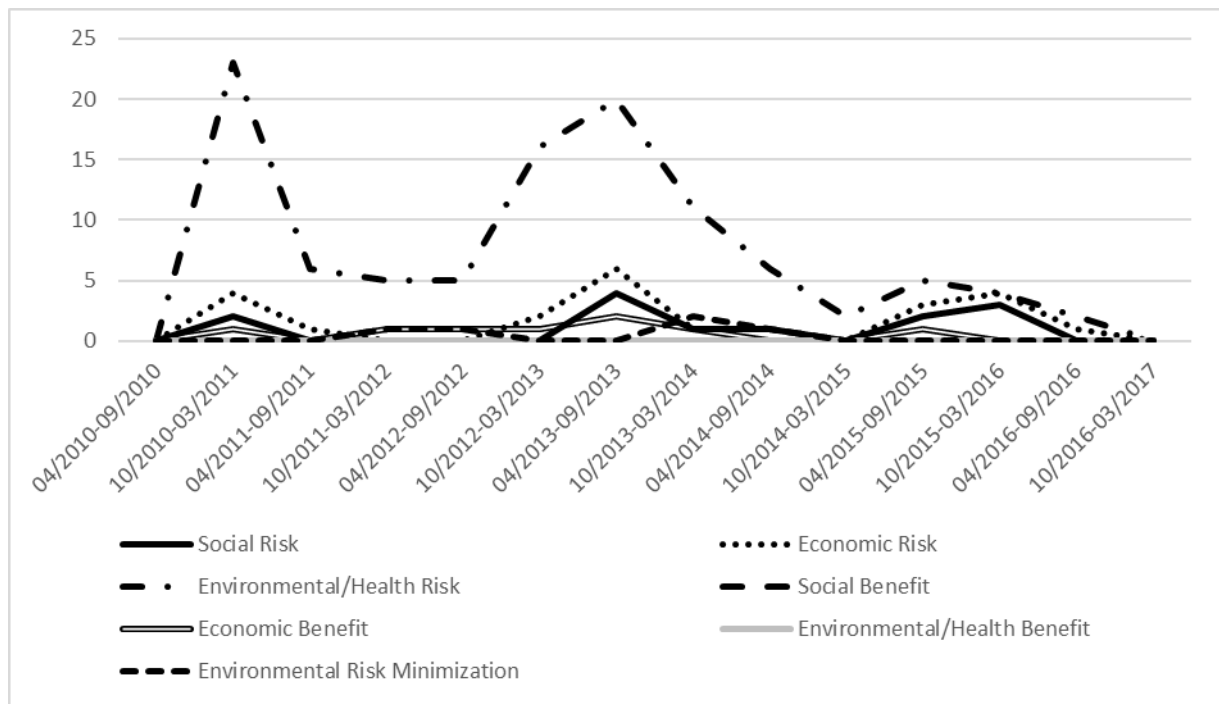


FIGURE 3. NUMBER OF MEDIA STATEMENTS ON THE RISKS/BENEFITS OF HYDRAULIC FRACTURING BY ANTI-FRACTURING COALITION MEMBERS

i The data have been collected in the context of an international research project on the politics of hydraulic fracturing, as supervised by Prof. Dr. Christopher Weible and Prof. Dr. Tanya Heikkila (School of Public Affairs, University of Colorado Denver).

ii To be clear, the rules did not change, but the issuance of the permits is the expression of a major change in the policy outputs resulting from these rules, following the ministerial decision.

iii This highlights that, while this study focuses on the politics of hydraulic fracturing, the policy issue was extended to all hydrocarbons between 2010 and 2017. This extension, however, does not question the robustness of the study.

iv Translated from the following French transcript: “Je pense que ce qui a fait monter les gens aux créneaux, c’est le fait qu’ils soient concernés localement. C’est que leur territoire soit attaqué. Ça, ça a fait réagir très fort les gens. Particulièrement ici où ils choisissent un territoire un peu préservé, si on vient leur amener l’industrie, ce n’est pas le but du jeu, sinon ils ne seraient pas venus en Lozère, donc c’est pour ça qu’ils sont très remontés.”

v Translated from the following French transcript: “C’est extrêmement simple: tout ce qui concerne la fracturation hydraulique est contraire à toute la problématique du département de l’Hérault. Notre stratégie est aujourd’hui une stratégie économique largement touristique, un tourisme vert, de découverte, de sentiers de randonnée. Franchement, l’économie par les gaz de schiste ce n’est pas du tout notre vision de notre département.”

vi Translated from the following French transcript: “Il faut quand même savoir que le problème maintenant est une remise en cause du Code minier, chose qui a été réclamée depuis le début. (...) Même s’il y a une démobilisation pour l’instant et que la pression n’existe plus momentanément, tout le monde semble éveillé que ce soit au niveau régional ou national sur les retours de bâtons, on va

dire, juridiques que pourraient faire les sociétés à qui on a octroyé des permis d'explorer éventuellement."

vii Translated from the following French transcript: "Nous au Conseil Général, on a été amené à organiser des assises de l'énergie, c'était en novembre 2011 où on a posé le problème au niveau ardéchois: qu'est-ce qu'on consomme? Qu'est-ce qu'on produit et quel avenir? (...) On s'est dit qu'on ne pouvait pas être que dans une politique du non, sans poser la question de l'avenir énergétique, avec deux pistes: produire des énergies renouvelables en Ardèche et essayer de moins consommer."