Fracking and framing in Transatlantic perspective

Fracking and Framing in Transatlantic Perspective: A Comparison of Shale Politics in the US and European Union

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Biography
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Accepted for publication, November 2016; due to appear in *Journal of Transatlantic Studies,* volume 15 issue 2 (2017).

Abstract

This paper offers a transatlantic comparison of shale politics. Both the US and European Union (EU) have ample shale beds; both are high consumption democracies thirsty for plentiful, stable, cheaper sources of energy. Yet exploitation of shale in the US has proceeded at fever pitch, while in the EU development has been hesitant if not stagnant. Structural explanations – geological, geographic, economic, technological - are key to understanding this difference, but so too is the role of agency – who are the actors shaping policy and how do they seek to influence public debate and government agendas? This study, while mindful of structural conditions, applies insights from network and framing analysis to highlight the set of actors, interests and frames that shape shale's variable development in the US and Europe. Drawing on an in-depth, systematic analysis of news reports, websites and interviews from 2013-2015, it demonstrates how differences in shale policy are explained not just by geology, economic or other structural factors, but also by the role of competing pro- and anti-shale networks, and the framing strategies they enjoy. In short, it argues that the *interaction* of structure and agency best explains transatlantic differences.

Key words: shale, fracking, framing, US, European Union

Introduction

The exploitation of shale gas is one of the more significant innovations in global energy extraction this century. According to International Energy Administration estimates, global shale gas supply could grow by more than 50 percent by 2035.[1] Shale exploitation promises potentially huge benefits: plentiful and cheap supplies of natural gas, reduced dependence on foreign imports, local economic renovation, and the creation of thousands of jobs. But extraction of shale, most notably through hydraulic fracturing or 'fracking', is controversial. Particular concerns include water pollution, methane leakage, triggering of earthquakes, and an adverse impact on landscapes, health and communities.

While the benefits and risks of fracking are broadly similar across the globe, the process has developed in dramatically different ways. A particularly notable comparison is that between the US and the European Union (EU). Of course both the US and Europe feature considerable internal variation in the development of fracking.[2] Within the EU, that diversity is reflected not just in member states' varying enthusiasm for shale, but also in an uneven reliance on external energy sources.[3] This study acknowledges that diversity; it draws on evidence from member states with varied positions, while focusing, where possible, on an 'EU position' on shale. It also draws on other scholars who offer additional analysis of that diversity through a rich array of single state or country case studies on shale.[4]

This study's main aim, however, is to explain the broad *transatlantic* differences between two political systems which represent quite different levels of, and approaches to, shale development.[5] Both the US and EU have ample shale beds, both are high consumption democracies thirsty for plentiful, stable, cheaper sources of energy. But in the US, shale extraction has proceeded at fever pitch, spurred on by favourable policies, supportive elites, and a permissive public.[6] A decade ago shale gas was an insignificant source of energy: today it comprises over a third of America's total gas supply.[7] In Europe shale reserves are also massive. Poland, France, the UK and Romania all feature significant shale gas basins. Yet the exploitation of shale gas within the EU has been slow, hesitant and ambivalent. Public support as a whole is low,[8] and policy initiatives stymied. No shale play is yet to produce gas. In short, both in terms of policy and public acceptance, US shale extraction is much more developed than in the EU.

Most literature has focused primarily on *structural* explanations for this transatlantic variance. These include geology (shale is more plentiful and easier to access in the US), geography (Europe is more densely populated), and technology (drilling innovations emerged and are more advanced in the US).[9] Furthermore, different regulatory structures - rules, directives, laws –

matter. Broadly speaking US legislation on environment, chemicals and safety are more favourable to shale development.[10] Meanwhile, economists have highlighted the role of economic conditions – including the level of market liberalisation, tax credits and land ownership – as more or less conducive to the extraction of shale gas.[11] However powerful these structural factors, they alone provide an incomplete picture of transatlantic variation and its causes. States that are equally geologically rich do not follow the same patterns. States with access to similar technology or markets, or governed by similar laws, do not necessarily adopt similar policies or stances towards fracking. Structural explanations tend to neglect the role of *agency*: which actors (political, economic, public) are most active? What sort of networks do they form to promote or oppose shale exploitation? Why and how do these pro- and anti-networks present or 'frame' issues in a particular way? [12] This article draws on network and framing analysis to answer these questions. It argues differences in shale exploitation in the US and EU are indeed shaped by geology, technology or economics, but are also explained by the characteristics of the pro- and anti-shale networks, and the framing strategies they employ. In short – it shows how structural and human factors interact to shape the varied development of shale policy.

After introducing the framework and methodology (Section 2), this article examines opposing networks and the framing strategies they employ in the US (Section 3) and European Union (Section 4). Section 5 analyses the differences – it shows how the composition and character of opposing networks (membership, resources and 'reach') have led to a far more cautious European approach, amplifying structural constraints and limiting significantly the development of shale gas extraction in the EU.

Framework and Methodology

Policy network analysis – which focuses broadly on the role of actors and interaction between them - is a useful approach for this study's focus on agency. Policy networks include an identifiable and policy-concerned set of public and private actors who come together to shape policy.[13] In the area of shale, opposing networks have emerged on either side of the shale issue, pushing *for* shale or protesting and seeking to halt its development. Both the pro and anti shale networks include actors from government institutions, interest groups, experts and civil society who work together to advocate policy positions, mobilize the public and policymakers, and shape the policy agenda. They are held together by an informal exchange of resources such as funding, expertise, access, or legitimacy. Industry brings funding and knowledge; NGOs and experts can offer legitimacy in exchange for access, while government actors need the expertise, support, and legitimacy of a range of groups. Shale networks can include actors who do not necessarily

share common beliefs on, say, the desirability of energy efficiency, the role of government, the severity of climate change or its causes, and they are not seeking to realise a particular belief system. They are instead held together by a desire to shape policy, and the exchange of resources needed to achieve that aim.

Both pro- and anti-networks seek to shape the government and public policy agenda by advocating particular positions, and convincing the public and policymakers of their merit. How those ideas are framed and presented is crucial to that success. To capture these dynamics this study supplements network literature with insights from framing analysis, which emphasizes how problems are defined, argued and debated. ***Framing*** refers to how actors select and accentuate particular aspects of an issue according to an overarching shared narrative and message.[14] Frames combine empirical information and emotive appeals. They are often connected to core political values (such as economic growth or security), and are communicated to the public simply and directly. They can be used to draw attention to a problem, but also to deflect attention away from an issue.[15] In short, political actors frame issues to increase or decrease attention to them, mobilize actors, and direct policymakers towards solutions. Whose definition or frame takes hold is important because it shapes how an issue is handled.[16]

This study constructs an overview of competing networks and frames by examining systematically a series of news stories, statements, policies, and websites of key network members. I first identified the main actors and issues of contestation through a review of secondary literature supplemented with a preliminary examination of news stories from major (English language) news sources in the US and Europe .[17] This preliminary examination was used to identify the actors and coalitions featured in **Table 1**. Having identified key players and their coalitions I then focused on the main websites and press quotes of key actors in both coalitions: industry federations, government officials, environmental NGOs and community groups. Using the Nexis® database I collected and analysed the content of, and quotations from, 50 news stories from 2013-15, as well as 15 actors' websites to identify the key discursive frames communicated by each coalition. I manually coded the data (websites and quotes in news stories) to identify the key words and phrases associated with these core frames. For example an 'economic growth' frame included the key words of jobs or prosperity; the environmental risk frame included references to water contamination, industrialisation and destruction. **Tables 2 and 3** below show the key frames identified and their relative salience. Finally, semi-structured in-depth interviews (N=5) with key actors in various coalitions were conducted for background information and to gain a deeper understanding of the frames and their use.

Table 1: Pro- and Anti-Fracking Networks in the US and EU

US Networks	*Primary member types*	*Member examples*	*Key resources exchanged*	*Frames*
Pro-fracking	Oil & gas firms Service industries; Govt supporters; Landowners	API; APPI Business Roundtable State governors; MSC	Financial and tech support; Govt access & influence; Legitimacy Land	Economic growth; Security; Reassurance/Tech prowess; Clean energy
Anti-fracking	Local residents; Environmental & health NGOs and coalitions; Celebrities	AAF, FoE; Food & Water Watch; Josh Fox;	Local support and knowledge; Scientific data; publicity and media exposure	Risk; David v Goliath; Fossil fuel 'lock-in'
EU Networks				
Pro-fracking	Oil & gas firms Service industries; Govt supporters;	Shale Gas Europe Chevron; ERT; IOWG UK and Polish govt; DG Energy	Financial support; expertise; experience; legislative access	Economic growth; Security; Reassurance; Clean energy (bridge)
Anti-fracking	Local residents and groups; farmers; environ-mental and health NGOs; National and EP parties; national officials; Renewables firms	FracAttack French politicians; Members of the European Parliament; DG Environment	widespread local support; strategic and tactical advice; entry to national & supra-national parliaments and govts	Risk; David v Goliath; Fossil fuel 'lock- in'

Fracking in the US

Exploitation of shale gas through fracking is not new, but it has experienced an astonishing revival in the US, with yields jumping from less than one percent in the late 1990s, to 20 percent of domestic gas production by 2010.[18] The increase in gas production is so great that liquefied natural gas (LNG) import terminals in the US are being re-vamped to export the gas. The geographic, technological and economic structural factors mentioned above provide a conducive environment for such development, but we still need to know which actors exploited or thwarted such structural conditions, and how. Below I identify the competing networks and frames they employ to either promote or halt shale developments.[19] I show how the US pro-shale network's composition and framing strategy has strengthened the pro-shale message, even if opposition is clearly present.

US Pro-Fracking Network: Members, Resources, Frames

Some of the most active members of the pro-fracking network represent various energy and associated industries. Obvious proponents are the oil and gas companies who have the largest economic stake in fracking operations and are professionally well represented by organisations such as the American Petroleum Institute (API), the Independent Petroleum Association of American (IPAA), or America's Natural Gas Alliance (ANGA). Also involved in the network are associated 'downstream' service companies, especially those providing supporting infrastructure, including transmission pipelines, gas processing or storage capacity. These economic actors often join together in coalitions linked to different shale basins. One of the largest is the Marcellus Shale Coalition (MSC)[20] which represents dozens of large oil and gas firms but also many associated drilling, haulage, transport and chemical industries. These economic interests bring enormous resources, not just financial, but also expertise and information on the positive impacts of 'responsible natural gas production'.[21]

Federal but especially state governments can benefit mightily from shale development. Policymakers can boast a record of job creation for their state, district or locality, and benefit from generous windfall taxes or royalties from businesses. In exchange, the gas industry benefits from a range of state tax credits and R&D subsides that help to make development economically more lucrative, and keep shale development high on governments' policy agenda. Although some fracking champions operate in Congress (a natural gas caucus exists in both houses), most are active at the state level. State level policymakers have responded to industry's desire for advantageous state legislation, or favourable implementation of federal rules. For example, Rabe and Borick underline the role of Pennsylvania's entrepreneurial former governor Tom Corbett who championed shale gas, and minimized governmental interference.[22] Similarly, Davis' study

of fracking in Colorado uncovers the tight relationship between industry representatives and state legislators.[23] The US networks feature a less prominent role for local or community representatives even though their governing remit is deeply affected by fracking operations.[24]

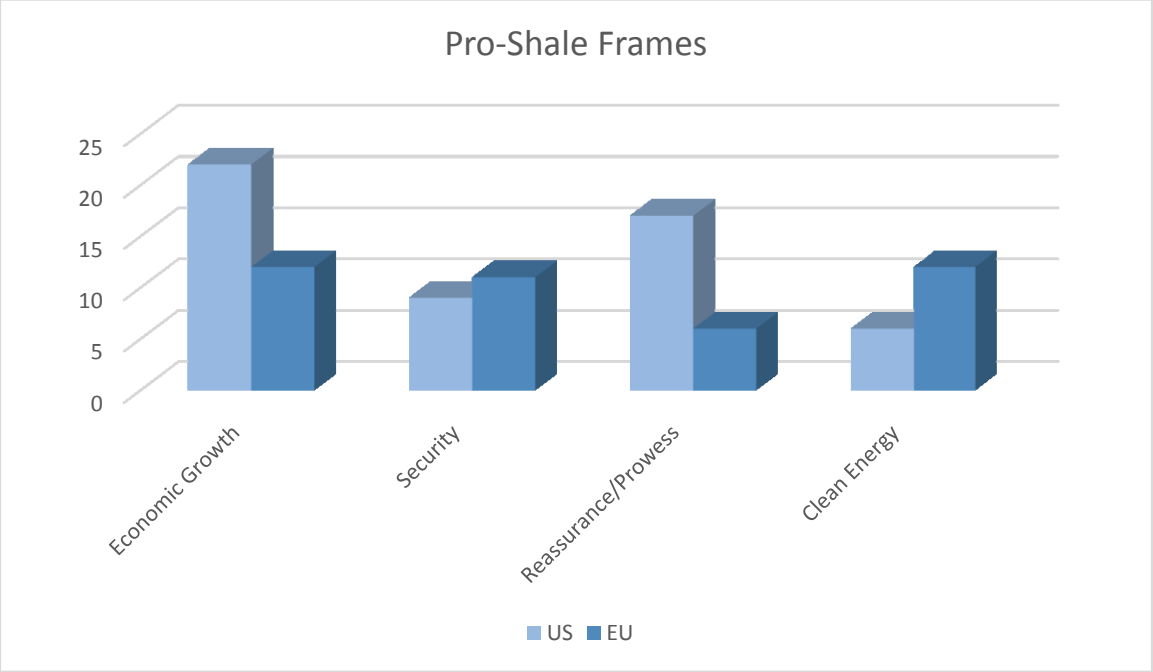
Landowners in the US have a significant resource to exchange: the lease of their land and local support. In the US mineral rights normally belong to landowners rather than the state. The majority of wells drilled are on private land. Consent is easier to obtain if landowners feel they will benefit personally, and often generously, for operations on their property. When the economic incentive to allow exploration and extraction is accepted, the benefitting landowners become participants in the pro-fracking network by acting as advocates for the policy generally, or at least not advocating its restraint. These landowners are a key network member missing from Europe.

Finally energy experts bring to the network expertise but also much sought after credibility. While some are accused of acting merely as fronts for industry bodies,[25] less controversial experts are also involved, such as energy institute fellows, editorial writers, or academics. These members' promotion of fracking is qualified but still robust. Shale is viewed, on balance, as the most reasonable way out of the energy crisis, provided it's part of a 'reasonable energy mix'.[26]

Frames

The relative salience of pro-shale frames is depicted in Table 2. Of the top four pro-fracking frames identified, the most dominant is that of **economic growth** brought about by a cheap, secure energy supply. In the US economic benefits are often pitched at individuals: lower energy prices, more jobs, and the promise of continued economic opportunity. Expressing this frame well is the trade body American Petroleum Institute, whose spokesman promises the 'creation of hundreds of thousands of new jobs…billions of additional dollars in revenues for government, [and] lower household energy bills'.[27] This frame also depicts regulation as a threat to economic growth. In their news releases the API warned that the job creation brought about by shale development could be stymied by 'unnecessary, duplicative regulations'. [28] Or, representing a wider range of major firms, the US Business Roundtable urged the US Environmental Protection Agency to base its regulations 'on sound science' and 'take into consideration the net cumulative impact these regulations have on energy costs, economic growth and job creation'.[29]

Table 2: Pro-Shale Frames in the US and EU



Key: figures represent the number of times a frame was invoked by pro-shale network members' websites or (by direct or indirect quotes) in 50 press stories from Jan 2013 to Jan 2015

Closely intertwined with economic growth is a frame encompassing secure energy supply, and the resulting **energy security**, if not independence, for the US. This goal is long standing and linked closely to wider concerns of national security. It gained particular resonance since 2011, in the wake of growing uncertainties driven by the instability in the Middle East and Eastern Europe.[30] This frame is repeatedly invoked by actors such as the Marcellus Shale Coalition which, its website states, exists to 'address issues regarding the production of clean, job-creating *American* natural gas….[31] Moreover, shale can strengthen America's emergence as a 'global energy superpower' and offers America a 'once in a life time opportunity to become an energy leader'.[32]

The pro-fracking **technological prowess and reassurance** frame touts US technological expertise and efficiency in shale exploitation. The US Business Roundtable attributes the nation's 'astonishingly' improved energy outlook to:

> our development of technologies to unlock vast new domestic oil and natural gas resources and the application of innovative technologies to economically extract and deliver these resources to market.[33]

The frame includes a strong reassurance message designed to quell concerns of fracking. Similar to the frames used by the pro-nuclear lobby[34] it highlights especially the 'exaggerated fears' of opponents or perceived risks. Industry representatives regularly dismiss concerns of fracking with the argument 'we have been doing this for years and we know what we are doing'.[35] An API website reminds the public that fracturing is a 'proven technology used safely for more than 60 years in more than a million wells.'[36] This frame depicts existing regulation as sufficient and warns against overreactions. As noted by the Petroleum Institute spokesman: 'We can pursue a rational, fact-based national energy policy, or we can let misinformation and extreme ideologies guide our energy future'.[37]

Finally, though not as dominant in the US as in Europe, the final pro-frame identified is that of **'clean energy':** shale is promoted as 'clean' and therefore a step towards a more sustainable energy future.[38] For instance the MSC reminds the public that: 'for shale producers…. 'every day is Earth Day', claiming their 'commitment to responsibly develop these abundant, clean-burning resources has never been stronger." [39]

In sum the US pro-fracking network features a wide membership, including private and public actors stretching from local landowners, up to state and national champions. Each brings to the network resources such as local support, knowledge, credibility, expertise and access. The members do not necessarily share core beliefs about the environment, energy use or climate, but they are bound together by a shared policy goal and core message: shale is worth exploiting. That message is conveyed by emphasising the economic and security benefits of fracking, and downplaying its perceived risks.

US Anti-Fracking Network: Members, Resources and Frames

Concerted opposition to fracking began to emerge in 2011 as environmental and health concerns about the effects of fracking mounted in the US. A disparate network (see Table 1) formed around these shared concerns as the debate over fracking became increasingly popularized and heated. Most network activity emerged from local citizen groups who highlighted the adverse local impact of fracking, especially related to issues of water use and quality.[40] Other community groups joined because of fracking's impact on neighbourhoods, including noise pollution, debris

and the disruption of landscape. While these locals bring to the network grassroots support and stories, not all local citizens or groups are opposed, especially not those set to gain from fracking operations.

Local concerns have to a certain extent also been taken up by larger national environmental NGOs or coalitions which form a further node in the protest network. The largest, 'Americans against Fracking' (AAF), represents several dozen national organizations as well as state-level groups. Other NGOs most heavily involved are Food and Water Watch and Friends of the Earth (FoE). These large national environmental organisations can offer grassroots groups a national forum, lobbying and organisational skills. They in turn need the stories and local support of citizen groups. But the extent of systematic involvement of national organizations in fracking is less than in Europe (see below) and most protest remains local. While many US environmental NGOs are actively opposed to fracking, they have not yet prioritized the issue and are not as active as NGOs in Europe.[41]

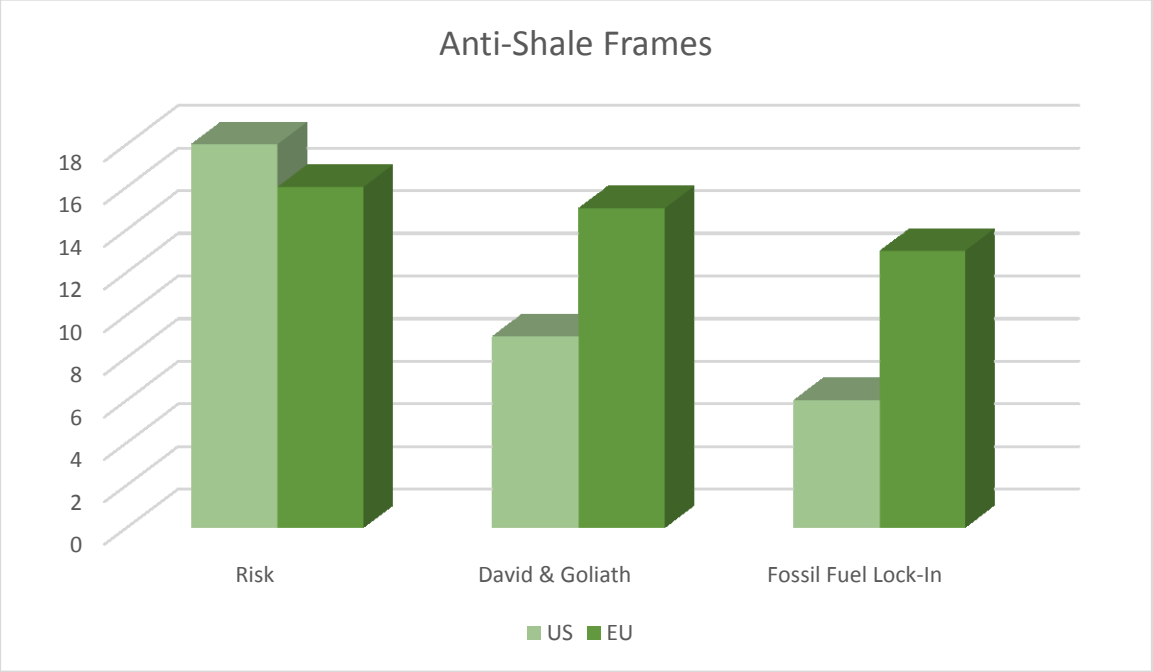
Compared to the government involvement and investment seen in the pro-fracking network described above, the US anti-fracking network features fewer government champions. Very few governors or high profile state officials are part of this anti-network. In some state legislatures (such as New York) elected officials have worked with groups to introduce anti-fracking legislation, but most proponents face a tough time convincing state representatives to oppose actively a practice generating direct revenues for the state. At the federal level congressional opponents are sparse. For instance, although a fracking bill (FRAC Act) which would strengthen regulation was introduced to Congress in 2009, it was defeated, along with similar bills subsequently introduced.[42] And when in spring 2015 President Obama announced curbs on fracking on federal lands he was careful to present himself (and the government) not as opponents to fracking but merely as regulators seeking 'the more appropriate balance between public health and safety and allowing for responsible production'.[43] The anti-network can thus not yet rely on a wide array of government officials.

A distinctive node of the US protest network are media and entertainment celebrities who bring to the network the prized resource of media attention. In the US local campaigns tend to be promoted less by legislative sponsors and more by film or media celebrities. A well known example is Josh Fox's controversial documentaries *Gaslands* and *Gaslands II* which depict the damage fracturing had on a local community. In 2012 Mat Damon's drama *Promised Land* again highlighted dangers of fracking, albeit in gentler form.[44]

Frames

This network's primary frame is that of **risk** (see Table 3). Members such as AAF have made the most of possible risks to water and health, especially at home, or in the community: 'Fracking threatens the air we breathe, the water we drink, the communities we call home and the climate on which we depend'.[45] The documentary *Gaslands* embodied dramatically the environmental risk frame by depicting residents living near fracking sites lighting their 'burning faucets' for the camera; their tap water contained enough leaded methane to make them as flammable as lighter fluid. While members from the opposing network have strongly disputed the link between methane content and fracking depicted in the film, the connection between fracking and environmental danger stuck. Today the depiction of burning faucets remains one of the protest networks' most powerful images.

Table 3: Anti-Shale Frames in the US and EU



Key: figures represent the number of times a frame was invoked by anti-shale network members in their websites or (by direct or indirect quotes) in 50 press stories from Jan 2013 to Jan 2015

The second frame allows opponents to depict the conflict over shale as one between well-resourced economic interests versus local citizens. I call this the **David v Goliath** frame. The frame is often invoked in support of measures for local fracking bans or moratoria where industry can substantially outspend opponents. For instance an organiser for a ban in a Texas town described the battle 'more like David and Godzilla then David and Goliath.'[46] More generally, opponents refer to shale drilling firms or proponents as 'big business' exploiting lax regulation while local citizens suffer.[47] But in the US this frame can be partly countered by locals who serve to benefit from fracking operations. The review of news articles revealed that this frame is more often invoked by environmental NGOs who accuse oil firms of a campaign of 'intimidation and obfuscation' seeking to shape the agenda with an 'impressive propaganda effort carried by slick PR firms'.[48]

The final, less prominent, anti-shale frame in the US I term '**fossil fuel lock-in.**' It conveys the worry that shale is another fossil fuel that will nudge out investment in renewables and hinder the transition to a low carbon economy by 'locking-in' damaging fossil fuel dependency. Environmental NGOs refer to it most often, though its core message is well expressed by a professor of engineering at Cornell who described fracking not as a bridge but 'a gangplank to more warming and away from clean energy investments.'[49] According to our study, however, the frame was not often invoked by other members.

In sum the US anti-fracking network is broad and varied but somewhat lopsided; it is populated primarily by disparate local protesters, some environmentalists and celebrities, with a lighter presence of elected officials, government representatives, or business. Compared to the pro-fracking network there appears to be less integration between those protesters intensely opposed, and those actors within government and business who share concerns, but not the same oppositional zeal. The network is vocal, relying on frames of risk and skewed battles, but it remains primarily an external protesting force invoking often fiery frames.

Fracking in the EU

Although Europe as a whole is considerably less active in fracking than is the US, it is not for lack of shale. According to the EIA the technically recoverable shale gas reserves are considerable and could account for as much as one-tenth of global resources.[50] Northwest England alone features huge deposits – 'in the same league' as in parts of the US.[51] Fracking in Europe involves a broadly similar set of benefits and costs as found in the US, though structural conditions are less

conducive to fracking operations. Europe's energy infrastructure is less developed with fewer integrated pipelines or transport networks. The regulatory setting is also less welcoming. Although there is currently no EU-wide binding regulation on shale (member states decide whether to frack or not), the EU did agree a set of non-binding recommendations in 2014. Moreover, all states are affected by existing EU water, air and chemical legislation which is itself heavily shaped by the precautionary principle.[52] How have European actors mobilized in the context of these structural conditions, and with what effect?

European Pro-Fracking Network: Members, Resources and Frames

The pro-fracking network in Europe features many of the same players as in the US (see Table 1), but with some notable differences. **Industry** players again play the most prominent role. Global oil and gas companies are keen to shape a favourable agenda in Europe as in the US. Multinational companies such as Chevron, Exxon or IGas can bring to the network huge financial and information resources. The industry coalition 'Shale Gas Europe' (SGE) represents these global but also European-based firms such as Cuadrilla, the main firm active in the UK. Like the Marcellus Shale Coalition, SGE aims to nurture a debate that is 'balanced and informative.'[53] Another well resourced member is the International Oil and Gas Producers Association (IOWG) which represents oil and gas and associated firms. But even with the ample resources of these industry coalitions, the European network includes far fewer 'downstream' actors. Because Europe lacks the chain of supporting industries producing, say, equipment for exploration and drilling, the European network does not enjoy the same advocacy from associated firms. Nor are as many investors on board. Questions of how easily technically recoverable resources of shale gas will actually translate into production continues to create 'serious investor uncertainty'[54] and limits further the number and type of economic actors in the European pro-shale network.

Government advocates in Europe are found only in some member states, most notably Poland and the UK. These advocates tend to be national politicians who can contribute to the network crucial government support and enthusiasm for shale's potential. There are fewer sub-national or local government supporters because while disruption is felt locally, benefits are not. (Unlike in the US, royalties and revenues from operations accrue primarily to the national level governments.) Advocates from national governments have often worked with industry to create an environment conducive to fracking. For instance, in exchange for the promise of industry investment, the UK government set up an Office of Unconventional Gas and Oil to simplify the regulatory process, and in 2013 it proposed a series of measures and tax breaks to attract shale gas developers. Similarly Polish government officials have been enthusiastic proponents,

negotiating through EU institutions to ensure EU-wide legislation does not unduly limit fracking opportunities. But elsewhere - such as in France, the Czech Republic or Bulgaria - national government support is lukewarm or lacking entirely.

Amongst EU institutions, support is mixed but overall hesitant. That matters because EU institutions shape decision-making surrounding shale. We certainly do not find the active EU institutional 'cheerleaders' as found in, say, the area of renewable energy or climate change.[55] The European Commission, which proposes legislation, includes some shale advocates. Those in the Commission's Energy Directorate are most enthusiastic, though they also stress the need for caution and vigilance. Meanwhile the Council (where member state views are represented) has not yet endorsed fracking but has tried instead to reach consensus amongst the many different views represented there.[56]

Similar to the US pro-network, energy experts and academics can lend this network credibility and expertise at both national and EU levels. The Commission has set up a special task force of experts to 'share information between member states and the Commission' on shale gas.[57] Meanwhile, SGE brings together energy academics and scientists from across the EU to make the case for shale. Their selected 'leading experts in the field' form an Expert Advisory Panel which can advise member companies but also offer reassurance to the public.[58] Finally it is important to note who is missing from this network: landowners and local officials. These potential 'local champions' are missing in Europe because, as noted, the revenues from exploitation accrue to the state. Representatives from communities most affected do not see any immediate benefits and are thus less likely to join the network promoting such developments.

Frames

Like proponents elsewhere, the European pro-fracking networks presents shale exploitation as a way of creating profits, providing jobs and reducing foreign imports. But, as indicated by Table 2, the salience of some European pro-shale frames is muted in comparison to the US. The message is certainly more cautious, reflecting in part the make-up of the network.

As in the US, the pro-fracking network's dominant frame is that of **economic growth** (see Table 2). Drawing on US experiences, the IOWG underlines shale's exciting potential to stimulate jobs and 'jump start' economic growth in Europe.[59] Or, as expressed by the UK finance minister: 'we don't want British families and businesses to be left behind as gas prices tumble on the other side of the Atlantic.'[60] But this frame is often tempered with the caveat - more pronounced than in the US - of the need to regulate robustly. And whereas the US Business Roundtable fully and

enthusiastically endorsed shale as a core part of US energy strategy, the European equivalent (European Roundtable) adopts a different emphasis. It applauds the economic benefits of shale as part of an energy strategy but believes Europe needs an energy mix that '*ensures the transition to a low-carbon economy* while safe-guarding energy security, quality of supply, and cost to industry and society'.[61]

Security: the desire to free European states from foreign oil, especially Russian gas, creates a potentially strong second frame. Although this frame was not originally as prominent as found in US, bellicose behaviour by Russia has made this frame increasingly more salient in recent years.[62] Illustrating this frame is SGE's promise that 'Abundant sources [of shale] right here in Europe promise to consign energy security worries to the past'.[63] The Poles are particularly keen to embrace shale as a way to reduce European dependence on Russia which, according to a government minister, had become 'absolutely intolerable.'[64] This frame is potentially powerful and its resonance may increase if the perceived insecurity of Europe's energy security increases.

The **technical prowess and reassurance** frame is also present in the EU, but it takes a different form. It is not as confident or salient as seen in the US (see Table 2); technological innovation in this area is well behind the US. On one hand, assurances from global firms are similar to those heard in US. For instance, IOWG stresses to its European audience that 'shale gas production is safe and environmentally-sound, thanks to the constant upgrade of well-known technologies.'[65] However, network actors beyond the oil and gas industry express far more caution, as reflected by the EU's Director-General of Energy: '*If shale gas can be safely developed* in Europe then Europeans should not look a gift horse in the mouth'.[66] Elsewhere the note of caution is louder, as indicated in a statement from the Commission's Environment Directorate: 'Ensuring the environmental integrity of unconventional hydrocarbons extraction is the Commission's overriding concern'.[67] Put simply, the European pro-network seeks to reassure by stressing precaution (don't worry - we'll be careful) rather than expertise (don't worry - we know what we're doing).

Much more prominent in Europe than in the US is the **clean energy or 'bridge'** frame with its carbon-friendly message that shale is good for the climate; it emits far fewer emissions than coal and can contribute to a more sustainable energy future. To illustrate, on its website the IOWG lists 'carbon savings' as the second most important benefit of developing shale in Europe.[68] The European Commission sponsors conferences explicitly dedicated to 'shale gas *and* a low carbon Europe', and SGE regularly and robustly highlights shale's role in reducing carbon emissions elsewhere. (Indeed our comparative news and website analysis shows European proponents

make more of this reduction than do US shale proponents, even though no such reduction is evident in Europe.)

In sum: compared to its US counterpart the pro-fracking network in Europe is more narrow: there are fewer members from the local level, or associated industries, fewer landowners, fewer enthusiasts within government institutions, and less interaction amongst its members. In their central message the European pro-fracking frames are similar to those in the US – fracking brings economic growth and security, and risks can be managed effectively. But overall the emphasis on potential environmental benefits is greater, and the positive frames (economic growth and technological reassurance) are neither as definitive nor confident as in the US. The growing potential of the security frame, and the growing networking activities of Shale Gas Europe may strengthen this pro-shale coalition.[69] But for now it remains less vocal and less developed than its US counterpart.

European Anti-Fracking Network: Members, Resources and Frames

Fracking operations are not nearly as advanced in Europe as in the US, but the protest networks are. Health and especially environmental concerns have prompted the rapid growth of community and grassroots groups opposed to the development of shale gas across Europe. Local members include local environmental campaigners, but also a much wider range of participants. As a typical local protester noted: 'It's not just people who have been involved in the green movement before. We're seeing farmers, landowners, parents, health workers, and church groups expressing interest and concern'.[70] Unlike in the US these protesters are not offset by pro-fracking landowners. Moreover, these groups receive substantial levels of support from other network members. For instance, in exchange for local support and stories, these groups receive from national NGOs regular advice and workshops (on, say, how to use local planning systems to stop fracking operations).[71]

Like their US counterparts, larger European environmental NGOs share profound concerns about fracking's impact on environment, health and safety. They bring to the network a particular focus (and expertise) on certain concerns such as water, climate and land use. National and European NGOs work very closely with local protesters on this issue. For instance, in France mobilization of local groups on methane leaks triggered wider campaigns at the local and national level.[72] FoE Europe was closely involved in local protests in England. And in the Czech Republic, Bulgaria, Romania and Poland, several national NGOs have taken on the local cause by, for instance, calling for a national or EU moratorium on exploration and drilling.[73] In short, the multi-level interaction of protesters is well developed.

Another difference between protest networks in the US and the EU is that the latter includes close interaction between actors from within and outside of government. In Europe anti-fracking networks often garnered substantial levels of support from political parties and parliamentarians who can provide direct government access to network members. For instance, McGowan notes how Dutch local groups worked with Dutch Members of Parliament (MPs) to campaign against plans for test drillings.[74] In 2013 British Green MP Caroline Lucas was arrested alongside protesters in an anti-fracking demonstration in England. Similarly, in Germany, local protest was embraced by the Green party at the Land level where much of responsibility for regulation rests. In France a network of local protesters slowly built momentum drawing in opposition parties, first Greens and then the Socialists. Many members of the European Parliament have also played a supporting role. While the EP has stopped short of a moratorium on fracking, it has ensured the issue received far more robust attention to ensure that 'provisions for the protection of human health and the environment apply across all Member States'.[75]

Finally, green technology and renewable energy firms have joined the European anti-network, motivated by concerns that investment in shale gas will substitute for investment in renewables and low carbon technologies. The Aldersgate Group, for instance, a coalition made up of 50 UK and European green energy and technology companies and investors, has campaigned with NGOs, as have other trade bodies such as the European Wind Energy Association. Their involvement broadens the network considerably and renders it more than a protest network. A European Commission official who is lobbied regularly by many interests, including renewables firms, noted how these latter actors bring a 'much wider perspective…..they're not just protesters'.[76]

Frames

As illustrated in Table 3, the dominant, overarching 'anti' frame in Europe is, like in the US, one of **risk:** risk to human health, landscape and, especially, climate and the environment: FoE Europe warned:

> Shale gas poses a real and serious threat to the climate, the environment and local communities. The extraction of shale gas leads to ground-water contamination, serious health impacts, and significantly higher carbon emissions than other fossil fuels.[77]

Crucially, the frame is not only delivered by environmental NGOs. A European Commission study delivered a similar message:

> Risks of surface and ground water contamination, water resource depletion, air and noise emissions, land take, disturbance to biodiversity and impacts related to traffic are deemed to be high in the case of cumulative projects.[78]

To underscore the message, the frame also includes powerful threat images such as reference to 'disastrous' leaks' and 'unsafe' practices. Members also made frequent use of disaster imagery (such as stories of 'toxic waste floods' or 'fracking hell') to convey the message that both the environment and human life are subject to threat.[79]

The second most noticeable frame in Europe is the **David vs Goliath** narrative introduced above, though in Europe the frame is more prevalent and broader than in the US. It targets not just fracking itself but the process surrounding its regulation and development. The anti network, depicts fracking as an assault on local control and a contest between large, often external interests (oil and gas firms) versus local groups and 'ordinary' citizens. Representative of this frame is are messages delivered by Food & Water Europe who argue the oil and gas industry is able to call on 'well-heeled lobbyists, political campaign war chests and PR specialists' to 'leverage its entrenched position in politics, society and our economy.'[80] This frame is attractive to local groups across Europe who may not necessarily share environmentalist concerns over fracking but do worry about issues of accountability. An illustration of that breadth is found in the widespread protests in Britain in 2013 which featured seasoned environmental protesters but also community and village groups and local residents specifically protesting development in their particular area and what they viewed as an accompanying lack of transparency and control.[81]

The final powerful frame for European protesters is the climate-focussed, '**fossil fuel lock-in**' frame mentioned above. In Europe the frame is strongly expressed by many actors, including renewable firms and environmental NGOs:

> The reality is we do not need to gamble on fracking. Investing in clean…energy from the wind, waves and sun – along with a major energy-saving drive – would create hundreds of jobs, boost energy security and keep the lights on.[82]

The focus on climate effects is greater than that expressed by US opponents. For instance, European networks are more likely to highlight the risk of escaped methane, a greenhouse gas more potent than C02. Such a frame resonates with a public expressing significant support for renewables and environmental sustainability.[83] Moreover unlike the US, the EU prides itself as a leader on global environmental issues, especially climate change; it is keen to maintain this mantle.[84] In sum, we can identify in Europe an anti-fracking network with widespread

membership, and well integrated exchange of support and resources. Its frames include risk, but also a strong emphasis on wider consequences for business, citizens, and the EU's global role.

Concluding Analysis

Why has shale extraction developed so much more quickly, and intensively, in the US than in Europe? While structural conditions – linked to geology, geography, economics – are key, this paper has sought to strengthen those explanations by highlighting the role of agency and how it interacts with those structural conditions. It first identified competing networks of actors seeking to shape the fracking agenda, and then explored the frames they employed to further that aim. It found that while pro- and anti-networks mobilized in both the US and EU, the resonance of their arguments – and thus their possible impact – varied. In the US, the *pro*-network have thus far enjoyed more 'success' (measured by permissive public opinion and policy initiatives) whereas in Europe, the anti-network has enjoyed greater support and resonance. This section draws together preliminary explanations for that variance, focusing particularly on the character of the network, framing strategies, and how both were shaped by structural conditions.

A network's character refers to its membership, resource exchange and reach. This study suggests that the range of members comprising the network can affect its success. Especially important is how and to what extent government policymakers are involved. In the US, government representatives are core to the pro-fracking network, but largely missing in the anti-fracking network. Nor can the latter network rely on the same unified local opposition as found in the EU. Thus while the US anti-network was lively, active and celebrity-studded, it did not feature many core members from within government, especially federal government.[85] In European networks a different dynamic prevailed. While few government actors were core to the pro-fracking network, they were key players in anti-fracking networks. This study identified active legislators at sub-national, national and supranational levels of governance. Similarly this protest network included economic actors (especially those from low carbon industries) on its side. It thus spanned a greater variety of key actors able to mobilize beyond a traditional 'protest' contingent.

Integration and exchange of resources amongst members also affects a network's success. For instance, even though the US pro-fracking network members did not share core beliefs or political values (oil monoliths sat alongside small landowners), all members brought to the network key resources (financial clout, government access or local legitimacy) and all were able to cohere around a clear, simple message: the benefits of fracking outweigh the costs. By

contrast, the pro-fracking Europeans appear to have had, as of yet, fewer opportunities to present a unified view. Instead, the message of global oil firms members ('do not worry; the risks are overstated') was countered by other network members in favour of further exploration, but also deeply cautious.

Linked to membership integration is the network's multilevel reach. In multilevel systems such as the US and EU, successful networks need to mobilize across interests and institutions but also across different levels of governance. While networks in both the US and Europe involved some multilevel interaction, the European networks, especially the anti-fracking network, featured greater multilevel cooperation and interaction. These networks provided a forum necessary for local protests to be taken up by actors at the national and even supranational level. In the US, that reach is, for now, less developed with fewer links between local, state, and national members.

This paper also highlighted the important role of framing strategies. Both sides attempted to deliver a clear, simple message linked to the core imperatives of economic growth, environmental quality, risk and security. But networks were most successful when they showed awareness of – and then exploited - distinctive regulatory, economic or other structural conditions in their different polities. For instance, US proponents of fracking have been more successful in delivering the reassurance frame to help maintain a comparatively lax regulatory framework. Not only did they prioritise this message, but underlined its credibility by repeated reference to the US' rich experience with drilling and innovative technology. Conversely, with their heavy emphasis on fossil-fuel lock-in, the European anti-fracking network successfully exploited European citizen's greater concern with climate change, and the EU's institutional desire to play a global climate role. Also key to strategy was timing. The US pro-fracking network has been initially more successful than its European counterpart because it invoked a powerful idea (visible economic gain) at the right time (early on, before environmental concerns mounted). In short, 'success' depends on structural conditions but also how well coalition members exploited them.

In addition to these empirical findings, the study offers several conceptual contributions on which future research can build. First, as outlined above, the study can contribute to our conceptual understanding of network analysis by outlining how certain network characteristics (membership and integration but also multilevel 'reach') can shape a network's ability to achieve its aims. Secondly the study contributes to on-going questions about structure and agency and the relationship between them. The structural factors (technological, economic, geographic and

regulatory) shaping fracking are huge and have rightly received significant recent attention. However, few shale studies have focused on the role of actors, and even fewer have focused on both. This study does not deny the importance of structural conditions: the success or resonance of networks and their frames is contingent on the structural conditions in which they are formed and delivered. But we need also to examine the strategies and skills of actors, especially their ability to frame and mobilize support. In short, the paper suggests how structure and agency combine to shape policy agendas. Further such studies are necessary and welcome as a means to capture the rapidly changing nature of shale gas politics and governance.

Endnotes

[1] EIA (Energy Information Administration). *Annual Energy Outlook*. 2012. EIA: Washington DC.

[2] US states vary dramatically from fully engaged Pennsylvania and Texas, to Vermont and New York where the practice is banned. Similarly, European states represent a continuum from relatively enthusiastic Poles and Brits on one end, and adamantly opposed France and Bulgaria on the other.

[3] See John R. Deni and Karen Smith Stegen 'Transatlantic Energy Security: Convergence or Divergence? *Journal of Transatlantic Studies* 10 (2012), 305-12; Miranda Schreuers, *et al Transatlantic Environment and Energy Politics* (Surrey, UK: Ashgate, 2009).

[4] Rusi Jaspal and Brigette Nerlich, 'Fracking in the UK Press: Threat Dynamics in an Unfolding Debate.' *Public Understanding of Science* 23 (2014), 348-663; Tamara Metze 'Fracking the Debate: Frame Shifts and Boundary Work in Dutch Decision Making on Shale Gas'. *Journal of Environmental Policy & Planning*; Rusi Jaspal, B. Nerlich and S. Lemancyzk, 'Fracking in the Polish Press: Geopolitics and National Identity'. *Energy Policy*, 74 (2014), 253-61; Jale Tosun, 'Regulating hydraulic fracturing: the effects of issue redefinition'. In Jale Tosun, S. Biesenbender, and K. Schulze (Eds.), *Energy Policy-Making in the EU* (Berlin: Springer, 2015), 225-44

[5] For a related transatlantic comparison of different priorities given to energy goals and the role of shale in achieving them, see Marianne Haug, 'Shale Gas and Renewables: Divergence or Win-Win For Transatlantic Energy Cooperation?', *Journal of Transatlantic Studies* 10 (2012), 358-73 . For a transatlantic comparison of climate policies see Jon Birger Skjærseth, Guri Bang and Miranda Schreurs, 'Explaining Growing Climate Policy Differences Between the EU and the United States. *Global Environmental Politics,* 13 (2013), 61-80.

[6] The literature on US public support for fracking reveals higher support than in the EU (see Pew Research, 2 April 2013, Available at: http://stateimpact.npr.org/pennsylvania/2013/04/02/pew-survey-americans-have-mixed-feelings-about-fracking/). But US studies note clear internal differences among partisan and demographic lines. See K. Brasier, *et al* 'Residents' Perceptions of Community and Environmental Impacts from Development Of Natural Gas in The Marcellus Shale: A Comparison of Pennsylvania and New York Cases.' *Journal of Rural Social Sciences* 26 (2011), 32-61; Hilary Boudet, *et al*, 'Fracking Controversy and Communication: Using National Survey Data to Understand Public Perceptions of Hydraulic Fracturing', *Energy Policy*, 65 (2014), 57-67; Charles Davis and Jennifer Fisk 'Energy Abundance or Environmental Worries? Analyzing Public Support for Fracking in the United States'. *Review of Policy Research* 31 (2014), 1-16.

[7] Daniel Yergin, 'How Is Energy Remaking the World?' *Foreign Policy* July/August 2012. Available at: http://www.foreignpolicy.com/articles/2012/06/18/how_is_energy_remaking_the_world#sthash.65jcdp6u.dpbs

[8] Eurobarometer, *The Europeans and energy. Opinion Survey*. Brussels: European Commission. (2011) Available at: http://ec.europa.eu/energy/studies/doc/20110131_eurobarometer_energy.pdf For a comparison, see European Parliament *The Shale gas 'revolution' in the United States: Global implications, options for the EU* DG for External Policies Policy Briefing. April 2013.

[9] Several useful studies make this point. See Ivan Pearson, Peter Zeniewski and Francesco Gracceva, *Unconventional Gas: Potential Energy Market Impacts in the European Union*, (European Commission, Joint Research Centre, Institute for Energy and Transport, 2012); Karen Smith Stegen and Julia Kusznir, 'Transatlantic Energy Relations: A View from Washington' *Journal of Transatlantic Studies* 10 (2012), 313-27; Paul Stevens, *The Shale Gas Revolution. Developments and Changes*. Chatham House Briefing Paper. August, 2012; Haug 2012.

[10] Frances McGowan, 'Regulating Innovation: European Response to Shale Gas Development. *Environmental Politics,* 23 (2014), 41-58; Stevens 2012.

[11] Chi Kong Chyong and David Reiner, 'Economics and Politics of Shale Gas in Europe' in *Economics of Energy & Environmental Policy*, 4(2015), 69-84.

[12] For an examination of framing and coalitions surrounding shale debates specifically in the UK, see Matthew Cotton, Ian Rattle and Jan van Alstine, 'Shale gas policy in the UK. An argumentative discourse analysis', *Energy Policy* 73 (2014), 427-38; and Elizabeth Bomberg, 'Shale We Drill? Discourse Dynamics in UK Fracking Debates', *Journal of Environmental Policy & Planning*. Available on line, June 2015 DOI: 10.1080/1523908X.2015.1053111

[13] Dave Marsh and Rod Rhodes, *Policy Networks in British Government.* (Oxford: Clarendon Press, 1992)

[14] Chris Miller, 'The Dynamics of Framing Environmental Values and Policy: Four Models of Societal Processes.' *Environmental Values.* 9 (2001), 211–33; Falk Daviter, 'Policy Framing in the European Union'. *Journal of European Public Policy*. 14 (2007), 654-66.

[15] See Charles Davis and Katherine Hoffer, 'Federalizing Energy? Agenda Change and the Politics of Fracking' *Policy Sciences* 45 (2012), 221-41.

[16] Elizabeth Bomberg, 'Mind the (Mobilization) Gap: Comparing Climate Activism in the United States and European Union'. *Review of Policy Research* 29 (2012), 411-33.

[17] For both stages of news analysis, I used the Nexis® database to identify the main news stories on shale appearing in quality newspapers in both the US and Europe, 2013-2015. The main sources covered included the *New York Times, Washington Post, International Herald Tribune, Guardian, Telegraph, Der Spiegel (International) Le Monde (English version), Poland Weekly (English version), EUobserver, and European Voice*. For an unpublished but comprehensive examination of news coverage of fracking in several countries, see Hal Beresford *Differences in the Media's Framing of Fracking/Shale Gas in New York, Pennsylvania, Germany and the United Kingdom (2014)*. Unpublished MPP thesis, Sanford School of Public Policy.

[18] EIA (Energy Information Administration). *Annual Energy Outlook*. (EIA, Washington DC, 2012)

[19] For a similar investigation of networks in the UK, see Bomberg, 2015

[20] The Marcellus Shale lies underneath several states with Pennsylvania at its centre. It is estimated to hold over 50 percent of the nation's total shale gas. Barry Rabe and Chris Borick, 'Conventional Politics for Unconventional Drilling? Lessons from Pennsylvania's Early Move into Fracking Policy Development', *Review of Policy Research* 30 (2013), 321-340.

[21] MSC (Marcellus Shale Coalition). 2013. About us. Available at: http://marcelluscoalition.org/about/

[22] Rabe and Borick, 2013.

[23] Charles Davis, 'The Politics of Fracking: Regulating Natural Gas Drilling Practices in Colorado and Texas. *Review of Policy Research*, 29 (2012), 177–191.

[24] See Davis and Hoffer, 2012; Rabe and Borick, 2013.

[25] Greenpeace. 2013. Predatory Companies. Available at: http://www.greenpeace.org/usa/en/campaigns/global-warming-and-energy/The-Problem/fracking/Predatory-Companies/ (accessed July 2014)

[26] See, for example, supportive statements from Amy Jaffe, an expert on energy policy at the University of California, 'Defending the Motion'. *Economist Debates: Fracking*. Available at: http://www.economist.com/debate/days/view/934 (accessed Jan 2014)

[27] Erik Milito, Featured Guest: Defending the Motion. *Economist Debates: Fracking*. 2013 Available at: http://www.economist.com/debate/days/view/939 (accessed Jan 2014)

[28] API (American Petroleum Institute). 2012. News release. Shale energy development creating jobs but could be hampered by unnecessary, duplicative regulations. Available at: http://www.api.org/news-and-media/news/newsitems/2012/oct-2012/api-shale-energy-development-creating-jobs-hampered-by-regulations.aspx . See also API 2013. Oil and Natural Gas Overview. Available at: http://www.api.org/oil-and-natural-gas-overview/exploration-and-production/hydraulic-fracturing/hydraulic-fracturing-safe-oil-natural-gas-extraction

[29] US Business Roundtable. (2013). Taking Action on Energy. Available at: http://businessroundtable.org/studies-and-reports/taking-action-on-energy/

[30] See Smith Stegen and Kusznir 2012; Stevens 2012

[31] MSC 2013, emphasis added

[32] Milito, 2013

[33] US Business Roundtable, 2013; see also Jacob Matz and Daniel Renfrew 'Selling Fracking: Energy in-depth and the Marcellus Shale' *Environmental Communication*, on-line June 2014 DOI: 10.1080/17524032.2014.929157

[34] Frank Baumgartner and Barry Jones, *Agendas and Instability in American Politics, 2nd ed*. Chicago: (University of Chicago Press, 2007)

[35] Stevens 2012, 3

[36] API (American Petroleum Institute). 2015. 'Oil and Natural Gas Overview' http://www.api.org/oil-and-natural-gas-overview/exploration-and-production/hydraulic-fracturing/hydraulic-fracturing-safe-oil-natural-gas-extraction (Accessed Jan 2015)

[37] Milito 2013

[38] Jaffee 2013; Matz and Renfrew (2014) similarly outline well the 'green imagery' employed by pro-shale advocates of shale in the US.

[39] MSC, 'MSC Recognizes Earth Day' Press release 22 April 2014 http://marcelluscoalition.org/2014/04/msc-recognizes-earth-day/ Accessed Dec 2014

[40] Fracking involves pumping a mixture of water, chemicals, and sand deep underground to fracture rocks and release deposits of gas. It uses a huge amount of water, most of which remains below ground. But it also disgorges 'slick water' containing chemicals and toxins.

[41] For most major US environmental NGOs the related issue of tar sand extraction and the pipeline due to carry resulting crude, is the key priority.

[42] Davis and Hoffer 2012

[43] White House deputy chief of staff quoted in the *Washington Post* 20 March 2015. Available at: http://www.washingtonpost.com/news/energy-environment/wp/2015/03/20/obama-administration-tightens-rules-on-oil-and-gas-fracking/

[44] The celebrity focus prompted its own backlash with a counter documentary *FracNation* released in 2013 promising to 'find the truth' (see FracNation.com).

[45] AAF (Americans Against Fracking). 2012. National Call-in Day to Ban Fracking. Available at: http://www.americansagainstfracking.org/wp-content/uploads/2012/12/HS_1301_AAF-ObamaCallinDay_EDIT2.pdf

[46] Quoted in the *Guardian*, 5 Nov 2014, http://www.theguardian.com/environment/2014/nov/05/birthplace-fracking-boom-votes-ban-denton-texas

[47] See for instance, *Gaslands II*, or Friends of the Earth, Michael Brune, 'Against the Motion'. *Economist Debates: Fracking*. 2013. Available at: http://www.economist.com/debate/days/view/934 Federal legislation currently exempts fracking operations from protections under several Acts regulating air, water and waste disposal. The 2005 Energy Act, for instance explicitly excludes fracking from the Clean Water Act.

[48] Robert Kennedy, The Fracking Industry's War on the New York Times – and the Truth. *Huffington Post*, 2011. Available at: http://www.huffingtonpost.com/robert-f-kennedy-jr/fracking-natural-gas-new-york-times-_b_1022337.html; see also Greenpeace 2013

[49] Anthony Ingraffea,'Gangplank to a warmer world' *International Herald Tribune* 30 July 2013

[50] EIA 2012

[51] Guy Chazan 'UK Gets Big Shale Find'. *Wall Street Journal,* 22 September 2011

[52] Elizabeth Bomberg, Governing shale gas development : The European Experience. Issues in Energy and Environmental Policy Report, Ford School of Public Policy, University of Michigan, 2014.

[53] SGE (Shale Gas Europe). 'About us'. Available at: http://www.shalegas-europe.eu/en/index.php/about-us/about-shale-gas-europe

[54] Stevens 2012, 10

[55] see Skjærseth, Jon Birger, Guri Bang and Miranda Schreurs. 2013. Explaining growing climate Policy differences between the EU and the United States. *Global Environmental Politics* 13(2013): 61-80

[56] Haug 2012; Bomberg 2014

[57] The full name is 'Technical Working Group on environmental aspects of unconventional fossil fuels, in particular shale gas (E02671)'. Available at: http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=2671

[58] SGE 'Our Experts' Available at: http://www.shalegas-europe.eu/category/opinion/

[59] IOWG 'Shale Revolution. Opportunity to Jump Start Economic Growth' http://www.iowaenergyforum.com/article/shale-revolution-opportunity-to-jump-start-economic-growth (14 Nov 2014)

[60] Quoted in the *Economist,* 8 Dec 2012

[61] ERT (European Roudtable). 2013. Current Issues. Energy. Available at: http://www.ert.eu/issue/energy

[62] Russia supplies nearly 40 percent of EU's gas imports. See European Parliament, 'Shale gas and EU energy security' Briefing Paper, December 2014 http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/542167/EPRS_BRI(2014)542167_REV1_EN.pdf

[63] SGE, 2013

[64] Quoted in 'Interview with Piotr Grzegorz Wozniak', *Euronews,* 2 November 2012 Available at: http://www.euronews.com/2012/11/02/fracking-in-europe/

[65] IOGP (International Association of Oil and Gas Producers) 'FAQs' http://www.iogp.org/PapersPDF/v2_Shale_FAQs_1.2_high.pdf

[66] SGE 2013, emphasis added

[67] European Commission. 2013. Environment Directorate. Brussels: European Commission. Available at: http://ec.europa.eu/environment/integration/energy/unconventional_en.htm

[68] IOWG 2014

[69] See SGE 2013

[70] Quoted in the *Guardian*, March 13, 2013

[71] FoE UK (Friends of the Earth UK) 'Local action'. Friends of the Earth UK. Available at: http://www.foe.co.uk/news/using_planning_system_fight_39057.html (Accessed February 2014)

[72] McGowan 2014, 11

[73] Indeed some commentators – including NATO Secretary General Fogh Rasmussen - claimed these groups were receiving funds directly from Russia. Environmental NGOs have fiercely denied the claims. Andrew Higgins, 'Russian Money Suspected Behind Fracking Protests' *New York Times*, 30 Nov 2014. http://www.nytimes.com/2014/12/01/world/russian-money-suspected-behind-fracking-protests.html?_r=0

[74] McGowan 2014, p. 10

[75] European Parliament, 2012

[76] Interview with Commission official, Brussels, 16 March 2015

[77] FoE Europe (Friends of the Earth Europe) *Shale Gas: Energy Solution or Fracking Hell?*. Briefing Paper. March 2012, Available at: http://www.foe.co.uk/resource/briefings/shale_gas.pdf

[78] European Commission. 2012. Energy Directorate. Brussels: European Commission. Available at: http://ec.europa.eu/energy/studies/energy_en.htm

[79] *Guardian* 4 October 2013

[80] Food and Water Europe, 2014. *The Urgent Case for a Ban on Fracking.* Brussels: F&WE. Available at:

http://documents.foodandwatereurope.org/doc/EuropeUrgentBanFrackingFeb2015.pdf

[81] Bomberg 2015

[82] Helen Rimmer, 'Viewpoints: Fracking's risks'. BBC 5 Jan 2013. Available at: www.bbc.co.uk/news/science-environemnt.

[83] Eurobarometer, 'Special Eurobarometer 409. Climate Change' Brussels: European Commission. 2014. Available at: ec.europa.eu/public_opinion/archives/ebs/ebs_409_en.pdf; Frank Umbach also highlights this sustainability emphasis and its implications: 'The intersection of climate protection policies and energy security' *Journal of Transatlantic Studies* 10 (2012): 374-87.

[84] See Schreurs, *et al* 2009

[85] At the local level, however, where support is divided, government officials have often been very active opposing fracking and imposing local bans. See Kai Schafft, Yetkin Borlu and Leland Glenna, 'The Relationship Between Marcellus Shale Gas Development in Pennsylvania and Local Perceptions of Risk and Opportunity.' *Rural Sociology* 78 (2013), 143-166.