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Shale gas policy in the United Kingdom: An argumentative discourse analysis
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Abstract

Shale gas has become an energy policy priority in the United Kingdom in light of profitable extraction activities in the United States. Since 2012, the UK Government has created key economic drivers to encourage shale exploration, whilst growing activism in affected site communities has stirred significant media and academic commentary. This study examines the growing national debate as a matter of discourse; adopting an argumentative discourse analytic approach to assess data collected from stakeholder interviews (n=21) and key policy actor statements quoted in broadsheet newspapers. We explore three dominant 'storylines' emerging in relation to shale gas policy. 1) "Cleanliness and dirt" concerns the relative framing of the environmental benefits and harms of shale gas; 2) "energy transitions – pathways and diversions" concerns geographic metaphors of transitions to carbon intensive and low-carbon energy systems; and 3) "geographies of environmental justice" concerns divisions of economic benefit distribution, environmental impact and procedural fairness. We find that central government policy rhetoric emphasises economic development, regulatory oversight and distribution of benefits to site communities, whilst minimising discussion of the implications of shale gas for anthropogenic climate change. The role of these discourses in influencing shale gas policy is discussed.

1.1. Introduction

The development of unconventional gas resources from organic shales has risen to the forefront of energy and environmental policy debates in the United Kingdom since 2011. Recent research and development of horizontal drilling and hydraulic fracturing (fracking) techniques in the USA and Canada combined with rising fossil fuel prices, has led to the profitable expansion of global unconventional gas production to become the most rapidly expanding trend in onshore domestic fossil fuel exploration and production worldwide (Kargbo et al., 2010; Schlumberger, 2005; Vagnetti, 2009).

In response to the shale gas boom in the US, the UK has seen the emergence of a nascent shale gas industry, though at the time of writing it remains at the exploration, rather than commercial production stage. Exploration companies such as Cuadrilla and iGas are focusing attention upon the Bowland-Hadder gas play running across central England from Cheshire to Yorkshire, and the Liassic shales of the Weald Basin in Southeast England (Schulz et al., 2010; Smith et al., 2010), which a British Geological Survey report reveals an estimated yield of 20 trillion cubic feet (tcf) of recoverable methane (Andrews, 2013). Following this report the Coalition Government developed a policy framework in the Spending Round 2013 to stimulate shale gas investment: including industry tax incentives, a new regulatory framework and community benefits package for shale gas host communities (HM Treasury, 2013a), and 100% business rate recovery from fracking operations for local authorities (double the existing 50% rate), resulting in an estimated £1.7 million per annum

for a typical shale gas site funded by central government (Prime Minister's Office, 2014). Together, these economic drivers reveal a policy platform described by Prime Minister David Cameron as "going all out for shale" (cited in Watt, 2014). This political rhetoric links to a practice of shale industry expansion throughout 2013 and 2014. Notable examples include Cuadrilla's exploration activities in Balcombe, West Sussex; and iGas's exploration in Barton Moss in Salford, Greater Manchester. Also at the time of writing in early 2014 there have been announcements that French multinational integrated oil and gas company Total confirmed a $48.1m (£29.3m) deal for a 40% share in shale gas exploration in the East Midlands (Gosden, 2014), showing signs of growing interest in commercial extraction activities.

1.2. Environmental concerns in shale gas extraction

Though profitability and incentivisation of shale gas extraction remain key UK Government policy priorities, the issue remains politically contentious due to significant environmental impacts. US experiences in the Barnett and Marcellus shale basins have been instrumental in shaping environmental concerns over shale gas globally. Following US reports of methane contaminating drinking water, such as those documented in the scientifically contentious 2010 documentary Gasland, debate and localised protest have emerged in shale producing countries including France, Bulgaria and the UK (Jaspal and Nerlich, 2014; Wood, 2012). Additionally, the carbon footprint of shale gas (Broderick et al., 2011) the threat of fugitive methane emissions (Howarth et al., 2011a), excessive water use, traffic congestion and light pollution from flares (Kargbo et al., 2010; Zobak et al., 2010), alongside the potential toxicity of fracturing fluids (Chen et al., 2014; Colborn et al., 2011), have exacerbated scientific concerns over negative climate impact, health, air quality, water use and the sustainability of shale-gas fuelled energy systems (Howarth et al., 2011b). In response to these concerns the Government task the Environment Agency (EA) with clear environmental permitting regulations. Exploration and commercial shale gas producers must consult with the EA and apply for permits with regard to protecting water sources, such as groundwater (aquifers) and assessing and approving the use of hydraulic fracturing chemicals, the treatment and disposal of mining waste, and the treatment and management of naturally occurring radioactive materials (Environment Agency, 2014).

One issue that has been prominent in UK shale gas debate is seismic activity resulting from fracking in 2011-12. In May 2011 the Government issued a suspension of drilling activities pending the investigation of two seismic tremors with magnitudes 2.3 and 1.5 respectively following drilling in Weeton, Lancashire in Northwest England during fracking operations by Cuadrilla. However, following a range of BGS and industry prepared studies of the seismic risks (see for example Eisner et al., 2011; Green et al., 2012), the Government lifted restrictions on exploration activities in December 2012, leading to Cuadrilla and iGas's exploration activities, both of which have triggered significant organised local protest (from organisations such as the No Fracking in Balcombe Society, and Frack Free Greater Manchester) and blocking of access to drilling sites. This in turn has stimulated simultaneous mobilisation of national anti-fracking campaigns from Greenpeace and other environmental NGOs, and activist organisations such as No Dash for Gas, and Frack Off. Together the local environmental risks (contaminated water, traffic, seismic activity) and global environmental risks (fugitive methane emissions and additional carbon dioxide sources) alongside local and national protest, have spurred a public debate on the social and environmental acceptability of the nascent shale gas industry.

1.3. Social scientific research into shale gas development

With growing opposition to shale gas activities a growing body of social scientific analysis is beginning to emerge. The effect of shale gas upon gas and electricity markets and broader energy policy in the United States, East Asia and Europe is now well documented (Asche et al., 2012; Gény, 2011; Hu and Xu, 2013; Jenner and Lamadrid, 2013; Kargbo et al., 2010; Pearson et al., 2012; Rogers, 2011; Stevens, 2010; U.S. Energy Information Administration, 2013; Wakamatsu and Kentaka, 2013). Moreover, issues of public acceptability, risk perception, policy governance and social impact in the Marcellus (Finewood and Stroup, 2012; Malin, 2013; Smith and Ferguson, 2013) and Barnett (Anderson and Theodori, 2009; Wynveen, 2011) is being explored; alongside consideration of global fracking movements, community engagement and public opposition to the siting of shale gas facilities (Boudet et al., 2014; Cotton, 2013; Jaspal et al., forthcoming; O'Hara et al., 2013; Theodori, 2009; Wood, 2012). Of particular interest to this study is Jaspal and Nerlich's (2014) study of the threat dynamics of fracking reported in UK newspapers, and comparisons with this study are discussed in further detail in the results section of this paper.

1.4. Shale gas as discourse

The combination of central government rhetoric and growing grassroots activism, make shale gas a matter of public policy debate: a factor recognised by Prime Minister David Cameron (2013) in his op-ed in the Telegraph newspaper, stating: "Fracking has become a national debate in Britain – and it's one that I'm determined to win." Competitive debate over the social acceptability, environmental safety and economic viability of shale gas is drawing in a divergent range of stakeholders across industry, consultancy, NGO and activist organisations. The entanglement of divergent stakeholder interests reveals fault lines between competing world views, and an argumentative struggle amongst contested framings of the problem (see Bulkeley, 2000; Mander, 2008; Usher, 2013). This paper examines these issues through the lens of interpretive policy analysis, understanding public policy debate as a matter of discourse - referring to the ensembles of multiple understandings, framings and contexts that lead to the social construction of environmental problems by different actors (Hajer, 1993). The analysis of discourse encompasses what can and cannot be said about such problems in public dialogue, and by extension allows policy analysts to understand how the framing of energy policy problems and solutions through language can sustain or overturn dominant policy positions (Scrase and Ockwell, 2010).

1.5. Argumentative discourse analysis of shale gas policy

Our empirical analysis uses an argumentative discourse analytic approach (hereafter ADAA) (Fischer, 1995; Hajer and Versteeg, 2005; Majone, 1989), which has previously proved valuable in uncovering the linguistic relationships embedded in numerous energy policy analyses; for example in relation to nuclear power, coal, onshore wind and solar energy (Bern and Winkel, 2013; Hunold and Leitner, 2011; Jessup, 2010; Mander, 2008; Szarka, 2004; Usher, 2013). The ADAA presents a framework for interrogating environmental discourses: heterogeneous and shared ways of apprehending the natural world which inherently draw out contestation for capturing the terms of environmental policy making (Dryzek, 1997). Litfin (1995; 1994) suggests that discourses link actors together through their capacity to make authoritative claims about environmental decision-making based upon specialised knowledge – in essence discourses structure shared epistemic communities of actors and institutions and reveal the knowledge structures and power relations embedded in linguistic and interpretive practices, organisational strategies and contexts. Within these embedded epistemic communities, Dryzek's (1997) emphasises the

enabling potential of discourse for environmental policy, whereas Hajer's (1995) ADAA contrasts by critically examining how human activity is shaped and constrained by discourse (see also Rydin, 2003). Policy discourses pull together a multitude of actors with their own legitimate perspectives and modes of talking or engaging in an issue, and the ADAA aims to uncover these relationships.

In practice, the ADAA draws out the embedded contextual factors in which policy strategies emerge by focusing upon the linguistic strategies that actors mobilise in public dialogue over environmental decision-making. The storyline is the central component. Storylines are narratives on social reality that play essential roles in the "clustering of knowledge, positioning of actors, and ultimately, in the creation of coalitions amongst the actors of a given domain" (Hajer, 1995). Each represents a fluid and context-based discursive formation by which actors publicly justify their claims. Storylines are characterised by specific emblems: issues that 'dominate the perception of the ecological dilemma in a specified period' (Hajer, 1995). Hajer states discourses are often fragmented and contradictory, with conflicts between various coalitions formed around a particular way of thinking about the environment. During environmental policy debates, coalitions are constructed to sustain a particular storyline. Although the actors in each coalition may share specific preferences, they often have their own particular interests and motivations (ibid. p.12). Hajer explains that "these coalitions are unconventional in the sense that the actors have not necessarily met, let alone that they follow a carefully laid out and agreed upon strategy" (ibid. p.13). Indeed, what gives discourse coalitions their power is that the actors group around particular storylines (even though they may interpret the meaning of these storyline differently).

Discourses are understood as reflecting the values and motivations of the coalition members. These actors can also draw upon different (sometimes conflicting) storylines, and hence can potentially move between discourse coalitions over time (Bulkeley, 2000); and the success of particular policy strategies can be understood in terms of the dominance, legitimisation and effectiveness of particular storylines (Rydin, 2003). Because storylines do not necessarily adhere to specific political classes, parties or institutional settings, they can emerge across and between traditionally distinct political boundaries – linking diverse policy actors in capturing the terms of the debate and shaping institutional practices.

2.1. Materials and methods

Empirical data collection follows a similar structure to that recommended by Hajer (1995): involving semi-structured interviews key actors in the shale gas policy (n=21, see Table 1 for organisational details of interviewees, note that individual organisations are not mentioned to preserve anonymity), collected using a purposive sampling method.

Table 1 Organisational representation of interviewees

Stakeholder organisation	No. interviewees
Energy consultancies	2
Environmental non-governmental organisations	3
Local/national activist groups	5
Elected representatives/ local government officials	3
Scientific and regulatory organisations (civil service/academia)	5
Shale gas exploration/extraction companies	3

Industry, local and national government representatives, energy consultants, national environmental NGOs, scientists, regulatory bodies, and local opposition groups were represented. The range of interviewees encompassed Hajer's notion of capturing 'helicopter' perspectives across the policy domain (specialists with a broad overview of the issue), alongside others with specific interests in different policy outcomes. Thus, the range of interviewees were selected on the basis of an assumption that different organisations will ex ante adhere to different viewpoints, and hence present a suitable range of social analytic sites (Miles and Huberman, 1984) to encompass the range of competing storylines emerging in the policy domain. Interview data was supplemented by analysis of key actor responses to shale gas policy (in particular Government officials, industry representatives, national and local activists) found in UK broadsheet newspapers. Statements to newspapers act as key 'sites of argumentation' (Runhaar et al., 2006) to allow analysis of actor construction of storylines where interviews are not available, and revealing the development of storylines at different levels of policy governance (such as capturing senior politician responses). We examine articles drawn from a Nexis™ search (n=411 using the "shale gas" headline search, August 2010 – January 2014 in the Guardian, Independent, The Times, Sunday Times, Telegraph, Sunday Telegraph, Observer). These were then mined for relevant quotes using computer aided qualitative data analysis software MaxQDA™, which were then coded in the same way as interview data.

An initial thematic analysis of the combined dataset using a bottom-up in vivo coding (see Glaser, 1992), followed similar lines to the Braun and Clarke (2006) methodology. Firstly we familiarised ourselves with the corpus of data from interview and newspaper quoted materials, generated a bottom-up coding template checked between the researchers. Storylines were identified by looking (for example) at where particular framing devices are used, such as metaphors drawn from a common conceptual domain (Larson, 2011; Núñez, 2000), we then looked for specific discourse coalitions emerging. One means to do this was to look at where actors from different organisational backgrounds employed metaphors to describe facets of shale gas development from the same conceptual domain. We finally reviewed these relationships and used these as the basis for defining and labelling the storylines.

Three overarching storylines emerged. Each is given a label or moniker to encapsulate the substance of the issues presented. Discussion of the storylines draws upon the interview data and quoted materials from external sources; the aim is to present the storylines as coherent discursive formations and to discuss the policy implications of each. The final section of the paper discusses the coalitions of actors forming around these storylines and the implications of these for industry practices and policy developments emerging from the UK government in relation to shale gas.

3.1 Results

The three principal emergent storylines are discussed:

1. Dirt and cleanliness – environmental impacts, risk communication and institutional trust
2. Energy transitions – pathways and diversions – ecological modernisation, energy security and the role of fossil fuels in low carbon energy systems
3. Geographies of environmental justice – situated actors, fairness and the politics of scale.

3.2.1. Dirt and cleanliness

3.2.1.1 Fossil fuels

The first key emergent storyline concerns shale gas as a representation of cleanliness or dirt. Common to the framing of the problem by stakeholders across the spectrum of pro and anti-shale gas organisations, are the descriptors "clean" and "clean-burning" contrasted with those of "dirty", "toxic", "messy" and "contaminating". In each case the descriptor is comparative. Shale gas is defined in relation to other fuel sources: coal, tar sands, conventional oil, nuclear and renewables were key comparators identified across the range of interviewees. Cleanliness as an over-arching theme is defined in multiple ways; though the common thematic representation concerns the emission of carbon dioxide (hereafter CO_2) and other non-point source pollutants (defined as particulate ash, methane and sulphur) when compared with coal. Coal was universally construed as a "dirty" fuel by both shale gas industry interviewees, energy consultants, by local and national environmental activists, and scientists. Though all interviewees mentioned coal using negative descriptors (dirty), the inference was dependent upon which actors drew upon this metaphor. Industry and consultancy interviewees sought to bolster the environmental credibility of shale gas by positioning it as "cleaner than coal", justified by evidence of lower particulate matter, sulphur and carbon dioxide emissions:

> Industry interviewee: simply put, the burning of the gas is a much cleaner carbon option, and in fact it's one of the cleanest if not the cleanest of the carbon sources to get domestically.

Interestingly this fossil fuel industry interviewee posits CO_2 specifically as an unclean pollutant. A consistent challenge in the communication of climate change mitigation involves finding ways to overcome the relative socio-cultural invisibility of CO_2 and the barriers this creates in visualising environmental change (see for example Whitmarsh et al., 2011). The concept of a "cleaner carbon option" reifies carbon as dirty and then discursively frames shale gas through a storyline of relative cleanliness in relation to different types and scales of emissions from coal. This utterance from a fossil fuel industry actor contrasts with some of the pro-shale gas social representations of threat revealed in Jaspal and Nerlich's (2014) analysis of fracking in UK newspapers, whereby the 'dirt' storyline around fracking threats is

countered in some newspapers (notably The Telegraph) by one of a green energy 'threat' to energy security. It is noteworthy that this framing of renewable energy was absent from our interview data.

What is clear in the interview data, however, is that the 'dirt' storyline creates a discourse coalition of academic environmental scientists (in particular advocates of the Howarth et al., 2011a paper, that stimulated controversy over the climate impacts of fugitive methane emissions), environmental NGOs and protest organisations that seeks to shift the focus from particulate matter, sulphur and CO_2 (the reasons why coal is considered dirty) towards attention to fugitive methane emissions. This counter-discourse coalition mirrors Jaspal and Nerlich's (2014) findings, that shale gas is defined by shale gas opposition actors as dirty both in terms of higher methane emissions relative to coal (thus dirtier than coal, nuclear and tar sands which do not release methane) and higher CO_2 in relative terms to renewable energy resources, pointing towards scientific uncertainty regarding the scale of greenhouse gas emissions (GHG) and hence a precautionary approach to shale gas extraction:

> Labour party representative interviewee: "It's even dirtier than tar sands, it causes methane to increase."
> Green MP Caroline Lucas in the Guardian July 22, 2011: "It is deeply irresponsible to try to extract this gas. It is a dirty, dangerous and dodgy energy supply which is still not understood well enough."

3.2.1.2 Risk visibility

In addition to the cleanliness/dirtiness frame in terms of climate impacts, a second facet of the dichotomy concerns fracking chemicals, fugitive methane emissions and the potability of water. Water use is extensive in hydraulic fracturing, and the use of chemical additives is a significant cause for concern amongst local environmental groups opposed to shale gas exploration. Since 2011 there has been a discursive shift from the post-Gasland concern with drinking water contamination, and the post-Blackpool concern with earthquakes in UK newspaper reporting of the environmental issues. However, these localised environmental risks remain paramount to local activist organisations, such as the Residents Against Fylde Fracking (RAFF) and Ribble Estuary Against Fracking (REAF) groups interviewed. By contrast, it is clear that larger environmental NGOs such as Greenpeace and Friends of the Earth have shifted towards discursively emphasising the climate change impacts in their opposition to shale gas development in energy policy. In framing and negotiating the local and global scales of environmental impacts, a number of sub-storylines emerge - relating to the conditions of uncertainty, risk visibility and institutional trust that surround industry environmental management practices.

> Activist interviewee: This [water used in fracking] is not sea water that they pump from the sea. This is not dirty water that they have got from streams or rivers. This is fresh clean water of drinking standard. Now that water is being pumped at high pressure underground, with toxic chemicals and with sand. They say the chemicals are to clean it but we don't believe that.

"Contamination" is a key descriptor used both by academic scientist and regulatory body interviewees as well as environmental activists. Contamination concerns not only the potential harm to health and wellbeing, but is framed as through the "toxic" (a word commonly mentioned within this discourse coalition) nature of the process as something that marks or despoils the environment and the communities affected. The contamination of water

and the exacerbation of seismic activity are framed by these interviewee actors in terms of unknown risks (see Slovic, 1987) – whereby interviewee utterances emphasise that scientific uncertainty surrounds extraction techniques that are previously untested in the UK, and that scientific data on environmental impacts remain incomplete at the point where test drillings are taking place. Moreover, like CO_2 emissions, the contamination of aquifers and the exacerbation of seismic activity provide socio-culturally invisible risks because they occur underground, are diffuse and beyond the direct perception of lay people (Beck, 1996), are spatially spread (uncertainty over where will be affected) and temporally delayed (when people will be affected). This creates concern amongst local activists, particularly when stretching risks across temporal horizons:

> Activist interviewee: In America they can't find 3000 wells…. They've lost them. 'Cause you see when they finish they put a nice little piece of agricultural on top of the land so it looks all beautiful and finished… you can see farmland. What happens in 20 years when the cement fails, which it will. What happens under the ground, we can't see? Just 'cause we can't see it, doesn't mean it isn't there.

3.2.1.3 Bounded rationality and trust in fracking organisations

The sociocultural invisibility of fracking risks means that their interpretation and negotiation is mediated through trust relationships with the both the private institutions involved in shale gas exploration (most notably Cuadrilla), but also public sector organisations charged with environmental protection and the governance of shale gas resources (e.g.the BGS, Environment Agency, Local Authorities, DECC, DEFRA, the Health and Safety Executive, Treasury etc. See Poortinga and Pidgeon, 2003; Slovic, 1993; Wynne, 2001 for further discussion of trust relationships). This is because, as Lidskog asserts, science does not produce an uncontested view on what constitutes acceptable invisible risks, and so managing them inevitably involves boundary work - the negotiation and demarcation of what is acceptable, legitimate and safe (Lidskog, 2008). Thus, like in the post-Gasland USA situation where shale industry organisations keenly disputed the scientific claims of the film, the interviewed shale gas supporters expressed environmental safety in unequivocal terms. The use of metaphors is key. Metaphors "function as a key framing device within a particular discourse over a certain period of time" (Zinken et al., 2008) which in turn create a certain organisation of human experiences, influencing the framing of approaches to difficult social and policy problems (Lakoff and Johnson, 1980; Núñez, 2000). In this case metaphors are used by pro-shale gas actors seeking to establish the boundaries of what constitutes legitimate public risk concerns; specifically through alluding to the bounded rationality of scientific knowledge (see for example Kahan et al., 2012) in comparison to supposedly 'soft' social and psychological factors that give rise to public fears over shale gas impacts. To give an example:

> Energy consultant interviewee: If we go with the various ones [environmental impacts] - Earthquakes I mean is completely inconsequential. Earthquake is a very scary sounding word - The difference between the earthquakes that have been caused in Blackpool and an earthquake that actually kills people. Is like the difference between a mild headache and a brain tumour.

With regard to seismic risks, Cuadrilla have publicly declared their practices as 'open and transparent'. Following the earthquakes near Blackpool and the temporary ban on exploration activities Cuadrilla commissioned a series of studies alongside the BGS to establish a scientific baseline of information upon which to structure a 'traffic light' detection

system through a seismometer network around each of the wells. Continuing scientific assessment of seismic risks appears to have alleviated Government concerns (the ban was lifted directly following the BGS report), and so since November 2012, the emphasis upon seismic risks appears to have reduced in media reporting of shale gas, and in environmental NGO and activist framing of their opposition. Industry actors have been successful in institutionalising a discourse of an 'acceptable' level of seismic risk, and so challenges to shale gas policy and practices framed in seismic risk terms have had little effect on halting current and future shale gas developments. The risk acceptability of water contamination and chemical use has not yet been established, however, as one political party interviewee suggested, that:

> "…for commercial reasons, we're not told what those [fracking] chemicals are, as it is commercially confidential; and thus we can't know what it is, and what its life is in the ecosystem, what the potential health and environmental risks are, from those chemicals, and if you were to do an environmental impact assessment, it's impossible without having that information. So we're not being told enough by the people doing it.

The community and activist-perceived lack of transparency exacerbates the socio-cultural invisibility of fracking risks, and appears at odds with Cuadrilla's CEO Francis Egan's claim that the establishment of trust with communities comes down to "communication, communication, communication" (cited in Neate, 2013), akin to the deficit model that assumes that information provision in the public domain will promote the public acceptability of shale gas and organisational trust relationships with affected communities (Irwin and Wynne, 1996; Wynne, 1993); mirroring the response to protest amongst US shale gas industry organisations, which spent significant time and resources refuting the basic science presented in the Gasland film and establishing public relations mechanisms to refute claims of drinking water contamination. Yet as Wood (2012) and Cotton (2013) suggest, such practices misunderstand the motivations for activism – a social phenomenon driven not only by fears of visible risks like flammable drinking water, but also the types of economic development occurring in predominantly rural communities, and issues of place attachment and place identity when rural spaces become industrialised. As Jaspal et al. (forthcoming) have argued, shale gas presents profound opportunities and threats to human identity as environmental and place identity values conflict with desire for the local economic development in poor post-industrial and rural communities. Opposition to dirty shale gas thus concerns the threat of industry encroachment into rural places and the disruption this creates in the place identity of residents within affected areas (see for example Devine-Wright, 2005; Pasqualetti et al., 2002):

> Interviewer: Are there any other key issues you are concerned about?
>
> Activist interviewee: Well, the degradation of the countryside, the industrialisation of the countryside. There are countless lorries backwards and forwards. There are drilling rigs. There are fences, there are ditches. There are two huge tankers full of radioactive water, which maybe you don't know about.

In terms of place-identity effects, one significant concern is the threat of technological stigma that arises from industrial processes in rural environments. Traffic noise, air pollution, the visibility of drilling equipment, the flaring of methane, and light pollution surrounding drilling rigs were all mentioned by opposition group and environmental NGO interviewees. These impacts are not just pollutants in the sense of generating ecological and health risks;

rather their significance lies in the change to the characteristics of affected places - rural places become transformed into industrial places, and in turn the local residents' identity as rural people is altered, changing how they self-perceive their environment and how they are perceived by others outside their community (Broto et al., 2010; Cotton and Devine-Wright, 2013; Devine-Wright and Howes, 2010; Gregory et al., 1995; Simmons and Walker, 2004). How these cultural and psychological dynamics from the encroachment of dirty extraction activities affect locally site communities is an issue worthy of further research, as Jaspal et al. (forthcoming) note.

3.2.2. The significance of the dirt and cleanliness storyline

The storyline of cleanliness, dirtiness, contamination and toxicity highlights two fundamental aspects of discourse. On one level "dirt" is used as a framing effect that links interviewee's mental representations of shale gas pollution to the choice of language used in public communication. The alternate sub-storylines of cleanliness/dirtiness are emphasis frames which are reference dependent (see in particular Druckman, 2001). The communication of individuals' perception of reality shifts by focusing on a subset of the relevant aspects of pollution (i.e. CO_2 or methane). This creates a narrative which aims to encourage others to interpret information about pollution in certain ways and not others. In essence the emphasis frame (clean or dirty) aims to be persuasive, trying to assert the legitimacy of one discursive framing over the other and thus establish the legitimacy of the discourse coalition.

On a second, deeper level, we can see the dirt/cleanliness narrative as emblematic of an environmental problematique (Hajer, 1995), in the sense that it reflects the social processes of ordering society and the moral dimensions of national energy policy. Following Douglas (1966) (and more recently Nash, 2008), the cleanliness of shale gas can be understood not as an absolute measure based upon scales and types of pollutants, or quantitative measuring of social and environmental impacts or a metric of scientific demarcation of safe from unsafe. Rather the technical aspects of risk management are subsumed into an emergent discourse of defining ethical responsibility for shale gas resources and the spatio-temporal ordering of matter. Douglas construes dirt as matter out of place, which can be understood in three ways: firstly, as carbon and particulate matter released into the atmosphere rather than locked away geologically in fossil fuels; secondly, as chemicals deposited underground and earth tremors in seismically inactive places; and thirdly of lorries, gas flares, drilling equipment and other industrial devices in the rural countryside. Shale supporters employ cleanliness metaphors to establish the ethical responsibility for energy industries to promote lower carbon electricity and heating solutions in an energy-thirsty and climate change-threatened world (and as Jaspal and Nerlich, 2014 show, the concept of 'threat' is used by both shale gas supporters and opponents to bolster the rationalitiy of their positions witihn the debate); whereas opponents of shale gas development employ dirt metaphors to establish the irresponsibility of adding new carbon and methane sources to the climate system in places which would be irrevocably changed by industrialisation processes.

At the current stage of shale gas policy development in the UK, it is clear that Government policy initiatives have sought to exclude this contentious storyline, it appears to its emblematic representation of climate change as it relates to energy policy. The UK's commitment to meeting legally binding CO_2 reduction targets under the Climate Change Act 2008 and the concomitant effort to establish renewable and other low carbon energy sources is challenged by shale gas's potential to ensure short term energy security, plugging a growing energy gap between growing demand and declining nuclear and fossil fuel resources. So although the competing discourse coalitions of industry and activists construe the problem in terms of GHGs and other pollutants, Government has remained virtually silent

on this issue. In Government press releases, statements by David Cameron and George Osborne etc. and in the practices of tax incentivisation for shale exploration companies and local authorities to accept shale gas exploration, it is clear that there is unequivocal support from central Government to the shale industry. What we see is that the issue of environmental impacts is framed in government policy discourse as something that can be managed. It is principally framed as a matter of strict regulatory control following the Government's acceptance of the Royal Academy of Engineering report that states that "the health, safety and environmental risks can be managed effectively in the UK. Operational best practices must be implemented and enforced through strong regulation" (Royal Academy of Engineering, 2012). Thus the cleanliness storyline has had little effect on central Government policy formation, with Government actors shifting emphasis away from the controversial issue of climate change towards a second, (currently dominant) storyline concerning the temporal and geographic scales of energy transition and the policy measures around economic investment.

3.3.1. Energy transitions

3.1.1.1. Pathways and diversions

The second key emergent storyline concerns the concept of 'transitions' as means to frame the transformation of energy systems in light of climate change, energy security "threats" (Jaspal and Nerlich, 2014), national economic recovery and the alleviation of fuel poverty. In understanding shale gas in the context of transitions, like before, it is important to note the choice of metaphors used, and the conceptual domain from which they are drawn (Larson, 2011). Bridge et al. (2013) argue that the language of energy transitions is commonly framed in the context of socio-technical systems. Terms like niche, regime and landscape provide a contextual account of technological change and system innovations over time (such as why certain niches evolve or are incorporated into regimes while others are not). These metaphors are drawn from a linguistic source domain of geographic terminology, and socially construct energy in spatio-temporal terms. What we find in the interviewee responses is a related geographic-metaphorical language used to describe shale gas transitions, which like the clean/dirty storyline, is dichotomised between two competing discourse coalitions.

Firstly, the language of transition pathways was frequently evoked by interviewees from both industry and activist organisations. In the academic and policy literatures, it is posited that different assemblages of technologies, fuel sources, policies and communities of practice co-evolve to produce multiple "pathways" through which to achieve the decarbonisation and decentralisation of energy systems (Foxon, 2013). With regards to the framing of shale gas within this storyline, again the choice of metaphor is important in defining opposing discourse coalitions. One coalition formed of (for example) policy actors in DECC, and evident in industry and consultancy organisation interviews, principally adopt what could be terms a pragmatic position regarding shale gas development. These actors universally adopted the language of "bridges" and "pathways", geographic metaphors that imply visible and coherent transition management, allowing continued economic dependence on fossil fuels, whilst reducing GHG emissions when compared to coal or oil (Arthur et al., 2009; DECC, 2009); an issues which remains controversial, with concerns that the language of bridge fuels belies the carbon intensity of these gas sources (Stephenson et al., 2012). Nevertheless it is the relative transience of shale gas as part of the "energy mix" (Cameron, 2013), that has become the dominant storyline. By contrast, and in a manner that mirrors Jaspal and Nerlich's (Jaspal and Nerlich, 2014) study of threat dynamics, is that activists from Greenpeace, Friends of the Earth and local opposition groups have sought to overturn

the competing storyline by using competing geographic metaphors from the same source domain, describing shale gas as a "diversion", "distraction" or "block". For example:

> Environmental NGO interviewee: We see it as being not a destination fuel; it's not really even a transition fuel. It's probably more of a dangerous diversion we think for the UK mainly because of its climate change impacts.
>
> National opposition organisation interviewee: …there's talk about fracking being a bridge between dirty energy and clean energy and that's not really the case. In fact fracking is a block between that transition because we're keeping the price of energy and undermining the energy source which we should really be using [implying renewables].

There was significant consensus amongst both activist and industry respondents that the business-as-usual conventional fossil fuels sources were unsustainable in light of declining North Sea oil and gas reserves. However discursive divergence hinges upon the role of shale gas in meeting the legal obligations of the Climate Change Act 2008. With the emphasis on security of energy supply, there was expressed concern from NGO and activist respondents that this would hamper efforts to establish a market presence for renewables industries. The competing discourse coalition could be described as a contrasting idealist position, grounded in a moral stance on absolute CO_2 reduction to mitigate climate change, described as the "prism", as one environmental NGO interviewee termed it, through which shale gas was viewed.

3.3.1.2 Economic viability of shale gas

The transition discourse not only concerns CO_2, but also the economic viability of shale extraction in the UK context. No consensus emerged on this topic, even within the discourse coalition of academic, consultant and industry interviewees. An academic petroleum geologist described shale gas unviable due to "plummeting gas prices" in the US due to a system of individual land rights, whereby investment in shale gas rich regions requires the bulk purchase of individual licences with a legal requirement to drill within 3 years, encouraging mass drilling and market saturation. A UK industry interviewee framed the US case differently, suggesting it as an example of economic viability, because gas prices in Europe are much higher, and so increasing gas availability would make such a proposition viable. Industry and consultancy interviewees consistently drew upon a discourse of ecological modernisation; positing shale gas as the means to achieve economic growth and industrial development in a manner that provides net environmental benefits from coal reduction, thus positing that shale gas produces a win-win scenario of environmental productivity (Christoff, 1996; Hajer, 1995). This discourse is drawn upon in the highest levels of UK Government, whereby key politicians including the Prime Minister and Chancellor of the Exchequer emphasise global competitiveness as a motivation for shale gas expansion in the context of an age of austerity. As David Cameron states (2013): "Without it, we could lose ground in the tough global race." Or George Osborne (cited in Macalister and Harvey, 2013): "I want Britain to be a leader of the shale gas revolution - because it has the potential to create thousands of jobs and keep energy bills low for millions of people."

3.3.2. The significance of the energy transitions storyline

In practice, the storyline manifests through Government policy designed to stimulate shale gas investment and market uptake, using 'supply-push' and 'demand pull' strategies

(Loiter and Norberg-Bohm, 1999) announced in the 2013 Spending Round (HM Treasury, 2013b) and in the January 2014 announcement on local council business rate incentives mentioned above. Supply-push encourages development though tax incentives. The proposed 'pad allowance' exempts a portion of production income from supplementary charges – reducing the effective tax rate from 62% per cent to 30% at current tax rates, which is expected to stimulate up to £14 billion of investment in 2013 (HM Treasury, 2013a). Demand-pull is defined by regulatory and social benefit mechanisms to improve the uptake within the market, such as the proposed incentive package whereby operators provide at least £100,000 of benefits per well site to host communities during the exploration phase, followed by a share of at least 1% of overall revenues. DECC states that companies have also pledged to engage with communities early, prior to applications for planning permission (DECC, 2013), thus ensuring local involvement in environmental planning. The two policy mechanisms of supply push to the shale industry and demand pull to both local councils and affected site communities to consent to shale extraction in exchange for economic incentives therefore link a storyline of economic development in response to global competition and energy security, with the economic geographies of shale gas development as a matter of procedural and distributive environmental justice.

3.4.1. Geographies of environmental justice

There are two elements of environmental justice that relate to emergent shale gas policy in England and Wales. The first concerns the procedural aspect of justice, essentially the fairness through which the distribution of environmental risks and benefits occurs and the possibilities which individuals and communities have to avoid or ameliorate fracking risks, whilst maintaining visual and other amenity values, access to environmental resources and ecosystem services (Lawrence et al., 1997; Walker, 2009). The second refers to the distributive justice. This concerns the equitable distribution of environmental risks weighed against social and material benefits. Distributive injustice occurs when risk burdens fall upon populations predominantly composed of black people, migrant workers and the working poor alongside other socio-economically marginalised groups that are bounded by proximity to environmentally polluting sites, and benefits are felt by broader populations beyond the proximity of the immediate risk burden (Agyeman and Evans, 2004; Kaswan, 2002; Schlosberg, 2007; Walker et al., 2005).

3.4.1.1 Procedural justice

The procedural justice aspect of the environmental justice discourse relates specifically to community engagement and community benefit practices, which have proved deeply controversial for locally affected site communities. When Cuadrilla began exploration activities in Lancashire they obtained permitted site licences that did not require Environmental Impact Assessment (EIA). Part 2(d) of Schedule I of the Town and Country Planning Regulations 1999 in England and Wales regarding Environmental Impact Assessment relating to extractive industries advises a screening opinion to be required where the proposed area of any works would exceed 1ha. However, as Kotakis (2012) notes, the proposed operations by Cuadrilla did not fall under Schedule I as they were exploratory and not commercial, and not large enough to constitute Schedule II developments either as they were all declared as covering an area of 0.99 hectares. Thus, although Cuadrilla's environmental management practices represent compliance with the legal regulatory framework, they raise significant challenges to social acceptability of operations, and by extension trust in the organisation. Its actions were described by one environmental NGO interviewee as:

"Incredibly unwise because I think it made the industry look like they had something to hide".

By sidestepping EIA, Cuadrilla's actual environmental planning practices failed to establish what could be termed a social licence to operate (SLO), essentially a psychological contract that produces an ongoing status of local stakeholder approval. SLO extends beyond what is considered to be normal business practice or courtesy to ensure a feeling of security, and is based on a notion of a diffuse, generalised obligation of reciprocity and exchange (Kleinrichert, 2008). SLO is significant because acting contrary to community expectations may have unintended consequences for the industry (Howard-Grenville et al., 2008), which can include project opposition as well as tightening of regulatory conditions (Gunningham et al., 2004) as regulatory authorities are pressured by elected representatives to bridge the social licence gap with legislative instruments of environmental control. Community engagement in decision-making over site licensing is a key aspect of gaining SLO and thus establishing procedural fairness (see for example Gross, 2007); and failure to establish this intangible agreement can result in place-based communities around development sites becoming sites of political contestation (Calvano, 2008).

The participatory processes inherent to EIA are lauded as a means to achieve procedural fairness (Bartlett and Kurian, 1999; Hartley and Wood, 2005) and establish social licence. Though Cuadrilla espouse the aforementioned "communication, communication, communication" rhetoric, it is clear that amongst locally affected site communities in Lancashire and Suffolk concerns remain that Caudrilla's practices remain a form of deliberative speak (Hindmarsh and Matthews, 2008) - a rhetoric of engagement that is not matched by mechanisms to ensure community involvement in decisions, and thus fail to secure social license. As one activist states:

> Local activist interviewee: I just think the whole thing is just unfair. And Cuadrilla will come and do big public presentations and they talk about engaging with the community. Excuse me what you've done, you've bunged a couple of hundred quid for somebody to buy some flowers to go outside a village hall somewhere; that is not engaging with the community. So it is that lack of legitimacy that fires me up and inspires me to give up my time for [local activist organisation].

It is not only the exploration companies that come under scrutiny however, as there is growing concern that as local authorities will receive cash incentives in the form of 100% business rates for shale extraction activities, that this will damage the impartiality and procedural environmental justice capabilities of councils to protect vulnerable constituencies. As Barbara Keeley, Labour MP for Worsley and Eccles South in Greater Manchester stated in the Guardian (cited in Vaughan, 2014):

> To me, it [100% business rates] muddies the water to give councils two contradictory roles. One is a protective role, to check companies have safeguards. On the other hand, you have a cash-strapped authority that's lost £100m off its budget, like ours, that gets offered this cash incentive in business rates. The public involved in this, who live near the site, how can they trust the local council will make the right decision on this?

Together these utterances represent concern with an emergent discourse of trust and environmental justice that stretches local concerns for procedural fairness across multiple geographic and governance scales; linking local places and local authorities with national energy policy institutions in Westminster and Whitehall. This has analogues in the USA, for

example Smith and Ferguson (2013) studied political activity in relation to the Marcellus shale, showing how different actors across competing discourse coalitions argued that different levels of government policy making – local, state, and federal – should be the locus of policy decisions, generating new and subtle forms of political controversy around the scales at which decision-points are made and then contested. In the UK case, we see that contested scales of fracking adopt this governance dimension as local authorities' impartiality to protect publics from locally unwanted shale exploration is contested by a central government policy platform that may produce unintended effects such as peripheralisation (Blowers and Leroy, 1994) of cash-poor communities, whereby local authority support for the industry becomes increasingly framed as a solution to existing economic deprivation (Walker et al., 2005); in essence producing a form of economic coercion.

3.4.1.2 Distributive justice

The issues of procedural fairness are exacerbated by controversy surrounding the geographic distribution of benefits and harms, particularly across national scales. Concerns have been raised amongst interviewees and politicians in the national press around a growing North-South divide in the implementation of shale gas extraction practices. Conservative peer and former Energy Secretary Lord Howell's comments in the House of Lords in August 2013, positioned shale gas as suitable for "desolate" regions that he described as "unloved places that are not environmentally sensitive". The implication being, that Preese Hall in Lancashire (and by extension Barton Moss in Salford) are suitable for fracking, whilst Balcombe in West Sussex is not. By alluding to a lack of aesthetic (and hence amenity) value in the Northwest of England (Lord Howell also erroneously referred to it as affecting the Northeast of England) an issue of distributive environmental justice emerges. Though the Conservative and Liberal Democrat Coalition Government sought to distance themselves from Lord Howell's comments, extraction in Balcombe brought this environmental justice storyline to the forefront of media reporting and national political debate, and it is noteworthy that some industry actors have spoken in support of this framing. For instance, Neill O'Brien the head of shale gas exploration company Alkane Energy was quoted in The Times calling for the "traditional heartlands" of the Midlands and the North to be fracked before the Southeast, in order to save the industry from "becoming bogged down by a storm of protests in rural areas like Balcombe in Sussex" (cited in Webb, 2013). The emergent storyline involves complex spatial and scalar dimensions of environmental justice, and if it becomes dominant in shale gas policy then the environmental risks borne by areas of low visual amenity will be higher than those in areas of high visual amenity. The distribution of risk could therefore be based upon an arbitrary system whereby some place identities are valued higher than others (see in particular Walker, 2009). In 2011 economically marginalised areas in Lancashire (such as those close to Blackpool) were chosen as fracking sites. It is unclear what technical criteria are used for site selection within shale basins; but within the political discourse it appears that places like Preese Hall may become targets based upon the relative economic marginalisation of citizens and hence the peripherality (Blowers and Leroy, 1994) of affected communities within these regions.

Eric Ollerenshaw, MP for Lancaster and Fleetwood, goes further to suggest that a North-South divide is emerging in fracking politics, whereby Lancashire becomes the UK's "energy base", and "the North gets the dirty end and the South sucks up all the energy" (cited in Weston, 2013). The issues of where shale gas exploration should occur within shale basins, is thus a matter not only of the micro-politics of siting between developer and locally affected communities (often labelled by developers as a so-called Not-in-my-back-yard or NIMBY problem, see Burningham, 2000), but also concerns the scale at which political discourse is negotiated. Activists and protest organisations in Preese Hall, Balcombe and Barton Moss

involve amalgamations of local and national protest organisations – a strategy for such organisations to "jump scales" (Smith, 1984), i.e. engage in practices that signal how politics are spatialised across multiple geographic and political governance scales that are enacted as means for dominant organisations to disempower Northern English communities, and for activists to become empowered in national discourse (see for example Swyngedouw, 2004). This issue of jumping scales has stimulated commentary from newspapers such as The Telegraph, which have run editorials that emphasis how that certain activists involved in protests in Barton Moss "have no connection to the area", but are rather "militant activists…portraying themselves as representing local opinion" (Sawer, 2013) implying that grassroots activism provides legitimate grounds for protest, whereas as national movement of activists to sites of protest does not. This issue is strongly rebutted by No Dash For Gas, who argue that Sawer employs the language of 'outsiders' parachuting in and not taking local issues and needs into account as a discursive strategy that "perniciously uses xenophobic connotations around 'foreigners' and 'outsiders' who seemingly have no place in one which is not 'their own' to justify this position." (No Dash For Gas, 2013).

3.4.2. The significance of the geographies of environmental justice storyline

The issue of spatiality in shale gas is a key factor in determining how political conflict at fracking sites has become part of a national discourse concerning how certain places and certain communities become targeted and others are not. In practice it appears that the outcome of powerful interests in the Conservative Party and shale gas exploration companies "jumping scales", is that political support from Westminster for siting in the Northwest of England will be greater than in the Southeast, because of a discursive formulation of "dirty" industries being appropriate for "desolate" places. Within this discourse of scalar politics the North of England is posited as being remote from London politics, and thus less of a threat. Brenda Pollack of Friends of the Earth in the Guardian newspaper states: "Drilling in the home counties brings the threat of fracking geographically and politically closer to Westminster" (Booth, 2013). The conception of place value to powerful interests in the shale gas industry have created generated a storyline that potentially splits shale gas opposition into two geographically situated discourse coalitions operating at multiple geographic scales, concerned not only with local environmental protection but in countering a North-South divide within a national energy policy framework. Therefore, although the Government was quick to distance itself from Lord Howell's comments, and to emphasise both the strict regulatory environment that reduces environmental and amenity value impacts and ensure early community engagement; from interviewee responses this is clearly not experienced by concerned residents in affected local communities, requiring further empirical exploration not only of public perceptions of shale gas extraction risks, but also the distributive and procedural justice dimensions of energy policy frameworks, alongside examination of the scalar politics of place-identity and place-attachment related values in affected rural, peri-urban and urban communities when national activist organisations support and (it could be argued, discursively override) the positions of local community activists both within shale gas basins and in communities not currently affected by exploration activities.

4.1. Discussion

What is perhaps unsurprising about emerging storylines around shale gas development are the formation of competing framings of the issue that divide predominantly into two distinct discourse coalitions. As in Jessup's (2010) paper on wind energy discourse

coalitions, the storylines are summarised and organisation membership of attendant discourse coalitions in shown in Table 2.

Table 2 Storylines and associated discourse coalitions

Overarching storyline	Principal values and worldviews	Contrasting discourse coalition memberships	Other actors involved in the storyline
Cleanliness and dirt	Cleanliness as an organising principle, defined relationally. Characterised by comparative assessment of environmental benefits and harms in relation either to coal/tar sands/nuclear or to renewables. Social construction of cleanliness as relative reduction in carbon dioxide, and particulate ash in relation to coal. Social construction of dirt as an absolute increase in methane, and a relative increase in carbon dioxide in relation to renewables. Dirt storyline compounded by both the invisibility of fracking risks - toxicity, water contamination and the visibility of industrialising rural places.	Shale exploration companies, energy consultancy, academic environmental scientists and geophysicists, HM Treasury (cleanliness) Contrasted with: Environmental NGOs, Green Party, local and national activist organisations (dirt)	Environment Agency, DECC, DEFRA, HSE BGS (regulation, scientific assessment and environmental protection) Renewable energy companies Fossil fuel companies (Shell, BP etc.)
Pathways and bridges	Development of shale gas defined through temporal and spatial metaphors of transition, paths, roads, bridges and blockages. Discursive conflict between shale gas as a pragmatic position "a stop-gap" as society shifts from reliance on fossil fuels to lower carbon alternatives, and the idealist positions of it as a "dangerous distraction" in the face of the threat of climate change. Economic viability is variably defined in relation to the United States experience – either as viable (it can provide domestic energy security and reduce domestic gas prices) or unviable (market gas prices have fallen).	Shale gas exploration companies, larger fossil fuel extraction companies, HM Treasury, Conservative Party within Coalition Government, David Cameron and George Osborne (transition) Contrasted with: Frack Off, No Dash for Gas, Greenpeace, Friends of the Earth, local activist organisations (blockage)	Energy consultants Banks and shale gas investment institutions Local councils

Geographies of environmental justice	Defined in relation to procedural and distributive fairness aspects across geographical scales. Discursive conflict between supporters claiming transparent communication strategies and low environmental risks, versus actors concerned with inadequate community engagement, siting based upon arbitrary place valuation, and the peripheralisation of politically vulnerable communities in the North of England.	HM Treasury, industry, Conservative party (central government), DECC, DEFRA Contrasted with: Conservative and Labour (local government and MPs in affected constituencies), Frack Off, local activist organisations	RSPB Environment Agency County councils Councillors and with constituents in affected areas

It must be noted that such coalitions are neither definitive, nor complete – the fluidity and context sensitivity of discourse coalitions means that actors and institutions can move within and between storylines and so discourse coalitions shift and re-emerge in different configurations. To simplify, however, it is clear that on one side Government and industry interests emerge, which are contrasted with environmental NGOs, local and national activist organisations. The former seek to establish the rationality of shale exploration on pragmatic grounds of ensuring energy security and affordability in a manner that produces less climate change inducing carbon pollutants than alternatives such as coal, whilst trying to establish social acceptability through compensation/community benefits, clearer regulatory structures and communicative engagement with local communities. The emphasis of the second storyline on transitions, economic incentivisation, profitability and hence ecological modernisation is clearly espoused by this coalition. In contrast the competing coalition emphasises the idealistic and ethical stance that the goal of total emissions reduction is not satisfied by shale gas expansion, that unknown risks, visible intrusions into rural places and a lack of local community decision-making involvement make place-protective actions such as those seen in Balcombe and Barton Moss the only effective political solution in halting current and future development activities. Though the emergence of these dichotomised discourse coalitions is unremarkable, given the prevalence of social movements emerging in relation to polluting industries, what is important to note is the shared framing of shale gas in terms of shared metaphors of environmental, social and economic development across these two coalitions, and how the spatiality of localised fracking created new coalitions between actors which make 'strange bedfellows' (see for example Szarka, 2004). Notably as Neate (2013) suggests: "[fracking is] a highly emotive subject that has galvanised opinions across the political and environmental spectrum and threatens to align some of the highest ranking members of the Tory party with a new generation of eco-warriors."

5.1. Conclusions and policy implications

It is important to contextualise emerging developments in UK shale gas policy in light of these storylines, and to ascertain future policy directions that are implicated by the capacity of policy actors to capture the terms of the debate and assert their specific world views in shaping shale gas outcomes. The rapid policy response to shale gas within central government following the 'all clear' from the BGS on seismic risks and from the Royal Academy of Engineering on environmental pollution, shows that the Government prioritises the economic development potential of shale gas over the potential climate change impacts raised by national NGOs, and the localised disruptions, adverse health, air and water quality, place identity and place attachment effects raised by local activists, community members and academic scientists operating within that discourse coalition. The Government's policy practices exclude the cleanliness/dirt storyline almost entirely, emphasising that negative local environmental effects can be managed through regulation, and that opposition can be alleviated through upstream industry consultation (despite complaints from local communities over lack of decisional influence) and through economic incentivisation through profit sharing and benefits packages, both for locally affected site communities and for supportive local authorities.

In terms of the most pressing environmental issue of climate change, it is clear that there is both rhetorical and practical distinction between shale gas and climate change mitigation policy platforms. Climate change is very rarely mentioned in shale gas policy documentation, or in political statements from cabinet members. Also of significance is the lack of consideration over the rebound effects of shale gas on the comparator 'dirty' fuels – such as the influence of low gas prices on decreased in coal use in the United States, leading to oversupply of coal in Europe and a significant gas-to-coal switching in European energy markets (International Energy Agency, 2013). This is a significant issue that has already led to increased atmospheric levels of sulphur and nitrogen oxides and small particles within the UK as the amount of coal burnt has increased (Environment Agency, 2013), and links UK energy futures with climate mitigation, as the total impact of shale gas on GHG emission reduction targets is not satisfactorily addressed in current policy. Moreover the economic concerns over profitability, skills shortages and unfavourable market conditions raised both in independent economic reports (mentioned above) and by energy consultancy and academic interviewees in this study remain largely unaddressed. In short, though empirical data collection reveals the different typologies of perspectives emerging across industry, academic, local political and activist actors and organisations, these storylines have had little influence upon the development of current UK shale gas policy. The dominant storyline within central Government concerns global competitiveness, energy security and profitability - overriding not only activist concerns with environmental impacts, climate ethics, procedural justice and renewable energy development, but also framing shale gas more and more as a destination, rather than transition fuel. Thus a clear distinction emerges between the divergent stakeholder representations of shale gas evident in these emergent storylines and the policy platform espoused by Government. In essence this discursive divergence will likely exacerbate protest actions across multiple governance and geographic scales, as these myriad stakeholder actors attempt to reassert the dominance of their competing storylines in shaping policy outcomes, and the dynamics of this political struggle are worthy of further empirical analysis.

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