

Learning from Lancashire: exploring the contours of the shale gas conflict in England

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Abstract

This paper explores the conflict over shale gas exploration in Lancashire where the company Cuadrilla is preparing to horizontally drill and hydraulically fracture the first shale gas wells in England. At present, this is the only location in Europe where new commercial exploration for shale gas is underway, thus the outcome has wider significance. The initial planning applications were refused by Lancashire County Council in June 2015. The decisions were then appealed by Cuadrilla and there was a public enquiry in February and March of 2016. On 6 October 2016, the central Government over-turned the initial decisions at one site and gave Cuadrilla more time to address traffic concerns at the other. The paper uses the public enquiry to map the contours of the shale gas conflict. It is divided into three sections. The first explores public attitudes towards shale gas development in the UK and reveals growing public awareness and increasing opposition. The second presents the conceptual frame for the analysis, which includes both a critical assessment of the social licence to operate (SLO) and an introduction to a social, actuarial, and political risk and licensing model (SAP Model). The third deploys the SAP model to analyse the public enquiry. The model explains how Cuadrilla is able to drill despite the absence of both a local political and social licence to operate. It is concluded that unless the industry and the government can address growing

public concerns about shale gas development, continuing conflict could constrain commercial development.

Key Words: shale gas; hydraulic fracturing; social licence; Lancashire; United Kingdom

1. Introduction

Horizontal drilling and high volume hydraulic fracturing have revolutionised the oil and gas industry in the United States. Having expected to be a significant importer of natural gas, in 2016 the US became a net exporter, natural gas is replacing coal in power generation—bringing carbon emissions—and industry now has access to an inexpensive feedstock. However, the ‘fracking’ of hundreds of thousands of wells is not without controversy and there is growing public concern about the environmental and social impacts, with development banned in several US states and localities (Thomas *et al.* 2017, Partridge *et al.* 2017, Whitton *et al.* 2017, Gamper-Rabindran 2017). Given the positive macro-economic impact in the US, it is no surprise that the UK government seeks to replicate the experience. By contrast, the European Commission, and many member states and sub-national governments, have been more circumspect with bans or moratoria in place (Van de Graaf *et al.* 2017). In Poland, where support has been strongest (Goldthau and Sovacool 2016, Lis and Stasik 2017), the industry is no longer a commercial prospect (LaBelle 2017). On reflection, it is fair to say that the ‘shale gas revolution’ is struggling to move beyond North America and in Europe the UK is a litmus test for the future of shale gas.

In January 2017, a site off the Preston New Road in Lancashire in the northwest became ‘ground zero’ for the shale gas conflict in England. A company called Cuadrilla Resources is engaged in site preparation and, daily, shale gas activists stage demonstrations to slow the pace of progress and to protest the UK Government’s decision to allow drilling to proceed. There have been numerous arrests and the cost of policing is running into the hundreds of thousands of pounds; yet both sides seem determined to carry on regardless. A statement by the European Academies’ Science Advisory Council (2014, 11) aptly summarises the current situation. They maintain that: ‘...even if fully compliant with laws and regulations, activities that are particularly intrusive or perceived to carry significant risks can be vetoed by a hostile public through campaigns, legal actions, demonstrations or other democratic pressures. Such industries must negotiate a ‘social license’ with their community to conduct their business.’

This paper deploys a critical engagement with the social licence to operate (SLO) and the social, actuarial, and political risk and licensing model (SAP Model) to explore the national context and local specifics of the shale gas conflict in Lancashire. It is organised into three sections: the first reviews public attitudes toward and understandings of shale gas development in the UK; the second presents a critical assessment of the SLO and introduces the SAP model. The third section uses the SAP model as a framework to analyse evidence from the Cuadrilla Resources planning appeal in Lancashire to map the contours of the shale gas conflict. This enables an assessment of the status of the various licences and their interaction. In the conclusion, discussion returns to the SLO and the SAP model and considers their efficacy in framing an analysis of the shale gas conflict in England. The wider implications of the conflict are also considered.

2. Context and Review

This section provides the context for the conceptual and empirical components that follow. The first part uses UK government opinion surveys to chart changing public attitudes towards shale gas development in the UK. The second part presents a brief review of published academic research by UK social scientists on public perceptions of shale gas.

2.1 Public Perceptions and Understanding

Since 2012, the Department of Energy and Climate Change (now the Department of Business, Energy and Industrial Strategy or BEIS) has conducted a quarterly survey (known as the Wave Survey) that captures changing public attitude towards key energy and climate change issues at the national scale. The most recent data (Wave 21) was collected from a representative sample of 2,180 UK households between 29 March and 2 April 2017 (BEIS 2017). Questions about shale gas have been included in the survey since June 2012.

What do the Wave Surveys say about public attitudes to shale gas? First, there has been an increase in awareness over the period 2012, with 76% of respondents in Wave 21 indicating that they are aware of hydraulic fracturing for shale gas, up from approximately 40% in June

2012. However, this growth in awareness was not steady over this period, rather there was a steep increase in awareness in the period coinciding with the protests at Balcombe in West Sussex in the summer of 2013—with levels relatively stable thereafter. Second, there has been a gradual decline in support and an increase in the level of opposition. In Wave 21, only 19% of respondents supported shale gas development; while 30% opposed it, slightly down from the highest level of opposition (33%) in Wave 19 in autumn 2016. The share responding that they ‘neither support nor oppose’ has remained relatively stable at 49%, with only 2% now replying that they ‘did not know’. In Wave 21, of the 49% that ‘neither support nor oppose’ hydraulic fracturing for shale gas, 74% put this down to ‘not knowing enough about it’. Third, the survey provides insight into the primary reasons for support or opposition. The most frequent reasons for support were: need to use all available energy sources; reduces dependence on fossil fuels (coal, oil); reduces dependence from other countries, may result in cheaper energy bills, and good for local jobs and investment. Conversely, the most frequent reasons for opposition were: loss/destruction of natural environment; risk of contamination to water supply; too much risk/uncertainty to support at present; risk of earthquakes and not a safe process. How do these trends compare with the rest of the EU? With the notable exception of Poland, significant and rising levels of opposition to shale gas is common across the EU, as are the concerns identified above (Bradshaw 2016).

Parallel surveys by the University of Nottingham (Andersson-Hudson, *et al.* 2016) show similar public attitudes in the UK. Their latest survey (O’Hara *et al.* 2016), conducted by YouGov from 29 September to 3 October 2016, showed 37.3% of respondents in favour and 41% against shale gas development. This was the first time that the share opposing was greater than those who supported development. The two surveys are not directly comparable, and neither is longitudinal, nonetheless, they both suggest an increasing and now high level of awareness with growing and now significant opposition to shale gas at the national level. The Nottingham survey explored the relationship between knowledge and support and suggested there is a positive relationship between the two, those who knew what shale was were twice as likely to support its development (Stedman *et al.* 2016, 146). However, as the ‘knowledge gap thesis’ suggests (Rayner 2004, Sturgis and Allum 2004), it would be misguided for industry and government to assume that providing more ‘positive’

information to the majority who are undecided due to a lack of knowledge would necessarily result in higher levels of support. Interestingly, the Nottingham researchers suggested using the Social Licence to Operate framework to test approval at the local level (Andersson-Hudson *et al.* 2016, 588).

2.2 Social Science Research on the perception of shale gas in the UK

Williams *et al.* (2015) explored public perceptions of hydraulic fracturing in the UK and reported a feeling that the debate is too focused on economic issues at the expense of other areas of importance. This results in a short-term outlook within the shale gas industry that is likely to have negative impacts on environment and society. They identified four key areas where public perceptions and institutional framings of hydraulic fracturing for shale gas are not aligned. These are: trustworthiness, inclusivity, somnambulism and epistemological pessimism. Participants raised concerns about trustworthiness in relation to institutional and governmental actors involved in the industry. Likewise, in relation to inclusivity, participants felt that greater consideration should be given to democratic decision-making and the two-way nature of public engagement, so that the public feels included in the decision-making process. This is significant for the later discussion of the social licence and procedural justice. The issue of somnambulism suggests that the approach to safety and regulation is tantamount to sleepwalking into approving a potentially damaging activity. This contrasts with a more precautionary approach that would presume against development while high levels of uncertainty remain. Lastly, the expression of epistemological pessimism highlights the tendency to focus on the worst-case scenario and on areas of greatest uncertainty.

Many of the concerns recognised by Williams *et al.* (2015) are also evident in the Whitmarsh *et al.* (2015) study; however, they emphasised several additional issues to be considered by the Government and industry if they are to gain greater public support for shale gas. They show that while there are high levels of ambivalence amongst the public, attitudes are most strongly predicted by political affiliation and attitudes towards climate change. In terms of opposition, the most commonly raised concerns relate to the seismic risk associated with fracking and the potential for the contamination of water sources. Finally, they considered

public views in relation to the role that Government plays and noted that there are doubts associated with its ability to effectively regulate the industry and, in common with Williams *et al.* (2015), there are concerns over the trustworthiness of the government. Issues of trustworthiness, transparency and conflicting discourses have also been explored by Bomberg (2015), Cotton *et al.* (2014) and Cotton (2015, 2016). Beebeejaun's (2017, 9) comparative study of regulation in Texas and Lancashire concludes that: "The lack of perceived transparency set a context within which activism started to emerge, not least as an attempt to check the perceived pro-industry approach of the UK government." The lack of trust is also a widespread concern in the US, as is the sense that government regulators are too closely aligned with industry interests (Thomas *et al.* 2017).

A more recent US-UK comparative study explores how people shape their attitudes towards shale gas (Partridge *et al.* 2017, Thomas *et al.* 2017). In addition to the common issues identified above, that tend to focus on short-term and site-specific concerns, the study concludes that attitudes are also shaped by longer term global issues, namely the causes of climate change and the need for energy system transformation. This chimes with the findings of Williams *et al.* (2015); in that participants were critical of the short-termism of industry and government that serves to perpetuate a dependency on fossil fuels. It is the combination of these higher level and longer term global concerns with shorter term and site-specific (community) impacts that makes shale gas development such an intractable issue.

3. Conceptual Framing

This section reviews and critiques the concept of the social licence to operate (SLO). There are alternative approaches that we could have adopted, such as social justice (Whitton *et al.* 2017), social sustainability (Whitton *et al.* 2015), environmental justice, the related emergent area of energy justice (Sovacool *et al.* 2016) or an ethical (Evensen 2016) or human rights approach (Short *et al.* 2015). However, we chose the SLO because the term is evoked by community activists across England, which is not currently the case with the other perspectives. The second part of the section introduces the SAP model that is used to frame the analysis of the conflict over shale gas development in Lancashire.

3.1 The Social Licence to Operate

The concept of a SLO emerged in the late 1990's in the mining industry (Boutiller 2014), but only relatively recently has it begun to receive scholarly attention (Prno 2013, Brändle *et al.* 2016). Over the intervening period the concept has become widely accepted across a range of industries (Smith and Richards 2015) and the language of the SLO is now espoused by companies, governments and affected communities (Bice and Moffat 2014; Lacey *et al.* 2012). The SLO has been most prominent where the impact on local communities is severe and thus requires the responsible companies to secure approval from those affected (Demuijnck and Festerling 2015).

Smith and Richards (2015: 89) define the SLO as: “a tool whereby companies manage socio-political risk by conforming to a set of implicit rules imposed by their stakeholders... [a SLO] derives from communities' perception of a company and its operations, comprised of a company's ongoing acceptance and approval from stakeholders.” Here a SLO is something that a company acquires through its engagement with affected communities. Yet, despite the widespread application of the SLO, precisely what constitutes a SLO and what processes are required to obtain and maintain a meaningful licence remains unclear (Bice 2014; Moffat and Zhang 2014). In fact, a company is more likely to know when it does not have a SLO, thus it is considered by some as a “crude form of negative governance” (Owen and Kemp 2014: 4). Thomson and Boutilier (2011: 1786) identified three major elements that comprise successful achievement of a SLO: social legitimacy, credibility, and trust. They maintain, legitimacy is achieved through community engagement, raising awareness of the company and acknowledging community concerns, whilst adhering to context-specific norms, customs and practices. Companies then seek to gain credibility and secure trust amongst the local public.

Alongside these three elements of a SLO, Boutilier *et al.* (2012) define four levels of a SLO. The lowest level is *withdrawal* which occurs when there is no SLO in place and consequently industrial activity does not occur (this assumes that communities have the power to stop development). The second level is *acceptance*, using Thomson and Boutilier's (2011)

elements of SLO, acceptance is achieved when legitimacy is established, but credibility is lacking. When both have been achieved, the *approval* level is established and it can be understood that there are no longer socio-political risks associated with the industrial activity. When there is full trust in a company and their operations are fully supported by the community, *psychological identification* is considered to have been achieved, but this is very rare.

There is increasing recognition within controversial industries, like shale gas, that regulatory compliance alone is insufficient to address societal concerns (Moffat and Zhang 2014; Wilson 2016). To acquire a SLO, meaningful collaboration and engagement is required with the local community. Impacted individuals and communities are empowered to shape and ultimately grant or withhold the SLO (Harvey and Bice 2014; Wilson 2016). Surveys from the mining industry identify the key factors determining a SLO as: a respected corporate reputation, a recognition and understanding of local culture and history; and open communication with, and education of, local stakeholders (Prno and Slocombe 2012). The resultant SLO is place- and project-dependent and is therefore non-transferable (Wilson 2016). Nor is a local licence scalable to a national agreement. Thus, the idea that an entire industry can obtain a social licence at a national level seems untenable; although the use of a set of industry-wide principles could be agreed to aid acquiring a SLO. The IEA's (2012) 'Golden Rules for a Golden Age of Gas' could be an example of such a set of principles. However, the 'social dimension' is notably absent from the European Commission's (2014) recommendations relating to shale gas exploration and production. Finally, a SLO is dynamic and once achieved there is no guarantee that it will be maintained (Yates and Horvath 2013), unlike an environmental impact assessment that is a requirement at the start of a project (Hall *et al.* 2015). Instead, a company must continue to engage with the local community and demonstrate responsible working practices throughout their operations and beyond (Harvey and Bice 2014).

The SLO has been critiqued on two fronts, first in terms of its utility and second with regards to its capability as an analytical tool. Critics maintain that its utility has been overstated (Owen and Kemp 2013). Underlying this is the lack of clarity in terms of the ability of public stakeholders to approve or prevent industrial activity (Wilson 2016) and through this the

view that it may grant the public too much authority and consequently undermine the rule of law (Smith and Richards 2015). This suggests a tension between the perceived capacity of a community to stop a project by withholding a SLO and the actual legal basis upon which a project might be allowed or prohibited. Some question the usefulness of the SLO as an analytical tool. Initially introduced as a metaphor, Bice (2014:63) recognises that: “even metaphors require clear boundaries to make them meaningful.” Nonetheless, there is a general agreement that there is scope for further studies of SLO that might allow for a more nuanced approach to understanding the social dimensions of industrial activity (Owen and Kemp 2013; Moffat and Zhang 2014). Doing so will increase the effectiveness of the concept as an analytical tool, as well as providing industry with clearer guidance as to how to secure a social licence (Wilson 2016). Equally, a clear understanding of what constitutes a SLO may empower communities in their interactions with industry and regulators.

3.2 The SAP Model

Having reviewed the SLO, we argue that in the case of the shale gas conflict in England, a more holistic conceptual framework is required that places it within the wider legal and political contexts. To that end, Bice *et al.* (2017) propose the use of a social-actuarial-political risk and licensing model (SAP Model) in the extractive sector (Figure 1). They build on Morrison’s (2014, 12) approach linking political, legal and social licences and Haines’ (2011) dynamic risk framework. Bice *et al.* (2017, 48) suggest that the model: “...represents the wheel of influences and interactions between complex and competing groups, all rotating around a dynamic but central ‘public interest’.” For our purposes, the SAP model serves as a heuristic device, a general concept that we use to organise our analysis of the evidence from the public enquiry in Lancashire. Further, considering the Social, Actuarial (legal) and Political licences together acknowledges that the concept of SLO is increasingly using the language of other legal licences (Hall *et al.* 2015) as the efficacy-if not the necessity-of obtaining an SLO alongside other formal licences is recognised (Koivurova *et al.* 2015).

A strength of the SAP model is that public interest—understood as public welfare—is at its heart. A second strength is that all the stakeholders are in play, although the model says

little of the complexity of the interactions between them in relation to the licencing landscape. The model operates at a national scale, with communities just one of many stakeholders; as we shall see, this raises interesting question about the specificity of the SLO to a particular project and the affected communities. From the company perspective, the different licences serve to mitigate the various risks that threaten the success of their operations. From the viewpoint of the public the different licences can be considered as arenas of accountability where they can make their concerns known, either through formal channels and/or activism. In the context of the shale gas conflict, the *Actuarial* licence (Morrison’s legal licence) is the regulatory regime that companies must adhere to for lawful operation and is thus formal and enforceable. It can be rescinded if companies fail to operate appropriately. The *Political* licence is a representation of a political agenda and national government’s support for an industry. Third, as previously discussed, the *Social* licence can be defined as social acceptance and approval of companies, industries and their operations (Moffat and Zhang 2014).

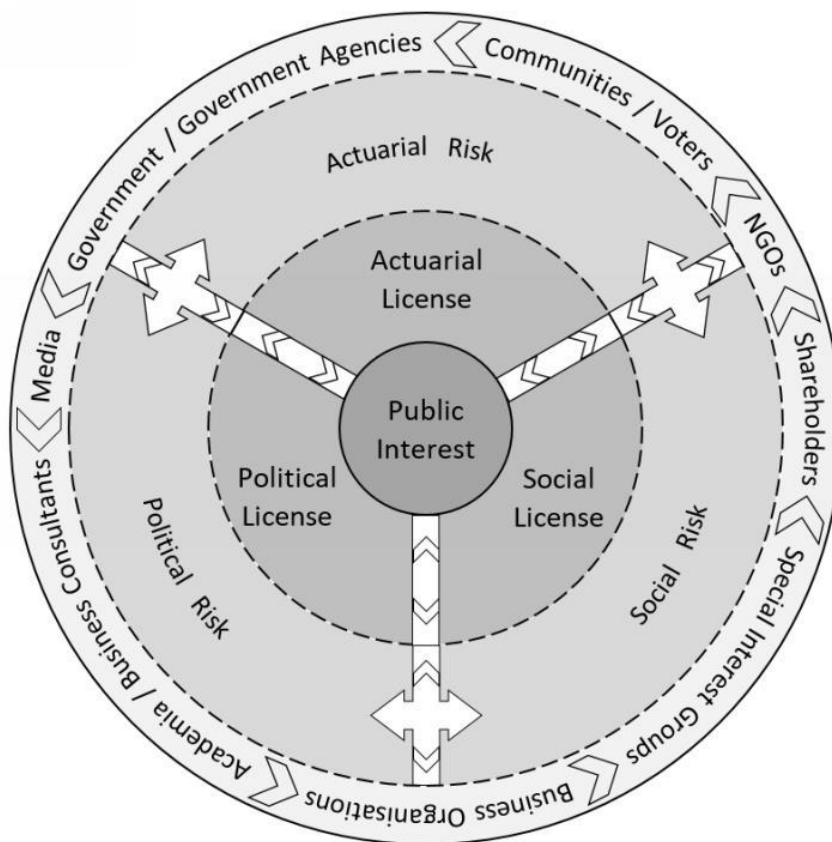


Figure 1: The SAP Model – reproduced with permission from Bice *et al.* (2017)

Bice *et al.* (2017) identify three types of associated risk. *Actuarial* (legal) risk relates to the physical damage (harm), financial loss and reputational damage associated with a company's failure to be compliant with existing regulations. *Social* risks are: "experienced by individuals and communities as signs of danger and allow community members to signal their concerns for the broader society in which they live." The earlier discussions of public perceptions and understanding of shale gas enumerated a wide range of social risks linked to the industry. There are two aspects to *Political* risk, first as a threat to a government's legitimacy and second, as: "the economic responsibilities and accordant risks that governments face via their responsibility to ensure appropriate resources to support the public interest." The SLO literature suggests that there must be clear material benefit for affected communities and political actors have a key role to play in ensuring the just distribution of benefits. This notion of distribution justice is also central to the concept of social justice and related work on energy justice. The model enables the power relationships between the various actors and tensions to be explored. However, one short coming of the approach, noted above, is that it fails to handle the complexity that geographical scale adds to the risk and licencing landscape. Actuarial and political licences gained at the national level do not necessarily translate into local political legitimacy and a SLO. Against this background, the remainder of this paper uses the SAP Model to analyse the conflict over shale gas exploration in England through the lens of the public inquiry in Lancashire that took place in spring 2016.

4. Learning from Lancashire

Formed in 2007, Cuadrilla Resources is a private UK-based company involved in the exploration and production of unconventional oil and gas. They have seven active sites, where there is ongoing work—across the Bowland Shale Basin (for a history of development in the region see: Tootill 2013). It is worth noting that their early activities in the region did not attract attention. It was only after drilling at Preese Hall in May 2011 triggered minor seismic events, resulting in a national moratorium on shale gas drilling between November 2011 and December 2012, that they came under closer scrutiny. This was compounded when they sought to drill for oil at in Balcombe, in West Sussex, in 2013.

The following analysis draws on four planning applications submitted to Lancashire County Council (LCC) for exploratory drilling at two sites (four wells at each site) and associated monitoring works, Preston New Road (PNR) and Roseacre Wood (RW). In June 2015, the LCC refused permission for three of these applications; the exploratory drilling at both sites and the monitoring works at PNR. It is noteworthy that the local Planning Officers recommended approval of the PNR application (see Tootill 2017 for an activist's assessment). Cuadrilla subsequently appealed all four decisions and a public inquiry, heard by a Planning Inspector—Wendy McKay LLB, Solicitor (non-practising)—was held at Blackpool Football Club 9 February to 16 March 2016 (19 days). A report was submitted to the Department for Communities and Local Government (DCLG) in July 2015 and a final decision on the applications was announced by the Secretary of State in October 2016. The two supporting groups were: Cuadrilla Resources and the North & Western Chamber of Commerce (NWCOC). The seven opposing groups were: Lancashire County Council, Friends of the Earth, two residents' groups—the Roseacre Awareness Group (RAG) and the Preston New Road Action Group (PNRAG)—and three Parish Councils. During the inquiry, there were also opportunities for the public to pose questions and express their views.

In her report, the Planning Inspector recommended that planning permission be granted at PNR—both for drilling and monitoring and that at RW the refusal of planning to drill be upheld, but that permission for monitoring be agreed. The Minister, Sajid Javid, announced his decisions on 6 October 2016 and agreed with three of the recommendations (subject to conditions), but in the case of the drilling application at RW he gave Cuadrilla more time to address concerns about highway safety (DCLG 2016). The emphasis here is not on the decisions of the Minister, but on the wider lessons that can be drawn from the public inquiry and subsequent actions by the community.

The remainder of this paper draws upon a qualitative analysis of the documentation produced and published online from the public inquiry (POSL 2016). The planning inquiry was also publically broadcast online and the data from this comprised the second part of our dataset. We have also followed the activities of community activists since the Minister's decisions were handed down. Our analysis focuses on the key issues and debates that unfolded during the inquiry, as well as subsequent community reactions, which we also link

to the issues identified in national surveys of public attitudes. Data was analysed thematically using the three types of licence proposed in the SAP model - social, actuarial and political - as a guiding framework. This involved a detailed qualitative assessment of the various outputs generated by the Inquiry, but we did not use qualitative data analysis software. The reason for this is that, in relation to the SLO element, we focused on the public sessions that only have a video record. The remainder of this empirical section is structured using these three licences. Unless otherwise stated, the quotations included were transcribed from the live video stream that was provided for much of the public inquiry and freely available online for a limited period after the conclusion of the inquiry (i.e. they are from the public record).

4.1 Actuarial (Legal) Licence

As noted above, this is the regulatory regime that companies must adhere to for lawful operation and is thus formal and enforceable. The governance of the shale gas industry in England is complex and multi-scalar, incorporating a range of regulatory bodies (see Bradshaw 2017 and Skea 2017). The organisations responsible for licensing, permitting and monitoring are national bodies: the Oil and Gas Authority (an independent agency that works with BEIS), the Environment Agency and the Health and Safety Executive (both within Department for Environment, Food and Agriculture or DEFRA). However, the decision as to whether to allow drilling and hydraulic fracturing for shale gas lies at the local scale because it requires planning permission from LCC's Planning Committee.

It is relatively straightforward to assess whether a company is in possession of an actuarial licence. At the time of the initial planning hearing, in June 2015, Cuadrilla had a Petroleum Exploration and Development Licence (PEDL) and was in possession of the necessary environmental permits, however, until local planning permission is granted, Cuadrilla does not have an actuarial licence for drilling and hydraulic fracturing for shale gas in Lancashire. Looking at the four applications, there are several key areas of disagreement that stem from the original reasons for planning permission refusal by LCC in June 2015 (details can be found in the LCC planning documentation available at: POSL 2016 and LCC 2017). The

monitoring works application at RW was granted with conditions and ahead of the public inquiry LCC and Cuadrilla had agreed conditions that would be acceptable to both parties. The monitoring works application at PNR was refused contrary to the Council's Planning Officers' recommendation, based on their adverse impacts on the landscape character and their industrialising effect on the countryside. Cuadrilla maintained that their environmental statement, submitted as part of the initial planning application, had adequately assessed the visual impact of the monitoring arrays. However, given that the proposal was to install 80 monitoring arrays, the LCC planning committee felt that the cumulative impact of the application would not be in keeping with the overall character of the landscape and therefore the application would contravene policy EP11 of the Fylde Borough Local Plan regarding building design and landscape character of new developments:

The RW application was refused in line with the recommendation of planning officers based on the impact on traffic and the rural highways network. This was despite Cuadrilla suggesting that their traffic management plan was sufficient to mitigate these impacts and that periods of intense HGV movement would be limited to an aggregate period of twelve weeks over the course of the six-year application period. The adverse impact of noise from the exploratory works was cited as the reason for refusal of planning permission at both PNR and RW. It became evident during the public inquiry that there were disagreements between the appellants, Cuadrilla and LCC, as to what the most appropriate guidelines are for industrial noise during the day and night. Several sources of guidance were cited during the inquiry including 'DEFRA's Noise Policy Statement, Planning Practice Guidance - Noise and the World Health Organisation Night Noise Guidelines for Europe. To quote from the National Planning Policy Framework (NPPF 2012, 29), one aspect of the planning inquiry was to determine the level of noise that would not give rise to "significant adverse impacts on health and quality of life."

Lastly, the planning application for PNR exploratory works was refused on the grounds of visual impact, including consideration of the impact of light from the drilling site. These concerns were also raised at the RW site and the mitigation methods proposed by LCC were disputed by Cuadrilla. Primarily this was to limit the height of the drill rig to 36m, which Cuadrilla believed to be unnecessary given the temporary nature of the exploratory works.

They also contended that the limit on height would make negligible difference to the visual impact of the site.¹⁰

Whilst these three issues were the key ones raised between Cuadrilla and LCC during the public inquiry, they were also frequently referred to during the open public sessions. These sessions brought to the fore significant issues with the actuarial licence and the extent to which the public are persuaded that there is a robust regulatory framework in place. In a Written Ministerial Statement, the then Secretary of State for Energy and Climate Change Amber Rudd (2015) declared that: “our regulatory system is robust and we are proven world leaders... in well-regulated, safe and environmentally sound oil and gas developments.” This is not the conclusion reached by academic research by Hawkins (2014), Stokes (2016) and Beebeejaun (2017, 11), the latter of whom stated: “The planning process has now been challenged as an inadequate mechanism to assess the potential impacts of a British shale gas industry.” Nonetheless, planning permission has now been granted to Cuadrilla at PNR and they are in possession of an actuarial licence (these decisions were subsequently upheld in the face of two legal challenges, one by the PNRAG and one by a private citizen, but the PNRAG decision went to appeal and a ruling has yet to be made). However, as discussed below, the very fact that the previous Secretary of State at the DCLG (Greg Clark) decided to make the final decision on the appeal has undermined the political legitimacy of those decisions as not reflecting local sentiment. The reason given for the Minister making the decision: “...is because the drilling appeals involve proposals for exploring and developing shale gas which amount to proposals for development of major importance having more than local significance and proposals which raise important or novel issues of development control, and/or legal difficulties (BBC News 2015).” Thus, Cuadrilla has gained its actuarial licence to operate from national regulators and Ministers, against the wishes of local politicians in Lancashire and most of the public that attended the enquiry. However, it is also important to consider that matters of ‘procedural justice’ are deemed critical to obtaining a social licence and the intervention of the central government to secure the actuarial licence has only added to the opposition’s sense of injustice (see also Cotton 2016 and Whitton *et al.* 2016).

4.2 Political Licence

According to the SAP model, a political licence reflects a national government's support for an industry. In 2014, the then Prime Minister David Cameron declared that his government was: "going all out for shale." This was then supported by the publication a joint DECC/DCLG (2015) Shale Gas and Oil Policy Statement in August 2015 and a Written Ministerial Statement made by the Secretary of State for Energy and Climate Change in September 2015 (Rudd 2015). This written statement was frequently utilised by Cuadrilla during the public inquiry as the Government's stance is that: "there is a national need to explore and develop our shale gas and oil resources in a safe, and sustainable and timely way." This national need results from a requirement to secure energy supplies, support economic growth and reduce carbon emissions, by utilising shale gas as a transition fuel whilst renewable energy industries are being developed. It is noteworthy that the Conservative Party (2017, 23) manifesto for the 2017 General Election renewed the commitment to develop a shale gas industry and proposed to: "set up a new Shale Environmental Regulator, which will assume the relevant functions of the Health and Safety Executive, the Environment Agency and the Department for Business, Energy and Industrial Strategy. This will provide clear governance and accountability, become a source of expertise, and allow decisions to be made fairly but swiftly." It also promised that: "Non-fracking drilling will be treated as permitted development, expert planning functions will be established to support local councils, and, when necessary, major shale planning decisions will be made the responsibility of the National Planning Regime." However, none this appeared in the subsequent Queen's Speech, and its status remains unclear. However, we can still conclude that there is a clear political licence to carry out exploration for shale gas on the part of the national government in London (though not in Northern Ireland and Wales, where moratoria are in place, or in Scotland where a public consultation has been conducted a final decision expected by the end of 2017); however, it is just as important to consider the local political legitimacy of shale gas exploration.

To understand fully the conflict in Lancashire, it is necessary to explore the initial planning process that preceded the four appeals being analysed here. The planning applications submitted by Cuadrilla were first considered by Planning Officers at LCC who made then made recommendations to the LCC Planning Committee. The Planning Committee is

comprised of democratically elected County Councillors who voted on the planning applications. It is significant—though not unusual—that both applications in relation to PNR were refused planning permission contrary to the recommendations of Planning Officers. As highlighted in the LCC’s Opening Statement at the public inquiry this was: “an example of local democracy in action.” It is also instructive to consider the LCC’s response to the Minister decisions in October 2016:

“A local council, made up of councillors democratically elected by local people, and charged with serving their interests, is exactly the right body to make decisions on local matters. It is clear that the government supports the development of a shale gas industry, but I would ask them to do more to address the concerns of local communities and the councillors who represent them by supporting the best environmental controls” (Johnstone 2015).

In relation to the political licence, it is necessary to consider the position of the NWCO, who spoke in support of Cuadrilla at the Public Inquiry because of the potential for the shale gas industry to provide jobs, income and financial security for the region. Thus, at the local scale there are contrasting opinions on local economic opportunities. This raises the issue of who constitutes and represents the community? There are clearly differences within the communities affected by Cuadrilla’s activities. The overwhelming public sentiment at the Public Inquiry was opposition to shale gas exploration, but how representative is that of the entire community? To ascertain that would require what Whitton et al. (2016, 21) call a: ‘more socially-informed approach to governance, facilitating articulation by stakeholders of what is prioritised and valued in their own communities.’ Franks and Vanclay (2013) suggest an alternative approach, the conduct of a social impact assessment (SIA) as a way of identifying community concerns and as a management tool essential to delivering and maintaining a SLO.

In sum, Cuadrilla has a political licence at the national scale; however, at the local scale the possession of this licence is contested by politicians and community activists. The elected councillors judged the applications to have unacceptable impacts and consequently refused planning permission. In the aftermath of the Minister’s decision, community activists have

framed the shale gas conflict as being a threat to local democracy, which does not sit well with the Conservative Government's support for localism (Cotton 2016, Tate and Lynch 2016). In August 2016, the introduction to the consultation on a Shale Wealth fund stated: "The government is clear that local people should have greater control and say in decisions that affect them (HM Treasury 2016, 3)."

4.3 Social Licence

There were four sessions during the inquiry when the public could voice to the Planning Inspector their views on the planning applications that were being appealed. During these sessions 19 individuals spoke in support of Cuadrilla, whereas 127 spoke opposing the planning applications. These sessions provide important insights into the status of the social licence and the issues that are at the forefront of public feelings towards both Cuadrilla's activity in Lancashire, as well as the shale gas industry more broadly.

The key reasons presented to justify the development of a shale gas industry in Lancashire focused on the potential for economic growth and job creation. It was also argued that shale gas could provide a secure, sustainable and affordable energy resource that could help ensure the UK's energy security. It was for these reasons that Malcolm McVicar (2016) felt that a shale gas industry could help "secure the future for younger generations." Likewise, John Standing (2016), an offshore oil engineer stated: "I do hope this inquiry overturns the refusal and can see past the minor inconveniences caused by shale gas exploration and see the potential benefits." Supporters also referred to the frequent use of data from North America being presented by opponents to the applications, Tony Raynor (2016) explained that there is a need for: "balanced judgement not direct inferences from the US where geology and regulatory regimes are different." It was for these reasons, as well as the contrasting numbers in support and opposition, that Paul Linderman (2016) closed his presentation to the inquiry by stating: "those who support may not be shouting loudly but we do need to consider their views."

However, the significant number of people who spoke in opposition to the planning applications suggests that Cuadrilla do not yet possess a social licence to operate in Lancashire. This was emphasised by Kate Styles (2016) who used her presentation to discuss the components of a social licence and noted that: “evidence of regulatory breaches and failure to comply with planning conditions means that there are questions over credibility and trust.” Ms Styles closed her presentation by referencing the Wave Survey and the declining support for a shale gas industry and questioned: “can a social licence ever be earned and on this basis, how can this business operate?”

Local, national and global concerns about the environmental impact of fracking were widely stated by the public, as well as by Friends of the Earth who were an opposing party at the Public Inquiry. Through their opening statement and representative witnesses, Friends of the Earth (Dehon and Lewin 2016) argued that the applications under appeal contravened the NPPF and policy DM2 of the Joint Lancashire Site Allocation and Development Management Policies, given the sustainable development commitment to reduce UK carbon emissions. Subsequent, unsuccessful legal appeals, sought to argue that the Minister’s decisions were unsound because they failed to consider the impact of the activities on climate change. These concerns were echoed in the public sessions with comments such as: “[there are] enough green energy solutions without having to go down this dirty road” (Sanderson 2016) and the: “applications are in the wrong place and in the wrong century” (Mitchell 2016).

The most frequently stated reasons for opposing fracking related to pollution. Residents were concerned about: air pollution caused by flaring of methane and increased industrial traffic; water pollution from flowback fluid from drilling and hydraulic fracturing operations; the possibility of groundwater contamination; and light and noise pollution from industrial activity. Related to this, Meg Green (2016) spoke about the ecological impacts that this activity declaring that she spoke: “for the environment that cannot speak for itself.” It was these local issues that compounded the public’s fear for the loss of the peace, tranquillity and the idyllic nature of the affected area of the Fylde coast. There are obvious parallels here to community opposition to onshore wind farms and the notion of “place attachment” (Devine-Wright and Howes 2010). In echoing LCC’s reasons for refusing the monitoring

works application at PNR, Angela Livesey (2016) noted that: “to swap birdsong for hydraulic drilling, that’s not rural, it’s industrialisation.”

Seismic activity was raised regularly in the public sessions. Several of those who spoke had first-hand experience of seismic activity having felt the tremors from Cuadrilla’s hydraulic fracturing at Preese Hall in 2011. Francesca Sullivan (2016), who spoke at the inquiry from both a personal perspective and in her role as a representative of the union Unite, highlighted the result of this was to: “undermine the credibility of Cuadrilla” as to date they have: “100% fracking failure.” This is significant in the context of obtaining and maintaining a SLO as credibility is a key component (Thomson and Boutilier 2011).

Lancashire residents are particularly concerned about the physical and mental health impacts of fracking. In the case of physical health impacts, cancers, respiratory problems and changes to blood pressure were frequently raised. The validity of the Public Health England report into Shale Gas (2013) was repeatedly questioned, with data and research from the USA considered a more reliable source of information (see Medact 2016 for an alternative assessment). Likewise, for mental health problems, several speakers were open about already suffering from stress, anxiety and depression because of the possibility of shale gas extraction taking place in their neighbourhood. Szolucha’s (2016: 29-49) community-level research highlights these issues and Short and Szolucha (2017), who have also analysed the planning decisions, write about the ‘collective trauma’ experienced by the affected communities.

Negative economic impacts were also a common theme running through the public sessions. Despite the potential for stimulating economic growth as suggested by Cuadrilla, the NWCOC and in the Written Ministerial Statement, there were clear concerns that any jobs created by the shale gas industry would not counteract losses in tourism and agriculture. HM Treasury (2016) is currently amid consultation about a ‘Shale Wealth Fund’ that aims to: “...ensure that the benefits of shale developments are shared by communities and regions in which the resource is developed.” The industry also has a community benefits scheme, but this is considered by activists to be either insufficient or tantamount to a bribe. The issue of

economic costs and benefits raises important questions about distributional justice that are essential for a SLO. The impact of a shale gas industry on house prices and related housing issues was raised by many speakers. This was the subject of a controversial DEFRA (2015) report whose full publication was delayed until after the initial planning decisions in June 2015. Recent academic analysis (Gibbons *et al.* 2016) suggests that the seismic events associated with Cuadrilla's drilling in 2011 did result in a 2.7-4.1 % decrease in local house prices. At the inquiry, several people spoke from personal experience about falling house prices and their struggles to sell their properties because of the possibility of nearby fracking. Home owners close to the proposed sites and near Cuadrilla's existing sites in Lancashire spoke about issues relating to subsidence, damage from the earth tremors at Preese Hall and the lack of insurance available for properties to cover issues arising from shale gas activity.

Two other key issues were frequently raised during the public sessions and can therefore be considered as constitutive factors to the residents of the Fylde withholding a SLO. The first of these concerns was the stated temporality of the exploratory activity that was used by Cuadrilla to describe the impacts as a short-term inconvenience. As Roseacre resident, Keith Hulme (2016) outlined:

“...this is the lid to Pandora's box and should be judged as such. We have been told the effects are temporary, short-term and affect few people. It will only temporary and short-term if the project fails to deliver.”

Residents were concerned about a permanent legacy of risk in the subsurface given the existence of abandoned wells and it was for this reason that Helen Dryden (2016) stated that: “it is misleading to say that they are temporary.” Related to this was the overwhelming concern of the public that the regulatory system is not sufficiently robust. This view in particular was emphasised by Mike Hill (2016) who has contributed to National and EU reports on shale gas: “fracking..., cannot possibly be allowed to go ahead. It would be against all good engineering principles, human decency and common sense.” The perceived insufficient nature of the regulatory framework extended to long-term monitoring of the abandoned wells. Chris Cannon asked that the planning inspector: “register the lack of

confidence felt by the local community on the regulatory system for monitoring abandoned wells.” Therefore, despite there being a regulatory framework in place, there remain clear concerns amongst the affected public as to how effective this regulation will be in protecting them and the environment. It is for this reason and all the other concerns outlined here that Diane Westgarth (2016) stated: “Cuadrilla do not have and will never have a social licence to frack the Fylde.”

The day that Communities Secretary Sajid Javid announced that he was overturning the decisions reached by Lancashire County Council the PNRAG (2016) released a press statement entitled: “Local Democracy is Dead.” They went on to state that: “There is no social license to proceed with fracking in Lancashire. It is deplorable that an industry which has been rejected on every level seems to believe it is acceptable to inflict itself on an unwilling county. That is neither right, nor fair and not least, it is wholly undemocratic.” They ended their statement by saying: “This is not the end. We will challenge this.”

5. Conclusions

What does the Lancashire case tell us about the shale gas conflict in England? First, the differing opinions and concerns made evident in national opinion polls and more detailed qualitative research were evident throughout the Cuadrilla planning inquiry. Thus, the Lancashire case serves as ‘ground truth’ for the academic research and opinion polls that describe the reasons for growing opposition to shale gas development. The company maintains that it can mitigate the risks associated with their operations and statements from central Government were used to state that shale gas exploration was in the national interest and that communities would be safeguarded by a robust regulatory system. Those from the community that opposed Cuadrilla had little faith in the regulatory system and were not persuaded about the economic benefits, rather they were concerned that the economic costs were greater. They were also concerned about a range of potentially negative economic and social impacts that are associated with shale gas activity elsewhere; and they also have first-hand experience of the seismic risks. Finally, they did not see shale development as compatible with the UK’s climate change policy (Climate Change Committee 2016). Community activists maintain that shale gas exploration should not be allowed in

Lancashire, or anywhere else for that matter, thus, there is no discussion of the terms under which shale gas development might be granted a social licence to operate.

What then is the utility of the SLO as a concept and the SAP as an analytical framework? Activists in Lancashire, and elsewhere in England, are making clear the lack of a SLO to articulate their opposition to shale gas development. Yet, the Lancashire case also makes clear that because the SLO lacks legal standing, companies can proceed without it. However, as the SAP model elaborates, to do so exposes them to risks that threaten their success. Daily, Cuadrilla must deal with protests at PNR, and the protestors are now blockading companies that supply Cuadrilla. Furthermore, across England at every site where shale gas development is contemplated there is likely to be a local activist group, protests and heightened media interest. Every planning committee hearing becomes an arena for conflict, with local government caught in the middle. Ultimately, the national Government may face challenges to its legitimacy if it continues to support an industry that, rightly or wrongly, is so widely opposed. The industry cites early opposition to mobile phone towers as an analogue and maintains that once drilling starts the public will realise that their fears are unfounded. However, shale gas may turn out to be more like GM crops and could fail in the face of public opposition.

A strength of the SAP framework is that it puts the multiple stakeholders involved in the shale gas conflict into play and it focuses on three critical dimensions: the political, the actuarial and the social. However, it is clearly not the case that the shale gas industry in England requires all three to operate. In Lancashire, Cuadrilla is proceeding with the benefit of an actuarial licence—facilitated by national government intervention—and a national political licence; but without local political support and a SLO. The outcome in Lancashire raises critical questions about both procedural and distributional justice (Whitton et al. 2016). The Lancashire case demonstrates a weakness in the SAP model in handling the complexity of scale. The literature suggests that a SLO is a local, project specific, construct; yet the SAP model links it to national political support. The real problem with shale gas is that the supposed benefits are at the national scale—energy security, balance of payments etc.—while the costs are both local and global. Local in the sense that it is the affected communities that suffer negative impacts, and global in the sense that shale gas

development is seen by activists as contributing to the problem of climate change. To progress, the SAP model must become more sensitised to the scalar complexities of the licencing landscape.

Clearly, the current conflict in Lancashire has wider significance for the progress of the shale gas industry in the UK. No doubt the application of the SAP model to other sites in the UK, such as Kirby Misperton in North Yorkshire and Balcombe in West Sussex would reveal the same asymmetry between national political support, on the one hand, and local opposition and protest and the absence of social licence, on the other hand; but in those cases, the companies involved gained all the required legal licences. Cuadrilla has chosen not to continue with developments at Balcombe, but Third Energy will soon be hydraulically fracturing an existing vertical well at Kirby Misperton. At the same time, the contours of the conflict have much in common with growing opposition elsewhere in North America, Australia and Argentina, for example, and explain the status of the industry in Europe. Ultimately, the shale revolution may have heralded a new age of relative fossil fuel abundance, but public opposition to exploration and development will continue to challenge the pace of exploration and will constrain the eventual level of production.

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