THE UNIVERSITY *of* EDINBURGH

An advocacy coalition framework analysis of local government drilling applications

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Thesis submitted for the degree of Doctor of Philosophy in Politics
University of Edinburgh
June 2021

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Declaration

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where states otherwise by reference or acknowledgment, the work presented is entirely my own.

Andrew Scott

29 June 2021

Acknowledgements

First of all, I would like to thank my supervisors, Professor Elizabeth Bomberg and Dr Shaun Bevan. This thesis was the first time I had studied public policy and their advice and guidance in was invaluable in helping me adjust to a new discipline and in writing this thesis.

I would like to thank my fellow PhD students in the department for their friendship throughout the last few years. There are too many names to mention, but I'll single out Sulian Lizé and Lukas Slothuus for being regular points of contact as we went through similar stages of our theses throughout covid. Those shared experiences were useful.

I'm grateful to my former colleagues at the Law Society of Scotland and my newer colleagues at the UCL Department of Political Science for their support and flexibility as I worked on my thesis alongside these full-time jobs.

Finally, thanks to my friends and family for all the usual stuff and for not saying "when are you going to finish your PhD?" *too* much.

Abstract

In the early 2010s the development of a shale gas industry was an important and prominent part of the UK government's energy strategy. Despite this government support, very little progress was made, with minimal drilling activity and no commercial production achieved. Government rhetoric blamed underperforming local authorities for this failure. In this thesis I study local planning processes in order to determine whether they were responsible for the outcome of local planning applications, and the other factors that may have played a part. Using the advocacy coalition framework, I begin by identifying a pro-shale coalition and anti-shale coalition for nine proposed drilling sites in three local authorities in England. I conduct a fuzzy set qualitative comparative analysis (fsQCA) of these sites in order to determine which coalitions were most successful and why. More specifically, the fsQCA is applied to determine the extent to which the outcomes of drilling applications are derived from four variables: external events, resources (such as finance and technical expertise), relationships with policy makers and public opinion. I follow this comparative analysis with three more detailed case studies consisting of one proposed drilling site from each local authority. My overall finding is that shale gas applications were determined by a combination of different factors, primarily resource limitations of the part of the pro-shale coalition and favourable external events and public opinion for the anti-shale coalition. These findings challenge some of the assumptions about shale policy. First, I find that local governments – considered by the UK government to have obstructed shale development – were more often than not permissive, despite their misgivings. Moreover, public opinion played an important part in the development of anti-shale coalitions. Finally, the extent to which a coalition had access to policymakers had no discernible impact on application outcomes. I also outline ways in which the conceptual framework introduced can be applied to similar policy areas, characterised by limited timeframes and the introduction and implementation of new and contested technologies.

Lay Summary

The United Kingdom government committed to developing shale gas in the early 2010s. The government and other shale gas supporters argued that this would be beneficial for energy security, the economy and the environment. In spite of this support, very little progress was made throughout the rest of the decade: shale developers gained permission to develop drilling sites but were unable to achieve commercial production.

In this thesis I attempt to explain shale gas developments at the local level. I contest the UK government's claim that these were delayed by local authorities obstructing drilling applications and instead propose that these outcomes could be attributed to a combination of other variables. I consider the role played by 1) events such as earthquakes or protests; 2) the technical and financial resources of supporters and opponents of shale gas and how they use these resources; 3) lobbying activity towards local and national governments by supporters and opponents and 4) public opinion.

I base my analysis on the actions of individuals and organisations attempting to influence shale gas policy. I divide these actors into two "coalitions": one pro-shale, the other anti-shale. I study the behaviour of each of these coalitions during the application process in order to establish the extent to which the different variables were responsible for a coalition's success. (For the pro-shale coalition success meant gaining planning permission. For the anti-shale coalition success meant preventing planning permission.)

This analysis leads me to my conclusion that planning outcomes can be explained by a combination of different reasons. Supporters of shale gas lacked the financial resources and technical expertise to develop drilling sites, while events such as the 2011 Preese Hall earthquake and 2013 Balcombe protests increased awareness of shale gas and led to a gradual decrease in public support. Sceptical public attitudes strengthened the anti-shale coalition. The pro-shale coalition attempted to counter this opposition and the planning delays caused by anti-shale coalition activities. But

the pro-shale coalition was unsuccessful: their attempts simply stretched their limited resources even further.

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ACF – Advocacy Coalition Framework
ASA – Advertising Standards Agency
BBC – British Broadcasting Corporation
CBM – Coalbed methane
CEO – Chief Executive Officer
CPRE – Campaign to Protect Rural England
EIA – Environmental Impact Assessment
FDA – Food and Drug Administration
FoE – Friends of the Earth
FPW - Flowback and produced water
fsQCA – Fuzzy-set Qualitative Comparative Analysis
HSE – Health and Safety Executive
NDPB – Non-departmental public body
NGO – Non-governmental organisation
Nimby – "Not in my backyard"
OAPEC – Organization of Arab Petroleum Exporting Countries
PEDL – Petroleum Exploration and Development Licence
QCA – Qualitative Comparative Analysis
RAFF – Residents Action on Fylde Fracking
UK – United Kingdom
Ukoog – United Kingdom Onshore Oil and Gas
US – United States
USA – United States of America

Introduction

In 2014, David Cameron announced that the UK government would be going "all out" for shale gas[1], reinforcing the government's commitment in that area (Watt, 2014). Yet, in spite of the government's stated belief that shale gas would benefit the UK in terms of energy security, economic growth and jobs, and despite generous support for the industry, remarkably little progress was made. Between the first well being drilled in 2011 and the imposition of a moratorium on hydraulic fracturing in November 2019, very few wells had been drilled and none had achieved production at commercial rates.

Cameron's government's ambitions for shale gas did not come to fruition. There are a number of plausible explanations for this failure, including but not limited to geology, external events and socio-economic factors[2]. Additionally, the UK government were not as "all out" for shale as Cameron had claimed, operating merely as one part of a multi-level process and not imposing development upon local areas (Cairney et al., 2018, p. 129). This multi-level process meant that applications for planning permission made to local governments were a key juncture of the permitting and regulatory process for shale developments: without gaining permission at this stage shale operators would not be able to proceed.

This decision-making power meant that the local level was a profoundly important part of UK shale gas politics, often featuring different actors, institutions and processes from shale politics at the national level. Despite this, research on shale gas at this level has been very limited compared to the broad range of work published on national level shale politics. In this thesis I attempt to address this by studying the dynamics of the local government application process and the events, actors and interactions that contributed to their outcomes.

Research aims and questions

The key research question of this thesis is: **what factors explain the outcomes of shale gas planning applications?** Additionally, while this thesis focuses specifically on shale gas in United Kingdom local authorities specifically, it provides an opportunity to consider broader questions of policymaking, including how and why contentious policies are decided – and by whom. It will also offer some insights into the ways in which policy positions can become polarised and how matters of risk and scientific evidence – and their interpretation by the actors involved – can affect policy outcomes.

[1] Shale gas is "unconventional" natural gas that is trapped within shale rock formations rather than "conventional" gas found in reservoirs. It is produced using a technique called hydraulic fracturing. Shale gas and hydraulic fracturing will be introduced more thoroughly in the next chapter.
[2] These factors include consumer energy prices, import costs and levels of employment.

Shale gas is a good illustration of these characteristics: it remains highly contentious and it involves the technically complex process of hydraulic fracturing, the safety and viability of which divided experts and policymakers alike.

Several recent studies of UK shale gas at the national level have identified the role, activities and interactions of a range of actors supporting or opposing shale gas as key determinants of policy outcomes (see Bomberg, 2015; Cairney et al., 2018, 2016; Ingold et al., 2017; Weible et al., 2016). This thesis will continue to emphasise actors, but at the local level,. I will pay particular attention to the role of actors in support of or opposed to the development of shale, examining these actors, the coalitions they form and the impact they can have on shale policy in general and on applications to drill for shale gas in particular.

Rather than study this on an actor-by-actor basis, I choose to place most analytical focus on coalitions. My reasons for this are threefold. First of all, the number of actors involved during the application process was such that considering them individually would be unwieldy, particularly when using the fsQCA, which – as I will demonstrate in chapter five – yielded no useful results when coalitions were not used as the unit of analysis. Secondly, there is clear evidence of coordination, collaboration and the sharing of resources and information playing an important role in application outcomes. All of these are processes which coalitions are ideally placed to study and explain. Thirdly, it is particularly suited for shale gas planning applications with only limited abstraction, as there were clear pro-shale and anti-shale groups in each of the cases studied.

Preliminary studies and reviews of relevant literature have also highlighted the importance of coalitions formed by the actors involved in shale development. Studies by Bomberg (2015) and Cairney et al (2016) identified two national-level coalitions: one supporting shale development and another opposing it. The pro-shale coalition consisted of actors including oil and gas companies, the UK government and some experts, while the anti-shale coalition had its own experts in addition to local residents and environmental organisations. I will also offer some insights into the role that coalitions at the local level might have had on the failure of shale gas nationally, although further study is required in this area as there are a number of other likely contributing causes that are beyond the scope of this study.

While research on shale coalitions at local government levels still remains limited, there is ample literature on policy coalitions more generally which shows how coalitions such as these can possess various characteristics which can shape their role and their ability to achieve their policy goals. These characteristics include coordination, beliefs, financial resources and expertise (Calanni et al., 2015, p. 903; Jenkins-Smith et al., 2017, p. 102; Weible and Ingold, 2018, p. 333). For example, coalitions

featuring members with scientific expertise grant credibility to that coalition's arguments relative to those of their opponents (Leifeld, 2013, p. 181). This expertise, as well as strong relationships with policymakers, can be used to enable a coalition to access and influence the policymaking process (Warleigh, 2000, p. 234). The resources of a coalition – primarily financial, but also its size of membership and number of supporters – are also critical in determining whether a coalition can implement the policy change it wants (Albright, 2011).

This thesis draws on that literature to explore **sub-question 1**: **what role did coalitions play in local level shale gas politics?**

To answer this question, I identify and analyse two specific coalition variables – **relationships with policymakers** and **resources** (incorporating finances, technical expertise, membership and support). I demonstrate how these variables can help explain the impact of pro-shale and anti-shale coalitions on shale gas policy.

However, policy outcomes and coalition behaviour are not shaped by the characteristics of coalitions alone. In particular, events occurring beyond the coalition can realign resources, leading to coalitions gaining supporters or causing existing members to question their beliefs in light of new developments (Albright, 2011; Sabatier, 1988, pp. 136, 148; Weible and Nohrstedt, 2012, p. 133). Shifts in public opinion can also benefit coalitions, with coalitions appearing to represent the public interest having more opportunities to have favourable policies implemented (Weible, 2007, p. 100). The presence of these external factors leads to **sub-question 2**: **to what extent did factors external to coalitions affect their behaviour and influence local level shale gas policy outcomes?**

I will answer this question by analysing two external variables: **external events** and **public opinion**. The ways in which these factors can influence coalitions and policy outcomes are well-established in public policy literature and initial studies of UK shale gas strongly suggested that they played a significant part in shaping policy outcomes.

To capture the role of actors in these coalitions I apply an adapted **advocacy coalition framework (ACF)**. The ACF is a framework that focuses on individuals and organisations forming coalitions with those who share their beliefs. These beliefs are the "glue" that hold actors together and serve as the "driving mechanism" for coordinating their behaviour in order to turn their beliefs into policy (Matti and Sandström, 2011; Sabatier, 1998). The ACF considers policy change to be triggered primarily through external events and policy-oriented learning (Jenkins-Smith et al., 2017, p. 99; Olsson, 2009, p. 170). These developments do not lead to policy change in of themselves but instead contribute to it indirectly, changing the coalitions by altering the balance of resources and the constraints of

actors within coalitions (Smith, 2000). There are a number of different ways of conceptualising coalitions, including frameworks based on resource dependency, discourse and policy narratives (Rozbicka, 2013, p. 848; Shanahan et al., 2011; Smith, 2000, p. 96; Weible, 2005, p. 462). Of these, I chose to use the advocacy coalition framework due to its usefulness in answering questions surrounding information exchange between actors, on the factors explaining policy change and on the behaviour of actors trying to change policy or maintain the status quo(Jenkins-Smith et al., 2017, p. 92). The manner in which external events facilitated information exchange and rebalanced the resources of coalitions and how this in turn shaped policy outcomes were highly important aspects of local level shale gas politics in the UK, and these are all aspects which the ACF is more attuned to explaining than equivalent frameworks.

These aspects are one of the main reasons why the ACF has been used so frequently in environmental and natural resource issues. These matters commonly feature extensive technical information, which is understood and interpreted differently by a wide range of actors, including scientists, business and industry associations, politicians, non-governmental organisations and grassroots activists. A review of applications of the ACF in natural resources policy by Sotirov and Memmler (2012) reports 41 such uses, with even more in areas of environmental policy not pertaining to natural resources.

I apply the ACF to demonstrate how pro-shale and anti-shale coalitions affected and were affected by the four variables outlined above. I shall also determine the extent to which these coalitions and variables influenced the outcome of shale gas drilling applications in the United Kingdom.

Research parameters and methods

Initial studies of the process and outcome of these drilling applications allowed me to identify three distinct periods of shale gas development in the UK: **1) a period of low salience (2009-2011)**, where shale was largely unknown and the absence of an anti-shale coalition enabled shale developers to manage the regulatory and planning process with ease; 2**) a period of conflict (2011-2014)**, where well-resourced anti-shale coalitions emerged as a result of two major shocks (the Preese Hall earthquake of April 2011 and the Balcombe protests of Summer 2013); **(3) a period of stagnation (2015-2019)**, where the government further centralised planning decision-making and pliant – yet often reluctant – local authorities accepted applications but limited progress towards development was actually made.

These different periods arose, to some extent, as a result of fluctuations in the strength and membership of coalitions. With the exception of the early period of shale development, I identified a

pro-shale and anti-shale advocacy coalition at each drilling site: a coalition that wanted the drilling application to be accepted and one that wanted it to be rejected. Members were assigned to coalitions on the basis of their beliefs and activities, which were deduced through representations, objections and oral evidence provided to local government planning committees.

The issues being debated and the empirical arguments made to these planning committees – primarily regarding energy security, economic benefits and environmental impacts – remained consistent across these applications. Yet, some applications were accepted and some were refused. If similar information being applied to the same regulatory framework can produce different results across time and place it strongly suggests that the application process was not simply a narrow consideration of regulations by the planning committee. This suggests that other factors shaped outcomes, and provides the impetus to consider how the four variables enabled – or prevented – coalitions from influencing the outcome of these applications

I use a **fuzzy set qualitative comparative analysis** (**fsQCA**) to find out how much each variable contributed to the outcome. The fsQCA is a useful method to use in these circumstances because it shows the extent to which combinations of variables contributed to an outcome in addition to variables by themselves. Following this analysis I conduct studies of three cases to provide more information on the causal effects behind the variables used in the fsQCA.

These methods are used to study local authority decision making on shale gas applications in the United Kingdom between 2009 and 2019. This ten-year period covers the first shale gas application and runs to the imposition of a fracking moratorium by the government in November 2019. The units of analysis are nine sites in England where applications to drill for shale gas were made. Six of these were decided by Lancashire County Council, two by Nottinghamshire County Council and one by North Yorkshire County Council. The case study section will look at a proposed drilling site within each local authority, with each of these applications being made by a different company.

The outcome I will study is the local authority planning committee's decision on an application. For the pro-shale coalition, success is a granted application and failure is a rejected application – while the anti-shale coalition uses opposite definitions of success and failure. However, there are also degrees of partial success and failure. For instance, the pro-shale coalition may gain planning permission after lengthy delays and obstructions from the anti-shale coalition, but have expended so many resources or suffered such reputational damage in the process that it affected their ability to develop the site afterwards.

Research focus and findings

My analysis focuses on the local level, testing the national government's claim of "underperforming" local authorities. In a statement to parliament in 2015, Amber Rudd, then Secretary of State for Energy and Climate Change, committed to "identifying underperforming local planning authorities that repeatedly fail to determine oil and gas applications within statutory timeframes" (Department of Energy and Climate Change, 2015a). As a reaction to this, the UK government undertook to reform the planning system to make it "faster and fairer for those affected by the development" (Atkinson et al., 2016, p. 14). Further plans to include shale gas into the category of "nationally significant infrastructure planning" – and in doing so withdraw powers from local governments – were based on similar motivations (Cotton, 2017, p. 197). Scholars such as Whitton et al (2017, p. 16) have also referred to a "sluggish County level planning system [which] frustrates industry and communities alike", which has led to shale developers looking to take decisions away from local government and have them made by national government ministers instead. The claim that local government has been blocking shale development has already been disputed by Cotton (2017, p. 199), who argued that the government has shifted much of the decision-making process away from local government towards direct engagement between residents and applicants, while the austerity regime has both deprived local authorities of resources to contest and block applications and incentivised them to pursue economic development through supporting fracking.

Based on my analysis of shale gas planning applications, I argue that the role of local governments in blocking or delaying shale gas applications has been overstated by the UK government. For the purposes of this study, I consider obstruction to include both wilful opposition to applications and the implementation of delaying tactics or processes designed to prolong the process. I find limited evidence of either. Only one of the three local authorities studied – Lancashire County Council – ever refused planning permission – and only on a minority of applications. Each time it did this the refusal was eventually overturned on appeal. The other two councils – North Yorkshire County Council and Nottinghamshire County Council – accepted every application submitted to them, despite their own strong misgivings and sustained opposition from local anti-shale coalitions. On occasion, the fear of being even being perceived to be delaying shale development served as a motivating factor for local authorities to approve applications.

My analysis also demonstrates that two of the variables studied – external events and public opinion – are also highly significant. Public opinion has been an important focus of shale gas research (see Evensen et al., 2017; Howell, 2018; Stedman et al., 2016). However, little is known about its specific effect on decision-making. Here I find that decision-makers were highly aware of public opinion but were careful to avoid making it a material consideration. Such caution meant that public opinion had no discernible *direct* impact on the success of shale gas applications. However, as public opinion

became more negative towards shale the interplay of public opinion and external events proved important in forming and strengthening anti-shale coalitions: that strengthening effect meant public opinion had a significant indirect impact.

External events, such as the 2011 Preese Hall earthquake or the 2013 Balcombe protests increased knowledge of the previously overlooked policy area of shale gas and provided significant material for the anti-shale coalition's arguments that the risks of shale gas outweighed the rewards. These events and accompanying public concern led to the formation of anti-shale coalitions. It also helped them accumulate resources in the form of membership, funds and expertise, enabling them to compete with the pro-shale coalition at a local level and prolong the application process.

The relationships with policymakers variable produced less decisive results. This finding is interesting because the privileged position developers enjoyed due to a close relationship with policymakers has been an important theme of the literature on UK shale gas (see Bomberg, 2015, p. 11). This positive relationship did exist at the national level and appears to have played some part in enabling the pro-shale coalition to receive favourable policies from the UK government. But I find it did not make any meaningful difference to application outcomes at the local government level. My study qualifies another finding in the literature on policymaking. One of the most common explanations for closer relationships with government and favourable policy outcomes is that an actor can provide expertise and has had successful past collaborations with government (Pappi and Henning, 1999, p. 265; Rasmussen, 2015, p. 370; Sabatier, 1988, p. 143; Warleigh, 2000, p. 234). This was not the case for the shale gas companies making these applications, who were relatively small and had very little experience of previous shale activities or collaboration with policymakers.

Having found that local governments did not obstruct shale development, I conclude that the local outcomes of shale development are best attributed to a combination of different factors. These include primarily a lack of resources on the part of the pro-shale coalition and favourable developments external to the policy subsystem for the anti-shale coalition. I find strong evidence connecting the stagnation of local developments to insufficient resources within the pro-shale coalition – particularly the potential developers. Shale development is financially demanding and technically difficult, and the pro-shale coalition struggled in meeting both these challenges. However, these resource limitations were exacerbated by the anti-shale coalition. There were severe delays throughout the shale gas-planning process. These were highly problematic for developers that had not yet achieved commercial production and were largely dependent on the goodwill and patience of their investors and creditors. However, these delays were not as a result of local government obstructionism but rather the emergence and growth of anti-shale coalitions

comprised – mainly – of local residents and environmental campaigners. These groups submitted consultation responses, attended committee meetings and eventually obtained sufficient resources to commission their own scientific studies of the implications of the development. Their actions led to the pro-shale coalitions commissioning their own research in response, leading to longer and longer delays and exhausting the pro-shale coalition. Even when they finally gained planning permission, many of the sites remained undeveloped and the work they pledged to do remained unfulfilled.

To summarise, while the pro-shale coalition's resources dwindled, the anti-shale coalition benefited from favourable external events and public opinion. This finding underlines that three of the four variables – external events, public opinion and resources – can account for the failure to develop these drilling sites, while the relationships with policymakers variable had a more limited impact.

This first chapter has served as an introduction to the thesis, outlining my research question and its wider significance. I have set out the impetus for this question: we have seen a range of significant and interesting public policy research on UK shale gas but little of this has focused on decision-making processes at the local level, which I identified as an important but overlooked area, outlining my intention to study coalition dynamics at this level, as well as test for four variables: external events, relationships with policymakers, resources and public opinion. Thereafter, I introduce d the methodology: a combination of a fuzzy set qualitative comparative analysis (fsQCA) and three case studies. I then outlined my findings: to recap, coalitions and their characteristics played a significant role in the outcome of planning applications at the local level: the pro-shale coalition were hampered by their lack of resources, but the delays in the process were also due to external events and public opinion leading to the formation of anti-shale coalitions that were able to oppose pro-shale coalitions and stretch these limited resources.

Outline of remaining chapters

In the next chapter I introduce the most important empirical and technical aspects of shale gas. I discuss what shale gas is and how it differs from conventional gas. I explain hydraulic fracturing (or fracking) and the debate regarding the safety of the process and the risks it poses. Most importantly for the purposes of this thesis, I consider how this debate is understood and interpreted by policymakers lacking a technical background. The subsequent section reviews shale gas development with its beginnings in the United States and eventual – yet thus far unsuccessful – move to Europe, and outlines the significance of these developments for shale gas in the United Kingdom. Afterwards, I move on to shale gas in the United Kingdom itself. I introduce the key arguments for and against shale gas in the UK. These are categorised into debates based on energy

security, economic efficiency, environmental sustainability and a fourth, miscellaneous, category. The following section briefly sets out some of the most important reforms relevant to shale gas – particularly in the fields of tax and planning – made by the United Kingdom government before outlining the current planning process for shale gas and the decision-makers involved. The purpose of this section is to contextualise local shale developments with national and international developments, which is important because many of these factors are relevant to the issues considered in the drilling applications.

The third chapter of this thesis will focus on the advocacy coalition framework. I will first introduce the key concepts of the framework. In particular, I will focus on what the advocacy coalition framework tells us about the behaviour of actors who attempt to influence policy. I outline what the framework says about the role of beliefs and coordination in leading individuals and organisations to join in coalitions and the way they collaborate, use their resources and attempt to implement their beliefs into policy. The second major part of this chapter introduces the aspects where I intend to make amendments in order to better fit the circumstances of the study. In particular, I provide justifications for my decision to assign actors to coalitions based on shared secondary (concrete and policy-based) beliefs rather than "core" (stronger, more philosophical or ethical) beliefs. I note there has been a tendency in some ACF studies to overlook the requirement for advocacy coalitions to consider coordinated behaviour when studying coalition membership and provide reasons for why it is of particular importance for this study. Finally, I argue that the framework's requirement that policy change be considered "over a decade or more" need not be followed in this study, and that the ACF can be a useful means to study new and emerging policy areas.

My research methodology (chapter 4) follows the conceptual framework chapter. I explain my decision to combine an fsQCA study with case studies: the strengths and weaknesses of the two approaches complement each other. The fsQCA gives an indication of the variables or combinations of variables responsible for the outcomes of shale drilling applications, while the case studies provide more detail on the ways in which these variables combine to produce results. I explain my decision to rely on local government documents for the bulk of my data collection rather than interviews, and discuss how these documents will be used in my analysis. The concluding section of the methodology chapter discusses the variables in more detail. External events, relationships with policymakers (including access and influence), resources and public opinion are variables that are widely used and subject to various definitions. I explain how I will define each variable, how I will measure them and justify my decision to choose them by discussing their relevance to developments in UK shale gas. Finally, I introduce my four hypotheses.

Chapter 5 begins a more detailed introduction on what an fsQCA is, what it is used for and how it works, before providing a "walkthrough" of how it is used in this study. I explain how values were chosen for each of the outcomes and variables relating to pro-shale and anti-shale coalition activity at the nine drilling sites. Afterwards, I present the results of this analysis: the extent to which the four variables (or combinations of them) contributed towards a coalition's success in their goal of gaining planning permission (for the pro-shale coalition) or preventing planning permission (for the anti-shale coalition). I next run the analysis in a slightly different manner, testing for the way in which the variables lead to a coalition failing in their goals (failing to gain planning permission for the pro-shale coalition or failing to prevent planning permission being granted for the anti-shale coalition). Finally, I identify and discuss conclusions that can be carried through to the discussion chapter and considered alongside the case study results.

Chapters 6, 7 and 8 serve as case studies of the sites of Grange Road in Lancashire, Kirby Misperton in North Yorkshire and Tinker Lane in Nottinghamshire. Each of these chapters begins with a narrative of developments at each site before I introduce the coalitions and the actors involved. The main body of each case study consists of a systematic study of the four variables in turn, before offering general conclusions. Each site apart from Tinker Lane received multiple applications, so I follow this process three times for Grange Road and two times for Kirby Misperton.

In chapter 9 I discuss results of the fsQCA and the case studies in comparison to one another, furthering my investigation through a combination of these different methods. I summarise the key findings from the four different chapters and how they compare to each other, providing general conclusions for each of the four variables in turn. Next, I consider what these findings means for the hypotheses more generally before concluding with a review of some of the implications this study has for the advocacy coalition framework.

Chapter 10 provides my conclusion. I summarise my overall findings, noting again that the failure of shale gas can be attributed to a lack of resources on the part of the pro-shale coalition and a combination of external events and public opinion for the pro-shale coalition; and underlining my finding that the role of local government as an impediment was very limited. I outline the empirical contribution of my thesis, highlighting the themes and aspects of existing literature they confirm and the ways in which they further our knowledge of shale gas policy in the UK. Next, I look at the conceptual contribution of my amendments to the advocacy coalition framework, addressing the ways in which my changes to beliefs, coordination and timeframe aided my study and could contribute to our understanding of the ACF more generally. Finally, I outline avenues for further research, with a particular focus on how the amended framework could be used to aid our

understanding of coalition formation and policy change in other new and emerging areas such as the regulation of technologies including gene editing and artificial intelligence.

Background

In the remainder of this study, I cover a set of circumstances where local authorities are required to make a decision on a novel, complex and controversial issue that they have no prior experience of. As such, I intend this chapter to provide a foundation for many of the key aspects that this involves. It sets the local authority planning process within the context of the wider shale gas permitting process. It also introduces many of the debates, narratives and frames that are relied upon by coalitions throughout the planning process. I also provide a brief introduction of shale gas elsewhere in the world – particularly in the United States – because this played an important part in deliberations, serving as an inspiration or cautionary tale depending on the actors' view of shale gas.

The technical aspects of shale gas and its impact on policymakers

Historically, oil and gas production tended to be *conventional*: an operator drilled a well which collected deposits of oil and gas from an underground reservoir (see figure 2.1). Between 2005 and 2010, the development of unconventional oil and gas took off in the United States, primarily driven by rapid technological and infrastructural development, the prospect of high revenues, political support and – in the case of gas – its perception as a clean fuel (Bocora, 2012, p. 437; Kefferpütz, 2010). Shale oil and gas – also known as tight oil and gas – is a particular type of unconventional oil and gas. Rather than sitting in an unconventional reservoir, the resource is trapped at far greater depths within microscopic pores in shale rock[4]. This means that the oil or gas does not readily flow into the well, making production significantly more expensive and technically challenging (The Royal Society and The Royal Academy of Engineering, 2012, pt. 1.1).

Hydraulic fracturing, also known as fracking (fraccing to the US industry), is the process used to get the oil or gas out of the shale rock. It involves a complicated drilling process, involving vertical then horizontal stages (see figure 2.1), after which the horizontal well is perforated by explosive charges. From here, millions of gallons of water are forced through the perforations at intense pressures to fracture the shale rock, opening up cracks that extend for hundreds of metres, allowing the trapped oil and gas to escape. Sand (to prop open the cracks) and some chemicals are also injected into the well. Following the hydraulic fracturing process the well is depressurised, causing oil and gas and the water (with added saline water and dissolved minerals from the underground formation) to flow to the surface (The Royal Society and The Royal Academy of Engineering, 2012, pt. 1.1).

[4] A common type of rock consisting of mud, silt, clay and organic matter.

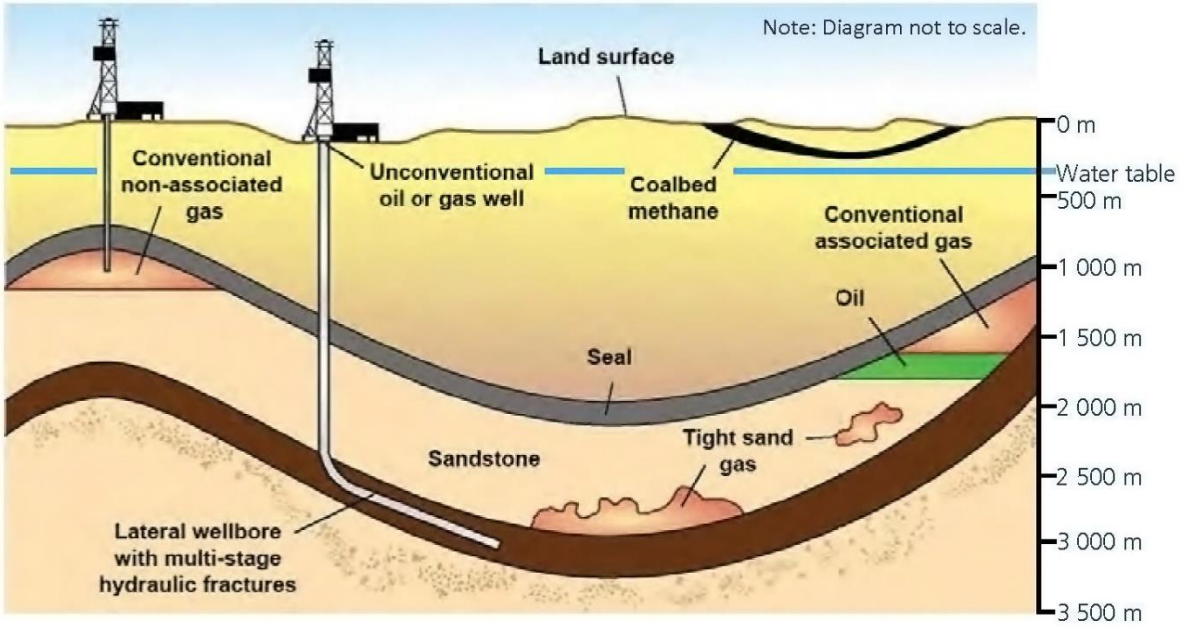

Figure 2.1: Geology of conventional and unconventional oil and gas (Energy Institute, 2014)

Various aspects of this process have been highlighted as presenting a risk. The "flowback and produced water" (FPW) that returns to the surface of the well can contain oil and gas, biocides, radioisotopes and metals. If it were to be spilled or released, it has the capacity to seriously impact the local environment (Blewett et al., 2017, p. 1). The risk of such a spill occurring has been the subject of vigorous debate. The 2010 film Gasland attracted a lot of attention with footage alleging that a leak from a shale well made local water supplies flammable, although oil and gas producers argued that this was fake (Everley, 2013; Fox, 2010).

Theoretically, FPW can cause contamination in a number of ways. Two of the most common concerns highlighted were that it could be spilled in transit or that it could escape into groundwater, most likely through cracks in the concrete well casing which became under more pressure at greater depths. The extent to which this presented a risk was intensely debated, with supporters and opponents of the procedure both able to point to credible studies supporting their point of view. A study conducted for the UK government by the Royal Society and the Royal Academy of Engineering (2012, p. 4) found that the health, safety and environmental risks of fracking can "be managed effectively in the UK as long as operational best practices are implemented and enforced through regulation". Similarly, a long-anticipated geological study by Davies et al (2014) looked at data from nine different countries, concluding that the likelihood of groundwater pollution was minimal. On the other hand, the water chemists Gordalla et al (2013) argued that the risks to drinking water were concerning, and further research was required to understand the environmental impact of flowback

water. Similarly, Allen Burton et al (2014) reported that there was "inadequate data to predict ecological risk" but that hazards were plausible.

The risk of fracking causing earthquakes[5] has also been a matter of concern. The magnitude 2.3 tremor at Preese Hall was felt locally and came to be emblematic of the risks of shale gas. Cuadrilla admitted this was as a result of their activity, although Davies et al (2014) claimed the risk of fracking causing earthquakes was barely existent. Meanwhile, the earth scientists Keranen et al (2014) showed that an increase in seismicity could be attributed to oil and gas producers injecting wastewater into underground reservoirs, suggesting that the water used in fracking could do the same. In evidence submitted to the House of Commons Environmental Audit Committee, Verdon and Kendall (2015) – both geophysicists – said that fracking "has the potential to trigger seismic events that can be felt by local populations", but that "such events are unlikely to be of sufficient magnitude to cause damage to buildings or other infrastructure".

Evidence

It is worth noting here that the research mentioned over the previous two paragraphs is enormously complex, involving experts in petroleum geology, water chemistry, biology, ecological risk and geomechanics. Nobody could expect the average member of a local government planning committee – or even the planning officers making recommendations for the committee – to have specialist knowledge of these issues. Nevertheless, a large part of the decision process was based on understanding and assessing the risks of hydraulic fracturing to the local environment.

Sorrell (2007, pp. 1860–1861) makes several salient points about the way policymakers react when faced by such evidence. He notes that a high volume of research makes it "difficult to keep abreast of current understanding" and that the complexity of the issues, variation in quality of research and the biases of individual researchers lead to "conflicting recommendations by different authors and corresponding uncertainty over whom to trust", a problem which can be "exacerbated by the selective use of evidence by powerful interest groups". Such an overload of information appears likely to lead to selection bias and, with policymakers reaching the limits of their ability, in them "satisficing" on the first good outcome rather than considering the implications to their fullest (Simon, 1955). This leads to the assumption that policymakers do not consider this information in a neutral, detached manner, and that information they choose to look at – and the conclusions they draw from it – can be influenced by others (Jones and Baumgartner, 2012; Simon, 1957).

[5] Or, more accurately, "inducing seismicity" by triggering pre-existing faults (British Geological Survey, 2020).

On this basis, while I include a brief technical overview to introduce the matters being discussed, I will work on the assumption that the source of the evidence is more important than the evidence itself. As such, I will pay more attention to which advocacy coalition submits information to a committee than I will to the evidence itself. This is consistent both with the findings of my research and the advocacy coalition framework, which assumes that actors are boundedly rational with limited abilities and "relies on beliefs as the principal heuristic to simplify, filter, and sometimes distort stimuli" (Rozbicka, 2013; Sabatier, 1998, p. 109; Weible, 2007, p. 98; Weible et al., 2009, p. 122). Similarly, disagreement between experts provides "technical legitimacy" to a number of different framings of the issue (Barnes and Hicks, 2018, p. 342). Instances where this occurs will be highlighted in the case studies.

Shale gas and oil around the world

The UK has no prior history of shale development, so both pro-shale and anti-shale actors looked abroad for support when arguing for their cause. In most cases, this meant the United States, where there was a rapidly maturing industry with staunch advocates and opponents. The US inspired much of the discourse around shale gas as well as the original impetus for shale development in the UK, so it is worth introducing the development of their industry. This, and a somewhat briefer look at shale in Europe, will give an overview of previous and contemporary shale developments occurring outside the United Kingdom. Thereafter, I will provide more specific detail on shale gas developments in the UK itself.

The United States

In 1981, annual oil production in Texas stood at 932,350 thousand barrels (US Energy Information Administration, 2020a). This total fell each year, reaching a low of 391,261 thousand barrels in 2007. From here, production rose sharply, surpassing one billion barrels by 2014 and peaking – so far – at 1,850,715 thousand barrels in 2019. This trend was reflected elsewhere in the United States, with areas that had previously been a footnote in oil and gas production experiencing a rapid boom. North Dakota, the location of the Bakken formation, produced 42 billion cubic feet (1.2 billion m^3) of gas in 2000 (US Energy Information Administration, 2020b). By 2015, this had reached 487 billion cubic feet (13.8 billion m^3), rising to 720 billion cubic feet (20.3 billion m^3) by 2018.

This sharp increase in fossil fuel production was largely unanticipated by policymakers. For instance, the US Energy Information Administration's (2005, p. 101) Annual Energy Outlook for 2005 projected that dependence on oil imports would rise from 56% of consumption in 2003 to between 63% and 72% of consumption by 2025. However, the same institution's Annual Energy Outlook for 2020

predicted that the United States would be a net exporter of petroleum and natural gas until the late 2040s (US Energy Information Administration, 2020c, p. 11).

This rise can be attributed to the production of unconventional oil and gas. This impacts of this "shale boom" went far beyond the energy sector. It has been credited with revitalising the entire US economy in the wake of the 2008 global financial crisis and potentially staving off the US's "relative decline" (Dunn and McClelland, 2013, pp. 1412, 1427). Much attention in the United States has also been devoted to potential benefits such as energy independence, job growth and environmental benefits[6] (Gearhart et al., 2019, p. 172). Nevertheless, the US shale boom has not always been portrayed in positive terms. Its long-term future is by no means secured, as the high production costs and requirement for continuous capital investment mean that it is "dependent on high prices and cheap credit" (Thompson, 2018, p. 48). Moreover, a 2013 report by the Stanford University Energy Modelling Forum estimated that shale development would boost the US economy by $70 billion per year, an amount that "appears large" but "represents a relatively modest 0.46 percent of the US economy" (Huntingdon, 2013, p. vii).

American unconventional oil and gas production has also been criticised on environmental grounds, with risks of pollution, water contamination, and seismic activity being the issues highlighted with the greatest frequency (Gearhart et al., 2019, p. 172). These concerns have led to fierce opposition in some parts of the country, with New York issuing a fracking ban in 2015 and California – despite being the location of the Monterey Shale, estimated to hold 64% of the continental USA's shale oil (Saini et al., 2019, p. 219) – reporting a decline in production since 2010 and "toughest-in-the-nation fracking rules" (Cart, 2015; US Energy Information Administration, 2020d).

In any case, unconventional oil and gas producers in the US generally benefited from a friendly federal policy environment. Most notably, the Energy Policy Act of 2005 provided a package of benefits for the industry, including tax breaks and an exemption of hydraulic fracturing from water quality regulations. These tax breaks were important, because the companies at the vanguard of the shale boom were "momma and poppa" companies such as Devon Energy of Oklahoma City – the first to combine horizontal drilling and hydraulic fracturing – and Range Resources, the first company to drill the Marcellus Shale formation (Stevens, 2013, p. 7). This would also be the case with shale

[6] The environmental benefits of shale gas can be attributed to it emitting less carbon dioxide when burned than coal or oil. As stated by Barack Obama, natural gas is "the bridge fuel that can power our economy with less of the carbon pollution that causes climate change" (Neuhauser, 2014). Others have contested this, arguing that the processes used in producing unconventional oil and gas – including fracking – are much more carbon intensive than conventional production (see Wainwright and Mann, 2018, p. 26).

gas in the United Kingdom, although the likes of Cuadrilla, IGas and Third Energy would have much less success.

The policy environment in the United States (or at least in some parts on the United States) stood in stark contrast to the United Kingdom. In a previous role I discussed the potential of UK shale gas with an executive from a Texas based operator who was confident in the geological potentiual of UK shale gas but was inclined to stay away as he could complete the permitting process for the same operation in Texas within a week (Scott, 2013).

Europe

As can be seen in figure 2.2, there are a number of European countries with shale gas potential. With much of Europe being dependent upon energy imports, particularly from Russia, it might be thought that this would create an impetus to develop these resources (Gustafson, 2020). However, there has been very little success in developing shale gas and oil in Europe – the UK included. Possible reasons for this include technical and geological conditions, regulatory environments, relationships between public and private interests and institutional and political contexts (Van De Graaf et al., 2018, p. 1288).

In a comparative study of European countries, Van de Graaf et al (2018, pp. 1276, 1278) found that energy security concerns had no impact on a European government's likelihood to adopt a permissive regulatory regime, with public opinion being the decisive factor. This can be seen in the case of France, the country with the most shale gas and oil in western Europe (US Energy Information Administration, 2015). French governments have continued to oppose fracking since banning it in 2011, with public opinion overwhelmingly in opposition to shale gas development in spite of the country's significant dependence on fossil fuel imports (Baudet, 2012; US Energy Information Administration, 2020e).

Figure 1.2: Schematic diagram of the geological basins with possible light tight oil and shale gas potential in Europe (Andruleit et al., 2013, p. 37)

Instead, it was Poland that took the lead. A large number of concessions were granted to US companies with strong support from then Polish Prime Minister Donald Tusk. This led to the first well being drilled in 2010, followed by 41 others. However, by 2012 a number of companies had pulled out, citing the "wrong sort of shale" and problems with geology and tax policy (Buchan, 2013, p. 4). This meant that by the time interest was peaking in the UK, Europe's first experiment with shale gas coming to an unsuccessful end.

Shale gas in the United Kingdom

Of the examples outlined above, it was that of the United States that carried the most weight in the UK. Poland, meanwhile, served as more of a cautionary tale – a reason for shale developers to avoid Europe rather than get involved. The US, on the other hand, had a mature unconventional oil and gas industry that offered plenty of inspiration for both pro-shale and anti-shale actors. Supporters of shale, such as the UK government, emphasised the energy security, employment and economic

benefits of shale in the US. They further argued that British regulation would be more robust and that the US being the first mover offered opportunities for the UK to learn about what works and what doesn't work (Department of Energy and Climate Change, 2013a). Meanwhile, the anti-shale coalition invited New York politicians opposed to shale to discuss the environmental effects of fracking in their communities, while Gasland director Josh Fox toured anti-fracking groups in the UK for screenings of his film (Cardwell, 2013; North Yorkshire County Council, 2016a).

Key issues of shale gas policy in the United Kingdom

Energy policy is commonly presented as consisting of three "pillars" (Chaudry et al., 2013, p. 473; Kuzemko, 2014, p. 65; Ligtvoet et al., 2016, p. 26; Winzer, 2012, p. 36). These are energy security, economic efficiency and environmental sustainability. These, pillars, which are perceived and presented differently by supporters and opponents of shale development are summarised in Table 2.1, as well as some miscellaneous aspects.

Table 2.1: Arguments made by shale supporters and opponents

Issue	Pro-shale argument	Anti-shale argument
Energy security	Declining UK gas production has increased reliance on imports, which brings risks for energy security in the form of geopolitical events and trade disputes. This is particularly concerning for gas which relies on being transported by pipeline.	The majority of UK gas imports are from Norway and the Netherlands, not areas of high political risk.
Economic efficiency	Shale gas has been highly beneficial to US economy and the UK will see similar benefits in the form of lower energy prices and more jobs.	Differences in gas markets mean shale development would not result in lower energy prices as seen in the USA. It won't create many jobs and many of those created will be short term.
Environmental sustainability	Shale gas is much cleaner than coal. It is cheaper to develop gas domestically than transport it from far away. It can act as a bridge fuel until renewable technologies progress sufficiently.	Producing shale gas is polluting and carbon intensive. There is not enough infrastructure in place to allow for a shale bridge; the UK should prioritise renewables now.
Others	The industry is very highly regulated and committed to working closely with local communities.	The noise and disruption of shale development will affect the health and wellbeing of locals. Forcing shale development upon local

		communities is a threat to local democracy.

Energy security

Over the last century, the United Kingdom has been caught up in a number of energy security crises, both real and perceived. Prominent among these are the Abadan Crisis of the early 50s, when Iran nationalised the assets of the Anglo-Iranian Oil Company, and the 1973 Oil Crisis, where members of the Organization of Arab Petroleum Exporting Companies (OAPEC) launched an oil embargo against nations that were thought to have supported Israel during the Yom Kippur War. The sharp increase arising from the 1973 crisis led the countries of Europe to become increasingly concerned with their dependence on imported oil and attempt to diversify their energy sources (Gustafson, 2020, pp. 81–3). It was also around this time that the first reserves of oil and gas were detected in the North Sea, and the ensuing development of these soon allowed the United Kingdom to become a net exporter of both oil and gas by the mid 1980s, although this would only last until 2004 for natural gas and until 2005 for oil (US Energy Information Administration, 2014). This is largely because North Sea oil and gas production began to tail off rapidly, peaking in 1999 and declining by between 5 to 10 per cent per year during the subsequent decade (Scottish Parliament Information Centre, 2013, p. 5). This decade was also marked by a steep rise in crude oil import costs and a high level of price volatility due to factors such as the September 11 terrorist attacks, the Iraq War and the 2008 financial crisis (Fan and Xu, 2011; International Energy Agency, 2014).

While the following decade would bring reduced energy demand, falling oil prices and an eightfold increase in electricity generation from renewable sources, concerns over energy security would form a key part of the arguments made by supporters of shale gas (Bomberg, 2015, p. 7; Department for Business, Energy & Industrial Strategy, 2020a, p. 1; International Energy Agency, 2014; Ofgem, 2020). For instance, the benefits of domestically produced gas for UK energy security was one of the key issues cited by Cuadrilla Resources in support of their planning application at Preston New Road in Lancashire (Cuadrilla Resources, 2014a). In addition, the government's guide to fracking noted that "the government believes that shale gas has the potential to provide the UK with greater energy security" (Department of Energy and Climate Change, 2015b). More than any of the other arguments made for shale gas, the matter of energy security – carrying with it the risk of the lights going out – was used to create a sense of urgency. Speaking in 2015, Amber Rudd, then the Secretary of State for Energy and Climate Change argued that there was a "national need" to develop shale gas in a "timely" way and meet the government's objectives for energy security. This was used as justification for the government taking action against local governments that either

refused shale applications or did not – in Rudd's view – grant planning application quickly enough (Department of Energy and Climate Change, 2015a).

Opponents of shale gas generally did not address this argument, preferring to focus their opposition on environmental grounds. However, it ought to be noted that many of the starkest fears around energy security were unfounded. Russia's annexation of Crimea in 2014 made the issue of energy security more prominent, although UK gas imports from Russia are "negligible"[7] (Bomberg, 2015, p. 8; Department for Business, Energy and Industrial Strategy, 2018, para. G.23).

Economic efficiency

Pro-shale actors also attempted to advertise the supposed economic benefits of shale gas development, particularly the prospect of more jobs and lower energy prices. Cuadrilla's "high activity scenario" estimated that 16,000-32,000 full-time equivalent jobs related to shale gas would be generated, as well as reducing the UK's balance of payments by decreasing energy imports (Cuadrilla Resources, 2014a, pp. 56–57). Sajid Javid, then the Secretary of State for Housing, Communities and Local Government[8] stated that "shale gas has the potential to power economic growth" and "support 64,000" jobs (Vaughan, 2016). This may have been the case had the industry established itself, but the initial jobs figures were some way off that. For instance, Cuadrilla's application for a three year project at Grange Road in Lancashire proposed that twenty jobs would be created (Cuadrilla Resources, 2014b). Opponents of shale gas contested these economic arguments on the grounds that the jobs would go to trained specialists rather than people in the local area and that there would be no meaningful impact on energy prices as the gas would be sold on international markets (Lancashire County Council, 2014, pp. 16–17)[9].

Environmental sustainability

It was on environmental issues that shale gas was most keenly contested. As highlighted previously, the safety and risks of hydraulic fracturing were not fully known and there was some expert dissensus on the issue. Both pro-fracking and anti-fracking actors were censured by the Advertising

[7] The UK does not directly import gas from Russia but it is possible that small amounts of gas imported to continental Europe from Russia might make its way across the continent and into the UK along with imports from the Netherlands and Belgium.

[8] And consequently the minister responsible for calling in shale gas planning applications from local authorities.

[9] Economic realities notwithstanding, public opinion data suggests that supporters of shale gas had some success with their arguments on this issue, with consistent majorities of those expressing a view associating shale gas with cheap energy and bringing economic benefits to the UK between 2012 and 2015 (O'Hara et al., 2015a, pp. 10, 12).

Standards Agency[10] (ASA) for claims made about fracking and its impacts. In 2017 Friends of the Earth were asked to withdraw a leaflet stating that fracking can cause cancer, contaminate drinking water and cause house prices to plummet. Four years previously, the ASA reprimanded Cuadrilla for claiming that fracking uses "proven, safe technologies" (Sweney and Carrington, 2017). Despite these rulings, each of these claims were and continued to be crucial aspects of the arguments put forward by each side. Supporters of fracking were keen to emphasise that their operations were safe, carried limited risk and had been in use for many years. Opponents stressed risks to public health, wildlife and noise, air and water pollution among many other issues.

Matters of carbon emissions and climate change, in addition to these more localised environmental issues, also proved an important area of debate. Supporters of shale gas, such as Michael Fallon, the Minister for Energy in 2013, argued that shale gas is an important part of the UK's "move to a low-carbon future" (Department of Energy and Climate Change, 2013a). Much like Barack Obama in the USA, the UK government was keen to adopt the metaphor of shale gas as a "bridge" between "dirtier" fossil fuels and energy from "clean" renewable sources, while opponents of shale gas were more likely to describe it as a "diversion", "distraction" or a "block" (Cotton et al., 2014, p. 6). Shale gas emits less carbon dioxide when burned than other fossil fuels, allowing supporters of shale gas to portray it as a cleaner alternative to coal or oil that could give renewable technologies time to improve. Cuadrilla Resources (2014a, pt. 5.1.2), for instance, stated that "gas is likely to continue to be required during periods of interruptions of renewable supply (such as wind) and during the period when new renewable energy technologies are being developed". Opponents of shale gas, meanwhile, argued that shale gas extraction would actually make it harder to reduce carbon emissions by diverting investment away from renewable energy sources while highlighting the potential for leakages of methane – a greenhouse gas far more potent than carbon dioxide.

Other arguments

While many of the reasons given for supporting or opposing shale gas development could be categorised under energy security, economic efficiency or environmental sustainability, there were a few additional issues that sit outside these broad pillars. The disruptive potential of development was consistently an important issue. For example, local residents were concerned that large vehicles transporting materials to and from the site would cause congestion and damage narrow country roads that were not always built with heavy vehicles in mind. Both coalitions also placed a great deal of weight upon governance. The government and shale developers were both keen to emphasise

[10] A self-regulating organisation funded by the UK advertising industry.

that fracking was safe because it was highly regulated[11]. Opponents of shale gas counterclaimed that the existing body of regulation was insufficient (North Yorkshire County Council, 2016a, pt. 5.3.7). Beyond regulation, many opponents of shale gas contended that the process was a threat to local democracy (Bomberg, 2015, p. 9). Every shale gas application that was rejected by a local authority would later be appealed to and overturned by the UK government. This was described by a Greenpeace[12] campaigner as showing that "the government is struggling to force fracking on a reluctant nation" (Vaughan, 2016).

This thesis will demonstrate how different arguments were interpreted and presented by different coalitions and with what impact. In particular it will examine the interplay of variables such as external events, resources, relationships with policymakers and public opinion that played an important role in determining the outcome of applications.

The UK government and shale gas

The UK government expressed its strong support for shale gas on several occasions. The government's overall view of shale gas was that it could provide the UK with greater energy security and growth, and thousands of extra jobs (Department of Energy and Climate Change, 2015b). There was an element of haste to this: in 2013 the Treasury stated that 20 to 40 wells would have to be drilled within two years to assess the commercial validity of shale development. The industry would be supported in this project by getting the Environment Agency to fast-track their processes to ensure permits for shale gas exploration were issued within two weeks (HM Treasury, 2013, pp. 31–32). This provision came following complaints from the industry that the process in place took "too long" (Bakhsh, 2014; Schaps and Chestney, 2015). Further refinements to the planning and regulatory system included the Infrastructure Act 2015 which carried provisions allowing deep-level land to be used for exploiting oil and gas.

The government also aimed to create incentives for shale gas developers and the local communities potentially affected by these developments. In an attempt to counteract the high initial costs of shale gas development and encourage investment, the Chancellor announced that the tax rate on early profits would be effectively halved in the 2013 Autumn Statement (HM Revenue & Customs, 2013, pp. 1–2). The following year's statement announced the provision of £5 million to go towards providing evidence to the public that the existing regulatory scheme for shale development was sufficiently robust (HM Treasury, 2014a, pt. 2.209). To address public concern, the government and

[11] See for instance the website www.talkaboutshale.com, run by the representative body of the UK onshore oil and gas industry, which outlines a number of common concerns about shale gas and fracking and how each of these issues are regulated.

[12] An organisation that was consistently a member of anti-shale coalitions.

the industry announced a package of benefits, including a commitment to consult with local communities and give them £100,000 per well drilled as well as 1% of ongoing revenue (United Kingdom Onshore Operators Group, 2013).

The government has also provided significant research support to shale developers. The Department of Energy and Climate Change commissioned research from the Royal Society and the Royal Academy of Engineering on how the risks of hydraulic fracturing could be managed, while the British Geological Survey conducted a survey to estimate the quantity of shale gas in place in the UK.

These activities, while significant, are not as forceful as much of the government's rhetoric might have suggested. Cairney et al (2018, p. 5) remark that the government's strategy was to provide conditions to encourage development, rather than enforcing development itself: "pro-fracking policy outputs … not translated into many concrete outcomes".

While the UK government – particularly during the coalition years – held a number of different views and had varying enthusiasm towards shale gas, it is on this basis that they will be considered as an overall supporter of shale gas – and as a member of the pro-shale coalition – in later chapters.

Shale gas applications

As shown in figure 2.3, several different regulators are involved in the permitting process for shale development. Of these, the Health and Safety Executive is a non-departmental public body (NDPB)[13] of the Department for Work and Pensions, the Environment Agency is an NDPB of the Department for Environment, Food and Rural Affairs, Public Health England is an executive agency[14] of the Department of Health and Social Care and the Oil and Gas Authority[15] is an executive agency of the Department for Business, Energy and Industrial Strategy. The mineral planning authority was the county council, and as such the only relevant agency not connected to central government.

[13] An NDPB is "a body which has a role in the processes of national government, but is not a government department or part of one, and which accordingly operates to a greater or lesser extent at arm's length from ministers" (Cabinet Office, 2018).

[14] An executive agency is administratively distinct from a government department but remains legally part of it. Other examples of Executive Agencies include Companies House and the Disclosure and Barring Service.

[15] The Oil and Gas Authority was launched on 1 April 2015, then as an executive agency of the Department for Energy and Climate Change. Prior to this their responsibilities were vested in central government.

Figure 2.2: Regulatory collaboration and responsibilities for shale gas (Nottinghamshire County Council, 2016a, pt. 524).

Companies applying for a shale gas development followed a sequential process (see figure 2.4). Developers first had to obtain a petroleum exploration and development license (PEDL)[16]. After having secured the consent of the landowner[17], a developer could apply to the Environment Agency for an Environmental Impact Assessment (EIA). After this, the application for planning permission to the local authority could be submitted, followed by inspections from the Health and Safety Executive and Oil and Gas Authority.

[16] PEDLs cover specific areas of land, and obtaining one gives a company the right to pursue oil and gas exploration activities with that area. Onshore licenses were issued on a somewhat irregular basis, with the three most recent rounds occurring in 2015, 2007/8 and 2004. In many cases, the PEDLs for a particular area were obtained several years before the relevant shale application.

[17] Something that was not as straightforward in the UK compared the USA because UK landowners do not own mineral rights.

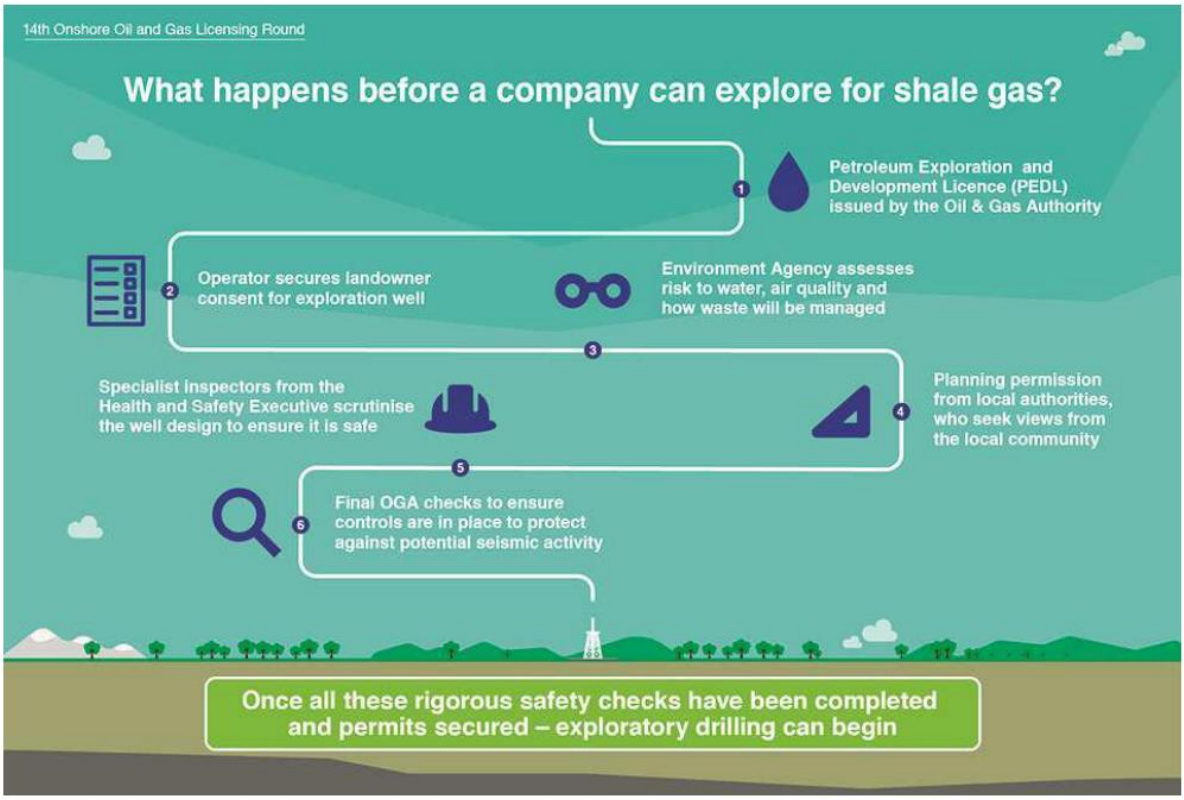

Figure 2.3: The shale gas permitting process (Nottinghamshire County Council, 2016a, pt. 524)

A veto player is an individual or organisation whose consent is required to change policy (Tsebelis, 1999, p. 593). As shown in figure 2.3 and figure 2.4, several organisations could be considered veto players in this process. However, the HSE, the Environment Agency, Public Health England and the Oil and Gas Authority are all associated – in one form or another – with the UK government. As independent veto players they are compromised through their accountability to government ministers. The Environment Agency in particular has limited ability to resist the will of the government (Bell and Gray, 2002). As the case studies will demonstrate, these bodies acted in concert with the pro-shale government, typically offering no objections when consulted during the planning process.

Local authorities are left as the one alternative veto player. The independence of these local authorities was often cited by supporters of shale gas as the reason the rate of development was not living up to expectations, something which also provided a justification for powers to be removed from local authorities. The government's references to "underperforming local planning authorities" that "repeatedly fail to determine oil and gas applications within statutory timeframes" and statements that "we expect every planning application or appeal, large or small, to be dealt with as quickly as possible" are illustrative of this attitude towards local authorities (Department of Energy

and Climate Change, 2015a; Department of Energy and Climate Change and Department for Communities and Local Government, 2015).

The advocacy coalition framework

Introduction

The conceptual framework used in this thesis is heavily based upon the advocacy coalition framework (ACF). I rely on the framework for two major purposes. Firstly, I use it assign actors to coalitions, as advocacy coalitions are a useful tool for analysing interactions in policy areas featuring a large number and range of actors. Secondly, I intend to use the framework's hypotheses of coalition characteristics and policy change to explain the outcomes of local authority planning applications.

The advocacy coalition framework, developed by Paul Sabatier alongside collaborators Hank Jenkins-Smith and Christopher Weible, is a useful model for examining the processes of coalition formation and policy change. It differs from other policy analysis methods – such as those viewing institutions as the dominant actors – because it recognises the actions and interactions of a large number of actors and organisations, as well as the important role that actors can play in shaping policy outcomes (Sabatier, 1988, pp. 139–140). In addition, the advocacy coalition framework is valuable for acknowledging that policy can be influenced by a larger number of groups than the traditional "iron triangle"[18]. Other advantages of the advocacy coalition framework can be found in its emphasis on the role played by external socio-economic factors and how it demonstrates the way ideas and beliefs can influence policy change.

These advantages all make the advocacy coalition framework particularly useful for considering the factors influencing the development of shale gas policy in the United Kingdom. This is a policy area that involves a large number of interested groups on each side, with decisions determined by beliefs concerning issues such as energy security, economic opportunity and environmental risk (Bomberg, 2015, pp. 7–9).

The ACF, has been adjusted and optimised by various authors. This development reflects the broad areas in which it has been used: mainly energy and environmental policy, but also domestic violence, tobacco, contraception, sport and disaster policy (Weible et al., 2009, p. 125). Similarly, I will alter several aspects of the framework to better reflect and explain the reality of shale gas policy in the United Kingdom over the last ten years. In particular, I will make changes to the way the ACF uses beliefs and coordination to assign actors to coalitions. Furthermore, the ACF sets out that policy

[18] A metaphor for the close and mutually beneficial relationship between legislative committees, administrative agencies and producer interests.

change should be considered over a period of a decade or more. In this chapter I will give my reasons for why this is not required in this study.

This chapter will introduce the advocacy coalition framework. It will then introduce various refinements that have been made since its introduction in 1988, as well as outlining the reasons behind the additional adaptations being made for this study.

Key concepts

Since its development in the mid-1980s, the advocacy coalition framework has been widely used, critiqued and adjusted. These continued refinements have seen the ACF's initial nine hypotheses (see Sabatier, 1988) expand to fifteen by 2009 (Weible et al., 2009, p. 129). The framework has continued to develop, with a 2017 review by Jenkins-Smith et al (2017) outlining two policy change hypotheses, five coalition hypotheses and five learning hypotheses.

In spite of this, the key components of the framework have remained relatively consistent. Firstly, the framework has remained critical of "artificial" distinctions, or stages, in the policy cycle and its notional starting and finishing points (Weible et al., 2009, p. 121). It typically insists that policy change should be considered over a period of "a decade or more" and claims that the most useful unit of analysis for understanding policy development is the "**policy subsystem**" (Jenkins-Smith et al., 2017, p. 97; Rozbicka, 2013, pp. 839–40; Sabatier, 1998, p. 99). Subsystems are the "networks actors form or operate within, to interact and coordinate actions with each other to influence the design of policy solutions (Ingold et al., 2017, p. 443). This means, for instance, that the areas of tobacco policy or of workplace health and safety regulations could be considered as policy subsystems. So too could shale gas in the United Kingdom, while shale gas in Lancashire might be considered as a subsystem within a subsystem.

Nested subsystems such as this, where policy subsystems reside within other policy subsystems, have been recognised within the ACF (Weible and Ingold, 2018, p. 329). Nested subsystems can offer different venues and develop differently from the subsystem they fall within, meaning that a minority coalition in one can be a dominant coalition elsewhere (Pierce et al., 2020, p. 80). Milhorance et al (2021, p. 574) noted that the definition of the boundaries of these subsystems can cause difficulties in understanding cross-coalition dynamics – something that could be an issue in this study.

Within the subsystem are a number of **advocacy coalitions**, "people [or organisations] from a variety of positions … who share a particular belief system … and who show a non-trivial degree of coordinated activity over time" (Sabatier, 1988, p. 139). Advocacy coalitions can easily be

differentiated from other political associations such as social movements, political parties or interest groups through their informal membership, involvement of any individual or organisation seeking to influence policy, the presence of shared beliefs and tendency towards stability (Weible and Ingold, 2018, p. 328).The number of coalitions present in a policy subsystem has been the subject of some debate, with Sabatier (1998, p. 108) observing that policy subsystems were more likely to consist of one to three coalitions, while Leifeld (2013, p. 170) argued that in some subsystems a single, hegemonic coalition was the "rule rather than the exception". My research provides evidence for both of these contentions: until 2011 there was only a hegemonic pro-shale coalition, but afterwards there were two opposing pro-shale and anti-shale coalitions.

Belief systems play a highly important role in the advocacy coalition framework, both in explaining the formation of a coalition and in the process of policy change. Sabatier (1998, p. 115, 1988, p. 137) defines belief systems as a "set of basic values, causal assumptions and problem perceptions". According to the framework, different actors are driven to coordinate their activity and form advocacy coalitions as a result of shared beliefs. With regards to shale gas, this led to a pro-shale coalition and anti-shale coalition, with the former believing that shale gas presents an economic opportunity and a means of assuaging energy security concerns, and the latter fearing that shale gas presents a risk to the environment, to local democracy and to the prospects for renewable energy.

The advocacy coalition framework is characterised by a "three-tiered belief system" (Weible and Ingold, 2018, p. 334). The first of these are ***deep core beliefs***: underlying ontological beliefs encompassing matters such as how individual freedom should be balanced against social equality, or whether humankind is inherently good or evil (Sabatier, 1998, p. 103). One level up from these are ***policy core beliefs***, which concern a given person's fundamental policy views and principles. These are slightly less abstract manifestations of the deep core beliefs, and include matters such as the extent to which one thinks the government should regulate the market and how power should be distributed across government (Sabatier and Jenkins-Smith, 1993, p. 31). At the surface of all this are beliefs in their most practical manifestation: the ***secondary beliefs***. These concern the ways in which policy beliefs should be implemented: the regulatory tweaks, nuts and bolts that make up the majority of policymaking.

Secondary beliefs are relatively easy to change, while an alteration of core beliefs would be "akin to a religious conversion" (Sabatier and Jenkins-Smith, 1993, p. 31). However, a change of secondary beliefs would generally require some form of compromise with a core belief, as specific secondary beliefs derive from the more general core beliefs. For instance, Cairney et al (2016, p. 15) found that the anti-shale coalition in the United Kingdom who wanted the government to intervene to stop

hydraulic fracturing [secondary belief] were also in favour of state intervention in the market [policy core belief]. It would be easier to change the coalition's view on whether fracking should be allowed, but doing so would require them to reach some form of accommodation between their pro-fracking beliefs and their pro-state intervention beliefs.

Finally, the "**policy broker**" is an important actor within the advocacy coalition framework. Sabatier (1988, p. 133) envisaged the policy broker sitting between two coalitions, acting as a mediator with the intention of finding a compromise. Administrative agencies, often holding more moderate positions than the coalitions, are often held to act as policy brokers (Leifeld, 2013, p. 171; Sabatier, 1998, p. 106). This does not necessarily mean that policy brokers can be assumed to be impartial. Dolan (2003, p. 231), for instance, observes that the National Economic Adviser played a role as policy broker of the National Economic Council, yet only ever tended to present one advocacy coalition's perspective to the president. Sabatier (1998, p. 119, 1988, p. 141) acknowledges that the same actor can be both a policy broker and a member of an advocacy coalition, but argues that a "relatively neutral" broker is required if opposing coalitions are going to find a compromise. This was supported by Ingold (2011) who found that actors with moderate or centrist views were best placed to reach compromise in case of a "hurting stalemate", though hesitated to label these actors as brokers due to their coalition activity. Beyond this, one aspect with particular relevance to this study is the hypothesis that technical information can be used to alter the views of policy brokers (Jenkins-Smith et al., 2017, p. 103). However, this should be treated with caution, having been identified as an aspect of the framework requiring further research (Christopoulos and Ingold, 2015; Jenkins-Smith et al., 2017, p. 106).

The advocacy coalition framework and policy change

By assembling a model of actors within a policy subsystem and assigning them to coalitions based on beliefs and coordination, the advocacy coalition framework attempts to explain policy change. The precise ways in which policy can change within the subsystem is one of the more contested aspects of the advocacy coalition framework, and I will offer my own proposals of variables to be used in the following chapter. The original ACF offered two pathways to policy change: external events and policy-oriented learning (Sabatier, 1988). With the addition of internal events and negotiated agreements, this was eventually expanded to four (Sabatier and Weible, 2007, pp. 204–206). Latterly, however, Weible and Nohrstedt (2012, p. 133) merged the four pathways into a single hypothesis, whereby the four factors outlined above "or some combination thereof" is a "necessary, but not sufficient" source of policy change. This amendment was suggested on the basis that the previous four pathways model was underdeveloped in offering an explanation between the occurrence and policy change (Weible and Nohrstedt, 2012, p. 133). My initial work supported this

contention, while I found compelling evidence of a combination of different factors instigated by an external event leading to policy change. For instance, external events (such as protests) gave anti-shale coalitions the means and motivation to augment their learning on a given issue.

The extent to which the activities of advocacy coalitions and policy brokers can lead to policy change are affected by three different types of **structural factors** (Sotirov and Memmler, 2012, p. 53). The first of these are **internal institutional factors**, such as how open the subsystem is and how amenable its actors are to consensus. **Stable factors** play a lesser role in influencing policy change because they themselves are less likely to change. They might include attributes such as the distribution of natural resources and their role in determining the wealth of a society and its major industries; cultural values and social structures, namely the distribution of power among different groups; and fundamental legal structures such as constitutional laws (Sabatier, 1988, p. 135). Most important to this study are **dynamic events**[19], which change far more regularly. These might include socio-economic change or technological development. This is typically the most important means of policy change identified in the advocacy coalition framework: a study of 67 applications of the advocacy coalition framework by Jang et al (2016, p. 42) found that 42 referred to external perturbations as the source of policy change. These events can be particularly resonant in energy and environmental policy, such as the 1973 Arab oil embargo spurring the development of nuclear power stations in afflicted countries, or the role of the Chernobyl disaster in dampening this enthusiasm in the late 80s (Bloomfield, 1975, p. 743; Yergin, 1988, p. 121). Rising environmental concern, changes of government and impacts from other policy subsystems can also be considered as dynamic events (Sabatier, 1988, pp. 136–7).

These external events can take hold within the policy subsystem in a number of ways. They can redistribute resources and in doing so provide an opportunity for a minority coalition to usurp the dominant coalition. It may also strengthen or intensify the beliefs of one coalition while causing other coalitions to doubt theirs (Sabatier, 1998, p. 118). External shocks can also produce a situation where all coalitions within the subsystem accept that the current situation is unmanageable and agree to negotiate a compromise (Olsson, 2009, p. 172).

In addition to external events, policy-oriented learning is another key means of achieving policy change. The advocacy coalition framework regards learning as being instrumental in nature: by improving their understanding of an issue coalitions have more ability to implement their objectives (Sabatier, 1998, p. 104). For learning to occur, it is hypothesised that coalitions must have the technical resources to engage in debate and that the debate does not involve the core beliefs of a

[19] Also, and often interchangeably, referred to as "external events" or "external shocks".

coalition coming into conflict with the opposing core beliefs of another. Learning is also more likely in a forum that is prestigious enough to force different coalitions to participate and for issues with accepted quantitative theories and data involving natural systems rather than social or political systems(Jenkins-Smith et al., 2017, p. 103). However, even when these conditions are fulfilled policy-oriented learning can by no means be assumed, and, similar to the way in which actors' commitments to their pre-existing beliefs can often be strengthened by learning within the coalition, attempts to engage in learning across coalitions can produce a "dialogue of the deaf" (Sabatier, 1988, p. 155).

While learning is key component of the advocacy coalition framework, I will not be treating it as a distinct variable as I will for external events. This is because the ACF attributes minor policy change to policy-oriented learning. The change I am studying – a rejected planning application – would represent a significant deviation from policy that could not be explained by learning alone. However, as seen in Nohrstedt's (2005) example of the Three Mile Island nuclear accident facilitating learning and policy change in Sweden, learning is more likely to lead to policy change when combined with an external shock.

External shocks and policy-oriented learning are the two enduring paths to policy change within the advocacy coalition framework, with a review of ACF applications by Jang et al (2016, p. 283) finding that internal perturbations or hurting stalemates were attributed with having contributed to policy change in fewer than 6% of studies. Much of the evidence I collected attributed coalition formation and shifts in relative power to external events, and as such this study will primarily focus on change deriving from them, though I will also consider how this combined with policy-oriented learning, largely by looking for evidence of information sharing within and between coalitions.

Finally, while they will not be a major component of my research, it is worth differentiating external shocks from internal shocks in order to avoid confusion. These result in policy change through the same mechanisms as external shocks, but differ in that they concern events happening within the policy subsystem rather than outside the subsystem (Nohrstedt and Weible, 2010, pp. 3–4). This is, admittedly quite a fine distinction: if I were studying the Balcombe drilling site subsystem the protests there in 2013 could be considered as an internal event, whereas in my studies of other shale gas subsystems they were treated as an external shock.

Amending the framework

The advocacy coalition framework (ACF) – and its emphasis on using coalitions formed by actors brought together by shared beliefs and coordinated behaviour to explain the way actors learn from

each other – proved a useful means of conceptualising this process. However, changes had to be made to the framework so that it would be suitable for answering my research questions.

This section will introduce three key areas of contention of the advocacy coalition framework, where I intend to make some adjustments. Two of these concern the ACF's conditions for coalition membership, where I will focus on secondary beliefs rather than policy core beliefs and on information exchange as a measure of coordination. Finally, I intend to place a reduced level of emphasis on Sabatier's requirement for the advocacy coalitions to be studied over a decade or more.

Conditions for coalition membership

Sabatier's (1988, p. 139) requirements that actors in a coalition must have shared beliefs and demonstrate a "non-trivial" level of activity have some value. The need for shared beliefs, as Sabatier puts it (1998, p. 107), "challenges the implicit assumption of most political scientists that an actor's organizational affiliation is primordial". In short, it provides a framework where actors otherwise assumed to be "passive", such as agency officials, researchers and journalists can be accommodated by the framework and have their role in shaping policy change fully appreciated. Similarly, it allows actors such as interest group leaders and legislators, normally assumed to be politically active and more driven by beliefs, to be more easily identified as passive or inactive when that is the case.

There are strong justifications for the role of coordination too. Actors might have shared beliefs, but that does not necessarily mean they should be considered as being in the same coalition. After all, it is entirely possible to have beliefs without advocating for them – or to have beliefs but neglect to act because one can free-ride on the actions of others with similar beliefs. Earlier applications of the advocacy coalition framework were criticised on the basis that it made the assumption that actors with similar beliefs would act in concert, a criticism that Sabatier (1998, p. 115) accepted. He responded to it by reemphasising the need for coordinated activity as a necessary condition for advocacy coalition membership(1998, p. 107).

However, there are several situations where something can be identified that looks like an advocacy coalition, and possibly behaves like an advocacy coalition, but does not easily meet Sabatier's conditions for what an advocacy coalition should be. A common feature in the shale gas case studies is the formation of an anti-shale coalition featuring members with different core beliefs. In the following section I intend to demonstrate the advocacy coalitions can be – and indeed, are – formed by members that do not share core beliefs.

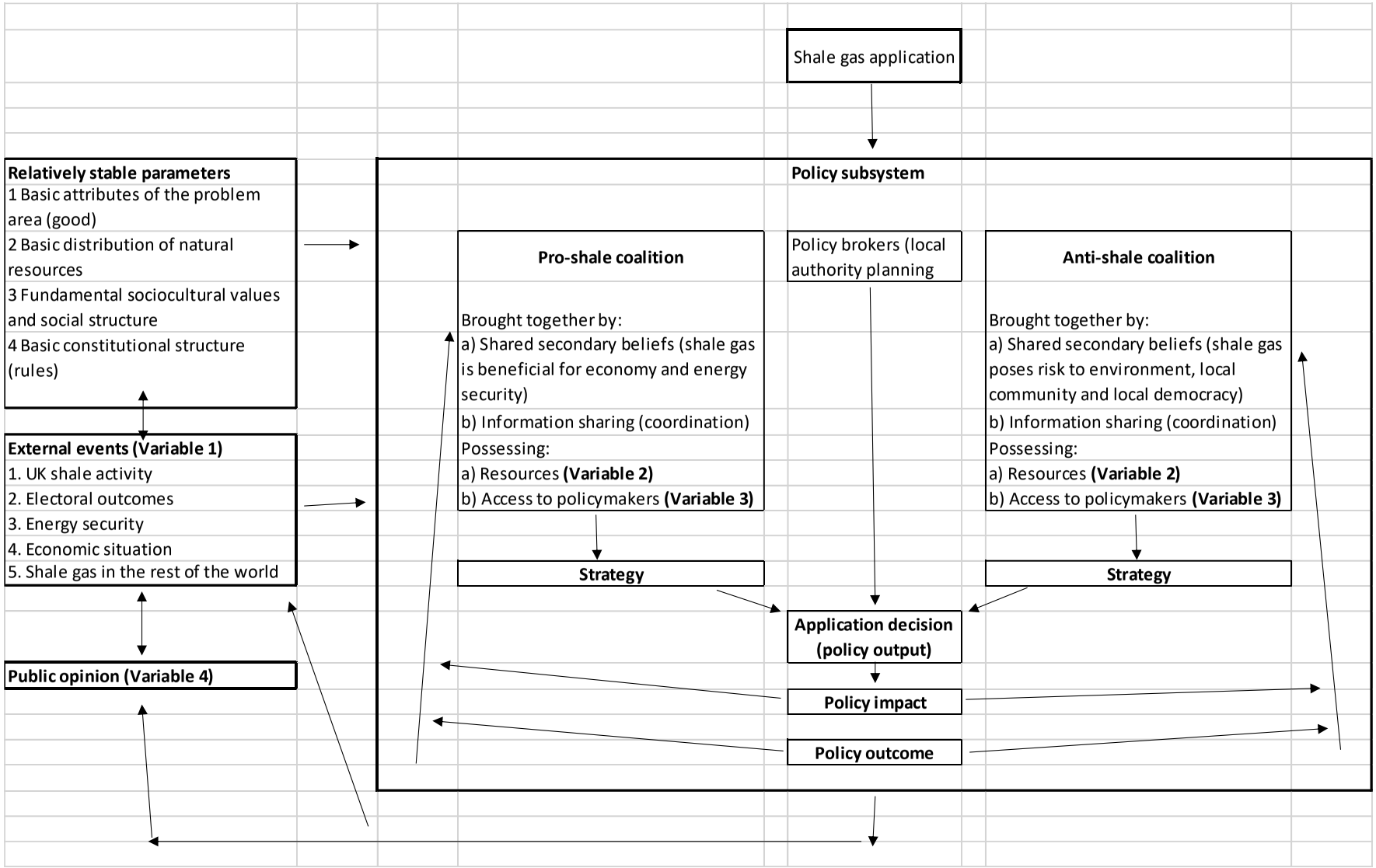
Shale gas application
Relatively stable parameters
1 Basic attributes of the problem area (good)
2 Basic distribution of natural resources
3 Fundamental sociocultural values and social structure
4 Basic constitutional structure (rules)
External events (Variable 1)
1. UK shale activity
2. Electoral outcomes
3. Energy security
4. Economic situation
5. Shale gas in the rest of the world
Public opinion (Variable 4)
Policy subsystem
Pro-shale coalition
Brought together by:
a) Shared secondary beliefs (shale gas is beneficial for economy and energy security)
b) Information sharing (coordination)
Possessing:
a) Resources (Variable 2)
b) Access to policymakers (Variable 3)
Strategy
Policy brokers (local authority planning
Application decision (policy output)
Policy impact
Policy outcome
Anti-shale coalition
Brought together by:
a) Shared secondary beliefs (shale gas poses risk to environment, local community and local democracy)
b) Information sharing (coordination)
Possessing:
a) Resources (Variable 2)
b) Access to policymakers (Variable 3)
Strategy

Figure 3.1: Diagram of the conceptual framework used in this study

Beliefs

In this study I choose to assign actors to coalitions based on the belief component of support or oppose the planning application being considered. This means assigning actors to coalitions based on a secondary belief. A secondary belief considers ideas about the best "instrumental means for achieving policy core ends" (Weible and Ingold, 2018, p. 334). A planning application is, I believe, an instrumental means: nobody takes a view on a planning application for its inherent existence as a planning application but rather for its ability to provide – or prevent – shale development, opposition for which derived from very different places. Proceeding on a such a basis involves a significant divergence from the framework, but I outline my reasons for doing so in this section.

The advocacy coalition framework does not comfortably accommodate actors with diverging core beliefs who continue to coordinate in policy activity on the basis of their shared secondary beliefs. The presence of environmental protestors and local homeowners coordinating because of their shared secondary belief formed the backbone of the anti-shale coalition, and a coalition model based on core beliefs risks failing to represent this situation accurately. This calls to mind the classic example of "Bootleggers and Baptists", where bootleggers and Baptists both lobbied for Sunday closing hours, albeit for very different reasons (Yandle, 1983).

Considering this in light of the ACF, Cairney (1997, p. 892) gives the examples of feminists and conservatives coordinating their activity in attempting to restrict the availability of pornography, an area in which their secondary beliefs are aligned, but are influenced by different core beliefs. He also highlights a similar situation with the alliance formed between Conservative Eurosceptics and the Labour party to defeat some aspects of the Maastricht Bill: a situation where the secondary beliefs and coordinated activity of the two actors derived from one actor's fear of pooling – or in their view, losing – national sovereignty, and the other's concern at some of the more liberal provisions of the single market and their simple wish to defeat the government[22].

[22] Recently, an arrangement similar to that seen in the Maastricht Bill arose during Theresa May's attempts to have parliament ratify the Brexit withdrawal agreement, where the "hard Brexiters" of the Conservative party and the Democratic Unionist party united with parties in support of a second referendum to vote down the bill on three occasions. In such an instance Sabatier and Jenkins-Smith (Sabatier, 1998, p. 119; Sabatier and Jenkins-Smith, 1993, p. 27) would be likely to contend that the hard Brexiters and the second referendum supporters formed two different advocacy coalitions, with each augmenting "its resources by developing 'coalitions of convenience' with a variety of other groups", something that they argued is "usually" required if an advocacy coalition is to achieve policy change. Sabatier (1998, p. 119) invoked the "pork barrel" politics of the US congress as an example of this procedure.

The reasoning behind this is that cooperative arrangements such as these are highly provisional affairs, and generally do not last long. Cairney et al (2016, p. 9) noted that "it is not easy to say" if this cooperation represented a short term "coalition of convenience" or "advocacy community" rather than a fully established advocacy coalition. The distinction between the two is not always easy to define, as coalitions of convenience can mature into advocacy coalitions as "ideological and coordinative congruence" increases (Ingold et al., 2017, p. 446; Stritch, 2015).

The 2016 UK fracking study identified a "hesitant" pro-exploration coalition and a "clearly" anti-fracking coalition (Cairney et al., 2015, pp. 16). While the actors were asked about their core beliefs, they were assigned to coalitions on the extent to which they agreed or disagreed with policy measures regarding the regulation of shale gas development in the UK – something that I could be considered as a secondary belief given that the regulations serve the instrumental purpose of facilitating or impeding shale development (Cairney et al., 2016, p. 10). Curiously, Cairney et al (2016, p. 13) found that the link between secondary beliefs and core beliefs was relatively loose, yet the deep core beliefs – in this instance taken be where they were situated along the axis of preferring individual market freedom or state intervention – of the pro-exploration and anti-fracking coalitions were not particularly different, something which the authors suggested "indicated that conflict might not be deeply rooted".

Other attempts have been made to supplant the role of core beliefs in coalition formation. Smith (2000, pp. 102–3) compared policy network analysis[23] to the advocacy coalition framework, showing each method could portray the same situation very differently. On one hand, Smith demonstrated that the advocacy coalition framework would reveal a "technocratic advocacy coalition" made up of inspectors and industry working together to "solve" the "engineering problem" of pollution – a unifying policy core belief. On the other hand, policy network analysis would recognise this as an example of resource interdependency, where the operator had far more technical information about their processes, putting the inspectors at a disadvantage in an asymmetric relationship. Smith (2000, p. 111) concluded that both frameworks have some merit, but both ultimately miss out a crucial part of the story. For the advocacy coalition framework, this is the role that resource interdependency can play in coalition formation, while the policy network framework, in turn, underplays the role of beliefs and policy communities in shaping change.

[23] Policy network analysis uses the policy network as a unit of analysis. It emphasises the role of resource interdependency as a source of stability within the network, with policy change occurring when external factors open the network to outsiders that are usually mediated and excluded.

Nevertheless, in this study I intend to continue focusing on the role of beliefs. However, I wish to challenge the assumptions made by the ACF. There are many examples – in UK shale gas and elsewhere – of secondary beliefs playing an important role in coalition formation. Secondary beliefs are particularly important here because the circumstances of my study goes somewhat against Ingold et al's (2017, p. 447) findings that hydraulic fracturing tends to "pitch actors with right-wing and economy-friendly beliefs against left-wing and environmental actors". This is clearly true for the shale debate at the national level, but at the local level the presence of anti-shale actors concerned at house prices and other economic aspects was far too significant. Whether to support an application is a secondary belief, and actors came to their conclusion for different reasons: concern for climate change for some and "nimbyism"[24] for others. Nevertheless, their cooperation was far too in-depth, and too enduring, to fit the descriptor of a "coalition of convenience". These actors co-opted each other's beliefs in their narratives, shared technical and political information and devised complex strategies, demonstrative of the ideological and coordinative congruence required to progress from coalition of convenience to advocacy coalition.

While core beliefs will not be used when identifying coalitions for this study, it should be noted that none of these points necessarily undermine the role of core beliefs in coalition formation. Shared core beliefs can lead to coalition formation, as can shared secondary core beliefs. The advocacy coalition's use of core beliefs as a mechanism for coalition formation should by no means be discarded, but there are good reasons to support it being elaborated upon further – particularly in the overlooked area of nascent subsystems or emerging coalitions, in which Uchtenhagen (2011, p. 186) found actors to be brought together more by "shared objectives" rather than core beliefs.

The benefits of focusing on shared secondary beliefs are firstly that they are easier to discern: actors are more likely to write or speak about their reasons for opposing or supporting a planning application than they are about their views on the extent to which business in general should be regulated, for instance. Secondly, it represents this particular situation far more accurately. There was so much coordination, pooling of resources and sharing of information between actors opposing shale gas for different reasons that a core beliefs-based approach would risk seriously misrepresenting the situation. Environmental organisations and local residents opposing shale gas on the basis of differing core beliefs would be assigned to different coalitions and this would not be appropriate representation of their behaviour.

[24] A pejorative term deriving from "not in my back yard", used to refer to people who object to developments in their own area while having no such reservations about the same development taking occurring elsewhere.

I feel that there is some value in attempting a different approach to the role of beliefs in coalition formation in terms of making a conceptual contribution. The prevailing belief system hypotheses have only found mixed support in ACF applications, with Jenkins-Smith et al (2017, p. 101) attributing this either to variations in conceptualising and measuring belief systems, or because the belief system is faulty overall. There are many alternative ways forward from this, and of these I found a focus on secondary beliefs most suited for the purpose of this study.

Nevertheless, there are alternative explanations. For instance, Matti and Sandström (2011) studied the role influence might have had in shaping coalitions alongside beliefs. For some time I considered studying the role influence and other such resources had in shaping coalitions but in collecting this information for the resources variable I found no evidence of it leading towards coalition formation.

Coordination

The meaning of coordination, Sabatier's second prerequisite for a coalition, has also been subjected to some debate. The previous section on beliefs brings coalitions together based on how they see the world. The added requirement of coordination (i.e. coalitions must involve non-trivial coordination) limits this further. In place of Sabatier's little-followed criteria for coordination, which I feel are over-demanding, I will interpret coordination as the exchange of political and technical information between actors with shared beliefs. In this section I will outline Sabatier's criteria before outlining the reasons behind my alternative interpretation.

Placing some kind of minimal threshold on the degree of requisite coordinated activity makes sense. Otherwise this would lead to situations where a passive consumer of news might be considered a member of a coalition simply through agreeing with it, making the whole idea of a coalition too broad to serve as a useful analytical tool. Nevertheless, while Sabatier's original ACF requires the behaviour of actors to be assessed when assigning them to coalitions, it has little to say about what threshold of coordination might satisfy this requirement beyond describing it as "non-trivial".

Sabatier's (1988, p. 139) original definition of an advocacy coalition states that it is made up of "people from a variety of positions … who show a non-trivial degree of coordinated activity over time". While, as previously outlined, the issue of beliefs serving as the glue in a coalition has attracted a great deal of debate, the matter of coordination has been somewhat neglected. Indeed, in the very same article where Sabatier set out above definition, he offers the example of the American air pollution subsystem in the 1970s, in which he refers an "apparent" divide between "two rather distinct advocacy coalitions": one supporting greater regulation and the other opposing

it (Sabatier, 1988, p. 140). Here, Sabatier outlines the shared beliefs of each coalition in detail[25] but he does not offer examples of coordinated activity occurring between the coalitions that could fulfil the criteria set out a page previously.

Much early work on the advocacy coalition framework overlooked the role of coordination. It is only more recently that it has become a "central interest" among advocacy coalition scholars, although beliefs have consistently been the predominant issue considered during coalition formation (Leifeld, 2013, p. 172). Indeed, Schlager (1995, p. 246) suggests that the lack of emphasis placed on coordination is built into the framework itself, with ten of its hypotheses relating to beliefs in some form but only two addressing coordination. Sabatier's disproportionate focus on beliefs can be understood, given his (1998, p. 117) assertion that beliefs, not coordination, are the "principal 'glue' holding a coalition together". This level of primacy makes sense, as coordination is much more likely to arise between actors who already have shared beliefs (Henry, 2011). Sabatier (1998, p. 108) himself was aware of this tendency towards the inconsistent application of the coordination prerequisite, noting that an advocacy coalition analysis he conducted in 1995 overlooked the requirement for coordinated behaviour. Upon reanalysing the data in 1997, this time with the criterion for coordinated activity included, Sabatier identified four coalitions, rather than the two which emerged in his original work.

Perhaps as a result of this early neglect, Sabatier elaborated further upon the meaning of coordinated activity, stating that "coordination requires agreeing on (a) the policy to be pursued, (b) the basic lobbying strategy (i.e. who should do what), and (c) some ability to monitor and enforce compliance with the agreed-upon strategy" (Sabatier, 1998, p. 116). Yet, this seems to raise more questions than it answers. First, agreeing on the policy to be pursued is – depending on the conception of beliefs being used – is little more than a restating of the requirement for shared beliefs. Secondly, it seems odd that Sabatier focuses on "agreeing" on the lobbying strategy but says nothing about the actual delivery of the strategy. What about actors at a grassroots level who might play a limited role in strategic discussions but will play a major role in delivering the strategy at a local level – regardless of whether they agree with it – due to their shared beliefs? Furthermore, such a pattern of behaviour needs to be developed over time (Stritch, 2015, p. 439).

Sabatier's requirements can cause methodological difficulties. If, in contrast, coordinated behaviour was simply taken to be "working together" or "acting in pursuit of a common goal", such meaningful activity can be more easily observed. It will not always be so straightforward to find out whether

[25] One coalition believing pollution was a problem and human health is more important than economic development and the other believing the opposite.

actors with the same views actually agreed on lobbying strategies or enforcement methods in order to determine whether they meet Sabatier's criteria. Moreover, it cuts out a lot of activity that otherwise would – and probably should – be considered coordination. In many local shale gas subsystems there is evidence of large, nationwide groups such as Friends of the Earth and Frack Off providing information such as research on air pollution and seismicity to smaller grassroots groups without necessarily telling them what to do with it. Without, in other words, agreeing on the basic lobbying strategy or ways to monitor and enforce compliance with that strategy. In a situation such as this, where actors with the same goals are sharing information, but in a relatively decentralised way in which each are free to decide how to pursue these goals, it seems unhelpful to consider them as being in separate coalitions due to insufficient coordination.

The advocacy coalition framework is fundamentally a tool for making studies of a policy subsystem more manageable, and it should, where possible, avoid setting tests that are difficult to demonstrate or bear little relationship with the reality being studied. On this basis, a number of authors have adapted the coordination requirement in ways that will better suit the particularities of their study. Focusing on information exchange has been found to be well-suited for studies of advocacy coalitions in shale gas. In their study on shale gas in the United Kingdom, Cairney et al (2016, p. 16) identified a pro-shale and anti-shale coalition, and in doing so stated that "actors within a coalition need to coordinate, and do so in a non-trivial way". In measuring coordination, they focused on "political and technical information exchange" (Cairney et al., 2016, p. 14). Political information is defined as: "information related to political affairs, i.e. information that allows your organisation to organise with others during the policy process". However, technical information, which is defined as "information on the technical aspects of unconventional gas development, as well as information on potential implications for the environment and neighbouring population", is just as important (Cairney et al., 2016, pp. 16, 30). Shale gas is a highly complex area, and smaller, less resourced actors relied heavily upon the provision of technical information from those with access to it. In 2014, there is evidence of information sharing between Friends of the Earth and Preston New Road Action Group, with each group appropriating the other's reasons for opposing shale gas development at Preston New Road (Lancashire County Council, 2015a, pp. 22–24). There was, in Cairney et al's terms, a great deal of technical information exchange, yet limited political information exchange. There are similar examples throughout almost all of the most contested shale gas applications.

This focus on information exchange is similar to another, slightly less restrictive hypothesis offered by Sabatier (1998, p. 116) with regard to "short-term" coordination, in which he states that actors sharing policy core beliefs are "more likely" to engage in such coordination if they interact

repeatedly, experience relatively low information costs and believe that there are policies that treat each actor fairly. This is something that there is clear evidence of in the pro-shale and anti-shale coalitions – sometimes over a short period of time[26], but often for periods of several years. This definition of coordination has significant explanatory power due to the patterns of information exchange, with evidence of such practices being widespread amongst actors with shared beliefs.

For these reasons, the approach to assessing coordination which I use in this thesis is coordination through information sharing. Information sharing, when it results in learning, is also an important aspect of the advocacy coalition framework with regards to policy change. With shale gas and hydraulic fracturing, the matter under dispute can be highly complex and technical, heightening the value of information – and, based on the observations of Cairney et al – can lead to situations where actors join coalitions and work together entirely in order to access it. When a local residents' group with limited technical and scientific resources begins to highlight research on the risks of fracking one might surmise that there is some information sharing, and therefore coordination, going on. In addition to this, this use of a relatively loose form of coordination better accompanies the use of secondary beliefs as the other "glue" for the coalition, as differences in policy core beliefs can be a significant barrier preventing more in-depth forms of coordination (Stritch, 2015, p. 450).

However, using information sharing as a measure of coordination poses problems in terms of where limits should be drawn. It could be coordination if a group provides another with information, but it would be inaccurate to identify coordination where someone just happened to read a pamphlet produced by another group. Assessing coordination by this means would require some form of active sharing of information from one group to another. Cairney et al deduced this by simply asking groups who they shared information with, but documentary evidence abounds of information sharing between actors in shale gas, whether this be the UK government listening to a developers' concerns or an environmental campaign group providing a template objection to smaller, less well-resourced organisations.

Sabatier's often-overlooked requirement for agreement on political activity is certainly reasonable: its presence should certainly be taken as an example of coordination. However, while it accommodates political information exchange, it has little to say about technical information exchange. Similarly, Weible's (2007, p. 106) proposed ally and opponent networks go some way to accommodating this but in doing so creates its own problems: groups might not mutually recognise each other as allies and it is possible for alliances and perceptions of alliances to shift over time.

[26] Although Sabatier does not state exactly how short "short-term" is.

This leaves information exchange as the most viable approach to take. It accommodates Sabatier's requirement for agreement on lobbying activity under the heading of political information exchange, but also accommodates technical information exchange, an example of coordination that is just as important in shale gas, which is notable for its high levels of decentralised, regionalised activity.

Policy change over a decade or more?

One of Sabatier's (1988, p. 131) key contentions is that the process of policy change requires a "time perspective of a decade or more" in order to be understood. The shale gas cases used in this thesis extend as a whole between 2009 and 2019. This gives an overall period of a decade, though the individual cases have a much shorter duration. However, as this section will outline, this will not pose serious problems to the research being carried out, and this requirement can be challenged in certain circumstances.

Prior to 2011, there was no anti-shale coalition. The few scattered objectors were anti-shale, but lacking in the coordination that would make them anti-shale coalition members. It is not unusual for a policy subsystem to contain several actors that are not associated to a coalition, though the framework assumes that they will be relatively unimportant until they either leave the subsystem or join a coalition (Rozbicka, 2013, p. 840; Sabatier, 1998, p. 103). This is precisely what happened as the shale gas subsystem began to form, and it further limits the timespan in which a fully-fledged policy subsystem with advocacy coalitions can be said to exist.

There has long been a distinction between "nascent" and "mature" subsystems (Sabatier, 1998, p. 111). However, little is known about how actors in nascent subsystems interact (Ingold et al., 2017, p. 443). Sabatier (1998, pp. 111, 114) suggests that a subsystem in the process of forming cannot be considered in the same light as one that has existed for a decade or more, which will have mature subsystem characteristics including active interest groups and specialised subunits at all levels of government. These traits were not present in British shale gas until the 2011 earthquake led to the creation of anti-shale coalitions and the government's post-moratorium determination to support shale gas development strengthened the pro-shale coalition[27].

Yet, the shale gas subsystem is not as nascent as it may appear. Sabatier (1998, p. 114) also spoke of new subsystems being "spin-offs" from existing ones, arising when a group of actors became dissatisfied with the neglect of a particular problem by an existing subsystem. Such an explanation could be applied to the UK's shale gas development subsystem: rather than being an entirely new subsystem, it was merely a "spin-off" of the existing onshore oil and gas subsystem, a relatively low-

[27] Such a coalition could be said to have existed before 2011, but it did not extend much beyond the shale companies themselves.

profile subsystem that had been existing for several years. Indeed, many of the same actors were present: the likes of the Department of Energy and Climate Change and the Environment Agency participated in both subsystems as regulators, while all the companies to apply to drill for shale gas also had conventional onshore interests.

Thus, the national level subsystem is consistent with Sabatier's requirement for policy change to be studied over a decade or more. But this is not consistent with the individual, regionalised cases, most of which are studied over a series of applications, often over a period of only a couple of years. These coalitions are not truly new. It would be more appropriate to label them as spin-offs of the nationwide shale gas subsystem, as the coalitions at regional level were anchored by many actors with a nationwide presence and very few of the regional actors acted independently of them.

Nevertheless, this shorter timeframe ought not to pose any problems: the aspects of the advocacy coalition framework being studied here, such as their formation and the impacts of policy change, learning and external perturbations, have been found to be present and consistent in nascent subsystems and emerging advocacy coalitions (Bandelow and Kundolf, 2011, p. 132). Furthermore, it is important to go back to exactly why Sabatier stated the requirement for a timeframe of a decade or more. He based this decision on the need to avoid focusing on short-term decision-making, to complete at least one formulation, implementation and reformulation cycle and to "obtain a reasonably accurate portrait of program success and failure" (Sabatier, 1988, p. 131).

If the advocacy coalition framework is being used for one of those reasons, it is perfectly reasonable to prescribe a generous timeframe – be it a decade or longer – for study. However, this should not rule out the use of the framework for studies of emerging advocacy coalitions, their formation or role of beliefs and coordination (Stritch, 2015, p. 443). I am attempting to explain these developments and the factors played the most important role in the success or failure of shale gas applications. I am not evaluating the policy but the circumstances of policy change. This means that while many of the coalitions studied are short-lived, the advocacy coalition framework remains a reliable tool for studying policy change.

Summary

The advocacy coalition framework is a valuable means of explaining the process of policymaking in an environment involving a large number of actors. It is flexible enough to accommodate policy subsystems that are high-profile and highly politicised as well as those that are more obscured or uncontentious. This makes it very useful for explaining shale gas in the United Kingdom. Furthermore, a key aspect of shale gas policy is that the relevant actors go well beyond policymakers, legislators and business interests. Civil society groups, environmental campaigners,

local residents, scientists, consultants and journalists all played very important roles in shaping outcomes. This, again, is another positive for the advocacy coalition framework: it is effective at explaining how these actors come together, how they work together, and how this can lead to policy change.

However, these circumstances of UK shale gas also indicated the framework was in need of adaptation, particularly with regards to coalition formation. As several others had found, actors can be part of the same coalition even if they do not share core beliefs, and the extent of their coordination and their willingness to learn is far too deep for the arrangement to be dismissed as a "coalition of convenience". Thus, actors will be assigned to coalitions on this study based on shared secondary beliefs.

The second amendment made concerns coordination. More often than not, applications of the ACF overlooked coordination entirely. I argue that doing so is highly problematic because beliefs on their own are not enough to limit coalitions and ensure they are a useful analytical tool. I would encourage other advocacy coalition scholars to be more transparent about how they define and measure coordination. However, I also argue Sabatier's (little applied) measure of coordination of agreeing upon lobbying strategies and monitoring compliance is also insufficient. The anti-shale coalition featured several actors who offered each other a great deal of support but would not be considered as members of the same advocacy coalition under Sabatier's definition. Instead, evidence of active information exchange will be required in order to better represent the activities of these decentralised and independent, yet closely networked, actors.

Finally, I outline the need to move away from Sabatier's requirement that policy change be studied over a decade or more, firstly because it can not easily be done in this case and secondly because it is not needed. The first shale gas drilling application was made in 2009, but it was not until 2011 that opposing advocacy coalitions began to form, leaving less than a decade before the last application was decided in 2018. The shale gas policy subsystem could be considered part of a pre-existing onshore oil and gas subsystem, but the escalation in public attention, the emergence of new coalitions and the new technology ultimately means that there is little difference as to whether it is considered an entirely new policy subsystem or merely one that has been radically transformed. Nevertheless, I have demonstrated that the aspects of the framework being studied in this thesis have been found to be consistent in both nascent and mature subsystems, and as a result this reduced timeframe will not be problematic.

The advocacy coalition framework "is probably the most ambitious of the various frameworks designed to explain policy development and change" (Capano, 2009, p. 23). This brings with it obvious benefits: it can be applied to a number of different settings, and it can allow for effective comparisons across jurisdictions, policy areas and timeframes. However, this lack of specificity also necessitates sacrificing some detail. The balance of adaptations and amendments outlined in this chapter effectively maintain the key components of the framework but will also allow the specific details of UK shale gas policy change to come through.

Having outlined the ACF and the changes I make to it, the next chapter will discuss how I obtain and analyse the data that I apply to it in order to discern coalitions and factors shaping policy change.

Methods

In this thesis I attempt to explain the outcomes of shale gas planning applications, with a particular focus on how factors internal and external to advocacy coalitions produced this result. In this section I will outline how I intend to answer this research question. I will address case selection, data collection, the use of case studies and the variables used in both the fsQCA[28] and case studies. Finally, I will introduce my hypotheses.

This research is undertaken on the basis of the assumptions of the revised advocacy coalition framework that were discussed in the previous chapter: namely that actors form coalitions because of shared secondary beliefs and coordination through information sharing in order to achieve their policy goals. I will attempt to determine the extent to which the selected variables – external events, relationships with policymakers, resources and public opinion – enable coalitions to succeed. The coalitions studied will be at a local level for two reasons. Firstly, as discussed in chapter 1, much of the responsibility for the stagnation of shale policy was attributed to local authorities. Secondly, the decision on whether to grant planning application taken by the local authority was the most important decision of the planning process and attracted a great deal of activity from pro-shale and anti-shale coalitions.

I used the fsQCA to identify the general trends and combinations of variables that are most likely to lead to successful outcomes for a given coalition. The subsequent case studies are used for their utility in showing how access can lead to influence and will also provide more detail on the ways in which coalitions interact and the way in which the variables can lead to success or failure. The definition of success varies by coalition. For the pro-shale coalition, success is a planning application that is accepted with minimal delays, while for the anti-shale coalition success is a rejected application. There are many instances of partial successes and failures – the most typical of these are applications that are accepted but with significant delays or conditions attached. These partial successes and failures will be accommodated within the fsQCA.

By comparing planning applications occurring in different local authorities, I will be able to offer generalisable explanations for their outcomes. The focus on the variables determining the success and failure of these applications will allow me to understand the interactions between coalitions and the extent to which this, and the role of resources, public opinion and relationships with policy makers, played in shaping the outcome of applications.

[28] The procedure for the fuzzy set qualitative comparative analysis (fsQCA) is outlined in more detail in chapter 5.

I also considered the possibility of bias when conducting this research. Prior to beginning work on this thesis I worked as a policy adviser at the Department for Communities and Local Government. Through previous work I have been involved in a number of shale gas policies and conducted research interviews and met a number of people involved in UK shale gas – including several named in this thesis. However, while I worked at a department responsible for several of the major policies discussed – such as the power to call in applications – the shale policies I worked on were of a technical nature (such as the permitted depth of boreholes and seismic testing regulations) and are not discussed here. Furthermore, my role was concerned with the assessment and review of policy proposals rather than the advocacy, development or implementation of the policy itself. However, this position was still significant for this thesis. It is what led to my interest in this area and my questioning of some established narratives. For instance, while I worked on a number of policies designed to enable shale gas development, there were not accelerated or prioritised any more than the many policies I worked on that were of far less significance. Now did I encounter any obstructionism from local authorities or failings to exercise due process. It was through this role that I first became interested in alternative causes behind local shale gas developments.

Methodological decisions and the ACF

The Policy Studies Journal's 2011 special issue "A Quarter Century of the Advocacy Coalition Framework" offers an interesting snapshot of data collection in the ACF, with differing approaches evident in Albright (2011), who combined interviews and document analysis, Nohrstedt's (2011) use of legislative content analysis and the questionnaires carried out by Ingold (2011) and Matti and Sandström (2011). In outlining these approaches – and others – Weible et al (2011, p. 353) noted that different research questions can lead to different theoretical focuses, and in turn to different data collection methods. In this study I chose to obtain information on beliefs, coordination and causal relationships through documentary sources, primarily local government documents and newspapers. Different approaches have been successfully used in ACF applications with regards to shale gas in the UK. I will outline these methods before discussing why I believe the data collection methods I used were suitable for the nature and circumstances of my research.

In answering my research questions I require data for two major purposes. The first of these is to inform the assignment of actors to coalitions, which involves the identification and collection of data on beliefs and coordination. The second is the collection of data on the causal factors determining the outcome of applications. In this section I will outline some approaches that have been successful in prior applications of the advocacy coalition framework. I will build upon this to outline – and to justify – my own decisions.

In a recent review of ACF applications, Jenkins-Smith et al (2017, p. 107) stressed the contextual nature of data collection and the need to use "the best methods given the research questions, contexts and resources" of the researchers. As such, there is considerable utility in studying similar applications of the advocacy framework and taking stock of the methods used. Here, a logical place to begin is the work of Cairney et al (2018, 2016) and Ingold et al (2017), who conducted ACF studies on fracking in the UK, as well as that of Bomberg (2015) who approached the same subject using coalitions – albeit discourse coalitions rather than advocacy coalitions. Here Cairney et al (on both occasions) conducted a wide-ranging survey where information on beliefs and coordination was derived by asking actors who they agreed or disagreed with, the type of information they exchanged and who they exchanged it with, their positions on a variety of fracking related policy questions and their perception of a variety of problems attributed to fracking (Cairney et al., 2018, pp. 144–147). For Cairney et al, this produced a reliable picture of pro-fracking and anti-fracking coalitions at the national level, with the study reporting a response rate of 53% and yielding a list of 34 organisations. While sufficient for Cairney et al's purposes the issue of survey responses posed a problem for my own research questions: I was focusing on the local level where actors are smaller, harder to contact and less enduring than those at the national level. In a number of isntances, a full complement of responses is not always necessary. However, given that my research questions focused on the role of coalitions in shaping policy outcomes, I was not willing to risk the potential oversight of a crucial actor due to non-responses. This was particularly important given that shale developers – perhaps the most important actor as the one issuing the planning application itself – had proven highly reticent and unwilling to talk in my previous work on this subject.

Bomberg (2015), while not using advocacy coalitions specifically, sought to assign UK shale gas actors to coalitions by relying on an analysis of newspapers. This made sense in the context given that this was a discourse coalition study and shared discursive frames were used to assign actors to coalitions[29], but documents have also been used to identify beliefs and coordination in advocacy coalition studies. A 2017 overview of 161 ACF applications between 2007 and 2014 by Pierce et al (2017, p. S26) found that 63% of framework applications used interviews and 58% used documents. This is a significant increase on a 2009 review by Weible et al (2009, p. 127) which found that 32 of 80 applications involved interviews in some form. Much of this increase can be attributed to the "recent phenomenon" of combining interviews and document analysis (Pierce et al., 2017, p. S26). One such example of this combination Albright (2011) which concerns 200-year timeframe of flood management in Hungary. Here, Albright (2011, pp. 490–1) conducted interviews with Hungarian

[29] The discourse coalition study conducted by Montefrio and Sonnenfeld (2011) also offers a very useful overview of the use of documentary sources in identifying coalitions.

officials but relied on a variety of documents to provide evidence of beliefs, coalitions and coordination across the full timeframe being studied.

I initially considered a similar combination of interviews and documentary sources. Interviews are well established within the ACF and are useful for data collection and identifying further stakeholders to interview (Weible, 2007, p. 103). However, a thorough ACF study involving data collected through interviews can be resource-intensive (Rozbicka, 2013, p. 842). Given the wide range of actors and different sites that I had to consider, doing interviews would certainly be time and resource intensive.

However, by not conducting interviews it is likely that I might have missed out on some important information. Interviews offer the possibility of insight to study access and interactions occurring outside official channels – something that is very difficult to observe through documents alone (Binderkrantz et al., 2016, p. 11). Within the ACF the nuanced discussion of beliefs and coordination it can allow is also likely to permit a more precise and accurate assignment of actors to coalitions, while it can also be useful in identifying further stakeholders to interview.

That being said, I am reasonably assured that the extra time and resources expended in conducting interviews would not be proportionate to the additional information gained. Moreover, interviews – and other approaches relying on testimony from actors themselves – can be flawed themselves. For instance, if an interest group is asked if they influence policy they might not always be inclined to tell the truth. They might also have an inflated sense of their own importance (Helboe Pedersen, 2013, p. 39). On matters of influence and resources I found documents to be particularly reliable because they can provide an observable measure of interactions between actors that can be compared and are independent of those actors perceptions, honesty and memories (Binderkrantz et al., 2016, p. 11).

One problem in looking to previous studies using documents in the ACF is that there is often a lack of transparency or specificity about the number of type of documents being used (Pierce et al., 2017, p. S26). However, Fisher et al (2013) are among those that have offered extensive descriptions of the documents identified. Here, they used transcripts of US Congressional testimonies to classify actors and identify coalitions (Fisher et al., 2013, p. 527). For the purposes of my own research, I regarded congressional testimonies, where actors state their policy goals, as broadly equivalent to the consultation responses and committee hearings which I used to assign actors to coalitions.

While consultation responses and committee reports were particularly useful in identifying the beliefs and coordination of actor, the second aspect of my data collection – where I aimed to find

the relationship between coalition activity, variables and policy outcomes – benefited from considering the full range of documents submitted to local government during the application process, in addition to newspaper articles and press releases. Such an approach was my preferred option due to its utility in helping to build and understanding of various aspects of the policy formulation process – particularly in problem definition and agenda setting (Kinney, 2005, p. 252).

Data collection

To answer the research question it is necessary to understand how local governments decide applications. During the period being studied there were nine locations in the United Kingdom where applications to drill or hydraulically fracture for shale gas had been made. At the majority of these sites, the prospective developer made ancillary applications in addition to the main drilling application. These included applications for projects such as site restoration or the erection of a security fence. While these applications did not concern drilling or hydraulic fracturing, they were made in order to enable these procedures to go ahead. As such, these applications often provoked just as much activity as applications to drill or frack, and they will to be considered to give a fuller picture of relevant developments. With applications at the same site often overlapping and being considered simultaneously, using an application as the unit of analysis would be unwieldy. Instead, for the case studies I use the site – encompassing all applications – as the unit of analysis. Where possible, I addressed separate applications in distinct subsections.

All the data I used in this research came in the form of documents. These fall under two main categories. Firstly, there were the documents associated with the application. These included the application itself, supporting statements, committee meeting minutes, scientific reports, consultation responses and objections. These were relatively easy to obtain, with each county council hosting these files grouped by application on their website[31]. Secondly, I conducted searches using the terms "'[SITE NAME]' AND 'shale gas'" and "'[SITE NAME]' AND 'fracking'" for news stories during the relevant application periods at Nexis.com. These were of secondary importance to the application documents but were useful for providing detail on the wider context and for publishing interviews with actors and liveblogs of protests and committee meetings.

This process produced a large number of documents for each case. The majority of these documents were largely irrelevant to the issues being researched, focusing entirely on scientific studies. I sifted through these documents and highlighted those that were relevant to the variables being

[31] These can be found at https://planningregister.lancashire.gov.uk for Lancashire County Council, at https://www.nottinghamshire.gov.uk/planningsearch/ for Nottinghamshire County Council and at https://onlineplanningregister.northyorks.gov.uk/register/ for North Yorkshire County Council. Further details on accessing these documents will be provided in Appendix 2.

considered or provided evidence (through an actor's beliefs and coordination) of coalition membership. I retained the documents that met these criteria and stored them on Zotero, where it was easy to highlight the key points and ensure that they were all considered in the case studies or when assigning values to variables for the fsQCA.

The documents I relied upon were freely available on newspaper and local government websites. Nexis.com allows the user to view stories from any news source, but where news sources were directly cited in this thesis I tried to avoid sites with paywalls and reference freely available sources where possible.

I followed Scott's (1990, p. 19) four quality control criteria for documentary sources: authenticity, credibility, representativeness and meaning. The documents I used can be relied upon to be authentic – they are what they claim to be and are written by who they claim to be written by – as they are hosted on local government websites or from reputable news sources. The question of credibility concerns how sincere the author is when expressing themselves and worth considering as one of the most important aspects of the document analysis is using consultation responses in order to determine an actor's beliefs. Determining the sincerity of a document involves assessing why that document was produced. In this research I have chosen to assume that an actor's reason for stating what they claim to be their beliefs is because those are their beliefs. They were actors seeking to influence the decision-making process and they are explicit about this.

It is possible that actors make a statement of their policy beliefs not to state their policy beliefs but to be included in a coalition, and that they want to be in this coalition because of shared interests or resource dependency rather than because shared beliefs (Rozbicka, 2013, p. 849; Weible, 2005, p. 461). This was something that I looked for carefully in the early stages of this research – initially planning to include resource dependency as a distinct criterion for coalition formation – but found no evidence for it. As such, it is reasonable to assume that the actors involved are sincere in the documents they write, and that those documents are credible.

The documents used can also be assumed to be representative of all relevant documents. The Information Commissioner's Office's (2013, p. 7) model publication scheme for local authorities requires them to publish records of decision-making processes and data used when making decisions – including public consultations. A requirement to publish does not necessarily mean that the information will be published, but the references of documents to other documents – the planning decisions, for instance, mention a large number of other documents – show that the overall range of documents I had access to was sufficiently representative. There were a few challenges: it was reasonably common for a document to make reference to a letter or a consultation response that

was not available. However, the key aspects of these documents could be obtained from the documents mentioning them.

The last of Scott's (1990, p. 22) quality control criteria is meaning, or how "the researcher relates the literal meanings to the contexts in which they were produced in order to assess the meaning of the text as a whole". Understanding the meaning of these documents proved to be an uncomplicated process. The documents were written to inform the planning committee or attempt to persuade them. As a result, they are clear about their meaning and it is consistently easy to derive.

All things considered, these documents proved a reliable, efficient and easily accessible data source and as I proceeded with the research I found that the documentary sources available were more than sufficient and that interviews would have been unnecessary. This is not to say that interviews could not have been used to achieve the same ends, but the extent to which technical data was involved and the number of actors that changed their beliefs throughout the process meant that document analysis proved to be the most efficient and reliable approach to take.

There are, of course, limitations to using documents only. In the previous chapter I outlined that I would require evidence of coordination when assigning actors to coalitions, and that this coordination would be identified through information sharing. References to information sharing were easy to come by in the documents I assessed. However, this information sharing itself was not always public, so it is quite possible that were instances of information sharing that were missed, leading to actors not being in coalitions when they should be.

Data analysis

Using a site as the unit of analysis proved to be the most appropriate means of applying the advocacy coalition framework. It enabled me to observe the interactions and activity of coalitions and the local government over an extended period of time, to observe the factors shaping their decision-making and how that changed for subsequent applications.

Unit of analysis
fsQCA: a coalition at a shale gas drilling site (e.g. pro-shale coalition at Grange Road; anti-shale coalition at Grange Road
Case studies: a shale gas drilling site (e.g. Grange Road)

While a focus on the prospective drilling site proved suitable for the case studies, it was less so for the fsQCA. As the pro-shale and anti-shale coalitions relied on different combinations of the variables to different extents a study of the way in which these variables led to success or failure

across a number of sites did not produce any useful information. This problem was overcome by dividing each site into two, so that the unit of analysis became a given coalition at a given site. For instance, the pro-shale coalition at Grange Road or the anti-shale coalition at Preese Hall. This allowed for clearer results, and meant that I was able to combine pro-shale and anti-shale coalitions into one analysis to find overlapping trends and carry out separate analyses for each type of coalition in order to find the conditions most conducive to success or failure and how they differed for supporters and opponents of shale gas.

Case selection
fsQCA: all the coalitions at all nine drilling sites (18 cases in total)
Case studies: three drilling sites (Grange Road, Kirby Misperton and Tinker Lane) within different local authorities across different timeframes

Each of these nine sites where shale drilling applications had been made would be considered in the fsQCA, doubled up so that each site had a pro-shale case and an anti-shale case and producing eighteen cases in total. I narrowed down the nine possible cases using two criteria. First of all, applications were made to three county councils – Lancashire, Nottinghamshire and North Yorkshire. It made sense to consider one from each authority in order to provide insight into how the decision-making process varied by location. Secondly, one of the key aspects of the study is the role played by the UK government as a member of the pro-shale coalition and their interactions with local governments. It was important to show how this developed over time and I wanted to ensure that a significant part of the 2009-2019 timeframe was represented in the case studies. By applying these criteria, I selected Grange Road (Lancashire County Council; 2010-2016), Kirby Misperton (North Yorkshire County Council; 2012-2016) and Tinker Lane (Nottinghamshire County Council; 2015-2017). This case selection proved to have additional benefits. Firstly, each site was licensed to a different company. Secondly, while many cases overlapped, the key decisions in each case were made at very different points. This allows for a full picture of shale gas in the United Kingdom to be provided in these three cases.

Why use the fsQCA?

In this section I will outline the use and value of the fsQCA. There will be less emphasis on how an fsQCA is actually performed, as I intend to introduce that fully in the next chapter.

The fsQCA has an energetic and active community that has developed a range of tutorials and workshops, meaning that it is relatively straightforward to carry out an fsQCA. It has been used in a variety of areas, including marketing research, organisational performance and political science (Gligor et al., 2021; Oyemomi et al., 2016; Vis, 2011).

The primary reason I chose to use the fsQCA is for its ability to capture what Schneider and Wagemann (2013, p. 324) call "conjunctural causality": an occurrence where the outcome of a single condition is influenced by a combination with other conditions. The recognition of conjunctural causality follows from the existence of "equifinality", or " a scenario in which alternative factors can produce the same outcome" (Schneider and Wagemann, 2013, p. 6). An fsQCA provides a means of unravelling these "causally complex patterns" (Schneider and Wagemann, 2013, p. 8).

Vis (2012), considered the comparative advantages of fsQCA and regression analysis by carrying out an analysis of the conditions under which governments increase spending on labour market policies using both methods. She concluded that the fsQCA was more suited for identifying multiple causality, as the five hypotheses – three of which included interactions – could not be tested simultaneously in a regression analysis, while interpreting interactions between several variables was "challenging" (Vis, 2012, p. 190).

One of my primary motivations for using the fsQCA was its use in previous research concerning shale gas., with Van de Graaf et al (2018) using it to determine the role of different factors – or combinations of factors – had in shaping regulatory outcomes for shale gas in Europe. In this study they demonstrate that shale gas policy outcomes cannot always be explained by a single factor. Their finding that the combination of a multilevel governance system and advanced economic development results in restrictive regulations is not something that would be easily uncovered using another method (Van De Graaf et al., 2018, p. 1289). This study is one of a relatively small number to investigate the factors shaping shale gas policy outcomes in Europe. With Van de Graaf et al having shown that these outcomes arose from a complex combination of variables – and with several of these variables being applicable at the local level, I was confident that the fsQCA would prove similarly useful for studying shale gas with regard to local government decision-making.

There are, however, some drawbacks to the use of the fsQCA. In Vis's (2012, pp. 190–191) comparison of the fsQCA and regression analysis, she noted that regression analysis was better suited for assessing the average effect of a variable and required less prior causal knowledge from the analyst due to its empiricist foundation and lack of a requirement to calibrate data. The data calibration requirement is certainly a potential disadvantage of the fsQCA, as the calibration of data is influenced by the researchers prior knowledge and understanding of the issue, leaving it open to confirmation bias. This is one of the major "troubling weaknesses" of the fsQCA identified by Krogslund et al (2015, p. 22), who find that fsQCA results are very sensitive to the minor parameter changes that could arise – consciously or unconsciously – from confirmation bias. They also noted

that in their analysis the fsQCA was "consistently failing to exclude random variables from the configurations found to be sufficient for a particular outcome" (Krogslund et al., 2015, p. 39).

I certainly encountered issues in this regard in my own use of the fsQCA. For instance, my decision to score outcomes 0.0, 0.3, 0.7 and 1.0 could just as easily be assigned values of 0.0, 0.2, 0.4, and 1.0. Jennings et al (2017, p. 23), reported a similar issue whereby the co-authors gave differing scores for cases, although they implied that this was of limited concern as there was no disagreement as to whether values were above or below 0.5. This scale of four values, which Ragin (2009, p. 5) terms as "fully out," "more out than in," "more in than out," and "fully in,", is also often recorded as 0, 0.33, 0.67 and 1.0. My scores represent these numbers rounded to one decimal place. In practical terms, this did not make any difference to whether a combination of variables was considered as a potential cause of an outcome, as this is determined whether variables are scored above or below 0.5. However, different scales may have a slight impact on the extent to which the fsQCA suggested a given combination of variables had an impact on an outcome.

In designing this research I considered the four limitations of the fsQCA highlighted by Li and Bathelt (2021, p. 389). The first of these are that results are sensitive to the "careful selection of cases", the second is that it "cannot quantify the specific role of conditions", the third is that it may have limited value where case numbers are very small and the fourth is that calibration is "somewhat arbitrary". I attempted to address the first of these issues by considering all shale gas drilling sites in the UK and mitigate the problems of the second by providing greater detail on the role of conditions through the case studies. With the regards to the third limitation, my eighteen cases broadly reflect a number of successful fsQCA applications. Finally, the issue of arbitrariness or confirmation bias – which I consider the most significant of these limitations – is mitigated through outlining the reasoning behind my calibrations in the appendix and using the case studies – which by considering six coalitions at three sites will provide more expansive detail on a third of the cases analysed in the fsQCA.

Combining case studies and the fsQCA

For the reasons outlined above, I considered the fsQCA to be highly applicable and relevant to the local dynamics of UK shale gas. However, due to the stated limitations, I was not fully confident that the fsQCA would be able to provide a full and reliable answer by itself. To address this, I decided to complement the fsQCA with three case studies of three drilling sites each featuring two coalitions.

My reasons for this are as follows. Firstly, case studies allow a greater appreciation of the extent to which a variable played a role in shaping that outcome, going beyond the fsQCA which merely states that a variable did or did not play a role. Secondly, the case studies will allow a greater consideration

of why (or why not) a given variable did (or did not) shape an outcome. Third, I hope that they will offer some transparency, giving a full and descriptive outline of why I scored one third of the fsQCA cases the way I did. This was to some extent built into the case studies: I have clear headings that reflect each of the variables of the fsQCA. Fourth, I use the case studies as a means of "sounding the alarm" if the fsQCA's limitations in terms of randomness or arbitrary calibration were to produce wildly different results – an outcome that would suggest a need to revisit the methods considered and the data analysed.

A case study is used to investigate "a contemporary phenomenon within its real life context" (Yin, 1994, p. 12). Given that the factors shaping the "phenomenon" being investigated were not clear at the outset of this research, the case studies proved useful at highlighting possible key variables and relationships. By conducting smaller scale preliminary case studies, I was able to gain insight into the key relationships that later enabled me to build a framework for the fsQCA. Afterwards, I returned to the case studies in more detail, and attempted to systematise them using the same variables as the fsQCA. Here, the two methods supported each other, and also enabled alternating inductive and deductive processes, where tentative conclusions are brought up, further investigated and discarded if proven to be invalid (see Hyde, 2000, p. 85; Kirk and Miller, 1986, p. 25).

I approached each case study systematically to enable easy comparison and consideration of separate variables. Each case study begins with a brief narrative. The actors involved are introduced before each variable is addressed and overall conclusions are drawn. In research such as this – where among other things I aim to find out how different coalitions act, interact, attempt to access decisionmakers and influence policy – case studies can be highly valuable. In particular, they are useful for highlighting informal access points and for showing ways in which access can lead to influence (Binderkrantz et al., 2016, p. 11; Voltolini and Eising, 2017). However, information derived from case studies cannot be generalised. I introduced the fsQCA in order to mitigate this: the fsQCA can highlight general trends that appear across all the cases, while the case studies can highlight the ways in which these trends might manifest themselves. For instance, the fsQCA might tell us that the anti-shale coalition relies on external events for success, but it cannot tell us the nature of these external events. The case studies can tell us what type of external events can occur that favour the anti-shale coalition, but it cannot tell us how often they occur, or how likely they are to lead to success. Combining the two methods will preserve the strengths of each, while going some way towards addressing their drawbacks.

The case study approach has some other limitations. The volume of available information proved to be so wide that there was always a real risk of selection bias. To a certain extent, "what one finds is

contingent upon what one looks for" (Gerring, 2004, p. 351). This issue is not entirely avoidable, but I have attempted to manage it by conducting a number of case studies and considering all cases in the fsQCA to give the themes that are most prevalent across cases the best possible chance of being addressed. The case study method has regularly been used with the advocacy coalition framework, where it has been able to show how coalitions interact with each other and react to policy developments (Weible et al., 2009, p. 131).

Broadly speaking, I intend to use the fsQCA and case studies in order to accentuate the positives and mitigate the negatives of the two aspects. What the fsQCA lacks in nuance and specificity is addressed by the case studies, while the risk of a case study placing too much emphasis on conditions that may only exist in a given site and giving an incorrect impression can be corrected through use of the fsQCA.

Defining and measuring variables

This thesis will test for the following four variables, all of which appear to have played a significant role in shaping the outcome of shale gas applications:

1. External events
2. Resources
3. Relationships with policymakers
4. Public opinion

In the advocacy coalition framework Sabatier (1998, p. 119) outlines different "paths" towards policy change, each encompassing a combination of different variables. Later revisions of the framework merged these four pathways into a single hypothesis, whereby external or internal perturbations, policy-oriented learning, negotiated agreements or some combination of these is a "necessary but not sufficient source of change" (Weible and Nohrstedt, 2012, p. 133). It is necessary but not sufficient because policy change is also contingent on how a coalition can exploit the opportunity arising from these perturbations. This can be exemplified by an external event leading to the redistribution of resources within the coalition, which in turn enables a coalition to achieve its goals, such as ensuring an application is refused. The fsQCA component of this thesis will focus on finding the combinations of variables that are most likely to result in a coalition achieving the policy decision they want from planning authorities. The advocacy coalition framework allows room for several different variables to shape outcomes (Capano, 2009, p. 21). The use of the fsQCA requires variables to be outlined clearly, and the following chapter will explain why external events, resources, relationships with policymakers and public opinion have been chosen, and outline how they will be measured. For the sake of consistency, these variables will also form the foundations of the case studies.

External events

There are various types of external events. For instance, in his first application of the advocacy coalition framework Sabatier (1988, pp. 132–3) drew attention to a number of variables affecting air pollution policy. These included relatively stable factors such as air quality, geographical features and political boundaries, but also more dynamic ones such as socio-economic conditions like unemployment and oil prices, as well as the nature of the present governing coalition. It is changes in aspects external to the policy subsystem that I will consider as external events.

Olsson (2009, p. 172) outlines three ways in which events can result in policy change within the advocacy coalition framework. Firstly, the event can redistribute resources and open new venues for a minority coalition to exploit. Secondly it can strengthen the beliefs of a minor coalition while causing the dominant coalition to doubt theirs. Thirdly, all the coalitions can conclude that the current situation is unacceptable, leading to a compromise being negotiated.

On this basis, external events can lead to policy change, but something else is required. Events provide the means for policy change to occur, rather than directly causing it themselves. This is because the external shocks also need to be accompanied by a coalition that is "capable and willing to exploit them entrepreneurially" (Rozbicka, 2013, p. 841; Weible et al., 2009, p. 124). This underlines the importance of the resources variable: external events mean little if a coalition lacks the resources to take advantage of them.

Shale gas development policy in the United Kingdom shows signs of being profoundly affected by a variety of external shocks. For instance, the 2011 earthquake at Preese Hall brought a previously low-profile policy subsystem to a whole new level of prominence, while the US "shale boom" and mounting oil prices and energy security concerns drove the British government to take a more explicit pro-shale stance by promoting shale-friendly promises and attempting to expedite planning applications where possible. Elections, both at a local and national level, changed the composition and balance of power between coalitions: the 2013 Lancashire elections produced a council that was no longer under Conservative control, which was followed by a number of shale applications being rejected. The 2015 general election resulted in a Conservative majority government, and a notably more pro-shale stance in the period immediately following the election.

It is difficult to produce an exhaustive list of developments that can impact shale gas policy. Some occurrences might be esoteric or localised, carrying significance for only a single case. However, most attention will be given to a smaller number of external events that are relevant across most or all cases. Some form of bounding is needed here, as what could be considered as an external event could be practically infinite. In a study of external events in the advocacy coalition framework, Jang

et al (2016) found that the key sources of external perturbations in policy change were, in order of importance, changes in systemic governing coalitions, changes in socioeconomic conditions and policy decisions and impacts from other subsystems. The five categories of external events selected for study can be thought of as analogous to these, but more specific to the circumstances of shale gas. These categories were arrived at on the basis of my preliminary research[32] and continuing data collection and analysis reinforced their relevance. These categories are as follows:

- UK shale gas activity, such as protests or applications at drilling sites external to those being considered in a given case. The 2013 protests at Balcombe or the Preese Hall earthquake are obvious examples here.
- Electoral outcomes: the composition of national and local governments and the policies this allows them to implement. These include events such as the 2013 local elections or the end of the coalition government in 2015.
- Energy security. The relationship between energy security and support for shale development has been investigated on a number of occasions. It is perhaps most explicit in shale gas policy from its presence in the National Policy Planning Framework, which stipulates that energy security must be considered when local authorities assess shale gas planning applications. In addition to planning committees being compelled to focus on it, energy security also formed a key part of the narratives pushed by the pro-shale coalition.

[32] This consisted of a review of the documents for Lancashire, Nottinghamshire and North Yorkshire, taking a general view and not focusing on any single site.

Variable		Definition	Example	Data source and measurement	Purpose of investigation
Extemal events	UK shale activity	Shale developments at a national level, and at sites other than the one being studied.	The Preese Hall earthquake in 2011, or the Balcombe Protests in 2013.	News stories, consultations, applications, documents from the application process and committee meetings.	To determine whether the variable being measured influenced: 1) other variables 2) coalition behaviour 3) the outcome of shale applications. This will be done by contextualising the relevant variable with information from the documents submitted to local planning authorities for each application.
	Economic situation	Changes in economic conditions.	The 2008 financial crisis.		
	Shale gas elsewhere in the world	Shale developments in other countries.	The US shale boom.		
	Electoral outcomes	Elections to UK parliament and local authorities.	The 2015 UK general election.	Election results.	
	Energy security and oil prices	The extent to which energy supplies can be accessed and maintained.	Decrease in North Sea oil production since 1999.	UK oil import cost statistics provided by International Energy Agency. Lower price means higher level of energy security.	
Resources	Financial resources	How much money the coalition has.	Total's investment in IGas energy.	News stories, consultations, applications, committee meetings, documents from the application process, Companies House documents and company reports.	
	Personnel, expertise and membership	The membership and staff of the coalition, as well as their technical and political knowledge and experience.	Cuadrilla having staff with experience of US shale development.		
	Publicity	The coalition's ability to generate attention and favourable news stories.	The anti-shale coalition gaining favourable news coverage for their concerns about fracking.		
Relationships with policymakers		How much access a coalition has to decision-makers in national and local government.	Cuadrilla's meetings with Treasury officials.	News stories, consultations, applications, documents from the application process and committee meetings.	
Public opinion		How supportive the public are of shale gas development.	Decreasing levels of support from 2013-2017.	Pre 2012: Yougov top political issues surveys (using concern for economy and environment as a proxy). Post 2012: Studies on opinions of shale gas by O'Hara et al.	

Table 4.1: Variables, definitions and measurements

Events falling under this heading include oil shocks and changes in energy prices.

- The economic situation. For instance, events such as the 2008 financial crisis led to increases in the cost of living – including increasing energy prices – while incomes have remained stagnant. Meanwhile, it has been claimed – and counterclaimed – that shale gas would lead to economic benefits such as lower energy costs and a new source of jobs, meaning that economic developments such as rises and falls in employment are highly relevant.
- Shale gas elsewhere in the world, most crucially in the United States. The American shale boom motivated a great deal of support for shale gas development in the United Kingdom, even though the extent to which it could be replicated was dubious. Nevertheless, shale gas in the United States has had ups and downs throughout the period being studied, and there is clear evidence of UK anti-shale and pro-shale coalitions learning lessons from this.

It could be considered that many of the factors discussed under the heading of external events are external, but not necessarily "events". There would perhaps be more appropriately described as "underlying conditions" such as growth rates, oil prices or levels of unemployment. It is worth noting that I am not so much interested in the underlying conditions, but the impact of events altering these. For instance, in this thesis I give some coverage to the financial crisis and energy price shocks which caused fluctuations in these more stable factors. The underlying conditions themselves were not considered when – for instance – giving values to external events in the fsQCA. Discussing these underlying conditions but not measuring them is a potential limitation of this study. The external events variable, however, does capture changes in these circumstances – and it these changes that are more likely to contribute to policy change (Sabatier, 1988, pp. 132–133).

UK shale activity

The advocacy coalition framework draws a distinction between internal events and external events. Internal events differ from external events in that they are, quite simply, events that occur within the subsystem (Weible et al., 2009, p. 124). Shanahan et al (2011, p. 551) use the Three Mile Island nuclear accident to exemplify how external events can influence policy , suggesting that part of the subsequent fall in public support for nuclear energy could be attributed to the failure of subsystem actors to produce a policy narrative that would enable them to take advantage of the situation.

Others have acknowledged that there is some potential awkwardness in this area. By arguing that the effects of external shocks "cannot be understood in isolation" from internal subsystem events Weible et al (2009, p. 128) implicitly accepted that the boundary between external and internal events is somewhat blurred. Similarly, Olsson (2009, p. 174) suggested it can be difficult to separate internal and external events because "in an open and dynamic world, many subsystems are closely

interconnected with their surroundings". In order to bring clarity to this, external events will be interpreted as events occurring outside a particular policy subsystem. Thus, the earthquakes at Preese Hall will be considered as an external event at the Grange Hill case, because although they were induced by Cuadrilla Resources, an actor within the Grange Hill subsystem, they occurred through Cuadrilla's actions as an actor in the Preese Hall subsystem. An event with "external perturbations" ought to be an event that resonated outside the subsystem, and as such should encompass the likes of the Preese Hall earthquake or the Balcombe protests, despite actually being caused by coalition members.

Another aspect highlighted as a principal causal factor – the emergence of new social movements (Sabatier, 1988, p. 130) – is also of great relevance. The period following the 2011 Preese Hall earthquake saw the emergence of the various "Frack Off" and "Frack Free" groups across the United Kingdom, providing a network for local residents and environmental activists to collaborate and share information. Meanwhile, longer-established and better-resourced groups such as Friends of the Earth began to involve themselves in shale gas policy and collaborating with the nascent groups.

Again, the matter of whether the emergence of new movements– while clearly a significant development – could be considered an "external" event is questionable, given that each of these movements eventually became participants in the policy subsystem. Once more, it seems that the simplest way of addressing this is to separate the event into its external and internal permutations, with the initial formation of a group – and the factors inspiring it – being considered external events

Electoral outcomes

A large number of members of both coalitions were political actors. Their stances and the extents to which they could influence policy were highly subject to the results of elections. For instance, the spell from 2013 to 2015 where Lancashire County Council began rejecting shale gas applications coincided with the redistribution of power following the 2013 elections, where the dominant Conservative party lost their majority. Similarly, the 2010 and 2015 general elections appear to have profoundly influenced developments at a national level, allowing the Conservative party – always more pro-shale than any other – increasing control over developing and implementing policy. The 2013 local elections and the 2015 general election coincided with both bodies taking a different direction with shale gas policy. This could, of course, be down to various other factors, but the role of the elections in contributing towards this is worth further scrutiny.

Energy security

This study will define energy security as the ease of accessing and maintaining energy supplies. This will be measured with regard to the cost of oil imports to the UK using information provided the by

the International Energy Agency (2020). However, precisely what is meant by energy security can vary widely, meaning that different coalitions have been able to advocate a range of conflicting policies, all with the intention of improving energy security. It has been noted that the precise meaning of the term is often "unclear", though among policymakers it often manifests itself as concern at a perceived overreliance on foreign imports (Taylor and Van Doren, 2008, p. 475). This aspect of energy security formed a key part of the pro-shale coalition's platform.

In their study on regulation of shale gas in Europe, Van de Graaf et al (2018, p. 1295) represented energy security on the basis of the share of domestic gas consumption provided by "unreliable suppliers". Such a method is appropriate when highlighting differences between different European countries. However, the sources of British gas imports have fluctuated relatively little in recent years, with the majority of imports arriving via pipeline from Norway, the Netherlands and Belgium. Countries that might be deemed "unreliable suppliers", such as Russia, only provide a small amount of UK gas imports (Department for Business, Energy & Industrial Strategy, 2020b). For a study drawing upon examples from the United Kingdom alone, it is more appropriate to focus on how energy security changes over time.

Regardless of whether domestically produced shale gas is a viable solution, the affordability of oil and gas does fluctuate over time, and the extent to which this has an impact upon shale policy ought to be analysed. Higher oil prices make it more difficult for maintain energy supplies, and as such this study will measure energy security with reference to the cost of importing oil in the UK. This may seem peculiar, given that much of the focus is on shale gas, not oil. However, oil prices are generally more well-established as a shorthand for energy security. It has also been established that "oil and gas in Europe compete in the same market and that gas prices are determined by oil prices in the long term" and that "a stable long-run relationship exists between oil and natural gas in UK" (Asche et al., 2012, p. 122). Furthermore, since the 1974 oil crisis, oil price benchmarks have gradually come to be incorporated into gas export contracts (Gustafson, 2020, p. 27). This means that oil prices should serve as a reliable proxy for energy security concerns relevant to both shale gas and oil, as gas prices are likely to follow the direction taken by oil prices.

Socio-economic events

Changes in socio-economic conditions are one of the key dynamic events that can lead to policy change. Sabatier (1988, p. 136) proposed that these developments lead to policy change "either by undermining the causal assumptions of present policies or by significantly altering the political support of various advocacy coalitions". As examples of this, Sabatier cited the role of rising environmental concerns in the late 60s in the implementation of the US Clean Air Amendments in

1970, and the way in which the Arab oil crisis made automobile workers unions pivot away from supporting air pollution controls to labelling them as "costly" and "energy inefficient".

In pointing out that these events are often beyond the control of policymakers, Sabatier (1986, p. 23) regularly used the example of oil crises. Indeed, the energy security issues addressed in the previous section are, for the most part, just another socio-economic matter, and they affect shale gas development in the United Kingdom in a similar way.

While they were not quite as pronounced as the energy security issue, other socio-economic issues played a part in shale gas applications. As highlighted by Bomberg (2015, pp. 7–9) and Cairney et al (2016, p. 3), the pro-shale coalition generally attempted to present shale gas as being an opportunity, while the anti-shale coalition strove to portray it as a threat. For instance, North Yorkshire County Council (2015a, p. 21) noted that Third Energy's application at Kirby Misperton could have implications for agriculture and tourism, while the potential socio-economic impact of a development often figured in objections (Lancashire County Council, 2015b).

It could reasonably be assumed that wider socio-economic circumstances at the time might play a significant role in shaping the extent to which of these opposing arguments wins most support. After all, if there are concerns about economic wellbeing with limited thought being given to environmental threats this could easily shape support for the "opportunity" storyline of shale gas. During much of the period in which applications were made to drill shale gas, this was the case. The United Kingdom had emerged from the 2008 financial crisis and was undergoing the Coalition's austerity programme. It was a period in which the economy was a key public concern, with the level of attention paid to environmental issues being comparatively minimal (YouGov, 2020, 2015). In spite of this, the anti-shale coalition were found to have the "discursive upper hand", thanks to their ability to expand the debate beyond environmental matters and because of the perceived untrustworthiness of the pro-shale coalition (Bomberg, 2015, p. 2). As time went on large numbers of the public continued to think shale gas would mean cheaper electricity, but this was not enough to persuade them to support shale development (O'Hara et al., 2016).

This shows that socio-economic matters might have some impact in influencing shale gas policy, but their capacity to influence can be conditioned by who supports a particular approach and the reasons they are perceived to do so. Routinely, local authority planning committees found themselves having to make a decision with evidence from pro-shale and anti-shale coalitions, both of which placed great emphasis on socio-economic factors, albeit approaching the issue from opposite directions.

Sometimes the overriding agenda can change to such an extent that politicians no longer have the time or interest to invest in supporting a coalition or implementing its policies. For instance, as parliamentary and governmental time began to be consumed by the UK's withdrawal from the European Union and its economic implications, shale gas sunk further down the agenda: in the six years prior to the referendum on the UK's EU membership there were eighteen House of Commons debates on the subject and 670 references to "shale gas", though there have only been 138 references and four debates since (Hansard, 2020). Likewise, the coronavirus pandemic of 2020 and 2021 makes it very unlikely that the fracking moratorium imposed in November 2019 will be revisited any time soon.

Events linked to shale gas elsewhere in the world

This final category of external event considers developments in shale gas elsewhere in the world and the ways in which they might have influenced shale gas policy in the United Kingdom. Most important was the example set by shale in the USA, as the most prominent of the few countries to successfully achieve unconventional oil and gas production. The American experience played a big part in shaping the claims and counterclaims made by the two coalitions. Commenting on the fall in US gas prices since 2008, Stevens (2013, p. 4) notes that "it is clearly the prospect of replicating this experience in the United Kingdom that has made the Treasury such a fan of shale gas". In a speech in 2013, the then Minister for Energy Michael Fallon praised US shale: "shale has reinvigorated its economy; gas prices have halved, reducing costs for industry and consumers, and it has created billions in new investment and thousands of jobs" (Department of Energy and Climate Change, 2013a).

Another important area where the USA served as inspiration came from the apparent absence of safety concerns and light-touch regulation found in many US states. Opponents of shale gas pointed towards reports of earthquakes and groundwater pollution in the USA, while those from communities neighbouring drilling sites in the Marcellus Shale in the eastern US worked with anti-fracking activists in the UK to provide evidence of their experience to local authorities. Meanwhile, the pro-shale coalition were careful to caveat any of their invocations of the US experience by pointing towards the UK's allegedly stronger regulatory system.

Measuring external events

Of the different types of events set out, energy security and elections are the easiest to measure. The former will be measured based on oil import prices to the United Kingdom, while the latter will be measured by comparing the relative positions of parties before and after elections. The other categories – energy security and shale gas outside and inside the UK – will be studied with reference

to documents that are likely to have been considered by the planning committee scrutinising applications: consultation responses, objections, planning submissions, research, committee minutes and contemporary news stories. References to an external event in these documents will indicate that the coalitions and the planning committee were aware of it.

This can indicate whether an external event was present, and the manner in which it is referenced in documents can provide information about its level of importance. Having identified whether an external event is present, it will be referenced to other variables, coalition behaviour and planning committee decisions to identify patterns of correlation, while the data gained in the case studies will be used to provide causal explanations.

Resources (finance, expertise, personnel membership, publicity)

External events are crucial, but they cannot cause policy change by themselves: instead, they provoke "changes in coalition membership, strategies, beliefs and minor policy changes", something which Weible et al (2009, p. 128) argued that external shocks "cannot be understood in isolation from". These characteristics – money, the membership of a coalition, its strategies and expertise (i.e. knowledge, derived from learning) – will be considered as resources. Sabatier (1988, p. 143) acknowledges that resources – such as "money, expertise, number of supporters, and legal authority" – play a critical role in determining whether a coalition will be able shape government programmes in a way that reflects their beliefs. Thus, given their importance and the way in which they interact with other variables, it is important to consider resources throughout this study.

Resources is, of course, a broad heading – and what can be considered a "resource" is practically unlimited. Drawing on past research, Rozbicka (2013, p. 848) referred to a hierarchy of resources, with money as the most influential, followed by the "access goods" of knowledge, expertise and information. At the bottom of the hierarchy – though still with the potential to make a difference – were the characteristics of the coalition and its members: size, nature of membership, organisation and geographical concentration. Groups with wide support and significant organisational resources, such as a large staff, had been, Rozbicka stated (2013, p. 848), "extremely effective" in achieving their goals. However, the importance of resources, and of certain types of resources, appears to vary depending on the nature of the coalition. In a study of advocacy coalitions in the European Union, Warleigh (2000, p. 231) demonstrated that some NGOs were able to play a meaningful role in the policy process in spite of significant resource deficiencies. In certain areas, such as climate change, decision-makers engaged with NGOs on the basis of their "ability to provide credible policy advice", something that relied most heavily upon previous successful collaborations, recognised expertise and a large membership (Warleigh, 2000, pp. 234, 236). In such a scenario, resources continued to

be important in influencing policy change, but the financial resources of the coalition were of limited importance.

Indeed, the extent of resources, their type and the extent to which they can influence policy change is perhaps best illustrated by Binderkrantz's work on insider and outsider groups. Here, Binderkrantz (2005, pp. 697, 705) found that groups consisting of many political employees controlling resources valued by decision-makers were more likely to be able to pursue insider strategies involving direct engagement with decision-makers, giving them a better chance of success in influencing policies. This holds parallels with shale gas in the United Kingdom, where the pro-shale coalition possessed resources – particularly expertise – that were valued by decision-makers.

The role of expertise as a resource and the way in which it facilitates learning and information exchange will be given special consideration because shale gas in the United Kingdom is a policy area involving a great deal of technical and political uncertainty. In situations such as these, decision-makers have proven keen to seek information from sources such as professional bodies and businesses in order to reduce their own appearance of uncertainty (Cairney et al., 2016, p. 4). Similarly, Warleigh (2000, p. 230) has written of political institutions suffering from an "expertise gap" which external organisations might be asked to fill.

Sabatier (1988, p. 159) has suggested that such information is often provided by neutral experts before being adopted by the "appropriate" coalitions. This holds true for several of the applications and objections made for shale gas, where both sides commissioned studies[33] from neutral experts and referred to those conducted by independent organisations, though only when the conclusions confirmed their pre-existing beliefs. The extent to which this evidence made a profound difference is debatable: planning committees, for instance, are unlikely to possess the skills and knowledge to differentiate between highly technical submissions in areas as varied as air quality and newt populations. The makes it still more likely for actors to seize upon information that supports their beliefs, provoking what Sabatier (1988, p. 155) labelled a "dialogue of the deaf", where coalitions "talk past each other".

This suggests that it might not be expertise itself that is the valuable resource here, but the possession of the "right" type of expertise. Indeed, coalitions rely upon expertise and learning not just to improve their understanding about a particular issue, but also to enable themselves to protect and bolster their own belief system when it is challenged (Sabatier, 1988, p. 150). In a "high

[33] With their ability to do so being dependent on financial resources.

conflict situation" – which shale gas with its protests and open confrontations no doubt was – this becomes the primary role of such expertise (Weible et al., 2009, p. 130).

Expertise as a resource must be considered, but its viability is highly dependent upon the extent to which the decision-maker is open to that expertise. This is one of the ways in which the resources variable appears to be dependent upon the relationships with policymakers variable: expertise means little if the coalition wielding it lacks access to decision-makers.

An organisation's personnel and/or membership can be valuable for reasons other than its expertise. The strength of the ties between an organisation and its followers can make difference (Bennett and Segerberg, 2012, p. 751). Power resources theory, meanwhile, claims that variations in organisation and membership of unions can account for success in achieving policy goals (Bradley et al., 2003, pp. 195–7). The commitment of a group's membership can also play a role, influencing the group's ability to place issues on the agenda.(Cobb et al., 1976, p. 130). The activities of members will be scrutinised in a number of different ways, but initial studies suggest that the characteristic of a group's membership that is most important is its expertise.

Publicity is considered as the ability of a coalition to gain attention, placing their issue on media and political agendas and potentially attracting new members. In a study focusing on Federal Drug Administration (FDA) approval, Carpenter (2002, p. 491) found that actors giving publicity to a disease increased its political salience and made it more difficult for the FDA to prolong their approval process. Actors in UK shale gas, particularly those in the anti-shale coalition, made similar attempts to increase the salience of the issue. This makes sense: generally speaking business groups prefer low salience issues because these are situations where policymakers have little to gain by opposing business interests (such as the pro-shale coalition) but run the risk of losing access to their expertise (Culpepper, 2011). By increasing the salience of an issue it is becomes imperative for interest groups to build alliances, something which the pro-shale coalition found more difficult than the anti-shale coalition (Rasmussen, 2015, p. 368). For these reasons, publicity – and the ability of a coalition to attract publicity – will be considered as aresource in this study.

Measuring resources

There are a large number of attributes that could be considered as resources, most of which are reasonably straightforward to measure. These have been divided into three categories for the purpose of this study. Financial resources will be deduced from financial statements and commitments from investors. Personnel, expertise and membership will be measured with regard to the actors involved in a coalition, their previous experience and credentials in technical matters, their contacts and the number of actors involved, as well as observation of their activities. Publicity

will be measured based on the success of coalitions attracting other members to their coalition. The information for these characteristics will be derived from consultation responses, committee reports and application information.

The presence of resources will be cross-referenced with the other variables, coalition activity and application outcomes in order to determine the extent to which resources possessed by coalitions determined outcomes and the manner in which they did so.

Relationships with policymakers

Ideally, relationships with policymakers would be expressed as a composite of a coalition's level of access to decision-makers and the extent to which they are able to influence them. Matters such as contacts, access and influence could easily be considered as part of the resources variable. However, there have been a large number of studies, particularly in interest group literature, that place a special emphasis on the relationship between business and policymakers as a means of business interests having the policies they want implemented (such as Anderson and Hassel, 2015, p. 2; Brownell and Warner, 2009, p. 274; Fairfield, 2010, p. 40). Further studies have demonstrated that energy and environmental policy in the United Kingdom has historically been particularly likely to be determined by a close nexus between industry and policymakers.

For instance, Saward (1992) wrote about the "corporatism" of the British nuclear industry, where the government-funded Atomic Energy Authority supported producer interests and ensured that they were subject to minimal democratic oversight from parliament. Rawcliffe (1998, pp. 121–3) has similarly demonstrated the important role that the oil industry – alongside the motor and road construction industries – have played in influencing British transport policy. However, these relationships are by no means one way. Organisations such as Greenpeace and Friends of the Earth, which were originally campaigning groups placing a great deal of value on mass participation and choreographed stunts, have become more and more institutionalised, finding that they too can benefit from nurturing relationships with government (Rose, 1993; Van Der Heijden, 1997). Friends of the Earth, a key actor in the UK shale gas subsystem, was praised for its participation in the 1977 public inquiry into the Windscale nuclear accident. This encouraged the organisation to pursue closer government engagement alongside their campaigning activities (Lowe and Goyder, 1983). Thirty years removed from Windscale, this dual role could still be seen in their actions in opposing shale gas, with the organisation actively involved in both coordinating expert research to be delivered at committee meetings and organising protests and blockades outside of them.

In any case, the relationship between policymakers and the shale gas industry has been the subject of much scrutiny and criticism, and it formed a key narrative of the anti-shale coalition (Bomberg,

2015, p. 11). Thus, it certainly merits further investigation, particularly given that it is a notion that the advocacy coalition framework does not readily accommodate.

The advocacy coalition framework places less weight on relationships with policymakers as a means of influencing policy change, instead focusing on the "generation, dissemination and evaluation of policy ideas" by and among a large number of actors (Jenkins-Smith and Sabatier, 1993, p. 179). However, in this particular instance at least, the role of relationships appears to be more important than the advocacy coalition framework assumes.

Shale gas in the United Kingdom has within its subsystem a large number of actors with varying levels of privilege and access to policymakers. It also features decision-makers who are, at times, clearly a member of one coalition or another. There are occasions where relationships matter. For instance, the UK government and shale developers did share ideas, but things went beyond this: shale developers told the UK government the regulatory change they needed, and the government acted upon this, exercising their power to redistribute decision-making power away from more hostile local governments and ensure a more favourable setting for developers to issue applications.

It is worth highlighting that my choice to combine policymakers at the national and local level for this variable could perhaps be confusing. Moreover, some of the policymakers concerned (namely the UK government) are also themselves members of coalitions. This combination muddies things somewhat, and perhaps loses a bit of clarity. However, my aim when introducing this variable was to have some measure of the holistic lobbying power of coalitions, not to find – for instance – which level of government was easiest to access and influence.

Measuring relationships with policymakers

If a coalition's relationship with a policymaker is to translate to achieving policy change, the coalition will require both access and influence. Truman (1951, p. 264) argued that interest groups cannot influence policymakers "without access to one or more key points of decision in the government". While this means that access is a necessary prerequisite for influence, it is not a guarantee of influence in of itself (Dür and De Bièvre, 2007). However, looking for access is still important, as it makes it easier to identify those groups that are most likely to be influential (Binderkrantz et al., 2016, p. 11). Furthermore, it is significantly easier to identify. As such, I have chosen to measure this variable based on the level of access to policymakers enjoyed by members of a particular coalition. This will be based on the frequency of contact between a coalition and decisionmakers at a national and local level. A higher frequency will represent a higher level of access.

Contact will consist either of face-to-face meetings, or correspondence that received a reply or a reference from policy makers. By limiting contact in this way, it will ensure that the examples of access being studied had, at the very least, the potential to result in influence. This approach is a fusion of two of the most common means of defining access, of which a total of ten were identified by Binderkrantz et al (2016, p. 4)in a selection of studies from 1967 to 2014. Most often, access was considered to be represented by meetings conducted – typically in person – with decisionmakers such as bureaucrats or politicians. A second, broader, definition focused on "contact", which considered phone calls and emails as sufficient to constitute access. I will consider both of these.

Access is necessary but not sufficient for influence. However, Binderkrantz et al (2016, p. 11) questioned the reliability of methods that go beyond measuring access and attempt to assess levels of influence, instead advocating for "conceptually moving from influence to access" because access Is observable and studying it can enable comparisons of interest groups across a wide range of policy areas and lobbying venues.

Documentary sources such as consultations and letters are the major data sources used in this thesis to detect and measure access. The existence of gatekeepers means the fact that such a document was sent does not actually mean it was noticed or made a difference. For this reason, I will limit consideration to documents that were responded to or remarked upon by the intended recipient, while records of meetings or other forms of face-to-face contact will also be considered sufficient.

Having established the definition, it will be measured on the basis of frequency. Hanegraff et al (2020, p. 56) measured access by asking organisations how often they had contact with policymakers, with higher frequencies of contact taken to represent higher levels of access. This will be adapted to the documentary evidence used in this thesis: coalitions with evidence of more contact with policymakers in the documents being studied will be taken to have higher levels of access.

Public opinion

Much like the previous variable, public opinion could easily be subsumed within the external events or resources variables. Public opinion has traditionally played a large role in explaining developments in environmental policy (Guber, 2003, chap. 3). This is largely because of issue salience, or, in other words, the importance attached to an issue by the average voter and the amount of attention it receives in the media (Rasmussen, 2015, p. 368). My initial studies of shale gas in the UK suggested that public opinion might have played an extensive role in shaping outcomes, and as such I thought it was worthwhile considering as a distinct variable.

An issue that is of interest to a particular group or set of groups produces a situation which Culpepper (2011) refers to as "quiet politics", where business groups are expected to wield a greater level of influence as policymakers have little to gain in opposing them. However, a scandal or accident might arise in such a way that effects a transition to "noisy politics", perhaps accompanied by rising anti-business sentiment and turning an issue into a "moralistic crusade" where politicians might seek to present themselves as a "tribune for the people" (Rasmussen, 2015, p. 369). Many political actors are conscious of this. For instance, the tobacco industry exerted a great deal of effort towards stymying shifts in public opinion and public awareness that would create an appetite for further regulations and legislation (Brownell and Warner, 2009, p. 260; Cairney et al., 2012).

This suggests that an issue receiving a low level of attention is much more likely to result in a positive outcome for business interests. This appears to be the case for shale gas in the United Kingdom. During the years 2009 and 2010, where shale gas was little known and discussed, developers were able to quickly and easily secure planning permission with minimal difficulty. This was later to be severely hampered by a number of events which brought shale gas to far greater levels of prominence – namely the 2011 Preese Hall earthquake and the protests of the summer of 2013. Following this, no shale application would have an easy time, with the majority taking at least several months to be decided, and several being refused altogether.

Public opinion – or the absence of it – is also a variable that could interact with the relationships with policymakers variable in interesting ways: low levels of public attention have been demonstrated to increase the importance of direct interaction between interest groups and government (Binderkrantz, 2005, p. 698).

The issue-attention cycle proposed by Downs (1972) places a premium on the role of public opinion in driving environmental policy decisions, with a "pre-problem" stage of limited activity quickly transitioning to "alarmed discovery and euphoric enthusiasm" following a scandal, accompanied by the government promising solutions as a reaction to public demand. Downs suggested that the government commitments are unlikely to be fully delivered as the public gradually becomes interested in something else[34], but Peters and Hogwood (1985) have offered evidence from the USA suggesting that high levels organisational activity often coincides with peaks in public attention, though Parsons (1995, p. 119) suggests this is only an attempt by policymakers to make it look as if they are "doing something". However, Anderson et al (2017) found evidence of much more long-lasting change, demonstrating that shifts in public opinion towards prioritising the environment between 1974 and 2015 played a significant part in increasing renewable energy policy development

[34] This also happened in shale gas from 2016 onwards.

in Europe. Similarly, Dasgupta and De Cian (2018, p. 84) argued there was "ample evidence that public opinion has a substantial positive impact on the passage of environmental friendly laws and regulations", though they also pointed out that "lack of public support can also act as a major barrier to transitioning to a low-carbon economy".

The advocacy coalition framework accommodates public opinion as a factor that can influence policy change. Sabatier (1988, p. 129) writes that in the mid-1950s, "air pollution was scarcely a subject of public policy" in the US. By 1970, there was a 20-fold increase in pollution control expenditure and the Federal Clean Air Amendments had been passed, something that coincided with a dramatic change in "problem perception: the air was no longer simply dirty, it was now perceived as unhealthy in many areas of the country". However, similar to what Downs outlined in the issue-attention cycle, the consensus in favour of further reform soon evaporated as increasing numbers of people became aware of the technical and political difficulties of implementing more ambitious legislation. One of the key elements of this story, Sabatier (1988, p. 130) claims, are shifts in "elite and public opinion concerning the salience of various problems".

However, Sabatier (1988, pp. 130–1) also argues that public opinion is one of the "undoubtedly important" matters that is sometimes overemphasised in studies of policy change at the expense of policy-oriented learning, interactions between specialists and belief systems. Weible (2007, p. 100) writes of public opinion, or more specifically opinion polls demonstrating support for a particular coalition, as a "major resource". This functions as a resource because it provides a means for a coalition to argue that it represents the public interest, and to use it to bolster their attempts to lobby for favourable legislation or to bring other resources to the coalition.

Nevertheless, Jones and Jenkins-Smith (2009, pp. 39–40) note that public opinion has gradually become more central to the advocacy coalition framework in a number of ways. Originally, Sabatier and Jenkins-Smith (1993, p. 223) argued that public opinion could serve as an important external constraint on elites, but served little other purpose as the general public "has neither the expertise, nor the time, nor the inclination to be active participants in a policy subsystem". This was later modified, with Sabatier and Weible (2007, p. 203) acknowledging that public opinion can also be an important resource, as indicated by the extent to which coalitions focus upon trying to gain public support.

It is as a resource to be weaponised following a shock that public opinion clearly becomes an important factor in influencing policy change in the advocacy coalition framework. Jones and Jenkins-Smith (2009, p. 40) give the example of Three Mile Island nuclear accident, which they determine to be an internal shock – "a disaster within a subsystem (Sabatier and Weible, 2007, p.

204) which is "by definition affected by subsystem actors" (Nohrstedt, 2008, p. 275). Such a shock can – as is well established – redistribute resources between coalitions. With resources now accepted to include public opinion, it can be seen that the internal shock of the Three Mile Island incident led to a significant decrease in support for nuclear energy, leading to more demanding regulations being imposed upon the nuclear industry. This revised tripartite structure for public opinion – where it is accepted as an external constraint, a coalition resource and a source of internal shock – produce what Jones and Jenkins-Smith (2009, p. 40) label a "promotion of sorts".

The importance of public opinion, and the way in which it can influence outcomes in a variety of different ways, is one of the reasons why it is being considered as a distinct variable here. It is worth special consideration with regards to shale gas. Van de Graaf et al (2018, p. 1278) have remarked that public opinion is the "decisive factor" in determining whether a country will support or oppose fracking, while Bomberg (2015) and Evensen et al (2017) have also highlighted, respectively, the efforts pro-shale and anti-shale coalitions make to win over public opinion and the way in which support for shale gas is related to broader themes such as sustainability and resilience.

Boudet et al (2014) have found that attitudes towards shale gas can be shaped by a number of factors, such as socio-economic status, perceptions of risks and benefits, worldview and proximity to the proposed site. Their research, conducted in the United States, found that "women, those holding egalitarian worldviews, those who read newspapers more than once a week, those more familiar with hydraulic fracturing, and those who associate the process with environmental impacts" are most likely to oppose fracking, while supporters tend to be conservative, older, educated to degree level, watch TV news and associate the process with positive economic or energy security outcomes (Boudet et al., 2014, p. 57). Similarly, supporters associating shale gas with economic opportunity and opponents associating it with environmental threat has been identified as the key determinant of public opinion in the United Kingdom (Bomberg, 2015, pp. 7, 9).

Van de Graaf et al (2018, p. 1289) also note that public opinion regarding shale gas is by no means static, but related to a "host of variables". These can include framing strategies adopted by both coalitions, as well as anti-fracking protests. Surveys carried out by O'Hara et al (2016, 2015a, 2015b) outline the extent to which events such as the 2011 Preese Hall earthquake and the Balcombe protests of 2013 have influenced public opinion.

Van de Graaf et al (2018, p. 1288) are correct to say that public opinion is "vital" to explain regulatory bans or support for fracking in Europe. However, the picture for the United Kingdom specifically is a bit more confused. There was little government support for hydraulic fracturing when opposition was limited or non-existent. Yet, from 2013 to 2016, governmental support for

fracking seemed to intensify as public opposition strengthened. Below the level of national government, public opinion appears to have affected local authorities in different ways, producing different outcomes depending on whether one was under the jurisdiction of Lancashire County Council or that of the neighbouring North Yorkshire County Council.

Public opinion is not just an important part of later revisions of the advocacy coalition framework, but it is also held to be a central determinant of shale gas policy. As such, it transcends the status of just another type of external event or resource, becoming something that ought to be considered in on its own merits. Public opinion is the link between external events and the development and strengthening of the anti-shale coalition. Without shifts in public opinion, the anti-shale coalition would not have gained the increased membership they depend upon, and in all likelihood would not have come into existence at all. There is limited evidence that public opinion has influenced shale gas policy change by itself, so special attention will be paid to its interplay with the other variables.

Measuring public opinion

Measuring public opinion is a more straightforward matter than measuring the other variables. This is because there is already a good deal of information on public attitudes towards shale gas in the UK, particularly the work of O'Hara et al (2016, 2015a, 2015b). These surveys offer rich and detailed data for the crucial period between 2011 and 2016, including overall support for shale gas as well as more nuanced matters such as support for the idea that shale gas will lower energy costs or that hydraulic fracturing causes earthquakes. Data on overall support for shale gas will be used most often, but opinions on other matters will be used where relevant.

There are, however, two small complications with this approach. The first is that O'Hara et al's study does not have data from before 2011. This is understandable: prior to the Preese Hall earthquake, shale gas was barely known. However, there is data available on perceptions of the UK's energy security, as well as levels of concern for the environment and economy, such as the Yougov (2020, 2015) series on perceptions of the most political issues. This can provide an indication of overall levels of receptiveness towards shale gas at this period.

While this measure is crude, it should not be a major concern. My main aim with measuring public opinion regarding shale gas from 2009-2011 is to demonstrate that public opinion was generally non-existent, and this can be demonstrated by the lack of consultation responses or activism on the matter.

A second concern is the general lack of geographically specific data. O'Hara et al's data is collected on a nationwide basis. This can skew things somewhat, as many of the benefits of shale gas accrue

to the country as a whole, while the potential drawbacks such as traffic, earthquakes and water contamination would be felt on a local level (Van De Graaf et al., 2018, p. 1280). There are some surveys that have been conducted locally, but many of these were managed by either shale producers or anti-fracking groups, and both returned results that favoured the party conducting the survey. To a certain extent, the number of objections can provide an indication of the intensity of local opposition, but this is not a perfect measure. It is highly likely that a large number of people had opinions on shale gas but did not see the point of communicating them to the local government.

Hypotheses

I now bring this chapter to a close by introducing my four hypotheses. These are informed by the previous chapters as well as some preliminary, abbreviated fsQCA work and case studies.

In chapter 1, and in the coming case studies, I outline a number of claims from pro-shale coalition members and the UK government where setbacks in shale gas are attributed to local authorities. For instance, Amber Rudd, then Secretary of State for Energy and Climate Change, referred to "underperforming local planning authorities that repeatedly fail to determine oil and gas applications within statutory timeframes: in a statement made to parliament (Department of Energy and Climate Change, 2015a). In 2016, Rudd's successor Andrea Leadsom stressed the need to "tackle the issue of extensive planning delays head-on if we are to reap the benefits that shale gas offers", while Cuadrilla CEO Francis Egan said that companies investing in shale gas were losing patience as a result of delays (Carrington, 2016).

While delays in planning applications may have contributed to the failure of shale gas, my initial research suggests that this was not down to obstruction from local authorities but can be better explained by the interaction of the coalitions and the variables of external events, relationships with policymakers, resources and public opinion. Moreover, as discussed elsewhere in this thesis, there were far more compelling reasons for the failure of shale gas at the national level, although a full exploration of these is beyond the scope of this thesis.

H1: Local authorities were not responsible for the delays in the application process.

The precise way in which these variables interacted in order to prevent pro-shale coalition success is not immediately clear, but my initial research highlighted some important aspects that help to structure and inform this study at its outset. As pointed out by Evensen (2018), public perceptions of shale gas or fracking have been one of the most popular areas of UK shale gas research[35]. With it being an important area that had gained significant attention from scholars, I wanted to further

[35] Alongside discourse and rhetoric and planning and regulation.

understanding by exploring the extent to which public opinion affected outcome of an application. It was possible that public opinion might have a *direct* impact on an application through decision-makers considering survey data or opinion polls in their deliberation. My initial scrutiny of planning committee deliberations revealed no evidence of this. However, it seemed highly likely that public opinion had a powerful indirect impact by shaping the growth and characteristics of coalitions and through interacting with other variables.

H2: Public opinion did not directly impact a shale gas application's likelihood of success.

H3: Public opinion had an indirect impact on an application's likelihood of success by shaping the membership and resources of advocacy coalitions.

There is a large body of literature outlining the ways in which technical expertise and past collaboration can enable actors or coalitions to achieve their policy goals (see Pappi and Henning, 1999, p. 265; Rasmussen, 2015, p. 370; Sabatier, 1988, p. 143; Warleigh, 2000, p. 234). I am sceptical as to whether the link between producer-government relationships and policy outcomes holds with regards to the applications considered in this thesis. This is because the emerging nature of UK shale gas and the small size of the companies involved mean that they have limited technical expertise or previous collaboration with government in this area, meaning that government has little to gain from this relationship. This leads me to my fourth and final hypothesis:

H4: The pro-shale coalition's relationships with policymakers did not affect an application's likelihood of success.

The following four chapters will test these hypotheses, while the outcomes will be discussed and summarised in chapters 9 and 10.

fsQCA analysis

Introduction

The key aim of this section is to demonstrate, using data from nine different UK shale development sites, which factors were most conducive to the pro-shale and anti-shale coalitions succeeding or failing during the application process. This will be conducted using a fuzzy set qualitative comparative analysis (fsQCA).

Qualitative comparative analysis (QCA) is, according to Ragin (2014, p. 84), the middle way "between complexity and generality, between the radically analytic variable oriented strategy and the highly personalised case-oriented strategy". In this study, this means that QCA offers a path between a large-n study and case-study based research to determine the factors that shaped outcomes at nine different shale sites in the United Kingdom. Principles of Boolean algebra are used to evaluate a list of all possible combinations of variables and determine which are necessary and sufficient causes. Boolean functions are most well-known through their application in logic gates, and it is this binary state – where either something is true (or present) or false (or absent) that forms a key part of qualitative comparative analysis (Ragin, 2014, p. 87). This can have several different applications in social science: often something happened, or it did not; or a condition is either present or absent. However, things are not always as clear as this. For instance, one coalition may have more resources than another, and these gradations ought to be represented. A qualitative comparative analysis where membership can vary by degree uses "fuzzy sets" (Rihoux and Marx, 2013, p. 169).

A fuzzy set qualitative comparative analysis proved a valuable means of identifying which combinations of external events, resources, relationships with policymakers and public opinion enabled a coalition to succeed or fail in gaining planning permission. Fuzzy-Set/Qualitative Comparative Analysis 3.1b for Windows (Ragin and Davey, 2019) was used for this.

This chapter will show, step by step, the data that was used for the fsQCA and what was done at each stage of the analysis. There are three main stages: 1) the transformation of data into fuzzy sets; 2) the construction of the truth table and 3) the analysis using Boolean logic (Kraus et al., 2018, pp. 17–19). The first stage involves variables being given a score based on full membership, or, in other words, how significant it was towards shaping the outcome of a given case. Such a score would fall between 0 and 1, with 0 representing a "complete absence" of a condition and 1.0 denoting "compelling and incontrovertible evidence of its role". Here, 0.5 represents a "crossover point", where a condition is more present than absent (Jennings et al., 2017, pp. 10–11). The second stage uses the fuzzy set membership scores to form a truth table – a list of all possible causal conditions and their empirical outcome (Ragin, 2008; Vis, 2012, p. 186). The truth table provides a list of all

possible combinations and their level of consistency: the extent to which they are likely to result in a successful result. This allows the researcher to manually exclude the combinations where the outcome has a low level of consistency, after which the remainder move to the third stage. It is these combinations of variables that are examined by the fsQCA, rather than the individual variables themselves. At this stage the fsQCA algorithm simplifies these combinations and limits the possible solutions (Mas-Verdú et al., 2015, p. 794). It produces values for consistency, raw coverage and unique coverage for each combination. Consistency indicates the extent to which a combination is related to the outcome, raw coverage shows how much of the outcome is explained by a "certain alternative path" and unique coverage shows which share is "exclusively explained by a certain alternative path" (Ragin, 2006; Schneider and Wagemann, 2010, p. 403).

Amongst its conclusions, the fsQCA indicated the pro-shale and anti-shale coalitions worked in very different ways: there was no common combination of variables that would be likely to lead to success for both coalitions. Instead, the anti-shale coalition relied on helpful external events while the pro-shale coalition sought to minimise those that would result in the expansion of the anti-shale coalition. Both coalitions required resources to succeed but resources alone would not be enough.

Method

Part one: Case selection

Each case represents a particular coalition at a particular location (e.g. pro-shale coalition at Grange Hill; anti-shale coalition at Preston New Road). This is because splitting the pro-shale and anti-shale coalitions into separate cases provides insight into the individual importance of each variable for each coalition and also allows for comparison between the two coalitions. These coalitions are constructed using the advocacy coalition framework with the intention of finding out how they are formed, attract new members and influence policy. Having the unit of analysis be a single application would not be a sufficient timeframe to study these developments, whereas observing a series of applications at a single location gives a far more informative picture.

The chosen cases were narrowed down to those locations where applications were explicitly made proposing to drill for shale gas and conduct hydraulic fracturing. This means that applications for coal bed methane (CBM), such as in Cheshire, or sites given approval for conventional drilling that later turned out to have shale reserves, such as Crawberry Hill in the East Riding of Yorkshire, are not considered. It was also decided that locations where the first application was made on or after 1 January 2016 would not be considered, as it would be too soon to evaluate the outcome of these applications and their causes. This means the Altcar Moss site in Lancashire would be omitted from

consideration as it received its first application in January 2018, as well as sites in Nottinghamshire for which applications were made in 2017.

Cases where the application was made before January 2016, but concluded later, such as Roseacre Wood (first application made in 2014; planning permission refused in July 2019) would be considered until the "end" – that being the date at which planning permission was accepted or refused for the most recent application up until the completion of this study in November 2019.

This method of case selection brings up one major anomaly that ought to be addressed. Balcombe, the Cuadrilla drilling site that witnessed major anti-drilling protests in Summer 2013, falls outside the scope of the criteria for cases because it was never subject to an application to be hydraulically fractured. Nevertheless, Balcombe was a key flashpoint in the mobilisation of the anti-shale coalition, and as such will still be considered as an external event of some importance.

By following these criteria I produced the following set of eighteen cases:

Lancashire County Council		North Yorkshire County Council		Nottinghamshire County Council	
Pro-shale	Anti-shale	Pro-shale	Anti-shale	Pro-shale	Anti-shale
Grange Hill	Grange Hill	Kirby Misperton	Kirby Misperton	Springs Road	Springs Road
Preese Hall	Preese Hall			Tinker Lane	Tinker Lane
Anna's Road	Anna's Road				
Preston New Road	Preston New Road				
Roseacre Wood	Roseacre Wood				
Becconsall	Becconsall				

Table 5.1: Cases used in fsQCA

Part two: Outcomes (dependent variables)

Firstly, the outcomes of each case were graded on the basis of whether the coalition in each case was successful. Here, "success" was defined as whether the planning committee accepted the application – or, in certain cases, whether the application was successful on appeal. For the pro-shale coalition, success is a granted application, while for the anti-shale coalition success will be reflected by a refused application. I graded these as follows:

Table 5.2: Definition of outcomes for pro-shale and anti-shale coalitions

Score	Pro-shale coalition	Anti-shale coalition
0	Complete failure: application refused; with little opportunity for recourse or loss of significant sunk costs	Complete failure: application accepted with minimal delay or effort from pro-shale coalition.
0.3	Partial failure: application refused, but with caveats, such as possibility of. future success with minor changes or minimal resource implications.	Partial failure: application accepted, but with caveats, such as delays, added conditions or significant costs incurred by pro-shale coalition
0.7	Partial success: application accepted, but with significant caveats, such as delays, resource implications or imposed conditions.	Partial success: application refused, but perhaps with conditions allowing for potential future development.
1	Complete success: application accepted without significant delays, conditions or reputational damage.	Complete success: application refused with finality.

These figures represent a four-value fuzzy set, which are used to indicate whether cases are "fully out", "more out that in", "more in than out" and "fully in" (Ragin, 2009, p. 91; Velástegui, 2018, p. 178). 0.3 and 0.7 here are chosen because they represent the mid-points - $\frac{1}{3}$ and $\frac{2}{3}$ – to the nearest decimal place. A case is "fully in" if it leads to a successful outcome for a coalition.

Part three: Independent variables

The second part of this process involves considering the respective importance of each variable in contributing towards the outcome. Each variable should be considered on the basis of the following question:

> *To what extent did [variable] in [case] contribute towards [outcome]?*

The answer to this question should be graded as follows:

Table 5.3: How independent variables are graded

Score	Role in shaping outcome
0.0	None or inconsequential
0.2	Minimal
0.4	Slight
0.6	Moderate
0.8	Significant
1	Fundamental/absolute

The independent variables under consideration are the same as those that are considered in the case studies: external events, relationships with policymakers, resources and public opinion: These

variables were calibrated with reference to documents submitted to the application and available on local government websites (including committee reports, consultation responses and application statements) and contemporary local and national news reports. This is a six-value study, which uses four intermediate levels between "fully out" and "fully in": "mostly out", "more or less out", "more or less in" and "mostly in" (Ragin, 2009, p. 91).

1. External events are events or issues occurring outside of the policy subsystem that influence the outcomes. These include socio-economic events such as oil price shocks, recessions or elections.
2. Relationships with policymakers are the extent to which relationships of access and influence with policymakers – at a local or national level – are present.
3. Resources are the extent to which resources possessed or controlled by a coalition are present. This includes – but is not limited to – control of financial resources, organisational abilities, size of membership and expertise.
4. Public opinion represents the public's view of shale gas development. This variable serves as a composite of the strength and intensity of views held by the public.

Part four: Different data sets

For the purposes of this research, three different fsQCAs will be conducted using three different data sets to provide more detailed conclusions. These are as follows:

1. Entire data set: this will provide broad generalisations of the best means of achieving policy success, without regard to the nature of the coalition or the location. It is worthwhile looking at this to discern whether there are trends true to both coalitions but given both coalitions acted in very different ways further nuance will be needed.
2. Pro-shale coalitions data set: this data set will consist only of the pro-shale cases, in order to provide evidence of the conditions that are most conducive to success for the pro-shale coalition.
3. Anti-shale coalitions data set: this data set will consist only of the anti-shale cases.

Results

Part one: Entire data set

The data set was constructed with reference to documents stored on the relevant local government website for each of the applications. The documents used were those that would be likely to highlight coordination such as planning applications, committee papers, consultation responses and letters – though more technical documents such as ecology reports and impact assessments were

scrutinised for relevant information. In order to provide more data, news searches were conducted – limited to the UK and using the terms "hydraulic fracturing", "fracking" and "shale gas" – for the relevant time periods. The shale gas survey data of O'Hara et al (2016, 2015a, 2015b) was the primary data source for informing the public opinion variable.

The following table summarises the results for the entire data set. More information, including the reasoning for each score given, can be found in the appendix. Examples of scoring include the Pro-shale coalition at Grange Road being given a 0.7 for outcome at Grange Road, justified as "Initial application in 2010 accepted with ease, but subsequent application (not for fracking) in Nov 2014 refused, finally being allowed after appeal on April 2016, where Cuadrilla were refused an award of costs". Similarly, the anti-shale coalition at Kirby Misperton was scored 0.6 for the significance of supportive public opinion as the "number of people opposed to shale gas was gradually overtaking those in support, the issue was becoming less salient. However, planning meetings featured large protests, suggesting intense local opposition."

Table 5.4: Data set for all cases

CASE	OUTCOME	EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION
Lancashire County Council					
Grange Road Pro-shale	0.7	0.4	1	0.6	0
Grange Road Anti-shale	0.3	1	0.6	0.6	0.2
Preese Hall Pro-shale	1	0.2	0.4	0.6	0
Preese Hall Anti-shale	0	0	0	0	0
Preston New Road Pro-shale	0.7	0.4	1	0.8	0
Preston New Road Anti-shale	0.3	1	0.4	0.8	0.2
Anna's Road Pro-shale	0.3	0.2	0.4	0.2	0.2
Anna's Road Anti-shale	1	0.8	0.2	1	0.8
Roseacre Wood Pro-shale	0	0.4	0.8	0.8	0.4
Roseacre Wood Anti-shale	1	0.6	0.4	1	0.6
Becconsall Pro-shale	1	0.2	0.8	0.6	0.6
Becconsall Anti-shale	0	0.6	0.4	0.4	0.4
North Yorkshire County Council					
Kirby Misperton Pro-shale	1	0.4	0.8	0.4	0.2
Kirby Misperton Anti-shale	0.3	0.4	0.2	0.8	0.6
Nottinghamshire County Council					
Springs Road Pro-shale	1	0.4	0.8	0.8	0.2
Springs Road Anti-shale	0	0.4	0.4	0.6	0.8
Tinker Lane Pro-shale	1	0.4	0.6	0.6	0.2
Tinker Lane Anti-shale	0	0.4	0.4	0.6	0.8

This data was used to construct the following truth table. The ones and zeroes here outline an instance where a condition is considered to be "present" – in other words the occasions in which a variable was given a score of over 0.5, and the "number" field denotes the amount of times a given combination of conditions being present occurred. As such, we can see that there were five cases where a coalition had over 0.5 for relationships with policymakers and resources, but only one occasion where the coalition had over 0.5 for resources alone. The raw consistency value denotes the extent to which a combination produced a successful outcome.

Table 5.5: Truth table for all cases

EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	number	OUTCOME	raw consist.
0	1	1	0	5		0.767
0	0	1	1	3		0.475
0	0	0	0	2		0.452
1	0	1	1	2		0.674
1	0	0	0	1		0.618
0	1	0	0	1		0.738
0	0	1	0	1		0.711
1	0	1	0	1		0.659
1	1	1	0	1		0.714
0	1	1	1	1		0.579
1	1	0	0	0		
0	0	0	1	0		
1	0	0	1	0		
0	1	0	1	0		
1	1	0	1	0		
1	1	1	1	0		

The truth table is useful for outlining the diversity of different situations encountered by coalitions: for highlighting, for instance, that there were ten different combinations of variables found throughout the cases or that there was never an occasion where an outcome was shaped by the presence of all four factors. However, at this stage, it does not tell us which combinations were most conducive to a successful outcome. Kent (2008, p. 6) notes that "[c]onsistency scores of less than 0.75 or even 0.8 mean that there is considerable inconsistency". This, broadly speaking, means that the combination does not result in a successful outcome often enough to be considered necessary or sufficient for that outcome to occur.

With the highest score for consistency recorded here being 0.77, none of the rows on the truth table are particularly consistent with those configurations being sufficient for a successful application. For this reason, the entire outcome column was left blank and further analysis was not conducted. It can

be concluded that the presence of both relationships with policymakers and resources is reasonably conducive to successful outcome for any given coalition, whether pro-shale or anti-shale. However, the lack of anything more instructive is unsurprising here: the case studies demonstrate that pro-shale and anti-shale coalitions pursued very different methods to find success, and as such separate analyses for different types of coalition proved more enlightening.

Part two: Pro-shale coalitions

For this section, a data set very similar to that in part one with the anti-shale cases removed was used. However, given that the opposition faced by the anti-shale coalition was a very important aspect of each case, it was important to ensure that it was represented somehow. To achieve this, four extra variables – opposition external events, opposition relationships with policymakers, opposition resources and opposition public opinion – were added to account for the extent to which the strength or weakness of the opposing anti-shale coalition might have contributed to the success or failure of the pro-shale coalition. Assuming that something positive for the anti-shale coalition would be negative for the pro-shale coalition, the four new variables would be inverted from their original value, calculated as $1 - original\ antishale\ coalition\ variable$. This is because the variables are marked out of how positive they were for each coalition, so a moderately negative grade of 0.4 for the anti-shale coalition is going to be a moderately positive outcome for the pro-shale coalition of 0.6, while a highly positive outcome of 1 for the pro-shale coalition is going to be a highly negative outcome for the anti-shale coalition

This data set (Table 5.6) produces a truth table (Table 5.7) that offers far higher levels of consistency than that in part one, including one cases where none of the variables were present for the anti-shale coalition (those where the OPP- variables are scored 1). This entry represents the Preese Hall application, where no anti-shale coalition was ever present and Cuadrilla had very little difficulty having their application accepted, as is represented by the consistency value of 1.

Table 5.6: Data set for pro-shale cases with anti-shale variables included

PROSHALECASE	OUTCOME	EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	OPPEXTERNAL	OPPRELATIONSHIPS	OPPRESOURCES	OPPPUBOPINION
Anna's Road	0.3	0.2	0.4	0.2	0.2	0.2	0.8	0	0.2
Becconsall	1	0.2	0.8	0.6	0.6	0.4	0.6	0.6	0.6
Grange Road	0.7	0.4	1	0.6	0	0	0.4	0.4	0.8
Kirby Misperton	1	0.4	0.8	0.4	0.2	0.6	0.8	0.2	0.4
Preese Hall	1	0.2	0.4	0.6	0	1	1	1	1
Preston New Road	0.7	0.4	1	0.8	0	0	0.6	0.2	0.8
Roseacre Wood	0	0.4	0.8	0.8	0.4	0.4	0.6	0	0.4
Springs Road	1	0.4	0.8	0.8	0.2	0.6	0.6	0.4	0.2
Tinker Lane	1	0.4	0.6	0.6	0.2	0.6	0.6	0.4	0.2

Table 5.7: Truth table for pro-shale cases with anti-shale variables included

EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	OPPEXTERNAL	OPPRELATIONSHIPS	OPPRESOURCES	OPPPUBOPINION	number	OUTCOME	raw consist.
0	1	1	0	1	1	0	0	2	1	0.846
0	1	1	1	0	1	1	1	1	1	1
0	0	1	0	1	1	1	1	1	1	1
0	1	0	0	1	1	0	0	1	1	0.9
0	1	1	0	0	1	0	1	1	1	0.857
0	1	1	0	0	0	0	1	1	1	0.846
0	1	1	0	0	1	0	0	1		0.786
0	0	0	0	0	1	0	0	1		0.722

Setting the consistency value at 0.80 in order to balance between a reasonable number of cases included and a reasonable level of consistency gave the following solution:

Table 5.8: Sufficient conditions for a pro-shale success

Solution	OPPEXTERNAL	OPPPUBOPINION
Consistency	0.895	0.870
Raw coverage	0.507	0.597
Unique coverage	0.149	0.239
Solution coverage	0.746	
Solution consistency	0.893	

This solution therefore suggests that either the lack of salient external events or public opinion in favour of the anti-shale coalition can be sufficient for a successful shale application by themselves. This, therefore, means that fluctuations in external events, relationships with policymakers, resources or public opinion in favour of the pro-shale coalition are not necessary for success: what matters most is avoiding external events or public opinion that favours that anti-shale coalition. This is further confirmed by the analysis of necessary conditions, which – with a higher consistency threshold of 0.9 – finds that no variables – either pro-shale or anti-shale – are required for the pro-shale coalition to be successful.

Table 5.9: Necessary conditions for pro-shale success

Condition tested	Consistency	Coverage
EXTERNALEVENTS	0.388	0.867
~EXTERNALEVENTS	0.731	0.817
RELATIONSHIPS	0.761	0.773
~RELATIONSHIPS	0.284	0.792
RESOURCES	0.672	0.833
~RESOURCES	0.433	0.806
PUBOPINION	0.209	0.778
~PUBOPINION	0.821	0.764
OPPEXTERNAL	0.507	0.894
~OPPEXTERNAL	0.522	0.673
OPPRELATIONSHIPS	0.731	0.817
~OPPRELATIONSHIPS	0.388	0.867
OPPRESOURCES	0.478	1.000
~OPPRESOURCES	0.597	0.690
OPPPUBOPINION	0.597	0.870
~OPPPUBOPINION	0.493	0.750

Variables preceded by a tilde (~) such as ~EXTERNALEVENTS and ~RELATIONSHIPS represent the consistency with the absence of a variable and a successful outcome. Unsurprisingly, there is little consistency here – there is no reason why the pro-shale coalition should attempt to avoid having

resources or good relationships with policymakers. One area worth noting is the absence of supportive public opinion being necessary with a successful application. This should be discarded: the pro-shale coalition lacked supportive public opinion in almost all of their applications, so the possibility of a relationship between this and a successful outcome can easily be discarded.

These results must come with a further caveat: the value for relationships with policymakers considered relationships nurtured both at a national and local government level, though the ultimate decision on a planning application was made – with the exception of those that were appealed – by local government. As such, these results cannot prove that building relationships with policymakers does not lead to success. However, given that the companies worked harder at building links with national government, it perhaps suggests that they could have targeted their lobbying efforts more effectively.

This analysis was inverted, in order to determine the necessary and sufficient conditions for the failure, rather than success, of an application. It was only in a minority of cases that the pro-shale coalition failed, and consequently no combination of variables were found to be consistent with an unsuccessful outcome (table 5.10). However, the necessary condition test found that the anti-shale coalition needs resources in order for the pro-shale coalition to fail (table 5.11).

Table 5.10: Truth table for pro-shale cases with anti-shale variables included (~OUTCOME)

EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	OPPEXTERNAL	OPPRELATIONSHIPS	OPPRESOURCES	OPPPUBOPINION	number	~OUTCOME	raw consist.
0	1	1	0	0	0	0	1	1		0.462
0	0	0	0	0	1	0	0	1		0.444
0	1	1	0	0	1	0	0	1		0.429
0	1	1	0	0	1	0	1	1		0.429
0	1	1	0	1	1	0	0	2		0.231
0	1	0	0	1	1	0	0	1		0.2
0	1	1	1	0	1	1	1	1		0
0	0	1	0	1	1	1	1	1		0

Table 5.11: Necessary conditions for pro-shale failure

Condition tested	Consistency	Coverage
EXTERNALEVENTS	0.522	0.400
~EXTERNALEVENTS	0.826	0.317
RELATIONSHIPS	0.783	0.273
~RELATIONSHIPS	0.348	0.333
RESOURCES	0.696	0.296
~RESOURCES	0.609	0.389
PUBOPINION	0.261	0.333
~PUBOPINION	0.827	0.264
OPPEXTERNAL	0.261	0.158
~OPPEXTERNAL	0.826	0.365
OPPRELATIONSHIPS	0.826	0.317
~OPPRELATIONSHIPS	0.522	0.400
OPPRESOURCES	0.217	0.156
~OPPRESOURCES	1.000	0.397
OPPPUBOPINION	0.522	0.261
~OPPPUBOPINION	0.739	0.386

Table 5.12: Data set for anti-shale cases with pro-shale variables included

ANTISHALECASE	OUTCOME	EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	OPPEXTERNAL	OPPRELATIONSHIPS	OPPRESOURCES	OPPPUBOPINION
GrangeRoad	0.3	1	0.6	0.6	0.2	0.6	0	0.4	1
PreeseHall	0	0	0	0	0	0.8	0.6	0.4	1
PrestonNewRoad	0.3	1	0.4	0.8	0.2	0.6	0	0.2	1
Anna'sRoad	1	0.8	0.2	1	0.8	0.8	0.6	0.8	0.8
RoseacreWood	1	0.6	0.4	1	0.6	0.6	0.2	0.2	0.6
Becconsall	0	0.6	0.4	0.4	0.4	0.8	0.2	0.4	0.8
KirbyMisperton	0.3	0.4	0.2	0.8	0.6	0.6	0.2	0.6	0.8
SpringsRoad	0	0.4	0.4	0.6	0.8	0.6	0.2	0.2	0.8
TinkerLane	0	0.4	0.4	0.6	0.8	0.6	0.4	0.4	0.8

Table 5.13: Truth table for anti-shale cases with pro-shale variables included

EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	OPPEXTERNAL	OPPRELATIONSHIPS	OPPRESOURCES	OPPPUBOPINION	number	OUTCOME	raw consist.
1	0	1	1	1	1	1	1	1		0.556
1	1	1	0	1	0	0	1	1		0.538
1	0	1	0	1	0	0	1	1		0.536
1	0	1	1	1	0	0	1	1		0.536
1	0	0	0	1	0	0	1	1		0.389
0	0	1	1	1	0	1	1	1		0.35
0	0	1	1	1	0	0	1	2		0.346
0	0	0	0	1	1	0	1	1		0.143

Part three: Anti-shale coalitions

Following a similar procedure to part two, the anti-shale cases were tested, with the opposition variables representing the pro-shale coalitions' scores subtracted from 1. This is shown in table 5.12. It is worth noting here that the anti-shale coalition had far fewer successes than the pro-shale coalition, with only the Anna's Road and Roseacre Wood applications failing.

Here, the highest consistency is only 0.56, meaning that no combination of variables is consistent with a successful outcome for the anti-shale coalition. This means that even when the anti-shale coalition possesses favourable conditions in three out of the four variables – as happened in three of the nine cases – success cannot be assured. The analysis of necessary conditions provides more information. Mirroring the test for pro-shale coalition failure, a necessary coalition is present for anti-shale coalition success: resources. The outcomes were then inverted (table 5.15) in order to find which conditions were sufficient for anti-shale coalition failure (table 5.16)[36].

Table 5.14: Necessary conditions for anti-shale success

Condition tested	Consistency	Coverage
EXTERNALEVENTS	0.793	0.442
~EXTERNALEVENTS	0.310	0.237
RELATIONSHIPS	0.483	0.467
~RELATIONSHIPS	0.793	0.383
RESOURCES	1.000	0.500
~RESOURCES	0.241	0.218
PUBOPINION	0.724	0.477
~PUBOPINION	0.517	0.326
OPPEXTERNAL	0.793	0.383
~OPPEXTERNAL	0.517	0.500
OPPRELATIONSHIPS	0.345	0.417
~OPPRELATIONSHIPS	0.724	0.318
OPPRESOURCES	0.621	0.500
~OPPRESOURCES	0.655	0.352
OPPPUBOPINION	0.793	0.303
~OPPPUBOPINION	0.276	0.571

[36] An analysis of necessary conditions for anti-shale coalition failure was also conducted but is not shown because it did not produce any meaningful results. It did, however, indicate that a high pro-shale public opinion score is necessary for the anti-shale coalition to fail. This obviously appears counterintuitive, but it can be disregarded as there were not any cases where the pro-shale coalition's public opinion was considered to be in their favour.

Table 5.15: Truth table for anti-shale cases with pro-shale variables included (~OUTCOME)

EXTERNALEVENTS	RELATIONSHIPS	RESOURCES	PUBOPINION	OPPEXTERNAL	OPPRELATIONSHIPS	OPPRESOURCES	OPPPUBOPINION	number	~OUTCOME	raw consist.
1	0	0	0	1	0	0	1	1		1
0	0	0	0	1	1	0	1	1		1
0	0	1	1	1	0	1	1	1		0.8
1	0	1	0	1	0	0	1	1		0.786
0	0	1	1	1	0	0	1	2		0.769
1	1	1	0	1	0	0	1	1		0.769
1	0	1	1	1	0	0	1	1		0.714
1	0	1	1	1	1	1	1	1		0.556

Setting the level of consistency at 0.8, the following sufficient combinations for anti-shale failure were found:

Table 5.16: Sufficient combinations for an anti-shale coalition failure

Solution	~RESOURCES	~OPPRELATIONSHIPS*OPPRESOURCES	~EXTERNALEVENTS*OPPRESOURCES
Consistency	1	0.813	0.833
Raw coverage	0.525	0.426	0.328
Unique coverage	0.163934	5.96e-08	0

Solution coverage	0.590
Solution consistency	0.857

Table 5.16 suggests that the anti-shale coalition will fail when they lack resources and when the opposition's possession of significant resources is coupled with no meaningful external events supporting the anti-shale coalition. It also shows that success is not guaranteed for the anti-shale coalition when the pro-shale coalition lacks meaningful relationships with policymakers, as this can be overcome if they have significant resources.

Analysis of results and comparison with case studies

The results indicated by the fsQCA analysis can be summarised as follows:

1. There is no general condition that will always lead to success for both the pro-shale and anti-shale coalitions.
2. The pro-shale coalition is more likely to see a successful application when there are no external events helping the anti-shale coalition, such as earthquakes or protests outside the local subsystem.
3. The pro-shale coalition is also more likely to be successful when the anti-shale coalition scores lowly for public opinion.
4. There needs to be an anti-shale coalition for the pro-shale coalition to fail.
5. The anti-shale coalition needs meaningful resources to succeed.
6. The anti-shale coalition is not assured of success if the pro-shale coalition lacks meaningful relationships with policymakers, as this can be overcome if they possess significant resources.
7. If the anti-shale coalition lacks sufficient supporting external events, the pro-shale coalition can ensure their failure through the mere exercise of resources.

There is no general condition that can be attributed as leading to success for both the pro-shale and anti-shale coalitions.

As can be seen in the case studies, there was a fundamental behavioural difference between the two coalitions: the pro-shale coalition tried to limit the policy subsystem to a small number of actors, while the anti-shale coalition pursued mass engagement strategies such as protests, leafleting and petitions.

For instance, at Grange Road, Cuadrilla publicised their policy of allowing site visits as part of their engagement strategy, but in practice this was mostly limited to political figures, with visits from Fylde Borough Council; Lancashire County Council; several MPs, ministers and peers; Friends of the Earth and 41 residents (Arup, 2014a, pp. 21–22). The figure of 41 residents may seem significant, but 1,242 residents issued objections (2% of the adult population of the Fylde) (Lancashire County Council, 2015b). Overall, it was in Cuadrilla's interest to limit their public engagement. Similarly, iGas also sought to control access to opponents by creating a Community Liaison Group for their Springs Road application, where each parish council was asked to nominate one member of the local community – a total of ten – to take part in monthly meetings, site visits, and "exchanging information and concerns" (IGas Energy, 2015a, pt. 3.2). This again represents a significant limitation of direct engagement for an application that faced over 2000 objections (Nottinghamshire County Council, 2016a). Much of the pro-shale strategy focused on this approach designed to target and limit involvement, with much emphasis being placed on direct engagement with national government, a body that was far more pro-shale than the local authorities or public opinion as a whole.

There was a point where shale gas operators began to be far more open to community engagement – if grudgingly. The Director of Operations at Third Energy claimed to have "open door policy to anyone who has genuine concerns" regarding the company's Kirby Misperton site in North Yorkshire, but his mind was nevertheless already made up, saying that "if [protestors] are coming just to cause disruption, my message to them is that we will still go ahead. Please go away." (BBC News: York and North Yorkshire, 2017).

Meanwhile, the anti-shale strategy was completely different. While the pro-shale coalition sought to close the policy subsystem down, the anti-shale coalition aimed to open it up. This can be seen in the publications issued by Friends of the Earth, the mass letter-writing campaigns coordinated by the anti-fracking groups under the Frack Off umbrella and the breadth of protestors, including local residents, environmentalists, anti-fracking activists and "serial protestors" (Henley, 2013).

With these differing approaches being taken by the two coalitions, it is understandable that no unifying method of success relevant to both coalitions can be found.

The pro-shale coalition is more likely to see a successful application when there are no external events helping the anti-shale coalition, such as earthquakes or protests.

As will be illustrated by the Grange Road and Kirby Misperton case studies, there was no entity that could reasonably be called an anti-shale coalition before the earthquakes at Preese Hall in 2001. The

publicity this gained, and the fear engendered by it, played a significant role in mobilising opposition to shale gas and forming anti-shale coalitions. Prior to the earthquakes, the pro-shale coalition were able to get planning applications accepted with limited effort. The other great external event that acted as a boon for the anti-shale coalition was the protests at Balcombe in summer 2013, and the period immediately following that saw growing opposition to shale gas. From this point on, shale developers would still see their applications being accepted, but it took far greater effort than it did before high-profile events drew attention to shale gas and hydraulic fracturing.

The pro-shale coalition is also more likely to be successful when the anti-shale coalition scores lowly for public opinion.

The pro-shale coalition is more likely to be successful when overall awareness of shale gas is low, the numbers of people with anti-shale opinions are low and the intensity of these opinions is limited. This is closely related to the contention that the pro-shale coalition is likely to be successful when there are no events favouring the anti-shale coalition: public opinion turning against shale gas development comes as a direct consequence of external events benefiting the anti-shale coalition. The aforementioned earthquakes and protests drew attention to shale gas. They increased awareness of shale gas, the proportion of those people holding negative views of it, and the intensity of their opposition. Again, this played a key role in forming anti-shale coalitions with thousands of participants from diverse backgrounds, and this widespread opposition made it harder for developers to get applications accepted.

At Grange Road and Preese Hall public opinion was scored at 0.2 and 0 respectively. The initial Grange Road applications came at a time when very few people had an opinion on shale gas, while the refusal of the third Grange Road application coincided with declining favourability and increasing knowledge of shale gas. Meanwhile, the 2009 Preese Hall application faced very little difficulty due to a lack of widespread awareness. On the contrary, Cuadrilla's application at Anna's Road, where the anti-shale coalition scored 0.8 for public opinion, was ultimately withdrawn. This January 2013 withdrawal came at an interesting time for anti-shale opinion, as the fracking moratorium had been lifted but the government was yet to offer strong and explicit support for shale gas. Unsurprisingly, this was a point at which public opinion was particularly opposed to shale, with around 70% of respondents associating shale with earthquakes and 45% with water contamination - both issues that featured prominently in objections (O'Hara et al., 2016).

However, public opinion in favour of the anti-shale coalition would not always mean pro-shale failure. At Tinker Lane in 2015-16 a poll of local residents found 87% opposed to shale gas, yet IGas

saw their application accepted with only minor delays imposed (Nottinghamshire County Council, 2017).

There needs to be an anti-shale coalition for the pro-shale coalition to fail.

Without an anti-shale coalition, those opposing shale gas are limited in number and unable to cooperate effectively, with an obvious example of this being the three locals who objected to Cuadrilla's first application at Grange Road in 2009. During this early period, anti-shale coalitions did not exist, and as such there was very little questioning, objection or contention of the proposals being made by Cuadrilla. Without the presence of an anti-shale coalition, the shale developers' application would be considered solely on the merits of the information provided by the pro-shale coalition.

The anti-shale coalition needs meaningful resources to succeed.

This follows on from the previous condition. If the anti-shale coalition possesses significant resources, such as expertise, financial support and mass membership they can succeed. If they lack resources, they will not. As membership is a resource, if a coalition has no resources it does not exist. This can range from the initial application at Grange Road in 2009 with no coalition and thus no resources to the threadbare anti-shale coalition at Becconsall. At Becconsall, Friends of the Earth, Ribble Estuary Against Fracking and Sefton Green Party had some limited coordination, but this only resulted in 240 objections to the application: a relatively small number. They were also unable to gain support from any of the mandatory consultees, such as parish or borough councils (Lancashire County Council, 2013a, 2014). For these reasons, the anti-shale coalition was scored at 0.4 for resources, and Cuadrilla's application was accepted with ease, with minimal consideration of the concerns raised by the anti-shale coalition[37].

While there were a number of occasions where significant resources were not enough to guarantee success for the anti-shale coalition, they were never able to succeed without them. Anna's Road, where Cuadrilla withdrew their 2013 drilling application before it was even considered (Arup, 2013), was the site of the anti-shale coalition's most resounding success. It was also the only location where they scored 1 for resources, due to extensive sharing of information between local residents and

[37] The council did later compel Cuadrilla to clean up the site. There is significant evidence that the anti-fracking coalition played a role in achieving this victory. Lesley Graham, the founder of Ribble Estuary Against Fracking was reported as saying "[a]nti-fracking campaigners and opponents around the UK can take heart that a small group of individuals can make a difference in preventing energy companies from having their own way", and was hailed by Friends of the Earth for its potential to "inspire people across the country" (Hayhurst, 2018a). This success, however, came after Cuadrilla's application was accepted, and is thus out of the scope of the study.

campaigners from locations as diverse and distant as Shetland, Sheffield and London. Residents' Action on Fylde Fracking and Friends of the Earth coordinated extensively and effectively, building a campaign that effectively focused on the dangers of fracking even though this was not part of the application (Lancashire County Council, 2013b). Were it not for the resources of the anti-shale coalition[38] Cuadrilla would not have been pressured into withdrawing their application. A revised application was promised, but it never emerged (Arup, 2013).

The anti-shale coalition is not assured of success if the pro-shale coalition lacks meaningful relationships with policymakers, as this can be overcome if they possess significant resources.

It is worth stressing here that there is necessarily some degree of abstraction to the relationships with policymakers variable, as a coalition can have different relationships with policymakers at a national and local level, or even within different departments at the national level. In general, the pro-shale coalition scored highly for meaningful relationships with policymakers, though in the early cases where governments were yet to express interest in shale gas this ambivalence was generally accompanied by a good deal of investment support and staff with experience of shale gas work in the United States. At Anna's Road, on the other hand, where the government was only moderately pro-shale and Lancashire County Council highly cautious, Cuadrilla also lacked the resources possessed by their opponents, being unable to summon even tacit levels of local support (Lancashire County Council, 2013b).

If the anti-shale coalition lacks sufficient supporting external events, the pro-shale coalition can ensure their failure through the mere exercise of resources.

This again highlights the importance of external events in mobilising the anti-shale coalition. This goes beyond the applications made before the Preese Hall earthquakes, where external events were largely unimportant to either coalition – at Preese Hall itself the anti-shale coalition scored 0 and the pro-shale coalition only 0.2 for external events. A series of applications around 2016-17[39] were rated at only 0.4 for external events in the anti-shale coalition's favour, as the consequences of external events had were more limited than previously. By this point, the saliency and resonance of the earthquakes had subsided, being emphasised far less in objections compared to earlier applications (cf North Yorkshire County Council, 2016; Nottinghamshire County Council, 2017, 2016). Google queries for terms such as "shale gas" or "fracking" were also noticeably lower in 2016 and 2017 compared to 2013.

[38] Namely organisation, membership and the production and sharing of information.
[39] Kirby Misperton, Springs Road and Tinker Lane

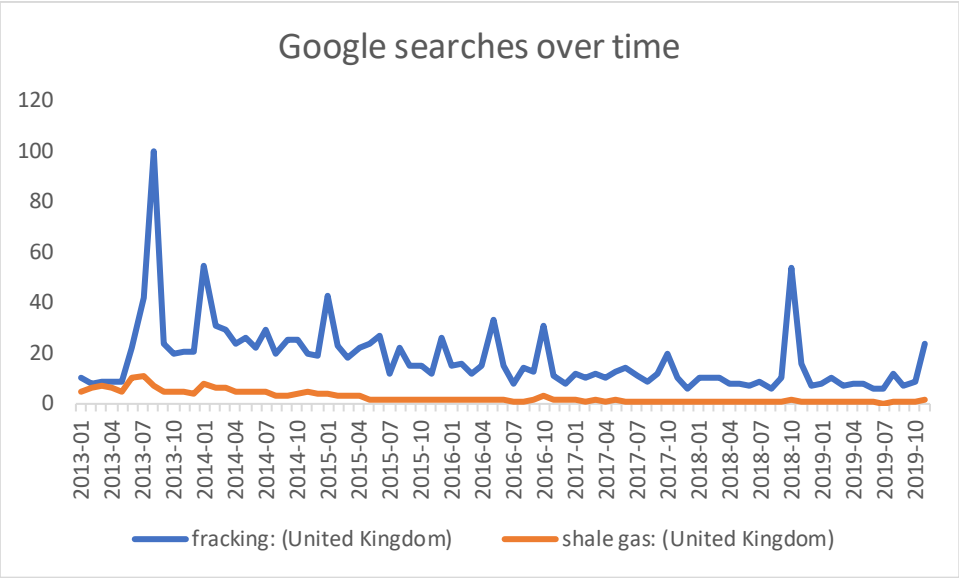

Figure 5.1: Search queries for "fracking" and "shale gas" in the United Kingdom between 2013 and 2019[40] (Google Trends, 2019).

Perhaps this decrease is representative of fatigue: people had spent enough time discussing shale gas and were ready to move onto something else. It might have usurped by the coverage and attention given to the 2016 referendum on European Union membership and its aftermath. Figure 5.1 shows searches conducted on Google for the phrases “fracking” and “shale gas” in the United Kingdom between 2013 and 2019. It shows a spike in Summer 2013, around the time of the Balcombe protests. There was a relatively large number of smaller spikes and a reasonably high baseline of activity for some time thereafter, though both of these had tailed off by 2017. This is indicative of the decreasing number significance of events that might drive new members to coalitions, and shale gas becoming a less salient matter of public opinion. This clear lull in external events bringing interest to shale gas enabled the likes of Third Energy and IGas to succeed in Kirby Misperton, Springs Road and Tinker Lane in the face of relatively meagre resistance.

Conclusion

There are a number of combinations of variables that can influence the success or failure of a shale gas application. Some of these, such as the need for an anti-shale coalition to ensure the pro-shale coalition’s failure, are quite predictable. Others, such as the absence of negative events or public opinion being sufficient to result in success for the pro-shale coalition, even if their own resources or relationships are limited, were not expected at the outset of this study.

[40] Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means that there was not enough data for this term (Google Trends, 2019).

Indeed, it is the relative absence of relationships with policymakers as a necessary or sufficient condition that is most surprising, particularly given the government's promises to "go all out for shale", their commitments to reform and streamline the planning system and the extent to which the pro-shale coalition had access to senior ministers (HM Treasury, 2013, pt. 1.13; Osborne, 2015; Watt, 2014). However, this must also be subject to a caveat: there were only two cases in which the pro-shale coalition scored less than 0.5 for relationships with policymakers – Anna's Road and Preese Hall. While these were both successful, the Preese Hall case is atypical in that it was fully completed before shale gas attracted increasing levels of scrutiny. Secondly, while it is outside the scope of the local government applications considered, relationships with policymakers do appear to have been highly useful in successfully overturning applications rejected at a local level. Nevertheless, strong relationships do not appear to have been a decisive factor in the applications themselves, as they were present for the pro-shale coalition in each of the applications that were rejected,

In general, the pro-shale coalition enjoyed strong relationships with policymakers, with a mean score of 0.73 for the variable across all cases. As such, the relative impotence of the government-developer relationship suggests that such relationships were not particularly important: both wanted shale gas development to succeed and both worked towards that end, but that relationship by itself was not sufficient – particularly when faced with strong public opposition and unfavourable external conditions.

The limitations of the developer-government relationship become even clearer when looking at the aftermath of the applications. While the pro-shale coalition's applications in seven of the nine sites were accepted, only two of these – Preston New Road and Preese Hall – were ultimately fracked and none of them produced any gas. A number of the applications that were accepted saw no further developments, with several sites abandoned and restored. Of the seven accepted applications, two of these were only assessed as partial successes, coming as a result of appeals processes could almost be regarded as a failure given the significant delays imposed on development.

Protests persisted at a number of the sites where applications were accepted, causing significant delays and blockages to developers that were trying move supplies, equipment and staff to and from their license. This underlines the fact that cases being assessed as successes for the pro-shale coalition during the application phase is not enough to guarantee that the technical – or exploration and production – phase will be implemented successfully. Shale developers are likely to have been confident in their ability to develop a site at the outset of their application. It is possible their inability to do so may result from their resources being stretched as a result of anti-shale coalition

opposition prolonging the application and putting them under pressure from investors looking for quick returns.

It is also worth addressing what this study indicates about the formation of coalitions. During the pre-earthquake application there were no external events or public interest, meaning that applications can proceed undisrupted. This supports Sabatier's assessment of the way in which coalitions are formed:

> "But, as information develops concerning the seriousness of the problem, the causes, and the costs of remedying the situation, actors tend to coalesce into distinct coalitions, often around some watershed event that clarifies the underlying conflicts". (Sabatier, 1998, p. 114)

The fsQCA study, as well as the case studies, show that there was a situation where a pro-shale coalition was only opposed by a few poorly resourced and disparate actors until an external shock heightened public interest, resulting in the formation of an anti-shale coalition. External shocks can "[tip] the advantage to a different coalition with different policy core beliefs" (Weible, 2007, p. 101). This was the case here, with external shocks and public opinion favourable to the anti-shale coalition playing an important part in the formation of anti-shale coalitions. These anti-shale coalitions were rarely able to prevent planning permission from being granted, but the attrition they inflicted upon the pro-shale coalition by prolonging the process may have been decisive in of itself.

Having revealed some clear trends across a larger range of drilling sites, the following case studies will reveal more about the relationships between these combinations of variables and how such connections arise. The case studies will not always conform to the conditions set out here, but they will go some way to explaining why they exist.

Case study 1 – Grange Road, Lancashire

The proposed drilling site at Grange Road was often referred to as "Land South of Grange Road" or as "Grange Hill". In the interests of consistency, it will be called Grange Road throughout this study.

This case study focuses on Cuadrilla's proposed drilling site at Grange Road in the north-west of England. The applications at this site were among the most contentious during this period, and as such the activities of the pro-shale and anti-shale coalitions offer a valuable perspective on the factors affecting policy change in the advocacy coalition framework.

For each of the applications made at this site, I analyse the membership and activities pro-shale and anti-shale coalitions in order to identify the extent to which the four variables – external events, relationships with policymakers, resources and public opinion – determine whether a coalition was successful in achieving its goals. For the pro-shale coalition success is defined as an accepted application, while a rejected application represents a successful outcome for the anti-shale coalition.

In this case study I find that each of the four variables play some part in determining outcomes. The pro-shale coalition relies upon resources, namely investors and technical expertise, in order to achieve their outcomes, though they also benefit to a lesser extent from a close relationship to government resulting in policy changes making it easier to attract investors and get applications accepted. The anti-shale coalition, meanwhile, also depends heavily upon resources, though in their case it takes the form of a larger membership to increase lobbying pressure upon local government and delay applications.

Background

Grange Road is near Singleton, a small village of around 900 people in the vicinity of Poulton-le-Fylde. It is situated in the Fylde, a coastal plain in western Lancashire. While shale gas applications were typically concentrated in rural areas the Fylde is something of an anomaly, being fairly densely populated and forming part of the Blackpool Urban Area. The Grange Road site itself is further inland, with Singleton one among a number of small villages dotting the interior. As such, the coalitions included both urban and rural interests.

As is typical throughout rural England, there is a multi-tier system of formalised local government (see figure 6.1), with Fylde Council being one of twelve such bodies falling in the tier below Lancashire County Council. Below Fylde Council, at the most local level, is Singleton Parish Council, where the councillors are all volunteers.

Singleton Parish Council has limited powers concerning planning, retaining only the "right to be notified" of a planning application affecting their area and to "make comments which the planning authority must take into account" (Singleton Parish Council, 2019). Fylde Council, while having decision-making power in everyday planning applications such as extensions or chimneys, are similarly relegated to the status of a mere consultee, with Lancashire County Council being the minerals and waste planning authority for the whole county (Fylde Borough Council, 2019). This

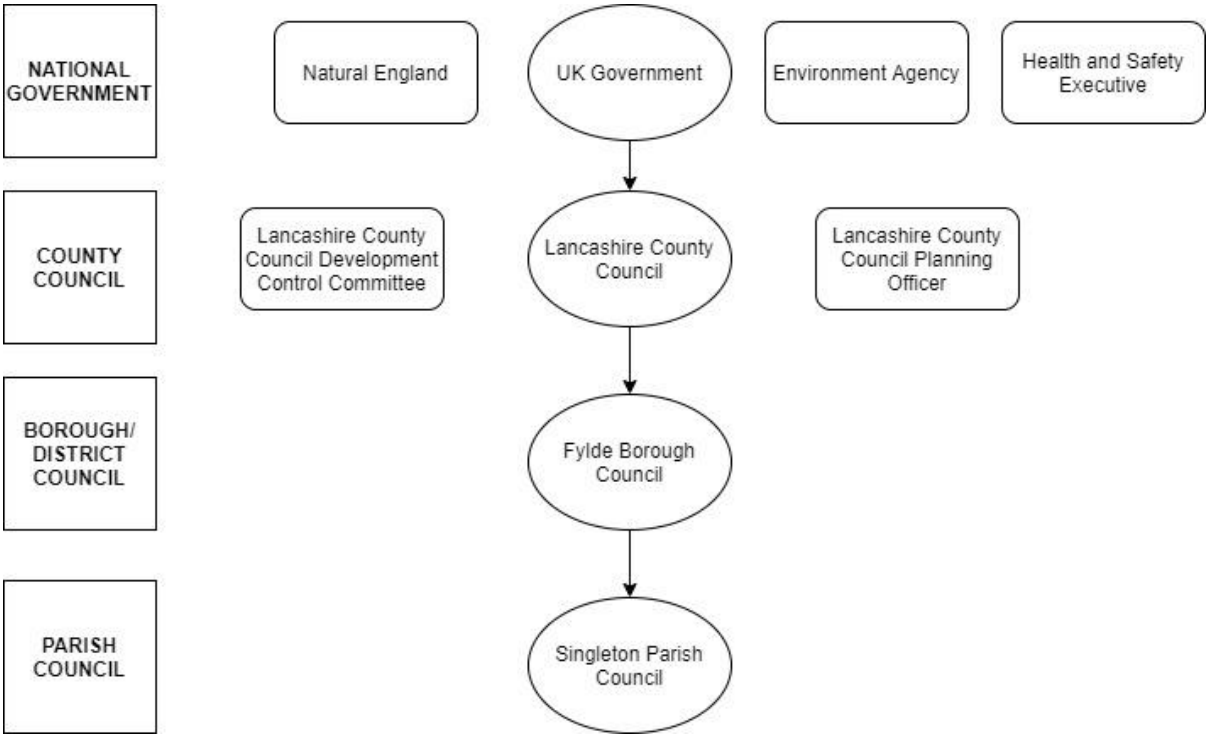

Figure 6.1: Key public bodies involved in Grange Hill application

decision-making structure will be replicated (with different local authorities) in the following two chapters.

Cuadrilla Resources made three planning applications regarding their license at Grange Road. The first of these was made in February 2010, with the aim of changing the use of the site from agricultural use in order to drill an exploratory borehole (Cuadrilla Resources, 2010). As was typical of shale developments in that early period, the application encountered very limited opposition, with planning permission being granted in April. A single well with a depth of 10,700 metres was drilled the following year. This and the other case studies will demonstrate that the application was able to proceed with ease because the lack of awareness of shale gas meant that there was no anti-shale coalition able to oppose the development.

A second application followed in December 2011 with the objective of extending the period of time allowed for completing work on the site. Perhaps as a result of the Blackpool earthquake that very

month, the application was withdrawn a matter of days later, before the local authority even had time to collect objections to the development.

The third application was issued two years later in May 2014, again with the intention of extending Cuadrilla's retention period for the site – this time with the stated intention of conducting seismic and pressure monitoring, plugging the well and readying the site for its eventual abandonment (Cuadrilla Resources, 2014c). By this point, following the earthquake and the 2013 protests at Balcombe, opposition to shale gas had begun to mount and a powerful anti-shale coalition had established itself. After a contentious planning process, the application was refused by Lancashire County Council in May 2015. Cuadrilla appealed this decision to the Planning Inspectorate (residing within the then Department for Communities and Local Government) with the appeal ultimately proving successful in February 2016.

In spite of the money and time spent by Cuadrilla – not to mention their opponents – in contesting this matter, there were no further meaningful developments at the site (Cuadrilla Resources, 2019). It was eventually restored to farmland on 5 December 2018 – almost seven years after the original deadline (Hayhurst, 2018b). While post-application developments are out of the scope of this study, it is worth noting that the granting of planning permission after appeal was unlikely to deter the elements of the anti-shale coalition focused on protest and direct action, and it is possible that their continued activity may have contributed to Cuadrilla's ultimate failure to develop the site. It is also likely that the sheer length and expense of the application and the appeals process exhausted Cuadrilla, limiting the resources they had available to commence work.

Grange Road is an interesting case, and worthy of investigation for a number of reasons. Firstly, it highlights the key role of coalition language and discourse. It led to a lengthy and heated engagement between opposing coalitions from 2014-2016, with an overwhelming amount of the debate focusing on hydraulic fracturing – even though this was not the proposal of the application in question. Nevertheless, the anti-shale coalition was aware of the rhetorical and mobilising power of fears associated with fracking and made this the focus of their objections, knowing that it carried more emotional weight than the aspects of the planning framework that the application was supposed to be decided on.

Secondly, the way in which engagement leapt from three objections against the 2010 application to over 300 for the 2014 application offers the potential for interesting insights into the ways in which political engagement can rapidly develop and nascent coalitions can begin influencing policy.

Finally, the fact that this was among a relatively small number of applications across England to be referred to national government on appeal is significant in itself. In the majority of shale applications government played the role of a pro-shale coalition member: encouraging applications, creating incentives and, as evidence of the coordination required to be a true coalition member, sharing information. Here, it also wielded decision-making power.

Application 1 (2010)

In February 2010, Cuadrilla Resources submitted an application for "the initial drilling of the Grange Hill exploration well" followed by a short testing programme which also required approval from the Health and Safety Executive and the Department of Energy and Climate Change (Cuadrilla Resources, 2010, p. 2). After a straightforward consultation period, the application was accepted on 21 April 2010, with very limited dissent.

Actors and alignments

First, it is worth restating the requirements for a coalition to exist:

1. The actors must have shared beliefs.
2. There must be evidence of some form of coordinated activity between members.

In this particular case no coalitions existed, as there was no meaningful coordination identified between actors with similar beliefs. As such, the alignments below should be taken merely as an indication of shared beliefs.

Table 6.1: Actors involved in Grange Hil application 1

Pro-shale actors	**Anti-shale actors**	**Uncertain/unaligned**
Cuadrilla Resources	3 objections from private individuals	Environment Agency
UK Government		Singleton Parish Council
		Fylde Borough Council
		National Grid
		Lancashire County Council (and relevant committees and directorates)

Pro shale

Cuadrilla Resources, the applicant. An exploration and production company founded in 2007. At this time, Cuadrilla was little-known a company with an opaque ownership structure (Companies House, 2010a, 2019a).

The **UK Government** did not act directly in this case. However, as noted by Lancashire County Council (2010a, p. 4) the government's stated policy at the time of the application was that the development and recovery of all economic hydrocarbon reserves is in the national interest. This application was one of the few made under a Labour government, with planning permission granted on 21 April 2010, less than three weeks before that year's general election on 8 May 2010.

Anti-shale

The only opposition to this application came in the form of three objections made by private individuals. These objections were related to the prominence of the site and its proximity to public vantage points making it visually unappealing as well as the prescient observation that any temporary consent granted could make further developments "difficult to resist" (Lancashire County Council, 2010a, p. 3). The visual impact of the site, as well as the fear that allowing one application would create a precedent for future applications, would continue to be important areas of focus for the anti-shale coalition upon its establishment.

Even when the criteria for consideration is widened beyond those who specifically participated in this application, opposition to shale gas is hard to find. At this stage there were no anti-shale protestors or discernible dissent in the media, political parties or NGOs.

Uncertain/unaligned

The **Environment Agency**, a government body responsible for environmental protection in England made no contribution, other than to suggest that Cuadrilla follow their anti-pollution guidance.

The **National Grid**, the company owning and operating the electricity transmission network in England, recorded no objection.

Singleton Parish Council and **Fylde Borough Council**, both mandatory consultees, had no observations to make. This is unsurprising, given that the nearest residential properties were around 550m away, and there was little awareness of what a nearby drilling operation might entail.

Lancashire County Council had returned to Conservative control in 2009 following a period of Labour dominance stretching back to 1985. 51 of the 84 councillors were Conservative, giving them a comfortable majority. With shale gas far down the agenda of local matters at the time, a clear council position is difficult to discern. In this application, the views and activities of the council were of little consequence.

The council's **Development Control Committee**, responsible for considering the application, was broadly proportional to the total number of councillors, consisting of 9 Conservatives (including the chair), 3 Labour and 2 Liberal Democrats (Lancashire County Council, 2009a, 2010b, p. 1).

External events

One of the key external events to influence later applications was the activities carried out by other coalitions at other sites across the United Kingdom. At this early stage, there was no such activity, and this played a clear part in the easy success of this application. Without protests and opposition against other applications playing a part in mobilising actors to form and join anti-shale coalitions, the underlying external factors created a generally favourable environment for Cuadrilla's application.

Cuadrilla's first application to drill at Grange Road came in the midst of a period of heightened concerns over energy security and energy prices. In August 2009, the Economist published a front cover asking "How long till the lights go out?", in which they outlined the United Kingdom's energy situation at the time: just over 45% of the country's electricity came from North Sea gas, with a 20GW shortfall estimated for 2015 – which would, "if nothing radical is done", have to be met from gas imports (The Economist, 2009). The lack of awareness around shale gas was such that this article, published just after Cuadrilla submitted their application to drill at Preese Hall made no mention of shale gas, stating that "at this stage there is no lightning bolt solution" (The Economist, 2009). Instead, the suggested solutions were based on gas storage, cross-channel power cables, further European energy integration and carbon taxes. The only mention of domestic energy production came in the form of the managed decline of North Sea production. However, it is worth noting that the energy security fears were not quite as stark as many might have been led to believe at the time. Indeed, electricity consumption actually decreased from 329TWh in 2009 to 311TWh in 2015 (Department for Business, Energy and Industrial Strategy, 2019).

Regardless of whether the fears around energy security were overstated, they retain the capacity to influence decision-making, and the framework used by the planning committee required them to consider this when scrutinising the application.

Nevertheless, there were legitimate reasons for uncertainty. In July 2008 oil prices reached a peak of $147 a barrel. By December, following the worst of the 2008 financial crisis, this had plummeted to $32. Thereafter, it recovered to $71 before beginning a more gradual rise to $77 per barrel around the time of the application being considered. (International Energy Agency, 2010a)

Meanwhile, domestic oil production had declined by 55% from its 1999 peak, with domestic gas production falling by 44% in the same period (International Energy Agency, 2019). With low carbon-energy generation yet to form a significant part of the energy mix – nuclear power generation was also declining, and wind power was yet to begin its rapid expansion – there was good reason for worries about where the UK would get its energy from in the future. Meanwhile, the rapid growth of

the Chinese economy – relatively unafflicted by the financial crisis – was expected to have severe implications for global energy markets, driving prices even higher (International Energy Agency, 2010b, pp. 97–100). At the same time, governments could have fewer foibles about pursuing fossil fuel developments than might have been the case a few years later: climate change was not yet particularly high on the political agenda: polling from June 2010 reveals that only 11% of respondents listed the environment as one of the top three concerns facing the United Kingdom, while 80% referred to the economy (YouGov, 2015).

The combination of increasing – and recently volatile – oil prices coupled with economic concerns thrown up by the financial crisis taking clear precedence over fears for the environment helped to create favourable conditions for companies hoping to produce domestic oil and gas. Government – and by extension local government policy favoured the exploitation of oil and gas reserves on the basis of what was economically efficient (Department for Communities and Local Government, 2012, chap. 13). This is something that Cuadrilla clearly aimed to make the most of in their application, stating that the "benefit would be on a national scale" and that hydrocarbons would be in the "public interest" (Cuadrilla Resources, 2010, pt. 1.6). For Cuadrilla themselves, the development costs of unconventional prospects were such that they would probably be impossible if energy prices were not high.

Meanwhile, the International Energy Agency's World Energy Outlook for 2009 asked "what does the unconventional gas boom in the United States mean for the rest of the world?" and whether other countries could expect " a global gas glut" (International Energy Agency, 2009). At that point, the United Kingdom was not expected to play a large part in this shale revolution, with the projected decline in British production from 2007-2030 cited as an energy security concern for the European Union as a whole (International Energy Agency, 2009, p. 120). Nevertheless, the widely published early successes of the American shale boom were beginning to be noticed in Britain.

However, this was also a point where the fossil fuel industry suffered severe reputational damage. On 20 April 2010, just one day before Cuadrilla's application was submitted, Deepwater Horizon, a BP offshore drilling rig in the Gulf of Mexico, exploded, killing eleven workers and causing the largest oil spill in the history of the petroleum industry. Yet the extent to which this could have impacted the committee's thinking appears to be negligible: studies on the spill's impact failed to find a significant drop in support for drilling in the USA (66% supportive in 2008 down to 59% in 2010) (Lilley and Firestone, 2013), and this effect may even have been diluted still further for an application made in the United Kingdom.

In general, underlying conditions at this stage were favourable towards oil and gas development. However, an external shock wields much greater influence in shaping the outcome of an application. The key thing that sets this application apart from those that followed is that there were no external shocks that threatened the credibility of the pro-shale coalition or drew support to an anti-shale coalition.

Public opinion

With no data being collected on attitudes to shale gas during the period of this application, it is difficult to measure the way public opinion influenced the application process. However, the reason data was not being collected on attitudes to shale gas was because awareness of it was minimal.

Using the previously referenced YouGov (2015) poll of political priorities from June 2010 as a proxy, the fact that only 11% of respondents listed the environment as one of their top three issues facing the country demonstrates that general opposition to fossil fuel development was likely to have been low – something that is corroborated during this application by only three objections being submitted. Furthermore, while surveys at the time found the public to have most positive opinions of energy generated from renewable sources (88% for solar, 82% for wind and 76% for hydroelectric), views of gas as a power source were reasonably favourable, with 56% of respondents in favour. This established gas as a far more popular power source than coal (36%), oil (33%) and nuclear (34%) (Spence et al., 2010, p. 11).

Some of the first public polling on shale gas would emerge a year later in the wake of the Preese Hall earthquakes, but even in March 2011 only around 37% of respondents were able to identify shale gas (O'Hara et al., 2015b, p. 5). A search of British newspapers from around the period of the application – using the terms "shale gas" and "hydraulic fracturing" – brings up one result, a Telegraph article from December 2009 entitled "Shale gas – a fossil fuel with a future" which refers to a "gas formation embedded in rocks across the US and potentially the world that needs to be fractured with water and sand leaving vast open scars across the landscape" (Mason, 2009). This was also the only reference to "hydraulic fracturing" or "fracking" that could be found.

Resources

At this stage, the resources of the different actors had little impact on the application. There was no anti-shale coalition: the only opposition came in the form of three letters written to Lancashire County Council. As the fsQCA analysis demonstrated, there needs to be an anti-shale coalition and it needs to command resources in order to successfully oppose an application.

Meanwhile, the situation of Cuadrilla was relatively humble, with only eight employees and assets worth £19 million at the end of 2009 (DueDil, 2019). However, in March 2010 eight new directors were appointed to the company (Companies House, 2019b, 2010b, pt. 6). Among these were Allan Campbell, the Sydney-based chief executive of AJ Lucas, an Australian company with a successful track record of extracting gas from coal seams (Fortson, 2013), Haroun van Hövell of Riverstone Holdings, a US-based private investment firm with significant energy interests (Rácz and Wilde-Ramsing, 2013, p. 10), and John Browne, a life peer and CEO of BP from 1995-2007. Browne's position came with a great deal of influence and contacts in the industry and government, but it was also something that would later be seized upon by opponents of Cuadrilla, who focused on a legacy at BP which had been linked to several accidents, including the 2010 Deepwater Horizon spill, which led to him being labelled "Lord Oil Slick" (Rácz and Wilde-Ramsing, 2013, p. 20; Urwin, 2013). Nevertheless Browne – also a partner at Riverstone – was a powerful figure in the oil and gas industry, while as a legislator he had a clear ability to influence policymaking.

Cuadrilla, backed by private investment and directors with decades of oil and industry experience (albeit not necessarily unconventional oil and gas experience), had some potential, and it is clear that in 2010 they acquired resources – not just financially, but also in terms of expertise. However, the possession of resources does not mean that they influenced the outcome, and at this stage there is little evidence that they did: largely because they weren't required. With minimal opposition, Cuadrilla's application merely had to demonstrate that it adhered to guidelines: no meetings were needed and no extensive evidence gathering or attempts to influence policy were required because no anti-shale coalition existed to oppose them.

Relationships with policymakers

Besides creating and maintaining a generally supportive environment for Cuadrilla, there is no evidence of any meaningful relationship between policymakers and any other actor at this stage. Cuadrilla's application came in February 2010, with the Labour party in government. At this point, Labour's confidence in deregulation, pro-business policies and "the end of boom and bust" had been rattled by the financial crisis, yet – as can be seen from their reluctance to reform the financial services sector in 2008/09 – they remained broadly supportive of private enterprise (Gamble, 2009, pp. 451, 458). However, Labour's record of support for the fossil fuel industry was somewhat more mixed. In 2008 Gordon Brown created the Department of Energy and Climate Change, with the goal of implementing legally binding emissions targets (Pearson and Watson, 2012, p. 36), while 2009 saw significant rises in fuel duty. Brown's controversial car scrappage scheme, while designed with the intention of rescuing the car industry, also had the stated goal of replacing older, less efficient, vehicles, leading to decreased fossil fuel consumption.

Nevertheless, the profile of shale gas was low at this point, meaning that the government had no special interest in Cuadrilla. Government policies on onshore oil and gas were largely tailored for the benefit of coalbed methane and mines gas, while shale gas was unknown.

Evidence of engagement with the county council is similarly limited. Planning meetings would be major centres of contention in future applications, and a key opportunity to access and influence decision-makers. At this stage there was not even any mention of Cuadrilla attending the planning meeting in April 2010 (Lancashire County Council, 2010b).

Those opposed to the application also had no meaningful opportunity to access and influence decisionmakers. The three objections received by the council were not supported by the council and none of the objectors expressed a wish to present their views to the committee (Lancashire County Council, 2010a, p. 4).

Summary of findings

Having considered a number of relevant factors, I conclude that Cuadrilla found their application being accepted with very little trouble because of a largely accommodating policy environment: governmental mineral planning policy was heavily skewed towards promoting the recovery of oil and gas, and local authorities were expected to place a great deal of weight upon this when making their decision.

The only way that Lancashire County Council would decide otherwise would be if there was clear opposition to Cuadrilla's plans, and if that opposition made itself known to the council. Neither of these conditions were fulfilled here. This means that Cuadrilla, while they equipped themselves with resources in the form of money, expertise and contacts over the application period had little need to use them. For Cuadrilla, relationships with policymakers and resources were present – or at least had the potential to be present – but there was no need to deploy them, and as such these variables had very limited impact on the outcome.

As such, the variables that had the most impact were public opinion – if only for the absence of public concern and interest – and external events. These together created an accommodating environment for Cuadrilla.

The lack of interest was perfectly encapsulated by a low-key BBC story from 28 March 2011 announcing the first hydraulic fracturing operation to be carried out in the UK, in which no mention was made of any protest or disagreement (BBC News, 2011a). Two weeks later, this drilling procedure would trigger two tremors and fundamentally change the dynamic of shale gas policy.

Application 2 (2011-2014)

On 20 December 2011, Cuadrilla submitted an application to Lancashire County Council requesting "more time to complete the testing programme and restore the site" – an extension of the permitted period from 18 months to 36 months after the start of the development (Cuadrilla Resources, 2011). Almost three years later, on 14 November 2014 – with very little engagement between the council and Cuadrilla appearing to happen in between – Cuadrilla sent a letter requesting that the application be withdrawn (Cuadrilla Resources, 2014d). The pro-shale coalition could no longer be assured of success, and the stagnating of the application – and its ultimate withdrawal – are indicative of this.

Actors and alignments

Pro-shale actors	Anti-shale actors	Uncertain/unaligned
Cuadrilla Resources		Lancashire County Council (and relevant committees and directorates)
		UK Government

Table 6.2: Actors involved in Grange Hil application 2

The key change since the 2010 application is that the **UK government** can no longer comfortably be called a pro-shale actor. Cuadrilla's development at Preese Hall near Blackpool had been blamed for two tremors of a magnitude of 2.3 and 1.5 in April 2011. This led to Cuadrilla suspending their operations in May 2011, pending the completion of an independent study to investigate if the fracking operations and the tremors were linked. Despite introducing the moratorium, it would not be accurate to describe the government as an anti-shale actor either: the moratorium was eventually lifted in December 2012 following a review recommending that the risks of hydraulic fracturing can be managed if regulated effectively (The Royal Society and The Royal Academy of Engineering, 2012, p. 4). At this point – and indeed for some time prior to the moratorium being lifted – the government's attitude towards shale development became progressively more supportive.

By the time of this application, **Cuadrilla Resources** had changed a great deal. It was previously noted that there was an influx of new directors and share capital during the course of the previous application. This trend continued, and on 15 June 2012, Cuadrilla announced the appointment of Francis Egan as their new CEO. Egan was previously an executive at the oil and gas division of BHP Billiton, the world's largest mining company, vesting Cuadrilla with further industry expertise and experience, albeit not in unconventional oil and gas.

Lancashire County Council also underwent significant change at this period, as the 2013 local elections saw Labour winning 39 seats and the Conservatives being reduced to 35. Labour were four seats short of a majority but assumed minority leadership of the council. This election was notable for the emergence of fracking as a key issue: groups such as Ribble Estuary Against Fracking and Friends of the Earth urged the election candidates to oppose fracking (BBC News, 2013a). Labour, more lukewarm towards shale gas development than the Conservatives, may have profited as a result. Likewise, the Green party, perhaps the obvious place to go for an anti-fracking vote, gained their first ever councillor in Lancashire.

External events

The obvious external event – and still one of two key flashpoints for the story of shale gas in the United Kingdom – was the April 2011 earthquakes. These tremors, while induced by Cuadrilla's activities, occurred at another site and as such are best considered as an external subsystem event. The extent to which this could be attributed to fracking continues to be debated, but in November 2011, Cuadrilla admitted that it was "highly probable" that their operations in Presse Hall triggered "a number of minor seismic events" (White, 2011). While Cuadrilla claimed that there was no threat to people or property, the reaction was fierce. Protestors from Frack Off "stormed" one of Cuadrilla's rigs at their Becconsall the same day as their announcement, in protest at developers attempting to portray shale resources as "green" (White, 2011).

The earthquakes have been identified as one of the key reasons for why hydraulic fracturing came to be framed ever more often in terms of "risk" rather than "reward" (Cairney et al., 2016, p. 3). From this point onwards, neither Cuadrilla nor any other prospective developer would have an application that would be accepted with as little difficulty as their 2010 submission.

The oil price remained high in the time that had passed since the previous application, rarely falling below $100 a barrel for the duration of the application (International Energy Agency, 2014). This was an obvious boon to Cuadrilla, as the production of unconventional oil and gas is generally only economically feasible when the oil price is high. Moreover, British households, slowly emerging from the financial crisis and in the middle of a decade-long wage squeeze, might have been hopeful that their own shale boom would see energy prices plummeting as they had in the United States (Oxford Economics, 2014, p. 11).

During this period, the United States continued to see rapid increases in shale gas production, seeing total production almost double from 5.3 billion cubic feet in 2010 to 10.4 billion cubic feet in 2012 (US Energy Information Administration, 2018). While much of this fall could be attributed to oversupply and reduced demand as a result of weak economic growth, it remained the case that a

significant part of this drop reflected the growth of shale gas from 1% of US output in 2000 to 20% by 2011 (Asche et al., 2012, p. 118). It was also at this time that the "shale boom" began to yield significant amounts of oil as well as gas, most notably in the Bakken field in North Dakota, whose production leapt from a "trickle" in 2007 to 400,000 barrels a day by 2011[41] (Krauss, 2011).

This success had begun to elicit some envy from the British government (Department of Energy and Climate Change, 2013a). However, a focus on oil production from shale was of questionable relevance to the companies such as Cuadrilla. While it had led to decreases in prices for petroleum products for American consumers, the pro-shale coalitions in the United Kingdom were generally keen to reinforce the claim that shale extraction offered a means of transforming to a low-carbon society (Bomberg, 2015, p. 7). This would hardly be possible with increased oil production. In any case, at this stage technical limitations meant that the British Geological Survey could only report that there was "potential" for a shale oil resource in Lancashire's Bowland Shale (Andrews, 2013, p. 1).

The industry had clearly progressed a great deal in the United States but in doing so it had set an example that offered just as much for anti-shale protestors as it did for the shale developers. The clearest difference in external events between this application and the 2010 application is that conditions had, very quickly, become a whole lot less favourable for the shale industry. The Preese Hall earthquakes stirred up opposition that did not previously exist, while the opportunity to learn about conditions in the USA ensured its entrenchment.

This application was withdrawn, so anti-shale actors did not have the opportunity to participate in the decision-making process. However, the Preese Hall earthquakes were the spark that brought them to life, and they would make their presence known in the next application.

Public opinion

Yougov's polling series on voters' top three political issues continued the trend seen in the first application, with the proportion of respondents naming the economy as a concern at around 80%, with the numbers concerned about the environment in single figures (YouGov, 2015, pp. 4–5). This is suggestive of a sympathetic setting for Cuadrilla to deploy their narrative of benefits to energy security and the jobs market and made it easier for them to downplay environmental impacts.

In 2012, a year after the earthquakes, O'Hara et al began regularly collecting data on attitudes towards shale gas. Their reports reflect the rapidity with which shale gas asserted itself as a major

[41] In another four years, Bakken production had tripled to 1.2 million barrels/day (US Energy Information Administration, 2019a).

issue that year: in March 2012 fewer than 40% could correctly identify shale gas. By December, that proportion had increased beyond 60% (O'Hara et al., 2015b, p. 5).

The poll makes it clear that further opposition was coming. Over 50% of respondents – and sometimes as many as 70% - consistently associated shale gas with earthquakes and 40% associated it with water contamination (O'Hara et al., 2015b, pp. 6–7). This is significantly more than those who associated shale gas with clean energy or lower greenhouse gas emissions – a key part of the message the shale industry was trying to get across (Bomberg, 2017, p. 16; O'Hara et al., 2015b, pp. 8, 11).

However, findings from the same period also found far greater numbers associating shale gas with cheap energy than the "don't associate withs" or the "do not knows", leading to over 50% reporting in June 2012 that shale gas extraction should be allowed against around 27% who said it should not and around 20% who did not know (O'Hara et al., 2015b, pp. 9, 13).

This result suggests that the general perceptions hinted at by the YouGov poll carried through to O'Hara et al's study on attitudes specific to shale gas. Large numbers of respondents associated shale gas with dangerous or environmentally harmful outcomes, but in the key question – "Should shale gas extraction in the UK be allowed?" – the answer reflected the YouGov poll, with the economic aspects having greater influence than the environmental issues. This suggests that the positive publicity shale was receiving had had some impact.

As such, at this stage it could be said that public opinion was in Cuadrilla's favour. Nevertheless, with no real coalition activity worth speaking of, it cannot yet be said to have made a decisive impact.

Resources

As outlined in the introduction, the main development for Cuadrilla was that they continued to gain more resources: more financial backing, and more expertise. Such expertise often came at little or no expense to them. The British Geological Survey study of the Bowland shale, published on 27 June 2013 provided the most thorough and accurate estimation of the Bowland's shale gas resource up to this point (Andrews, 2013). As a partly publicly funded body, the British Geological Survey provided Cuadrilla with a great deal of technical expertise at minimal cost[42].

At this point, publicity established itself as another, new resource for Cuadrilla. In the face of heavy criticism for the Preese Hall earthquakes, they also encountered a great deal of friendly media coverage. In a generous profile of new CEO Francis Egan, the Daily Telegraph referred to the tremors

[42] This report was, of course, also accessible to opponent of shale gas, who were able to point out the "speculative" nature of the reserve estimate.

in Preese Hall as "small 'earthquakes'" (newspaper's own quotation marks) while emphasising the benefits of shale gas (Power, 2012). Similarly, Nigel Lawson, the former Conservative Secretary of State for Energy and Chancellor of the Exchequer, wrote in the Daily Mail of the "so-called Blackpool Earthquakes" and of shale gas as a "game-changing piece of good news" (Lawson, 2012). The Daily Express referred to Cuadrilla's difficulties in commencing fracking operations as having "[d]ashed hopes of cheap gas" (Riches, 2014). Boris Johnson (2012) used his Telegraph column to refer to opponents of shale development, including – in his view – the Liberal Democrats – as "doom merchants".

With supporters of shale gas keen to portray it as an exciting economic opportunity and minimise fears that it may be dangerous or of minimal benefit, such publicity was a valuable resource. At this early stage it appears to have some benefit too: the Preese Hall earthquake had led to more and more people being aware of shale gas, but the proportion of those opposed to shale was not quite as high as might be expected, with more people associating it with economic benefit than environmental hazards (O'Hara et al., 2015a).

Cuadrilla themselves recognised the need to focus more on the benefits of shale gas. Shortly after Frack Off's protest at Blackpool Tower, at a September 2011 meeting intended to announce the discovery of 200 trillion cubic feet of gas in Lancashire, Cuadrilla were confronted by a small number of protestors from the Campaign Against Climate Change outside the Imperial Hotel in Blackpool. It was a harbinger of greater protests to come and coincided with a clear change in Cuadrilla's messaging. Where their provision of information had previously barely extended beyond responses to set questions in local authority application forms, Cuadrilla were quick to notice that more would be required and adapted their approach on that basis.

For the first time, they began to take the need to influence public opinion seriously and to provide incentives for local communities. For instance, in their initial application to drill at Grange Road Cuadrilla stated that "the employment of a small number of local people … may result" (Cuadrilla Resources, 2010, p. 4). By 2011, this had changed, with Cuadrilla now speaking of a potential of 1,700 jobs in Lancashire – and 5,600 in the United Kingdom – paying an average wage of £55,000 (BBC News, 2011b). In September 2011, with limited wage growth and employment at a fifteen-year high in north west England (Office for National Statistics, 2019), this promise could have gone some way towards bolstering local support.

Nevertheless, opposition to shale gas was growing, and it was around this time that the anti-shale coalition began to accumulate what would later become its key resource: membership. On 6 August 2011, two men pretending to be construction workers were arrested for hanging banners near the

top of Blackpool Tower, reading "FRACKING COMING TO THE UK; WE CAN STOP IT; FRACK-OFF.ORG" (Frackoffuk, 2012). Police reported that they believed the men "represented a website" (BBC News, 2011c). This was the founding action of Frack Off, a group that would come to play a key role in organising and coordinating opposition to fracking. One of the key differences between applications before this point and those after is that from this point onwards, every shale gas application would face opposition from what could finally be called an anti-shale coalition. Frack Off would be involved in every subsequent shale gas application.

One of the main forces that mobilised opposition to fracking in the USA was the film Gasland, in which the writer-director Josh Fox speaks to people living near gas fields across the United States, who complain of air and water contamination, court injunctions, non-disclosure agreements and close relationship between politicians and the shale industry (Fox, 2010). This would also come to wield significant discursive power in the United Kingdom.

The most talked about moment of this film forms the climax of the trailer, which has been viewed over 2.4 million times on YouTube (Cinema Management Group, 2010). A man living near a fracking site turns on his water tap, holds his lighter up and the entire kitchen sink is immediately engulfed in flames. Gasland, which was found to have played a key role in driving opposition to fracking in the United States (Vasi et al., 2015), appears to have had a similar impact in the United Kingdom. To a British anti-fracking movement mobilised by the Preese Hall earthquakes, Gasland became a significant part of recruitment drives. For instance, an article from Frack Off refers to a meeting of Frome Anti-Fracking, where "[e]veryone present had seen screenings of Gasland" (Gray, 2012). Josh Fox toured the United Kingdom to attend a number of screenings of his film with various regional anti-fracking groups, including Frack Free Lancashire, where he told them that their protests could stop drilling in the UK (Cardwell, 2013).

For this particular application, there was not yet an anti-shale coalition, but it was emerging. A protestor quoted in the New York Times said, "this now threatens our landscape, and local people are going to be in the firing line … the resistance is growing." (Reed, 2012)

Relationships with policymakers

This application was submitted and then withdrawn with very little documentation in between, meaning that the precise nature of Cuadrilla's relationships with policymakers during this phase are difficult to discern, while those of the anti-shale coalition were non-existent. As previously mentioned, the government introduced a moratorium on hydraulic fracturing in the wake of the April 2011 earthquakes. However, as Cuadrilla made an application to carry out further testing in December 2011, it seems likely that they expected it would be lifted. The supporting statement to

their application envisaged that testing would at most be suspended for "several months", and they pointed out that despite the incidents at Preese Hall no complaints had been received regarding their operations at Grange Road (Cuadrilla Resources, 2011).

Despite issuing the moratorium on planned and future hydraulic fracturing activity, the coalition government – particularly the Conservatives – still ought to be regarded as being close to the industry. For instance, David Howell, the father-in-law of the Chancellor of the Exchequer George Osborne, was criticised for balancing his portfolio as Minister of State for International Energy Policy alongside his role as president of the British Institute of Energy Economics, a lobbying organisation funded by Shell and BP. Howell had earlier spoken admiringly of US shale gas in the House of Lords, saying that its replication could be "fundamental in altering the energy vista in every continent" (Hansard, 2010).

Conservative disregard for the coalition's fracking moratorium was perhaps made most explicit by George Osborne's speech at the 2012 Conservative party conference. In what would become a recurring theme, Osborne rhapsodised about shale, expressing his support for "opening up the newly discovered shale gas reserves beneath our land" and pledging a "generous new tax regime for shale" so that "Britain is not left behind as gas prices tumble on the other side of the Atlantic" (Osborne, 2012). At this point, the fracking moratorium was still in place, albeit not for much longer.

Nevertheless, the Conservatives' enthusiasm for shale gas was the source of some tension within the Coalition government and tempered somewhat by the Secretary of State for Energy and Climate Change, Ed Davey, who formed part of the Liberal Democrat minority. The Liberal Democrats often professed themselves to be frustrated with Conservative support for shale, with one of their figures within government complaining of the "Tory obsession that somehow there is going to be this revolution in gas and the price is going to plummet" (Merrick and Chorley, 2012).

With the lifting of the fracking moratorium in December 2012, even the formerly cautious Davey welcomed shale gas as a "promising new potential resource" (Reed, 2012). Yet the extent to which Davey wholeheartedly supported his government's decision is questionable – seven years later, during his campaign to be leader of the Liberal Democrats, a party then seeking to distance themselves from their former coalition partners, Davey claimed that the reason shale failed to succeed in the UK was because of the environmental regulations that he implemented, and that he was "proud of [his] role in doing that" (BBC News, 2019).

The lifting of this moratorium is one of the most significant actions by government in shale gas. Yet, given that Cuadrilla continued to make applications during its imposition, there seems to have been

little doubt that it would be lifted. Here, Van De Graaf et al draw a distinction between the "opposition" of the French and Bulgarian governments who imposed open-ended moratoria, and the "precaution" attitude of the United Kingdom, where existing projects were merely suspended rather than cancelled (Van De Graaf et al., 2018, p. 1282).

While it is remains difficult to discern the extent to which Cuadrilla were able to directly influence this policy change, it is clear, as the most prominent of the UK's small number of shale developers, that this policy change was implemented for their benefit. In addition to this, the new UK government were, for the first time, explicitly supportive of shale gas. It would no longer be just one of many different methods of onshore hydrocarbon production.

Meanwhile, Lord Browne continued to gain further responsibilities in Whitehall, taking a further role as the government's "lead non-executive", giving him a prominent role in recruiting other non-executive directors (Leftly, 2013). By co-ordinating this project, Browne was expected to invite figures with a background in industry to participate in government and contribute their ideas, with a view to ministerial departments being run in a more business-like fashion (Doherty, 2010). Among these non-executive directors were figures from BG Group – a holder of shale gas assets in the United States – as well as Centrica and Riverstone Holdings (the owners of 42% of Cuadrilla). This led an investigation in the Independent newspaper to speak of "fracking industry bosses at [the] heart of [the] coalition" (Leftly, 2013). Such a claim is likely to have been exaggerated: the role of these non-executive directors was the reform of the running of government departments rather than the policy of these departments.

At this point, and despite growing opposition, all of the gains in the relationships with policymakers category were being made by pro-shale actors. Anti-fracking movements were growing throughout the country, but they were for the most part still too small, dispersed and lacking in resources and coordination to be able to form a meaningful coalition, or to have any opportunity of accessing and influencing policymaking.

Summary of findings

This application is difficult to assess on the set criteria due to a decision never being issued. Yet, the circumstances that drove Cuadrilla to withdraw the application indicate how much changed: it was submitted in November 2011, during which there was a fracking moratorium. This moratorium was lifted in December 2012. By this point the timeframe set out in the original application was running out fast, so just a few months later, in April 2013, Cuadrilla began seeking advice from Lancashire County Council about a new application for an even longer extension (Cuadrilla Resources, 2014b).

This was submitted in May 2014, and effectively superseded the pre-existing application, which was withdrawn in November 2014.

Before the Preese Hall earthquakes Cuadrilla could have expected an application such as this to be accepted within days. However, the earthquakes had led to the formation of real, coordinated opposition and a government moratorium. While the government moratorium would not last long, and close relations would soon be resumed, the emergence of an anti-shale coalition ensured that the pro-shale coalition would no longer have it so easy.

Application 3 (2014-2016)

Cuadrilla's third application, submitted on 23 May 2014, requested an extension of three years, during which Cuadrilla would retain their existing site in order to install monitors within the previously drilled well for the purpose of seismic and pressure monitoring. They also committed to restoring and abandoning the site within this timeframe (Cuadrilla Resources, 2014b). Nearly a year later, on 20 May 2015, Lancashire County Council's planning committee decided to refuse planning permission because "the retention of the site in its current form and scale would adversely affect the landscape character of the area" (Lancashire County Council, 2015c).

This rejected application was not the end of the process. The government encouraged shale developers faced with rejected applications to appeal to the Secretary of State for Communities and Local Government, a course of action that Cuadrilla duly pursued. After a contentious appeals process, with a number of submissions and presentations from both sides, the Planning Inspectorate[43] ultimately decided to allow Cuadrilla's appeal on 23 February 2016, dismissing the objections of Lancashire County Council and highlighting that the application "sits well with the Government's Shale Gas and Oil Policy"[44] (The Planning Inspectorate, 2016, p. 42).

On 4 December 2018, two months before their deadline, Cuadrilla announced the restoration of the Grange Hill site, including the decommissioning and plugging of the well. Francis Egan, the Cuadrilla CEO, attempted to portray this as a positive development, saying that he is "committed to Lancashire" and that the restoration works are a "fantastic example of how we return the land back to its original state" (Cuadrilla Resources, 2018). However, Cuadrilla were leaving a site they had gone to great effort to secure, eight years after their initial application, without producing any oil or gas. This might have been for technical reasons: little was known of the precise characteristics of

[43] An executive agency of the Department for Communities and Local Government (now Ministry of Housing, Communities and Local Government) responsible for handling appeals on behalf of the Secretary of State.
[44] This policy was expressed in a written statement to parliament made in September 2015 by Amber Rudd, the Secretary of State for Energy and Climate Change at the time (Rudd, 2015)

natural gas in the Bowland Shale and testing may have yielded unsatisfactory results It may, on the other hand, following all the protests, appeals and disputes, have stretched the company's financial resources further that they could go.

Actors and alignments

The actors in this application are significant for providing clear evidence of having formed advocacy coalitions for the first time in this case study. Here, the actors with shared beliefs also had the necessary coordinating activity. The actors within the coalitions consistently made the same claims when attempting to influence the outcome of the application, offering clear evidence of a meaningful level of information sharing.

Pro-shale coalition	**Anti-shale coalition**	**Uncertain/unaligned**
Cuadrilla Resources	301 objections from private individuals	Fylde Borough Council:
UK Government	Ribble Estuary Against Fylde Fracking (REAF)	Natural England
1 speaker at committee meeting	Friends of the Earth	Environment Agency
	Singleton Against a Fracked Environment (SAFE)	Singleton Parish Council:
	14 speakers at committee meeting	Health and Safety Executive
	Lancashire County Council (Development Control Committee)	
	Residents Action on Fylde Fracking (RAFF)	

Table 6.3: Actors involved in Grange Hill application 3

Pro-shale actors

Cuadrilla Resources in 2014 were a company of increasing ambition, yet they had still made little headway towards the large-scale shale development they were hoping for. Their Chairman, Lord Browne, had stated in January of that year that it would take five years and the drilling of 20 to 40 wells to judge whether shale gas in the United Kingdom was commercially and technically viable. Yet by this point Cuadrilla had spent over £100 million on exploration and had only fracked one site (Harvey, 2014). Browne himself would leave Cuadrilla in April 2015, before a decision had been issued on this application[45].

By 2014, the **UK Government** had become far more open in its support for shale gas. In January 2014, David Cameron declared that his government would be going "all out for shale" (Watt, 2014).

[45] Later, when asked to reflect on his time at Cuadrilla, he would say "[F]racking in the UK doesn't make much sense. I think it was a test to see if it worked. We probably don't need to do it" (Vidal, 2019).

This statement was accompanied by an increase in policy activity, including tax incentives for developers and local governments, as well as initial steps towards transferring decision making powers on shale developments from local authorities to central government. This process would enable the government to play a direct decision-making role in a shale gas application for the first time following the rejection issued by Lancashire County Council.

Anti-shale actors

Ribble Estuary Against Fylde Fracking (REAF) are one of the many regional groups within the Frack Off umbrella. They originally formed in 2011 and played a major role in coordinating opposition in the application, providing a template objection letter and addressing Lancashire County Council's Development Control Committee at the decision meeting.

Friends of the Earth (FoE), as an international organisation operating in 74 countries, operated on much larger scale than the other groups opposed to the application. Indeed, they have been identified as one of the leading members of the anti-shale coalition on a national level (Cairney et al., 2016, p. 11). However, the extent of their involvement varies quite a bit across different locations. In this instance, Friends of the Earth provided evidence to the committee on behalf of Singleton Against a Fracked Environment, suggestive of FoE's greater level of institutionalisation, resources and expertise than the more localised groups.

Singleton Against a Fracked Environment were also supported by Frack Off. This group objected to land owned by a trust created to benefit the villagers of Singleton being used for Cuadrilla's drilling operations. This group was formed by residents coming together to "resist the collusion" between the trust and Cuadrilla (Frack Off, 2016).

Lancashire County Council remained a Labour minority council. The Development Control Committee of councillors responsible for deciding Cuadrilla's application consisted of six Labour, six Conservative, two independent and one Liberal Democrat councillors[46].

Residents Action on Fylde Fracking (RAFF) are yet another local group supported by Frack Off. They played a major role in coordinating opposition to Cuadrilla's concurrent application to drill a horizontal borehole at Anna's Road, providing Lancashire County Council with 108 objections (Residents Action on Fylde Fracking, 2012). At Grange Road they played a more withdrawn role, but still gave oral evidence to the planning committee in February 2015.

[46] One of the councillors, the Conservative Paul Rigby, left the room during the consideration of Cuadrilla's application, declaring a pecuniary interest as Cuadrilla had previously accessed his land for testing purposes (Lancashire County Council, 2015d, p. 1).

Uncertain/unaligned actors

Fylde Borough Council had no objection to Cuadrilla's plans but requested that Cuadrilla carry out the restoration within the permitted period (they had failed to do so at a number of other sites, again suggestive of resource limitations). The council had been consulted on several shale projects and had taken little interest during the early stages of development. Despite their lack of involvement in this case, it is worth noting that they had objected to two other Cuadrilla applications made during this period – at Preston New Road and Roseacre Wood – on the grounds of noise from drilling operations (Lancashire County Council, 2015b, 2015a).

Natural England initially took the view that Cuadrilla did not provide sufficient information on the application's impact on local wildlife. Upon receiving further information, they concluded that the proposal was unlikely to have a significant effect on nearby wildlife protection areas.

The **Environment Agency** had no objection provided steps were taken to ensure pollutants would not be discharged into groundwater.

Singleton Parish Council made no objection but asked that the operations be carried out as safely as possible.

The **Health and Safety Executive** made no objection.

Coalitions

By 2014, a far clearer set of coalitions can be identified. On the pro-shale side, the government was open about its willingness to work with the industry. In July 2013, the Conservative energy minister Michael Fallon told an audience of shale developers including the CEO of Cuadrilla that his government are "committed to ensuring the industry can prosper if the conditions are right", and that they had done so by announcing fracking could resume, by providing the industry with geological data and by creating a "joint approach" for government and industry to inspect new shale gas operations together (Department of Energy and Climate Change, 2013a). This speech is a clear indicator of the ways in which government and the industry, including Cuadrilla, intended to work together and share information.

There was, for the first time at Grange Road, meaningful evidence of coordinated activity by anti-shale actors. Ribble Estuary Against Fylde Fracking, Singleton Against a Fracked Environment and Residents Action on Fylde Fracking all had their message amplified on blogs and social media by Frack Off. In addition to this, a cyclostyle letter submitted by local residents accounted for 220 of the 301 objections, suggesting that much of the activity against the application was coordinated, rather than the work of disparate independent actors (Lancashire County Council, 2015d). Friends of the

Earth also played a part in this: by making a representation on behalf of Singleton Against a Fracked Environment, they used their expertise, reputation and influence on behalf of a small local group.

Identifying whether the Lancashire County Council Development Control Committee were part of the coalition was somewhat more problematic. Officially, as they make the planning decision based on set criteria and frameworks, the committee should be assigned to the "unaligned" category, just as they were for the first application. However, in this instance, the committee refused the application, going against the advice of the council's own planning officers (Lancashire County Council, 2015d, p. 31). During the appeal process, the council's opposition became even more explicit, even including clear evidence of sharing information with other actors, a level of coordination sufficient for them to be considered a member of the anti-shale coalition. For instance, the council's written representation in opposition of Cuadrilla's appeal was written on their behalf by planning consultants that had represented Frack Free Ryedale, one of the many allied Frack Off groups (Atkinson et al., 2016, pp. 3–4). Here, the council – as a body, not just individual councillors – and anti-fracking groups were involved in the sharing of expertise, contacts and resources, making it appropriate for them to be considered part of the same anti-shale coalition.

External events

During the period in which this application was considered shale gas developments were regularly headline news. This largely derived from events in July 2013, when Cuadrilla began attempting to transport drilling equipment to their site near Balcombe in West Sussex in which they planned to drill a test well. Starting on 25 July, protestors blocked the site gates, preventing the lorries carrying equipment from entering the site. Protests continued on a daily basis, leading to a police presence and several protestors being arrested. This culminated in the six-day "Reclaim the Power" camp, involving around 1,000 campaigners bolstered by around £50,000 from online fundraising (Press Association, 2013).

The high-profile clashes at Balcombe were perhaps the single most important event in this case: they encouraged people that were previously not interested or inclined to protest to become active, and they played a very important role in increasing awareness of shale gas. Day by day, newspapers and news bulletins showed photographs and footage of protestors chaining themselves to vehicles and supergluing themselves to gates. Beyond the Balcombe site, protestors gained entry to Cuadrilla's headquarters in Staffordshire and attacked the offices of their PR firm Bell Pottinger.

One of the key groups that would soon mobilise against shale gas on a large shale were local homeowners – sometimes dismissed as "nimbys"[47] – who objected to shale gas on the basis of issues such as noise, blocked traffic and house prices rather than on environmental, pollution or climate change grounds. This group became particularly exercised following the publication of comments made by the energy minister Michael Fallon at a private meeting in August 2013. Referring to Balcombe, Fallon was quoted as saying:

> "The beauty of that - please don't write this down - is that of course it's underneath the commentariat. All these people writing leaders saying, `Why don't they get on with shale?' We are going to see how thick their rectory walls are, whether they like the flaring at the end of the drive." (BBC News, 2013b)

Despite the minister insisting the comments were "light-hearted", a spokesperson for Friends of the Earth insisted that they would "resonate across the UK and fuel more opposition to the government's disastrous support for fracking" (BBC News, 2013b).

The high point of the protests came on 19 August, three days after Cuadrilla announced their intention to suspend drilling on the advice of police. Dozens of protesters, among them Caroline Lucas, the Green party MP, were arrested for blocking the site gate. Lucas, one of the UK's more prominent MPs, joined the protest due to her opposition to the "democratic deficit" which put the interests of the oil and gas industry ahead of those of local residents (Harvey and Walker, 2013). Images of an elected member of parliament being led away by two policemen, helmeted and in hi-visibility jackets, were seen across national newspapers and news broadcasts.

One of the peculiarities of the Balcombe anti-fracking protest is that there was no prospect of hydraulic fracturing: Cuadrilla would later confirm that the target limestone rock was already naturally fractured, and as such fracking would not be required (Cuadrilla Resources, 2017). Nevertheless, the fact that an operation with no intention of carrying out hydraulic fracturing mobilised such protest is indicative of the extent to which Cuadrilla as a company had become intertwined with fracking – and the Blackpool tremors – and of the increasing strength of their opposition.

The other key external shock of this application period was somewhat more favourable to the pro-shale coalition. In May 2015, the very same month that Lancashire County Council were due to consider Cuadrilla's application, the Conservatives unexpectedly won a narrow majority in the

[47] A pejorative term deriving from "not in my back yard", used to refer to people who object to developments in their own area while having no such reservations about the same development taking occurring elsewhere.

general election. Labour, who were widely expected to win the election, took a cautious position on shale gas, pledging to put in place a "robust environmental and regulatory regime" and "forcing" developers to protect water sources, and promising that they "won't allow shale gas development to degrade our natural environment" (Labour Party, 2015, p. 10).

If the Conservatives were to continue in power, it was thought that doing so would require a renewal of their coalition with the Liberal Democrats, a party which were attempting to downplay the work done shale gas during their tenure in government. Their manifesto made no mention of potential benefits of shale gas, instead focusing on the "robust" regulatory regime they had created. They promised to build upon this by transferring revenues from shale gas to funding alternative low-carbon energy sources, and to require shale developers to provide finished shale wells to geothermal heat developers at no cost (Liberal Democrats, 2015, p. 33).

By comparison, the Conservative manifesto only made a cursory mention of the safety concerns of hydraulic fracturing, choosing to focus on the tax cuts for shale rather than the regulation created during their shared term in government. These cuts, the manifesto claimed, encouraged "the birth of a new industry, shale gas, which could create many thousands of jobs", with "safe" development ensuring benefits for local communities (Conservative Party, 2015, pp. 56–7). The Conservative manifesto also expressed concern at communities having energy projects imposed upon them against their will. However, it was onshore windfarms, rather than shale sites, that the Conservatives pledged to "halt" and "change the law so that local people have the final say" (Conservative Party, 2015, p. 57). With the Conservatives winning the 2015 election, there was an immediately more favourable environment for shale development.

However, the economic and energy security imperatives for shale gas development, made so forcefully on the developers' behalf by the Conservatives, became less and less pressing. Oil import prices, having risen to $111 per barrel when the application was made in Spring 2014, plummeted over the course of the application's consideration and appeal, falling as low as $32 per barrel in February 2016 (International Energy Agency, 2016, table 1). The pro-shale coalition, including the Conservatives, placed a great deal of emphasis upon promoting shale gas as a means of securing affordable domestic energy supplies (Conservative Party, 2015, p. 56). With energy more affordable than it had been at any time since the 2003 Iraq War, the energy security argument for shale gas became less pressing.

The external events arising before and during Cuadrilla's third application affected the outcome of the application in different ways. On the one hand, the protests at Balcombe brought opposition to shale gas to the top of the news bulletins this ensured the greater opposition and mobilisation of an

anti-shale coalition that would succeed in getting Lancashire County Council to reject the application. Meanwhile, the Conservative party, by far the industry's strongest supporters in Westminster, had cast off the more reluctant Liberal Democrats and had begun single-party government with a more pro-shale agenda. This enabled new policy developments and solidified the ability of government to call in planning applications from local government.

Public opinion

Public opinion during 2014-16 continued to harden against shale gas. Against a backdrop of news coverage of protests and disruption at drilling sites, more people than before knew about shale gas, and a higher proportion of them opposed it, though not quite a majority (O'Hara et al., 2016).

By September 2015, the first survey taken after Cuadrilla's application was rejected, 74.9% of respondents were able to correctly identify shale gas, higher than each of the ten previous occasions that question was asked going back to March 2012 (O'Hara et al., 2015b, p. 5). Despite playing a major part in the anti-shale narrative, the proportion of participants associating shale gas with earthquakes had consistently decreased since December 2012 – when the moratorium was lifted – though it remained over 50% by September 2015 (O'Hara et al., 2015b, p. 6). Meanwhile, the number associating shale gas with water contamination had been increasing during the same period, peaking at 48% in 2015 (O'Hara et al., 2016, p. 7).

The pro-shale coalition had placed great empohasis in encouraging the public to accept their "opportunity discourse" of economic growth, greater energy security and clean energy (Bomberg, 2015, p. 7). Unfortunately for them, these narratives largely failed to build support during this period, with the numbers associating shale with clean energy, cheaper energy, lower greenhouse gas emissions and economic benefits remaining static, and a sharp decrease in those associating it with energy security (O'Hara et al., 2015b, pp. 8–12). Altogether, only 47% of respondents in September 2015 believed that shale gas extraction should be allowed in the UK. This was the first time the study recorded a minority in favour of shale for this question (O'Hara et al., 2015b, p. 13). This a national survey where many respondents, living far from shale resources, might be more inclined to think about the benefits of shale gas rather than the disadvantages, which have little chance of disrupting their own lives. When people are asked if they favour fracking in their area, rather than fracking in general, views become more entrenched. A survey conducted by the Guardian in August 2013 found that only 30% of respondents opposed fracking. When they were asked if they would welcome fracking in their local area, opposition jumped to 40% (Press Association, 2013).

For those who lived in areas where shale companies held licenses, where fracking in the local area could easily become a reality, it seems likely that the proportion of residents opposing fracking

would increase even further. While only a small minority of people in the Singleton area were directly involved in the application, the proportion of opponents to supporters bears this out.

It is unlikely that public opinion directly affected this application. While elected officials are likely to be concerned about the views of the public on any issue, it did not form as large a part of their deliberations as would be the case in subsequent applications. Nevertheless, it played a profound impact on shaping the outcome. The anti-shale coalition relied on building its network of supporters. The more the public became aware and opposed to shale gas, the more opportunities there were for the anti-shale coalition to increase its membership, and, in turn, to decisively affect applications in their favour. This was what happened when this application went in front of the planning committee.

Resources

With Centrica's investment, alongside support from AJ Lucas and Riverstone Holdings, Cuadrilla certainly had more financial power than they had had at any point in the past. This is just as well, as they were also facing far more opposition than they had previously encountered. They had a number of licenses across the country, almost all of which were facing some kind of localised – and often national – opposition. The increased opposition meant that Cuadrilla had to work harder to get applications accepted, requiring more consultancy, research, outreach and administrative work.

Without the support of their investors, Cuadrilla would not have been feasible as a going concern. In their year-end accounts for 2014, Cuadrilla reported a loss of £11.6 million (Cuadrilla Resources, 2014e, p. 15). The company's revenue was £5.2 million, all from services for exploration and appraisal of oil and gas assets. Five years after Cuadrilla first applied to drill a shale well, they posted no revenue from gas, having only from generated £43,000 the year before (Cuadrilla Resources, 2014e, p. 22). Cuadrilla had financial resources, something that is clear from the extent to which they were able to pursue this application and its appeal. However, they were also making significant losses with little to show for it.

The documents submitted for the first and third Grange Road applications are a good indication of how the amount of effort required for applications had increased. In the first application (for drilling and hydraulic fracturing) Cuadrilla provided relatively limited information, including a brief document called "Ecology Study" (Lancashire County Council, 2019). By the time of the third application – even though it was far more limited in scope,and explicitly stated that there was no intention to drill or carry out fracking – Cuadrilla provided far more information, and what was previously just a brief ecology study had swelled to documents on great crested newts, bat activity surveys and a number of other ecological appraisals.

In the first application Cuadrilla provided most of these documents in-house, but by 2014, as more and more scrutiny began to be applied to their proposals, Cuadrilla outsourced most of this work to specialised consultancies. This, as well as having to do it all over again for the appeal – and the legal fees that came along with that, represented a significant burden on Cuadrilla's resources before permission had even been gained.

With Lord Browne's resignation in April 2014, Cuadrilla lost someone with contacts and decades of experience at the highest reaches of the oil and gas industry. However, his replacement, the former petroleum geologist Roy Franklin, brought hands-on experience of oil and gas exploration including a track record of success as the CEO of a number of smaller, independent British companies. As a member of the board at Statoil[48], a Norwegian operator with significant shale oil and gas operations in North Dakota's Bakken field, Franklin had access to contacts and expertise from an established player in unconventional production. This did, however, represent something of a step down: Franklin was certainly a respected figure in the industry, but he did not possess Browne's direct links with government figures.

The anti-shale coalition, at least at the local level, lacked the financial resources and technical knowledge of Cuadrilla. Several of the objections made – such as those referring to gas flaring, contamination of water supplies, the chemicals used in hydraulic fracturing or the risk of earthquakes – were related to the production and hydraulic fracturing stages of development and were irrelevant to the application. Focusing on these issues may have been a strategic decision – as a means of inciting further outrage and generate media coverage – or it might have been as a result of insufficient technical expertise. In either case, they were out of the scope of the application and not something that should be considered by the committee. Fortunately for the anti-shale coalition, they were supported by Friends of the Earth, an organisation that played a major role in opposing developments in the UK. Friends of the Earth, with its worldwide networks, had access to a greater level of technical information and expertise. The presentation they gave to the Development Control Committee on behalf of Singleton Against a Fracked Environment was more cogent in its subject matter, focusing on procedural irregularities, noise and ecological risks (Lancashire County Council, 2015e, p. 11).

For the most part, however, the anti-shale coalition relied on increasing awareness, membership and mobilising participants. Whenever there was a public meeting or a consultation, the many anti-fracking groups were always able to bring along far more people than the pro-shale coalition was ever able to muster. The councillors, not just reliant upon votes but also rooted in their local

[48] Since renamed Equinor.

communities to a far greater extent than national politicians, were encouraged to oppose the application in the face of this concerned opposition.

This application at Grange Road was the first at this location to be rejected by the council and came amidst a series of rejected applications in Lancashire. The role resources played in this, in concert with the other variables is clear to see: the earthquake at Preese Hall and the protests at Balcombe rebalanced resources towards the anti-shale coalition, providing them with the membership and organisation they required to forcefully oppose the application. However, resources were just as important for the pro-shale coalition. The government had attempted to ensure a favourable process for Cuadrilla, but it was their resources that enabled them to pursue the process until its end – even if they were unable to subsequently develop the site.

Relationships with policymakers

During the last two years of the oalition, many of the pro-shale policy developments in government were led by the Treasury. This reflects the fact that several of the new policies were financial incentives, but it also provides an indication of party dynamics and centres of power within the Coalition: the Treasury, unlike the Department of Energy and Climate Change, was a Conservative-run department. In his 2013 Autumn statement, George Osborne announced the reduction of the tax rate on profits arising from onshore fossil fuel production, a step taken with the intention of encouraging investment in shale gas (HM Revenue & Customs, 2013, pp. 1–2). The next year, in the 2014 statement, the Chancellor pledged that the government would provide funding to provide evidence to the public about "the robustness of the existing regulatory scheme" and to establish a "long-term investment fund" from tax revenues for shale that would be used to benefit local communities (HM Treasury, 2014a, p. 87). The clarity and ambition of the government's plans for shale gas is striking when compared with the 2014 statement's vagueness on renewable energy, which goes little further than to note that "the government is committed to achieving its low carbon energy goals through a range of technologies" (HM Treasury, 2014a, pt. 1.129).

The key aspect that must be measured in the relationships with policymakers is not merely that the government were pro-shale. The pro-shale coalition also must have some form of access to this process. Government policy, particularly in making it easier for developers to appeal rejected applications, clearly had a decisive effect in the outcome of this case. The extent to which this variable influenced the outcome will depend upon the access the pro-shale coalition had to this process. There is clear evidence of access throughout. The government themselves were members of the pro-shale coalition, and the coordination necessary for the government to be part of this coalition largely came about as a result of the access enjoyed by the rest of the pro-shale coalition.

The nature of secrecy typical to policy deliberations in the United Kingdom, is such matters of this nature are often be quite difficult to uncover (Wilson, 1989, p. 301). However, on this occasion it is somewhat more straightforward, as a 24 September 2014 letter from George Osborne urging ministers to make "rapid progress" on implementing a number of actions to assist the shale industry leaked in January 2015. Amongst a number of other requests, Osborne implored ministers to get working on supporting the development of 3-4 "exemplar" drilling sites to "prove the concept of safe shale gas exploration"; move towards more central regulation[49]; to influence the EU Commission on the importance of shale gas and; to develop a plan for ensuring government agencies have the "resources and skills to publicly defend the robustness and safety of the regulatory regime" (Osborne, 2015).

The policy proposals in this letter were by no means revelatory. However, it is here that evidence of access and coordination arises: several of these actions, this letter makes clear, come from Osborne's wish to "[r]espond to the asks from Cuadrilla" (Osborne, 2015). This included matters such as intervening with Lancashire County Council to alleviate their shale gas concerns on Cuadrilla's behalf.

The government had no such relationship with the anti-shale coalition. The record of treasury ministers' engagements from the last six months of 2014 show that almost every meeting with the purpose "to discuss energy" or "to discuss energy policy" featured an oil and gas company, including Centrica, the owners of a share of Cuadrilla, and IGas, another large shale license holder that will feature in the Tinker Lane case study. There were no meetings with actors or individuals from the anti-shale coalition (HM Treasury, 2014b, 2014c).

Of course, with many of its members favouring outsider methods of campaigning it is entirely possible that the anti-shale coalition did not want access, rather than that they wanted access but found it denied to them. Nevertheless, there is evidence of a relationship with the Treasury for the pro-shale coalition. Regardless of the reasons for why it failed to materialise, there was no such relationship between the treasury and the anti-shale coalition and as such it cannot be held to have had an outcome on the application.

The anti-shale coalition's lack of access at a national level does not mean that they lacked relationships with policymakers altogether. Things were different at the local level, and there is far more evidence of the anti-shale coalition choosing to target their resources at local government instead of national government. This could be because the Labour party – generally more cautious

[49] In order to redistribute powers for deciding applications away from allegedly obstructive local authorities.

towards shale gas – were the biggest party in Lancashire County Council at this period. It could also be because local councillors were simply more attuned to local concerns. In any case, there was regular interaction between the council and anti-shale advocates. For instance, in February 2015 the council's Development Control Committee took evidence from SAFE, Friends of the Earth, Ribble Estuary Against Fracking (REAF) and Residents Action on Fylde Fracking (RAFF) (Lancashire County Council, 2015f).

Conversely, the pro-shale coalition's access to local decisionmakers was more limited. For instance, the planning officers' report of May 2015 notes that fourteen speakers opposing the application gave evidence to the committee, while only two supporting the application – including Cuadrilla themselves – were present (Lancashire County Council, 2015e, p. 12). The paper prepared by the council's planning officers in advance of this meeting recommended granting permission. However, at the meeting itself, the councillors on the committee decided to refuse the application. It is highly likely that this unexpected decision was a result of the presentations given at the meeting or of the 301 objections made since the application was submitted. After all, many of these objectors and presenters were voters that the members of the committee relied upon for their position.

Indeed, the nature of the objections being made underlined the importance of the relationship between councillors and their constituents. While some objections focused on issues of national or even global significance, the majority of focused on local risks, such as the risk of well failure and water contamination, further earthquakes and loss of animal habitats (Lancashire County Council, 2015d).

In this case, relationships with policymakers, as measured by high levels of access, correlates with a coalition gaining a positive outcome. The pro-shale coalition had high levels of access to central government, getting the outcome they wanted from them in the appeals process – as well as the opportunity to have the appeal itself. The anti-shale coalition had high levels of access to local government and got the decision they wanted from them.

Summary of findings

The third application at Grange Road was where the transformation hinted at during Cuadrilla's withdrawn second application finally manifested itself. The council's development control committee had hitherto exercised little discretion, giving assent to every recommendation the council's planning officers sent to them.

By 2015, things had changed, with the Development Control Committee becoming a clear, though admittedly not wholehearted[50], anti-shale actor. This change of approach was reflected in applications at other sites, with Cuadrilla's far more extensive application proposing to drill and hydraulically fracture their Preston New Road license being rejected by the council and then resurrected by an appeal to the government around the same time (Department for Communities and Local Government, 2016).

Why, then, did the council accept the first application and reject the third? Sabatier(1998, p. 119) suggested that such developments can occur as a result of a "minority coalition" increasing in importance and taking advantage of a "window of opportunity opened by an external perturbation". Many of the facts of this case fit this, as does the interplay of the variables and their roles in shaping this outcome. The anti-shale coalition was not just a minority coalition at the time of the first application: it didn't exist at all, and this explains the docile policy subsystem encountered by Cuadrilla during the first application. However, those opposed to shale were quickly able to take advantage of the window of opportunity – or indeed several windows – arising from the earthquakes and the protests in Balcombe and beyond which sent public awareness of what had previously been a minor issue soaring. As awareness rose, so did associations of shale gas to a series of risks – risks to water and the local environment that were of greatest concern to those living closest to the sites. This mobilised a large number of people across a large number of groups that managed to maintain coordination through information sharing for the anti-shale coalition.

The anti-shale coalition attempted – successfully – to manipulate the dimensions of the issue. They portrayed the third application not as a by-the-book application to conduct testing on a well that had already been drilled, but as something that could develop into hydraulic fracturing, as an affront to local democracy, as risking earthquakes and groundwater pollution.

Many of those who joined the anti-fracking groups in Lancashire were local residents, who placed more emphasis on typical homeowner concerns such as house prices, insurance and green belt development (Lancashire County Council, 2014, pp. 16–17). Alongside them were Friends of the Earth, who opposed shale gas because it is a "climate wrecking technology" and because the government should be promoting renewable energy instead (Friends of the Earth, 2013). Soon, however, the two groups began using each other's rhetoric in order to appeal to different constituencies, with local anti-fracking groups talking about global climate issues alongside their

[50] The rejection was not unanimous.

local concerns and Friends of the Earth talking about “plummeting house prices” (Sweney and Carrington, 2017). This indicates the growing strength and coherence of the coalition.

One thing that is clear from this case is that mere opposition to the pro-shale coalition was not sufficient by itself. A coalition was needed. Residents might oppose shale gas development near them, but without the anti-fracking networks to provide organisation, resources and expertise, there was little that they could do. However, when an anti-shale coalition is present, it raises the possibility of rejection from the local authority – as happened here – or at the very least significant delays for the operator making the application. This part of the case study is particularly noteworthy because it represents one of the first occasions where the anti-shale coalition was successful on a local level, even though this was ultimately overturned on appeal.

While this case study focuses on the applications made to local government, it is worth dwelling for a moment on the key failing of the anti-shale coalition. They invested a great deal of resources in lobbying the council, and were successful, but nothing like the same effort was made at the national level. Nor did they have anything approaching the level of access possessed by the pro-shale coalition – unsurprising given that the government itself was a member of the pro-shale coalition. This did not preclude success at a local level, but it was a problem for the anti-shale coalition once the application was appealed to the Planning Inspectorate. Furthermore, while the anti-shale coalition were unsuccessful in preventing the application ultimately being accepted, they can at the very least claim a partial victory: they imposed significant delays on the coalition and in the end the well at Grange Road was plugged and abandoned in December 2018 without ever being fracked or achieving any production.

Case study 2 – Kirby Misperton, North Yorkshire

At Grange Road, the anti-shale coalition was able to have some success, pushing Lancashire County Council to reject Cuadrilla Resource's application. The anti-shale coalition in Kirby Misperton proved to be just as strong – and quite possibly stronger. With this application being made by Third Energy, a company that was smaller and ostensibly lacked the clear links to government that Cuadrilla had, it could have been assumed that a rejected application would be even more assured here. However, North Yorkshire County Council eventually, and with a degree of reluctance, granted planning permission, fearful of the ramifications that would arise from a refusal. Once more, no development occurred at the site even though planning permission was granted.

Background

With four applications made across seven years, Kirby Misperton is one of the lengthier cases. Viking Energy made their first application at this site in 2012. By 2016 they had been bought and absorbed by Third Energy, and while they were eventually given permission by North Yorkshire County Council to carry out hydraulic fracturing, these operations would never take place.

Kirby Misperton is of interest because it is, in many ways, the opposite of what transpired at Grange Road. At Grange Road, Cuadrilla were held up by local government but their progress was eased by support at ministerial level. Here, Third Energy encountered the reverse: North Yorkshire County Council accepted their applications relatively quickly, but their application to central government to carry out hydraulic fracturing dragged on inconclusively. In January 2018, the Secretary of State for Business, Energy and Industrial Strategy, Greg Clark, confirmed that a decision was not to be expected any time soon. Curiously, this hesitancy was not due to questions of the perceived risk or rigour of Third Energy's technical work, but as a result the company's perceived lack of "financial resilience" (BBC News: York and North Yorkshire, 2018). Third Energy would never satisfy these financial requirements, and they removed their equipment from the site in 2018 and eventually sold it in April 2019 (BBC East Yorkshire and Lincolnshire, 2019).

Kirby Misperton is a small village in North Yorkshire with a population of around 370 in the Ryedale district of the county. Ryedale is a predominantly rural and agricultural district, and, despite having an area of 1507 km^2 - the 12th largest of England's 317 districts – it has no settlement with a population over 10,000. Kirby Misperton is close to Malton, an affluent market town of around 4,900 people.

The local government structure is similar to that seen in the Grange Road case, with the multi-tier system found in English rural government. Here, North Yorkshire County Council, as the minerals and

waste planning authority, were responsible for making the final decision (North Yorkshire County Council, 2017). At the secondary level, Ryedale District Council – a body that would typically act as decision maker for planning policies – were merely mandatory consultees[51] (North Yorkshire County Council, 2015b, pt. 4.2). Kirby Misperton Parish Council, the body at the lowest level of local government, not usually vested with a great deal of decision making power, were also mandatory consultees (North Yorkshire County Council, 2015b, pt. 4.4).

It is worth remarking that the first application made during the period being studied in September 2012 made no mention of hydraulic fracturing. If it did, this application may have been more problematic, as it coincided with the government's post-Preese Hall fracking moratorium. As it happened, the application was quickly processed, with permission being issued on 9 January 2013 (North Yorkshire County Council, 2013). This application, to conduct additional drilling and production at an existing well site, was made in the name of Viking UK Gas, a company that had been bought by Third Energy the previous year (Third Energy, 2018).

It was not until 2015 when Third Energy issued their intention to explore for shale gas at this established conventional site. The first application, made in February 2015, appeared ominous to anti-fracking groups: it concerned the proposed construction of a boundary fence, motivated by, according to Third Energy, protester activity at other well sites across the United Kingdom (Third Energy, 2015a, p. 7). Despite attracting objections, the application was relatively innocuous, and it took only three months for permission to be granted (North Yorkshire County Council, 2015c).

Shortly before permission for the fence was granted, in April, Third Energy made their second application, which was the first to explicitly state their intention to conduct fracking at the site (Third Energy, 2015b, p. 4). However, this application was not actually to conduct hydraulic fracturing. Instead, it was to seek permission to drill five boreholes that would be used to monitor groundwater quality before, during and after hydraulic fracturing operations (Third Energy, 2015b, p. 4). By this point, with the intention to conduct fracking made clear, opposition began to accumulate, but at no great scale, and permission was once again granted within a relatively short period, this time after five months (North Yorkshire County Council, 2015d).

By this point, the third and final application at Kirby Misperton for 2015 had already been submitted, on 29 July 2015. Of all the applications, this was the most significant one: "to hydraulically stimulate

[51] They had the right to be consulted on developments, but their recommendations did not have to be followed.

and test the various geological formations … followed by the production of gas from one or more of these formations" (Third Energy, 2015c).

While Third Energy had openly signalled their intention to carry out hydraulic fracturing, it was this application that actually tried to make it happen. Unsurprisingly, this application was met with far fiercer opposition than any of the others, drawing 3,950 individual representations – the overwhelming majority of them in opposition (North Yorkshire County Council, 2016b, pt. 5). In spite of this opposition, planning permission was granted by the council's planning committee the following May (North Yorkshire County Council, 2016c). It is worth comparing this application to the concurrent third application at Grange Road: the Grange Road application took significantly longer – a year – to be considered, by which point it was ultimately rejected. This was despite Kirby Misperton immediately appearing to draw much more opposition than Grange Road, which only attracted 301 objections (Lancashire County Council, 2015d, p. 22).

This is just one of the many curiosities arising from this case. Indeed, some of the most interesting aspects arose once the planning process had already been completed. As touched on previously, Third Energy would never commence fracking or production operations at this site, despite having gained permission to do so. Instead, Third Energy would soon be beset by a number of financial problems. One of Third Energy's non-executive directors, Keith Cochrane, happened to be the former Chief Executive of Carillion – a major outsourcing firm and government contractor that was, at the time, undergoing a highly public and controversial collapse. Protestors and Labour politicians focused on this link, which may have led Greg Clark, the Secretary of State for Business, Energy and Industrial Strategy to put Third Energy's fracking application pending an investigation into the company's "financial resilience" (Helm, 2018). With Third Energy's most recent accounts showing a loss of £3.8m and debts exceeding £50m, there was obvious cause for concern, despite Clark's insistence Third Energy met all the necessary technical requirements (BBC News: York and North Yorkshire, 2018; Helm, 2018).

In the end, Third Energy gave up with Kirby Misperton and sold their entire onshore business to York Energy having been unable to gain permission from the government (BBC East Yorkshire and Lincolnshire, 2019). The sale, which took place in April 2019, reignited fears among anti-fracking protestors, with one saying "I don't know why this American firm would have bought Third Energy if they didn't want to frack" (Burn, 2019). As of June 2021, however, there have been no further developments.

In this case study I will attempt to analyse the characteristics of each of these applications in order to explain why the eventual outcomes were produced. The approach taken here will be slightly

different to the previous Grange Road case study: rather than consider each application in turn, the last three applications – those made in 2015 – will be considered concurrently as they all overlapped to some extent and they all formed part of a larger project.

Application 1 (2012)

On 28 September 2012, Viking UK Gas made an application to North Yorkshire County Council "[t]o construct an extension to the existing Kirby Misperton 1 wellsite and drill up to two additional gas production boreholes followed by the subsequent production of gas" (Viking UK Gas, 2012a). Viking UK Gas had extensive exploration and production experience in the North Yorkshire area, having owned gas fields in Malton, Marishes and Pickering as well as Kirby Misperton, a gas source that was discovered in 1986 and first developed by Kelt Energy in 1995 (Haarhoff et al., 2018, p. 129).

While relatively uneventful, this application is being considered as part of the overall shale gas story at this site as it was the first to raise concerns of anti-fracking activists. While no mention of fracking is made, the application's supporting statement does make note of Viking UK Gas's intention to evaluate the Bowland Shale (Viking UK Gas, 2012b, p. 21). Furthermore, anti-fracking activists Frack Off highlighted their concerns about a "deal" between Cuadrilla – then, as now, the most well-known shale gas developer in the United Kingdom – and Third Energy regarding the sharing of drilling equipment, and cited this as a key driver for the first meeting of Frack Free North Yorkshire in late 2013 (radix, 2013).

Actors and alignments

Table 7.1:Actors and coalitions in Kirby Misperton application 1

Pro-shale actors	**Anti-shale actors**	**Uncertain/unaligned**
Viking UK Gas (subsidiary of Third Energy)	North Yorkshire County Council Public Rights of Way (until objection withdrawn)	UK Government
		North Yorkshire County Council
		Environment Agency
		Ryedale District Council

Pro-shale

Viking UK Gas were the exploration and production company making the application. In 2011, Third Energy acquired all of Viking UK Gas's onshore assets in North Yorkshire. Nevertheless, the application was still made under the Viking UK Gas name as they were, at the time, continuing to operate as a subsidiary of Third Energy (Third Energy, 2018; Viking UK Gas, 2012b, p. 11).

Anti-shale

North Yorkshire County Council Public Rights of Way initially objected to this application because it interfered with a public footpath (North Yorkshire County Council, 2012a). This opposition was soon withdrawn once Viking UK Gas and the council agreed to a diversionary footpath (North Yorkshire County Council, 2012b).

Uncertain/unaligned

The coalition **UK Government** did not appear to have any direct involvement in this application. This application was made as the fracking moratorium was nearing its end, a time at which government attitudes towards onshore oil and gas development were notably warming. In general, government policy was favourable: "[g]overnment recognises that it is in the national interest to ensure the efficient recovery of all economic petroleum resources and further recognises that sound exploration activity is of merit in its own right" (Viking UK Gas, 2012b, p. 15). Nevertheless, there is a clear absence of direct activity or coordination that would normally be required to assign them as a pro-shale actor.

North Yorkshire County Council, as the mineral planning authority, were the decision-makers in this application. Following the 2009 election, the Conservatives had 48 seats, compared to 11 each for the Liberal Democrats and independents, and one apiece for the Labour and Liberal[52] parties. The Conservatives, however, were not quite as dominant as this might make them seem: the lack of a proportional voting system in English local elections allowed 51.9% of votes to translate into two thirds of seats. In Ryedale, the district within which Kirby Misperton is located, there were five Conservative councillors and one Liberal councillor. While one might expect the Conservative councillors to be sympathetic to the energy policies of the national government, the lack of pro-shale or anti-shale engagement in this application means that the council appears to have had limited political involvement in this application.

The **Environment Agency** are a non-departmental public body affiliated to the Department for Environment, Food and Rural Affairs. They are a statutory consultee but recorded no objections to this proposal.

Ryedale District Council were consulted by North Yorkshire County Council and made no objection on this occasion.

[52] Not to be confused with the Liberal Democrats: this is a continuation of the original Liberal party following its merger with the Social Democratic Party in 1989.

Coalitions and coordination

The lack of actors coordinating on this application means that there is no activity within this application that could be described as being part of a coalition. However, the aftermath of this application would be harbinger of things to come, as Frack Off and Frack Free North Yorkshire would draw attention to the drilling operations at Kirby Misperton to mobilise local residents and environmental activists worried about future developments.

External events

The Preese Hall earthquakes, an event that, because of its significance, will be returned to again and again throughout this thesis, occurred in April 2011 at a Cuadrilla drilling site near Blackpool. Unfortunately for the pro-shale coalition, these earthquakes followed the first shale hydraulic fracturing operation in the United Kingdom, and would colour popular impressions of shale gas and onshore development for some time to come (O'Hara et al., 2015b, p. 5).

While there was some indication that shale development could be pursued at Kirby Misperton in the future, the application in question concerned the extension of an existing conventional well. As such, hydraulic fracturing and shale gas were not, strictly speaking, relevant to this application. Nevertheless, there were those who conflated unconventional resource development, and in turn hydraulic fracturing, with all onshore oil and gas extraction. This was regularly done by Frack Off, the campaign group that promotes other more localised anti-fracking groups and draws attention to fracking throughout the United Kingdom. Frack Off's website, on a page entitled "Map of UK Fracking Sites", has a detailed and interactive map which labels a large number of onshore oil and gas developments in the United Kingdom, including coal bed methane and conventional sites (Frack Off, 2019a).

In addition to this, Frack Off's page for Kirby Misperton, which they class as a shale site with "planned" fracking, lists Viking UK Gas's conventional application alongside Third Energy's later unconventional applications (Frack Off, 2019b). This blending of conventional and unconventional gas suggests that – whether accurate or not – external events occurring at shale gas sites in the United Kingdom were relevant to the site at Kirby Misperton. However, the first stirrings of anti-fracking resistance in the area occurred quite some time after the earthquakes, and a few months after this application was accepted. Indeed, the events of September – where 50 local people attended a meeting "to hear about the threat to the area" - and October 2013 – the first meeting of

Frack Free North Yorkshire[53] – coincided far more closely with the 2013 anti-fracking protests at Balcombe (radix, 2013).

The protests at Cuadrilla's site near Balcombe in West Sussex are discussed more fully in the Grange Hill case study in the previous chapter. These events, which included protestors blocking the site gates, a "Reclaim the Power" camp hosting up to a thousand campaigners and tens of thousands of pounds in online fundraising support were perhaps most notable for the sight of Caroline Lucas, the UK's sole Green party MP, being arrested for obstructing the drilling site (Harvey and Walker, 2013; Press Association, 2013). They were credited with increasing and intensifying opposition to shale gas (O'Hara et al., 2015b, p. 3).

As such, it seems likely that these protests played an important role in engendering opposition to the conventional development at Kirby Misperton. This opposition came a little too late to oppose the application itself, but the combination of the application at Kirby Misperton and increasing awareness due to the events at Balcombe did lead to the development of an anti-fracking coalition that would play a significant role in subsequent applications.

With the Conservatives being more in favour of onshore oil and gas development than any other party, the local and national electoral landscapes were certainly in Viking UK Gas's favour. The 2010 coalition agreement between the Conservatives and the Liberal Democrats featured a number of commitments to encourage renewable energy and no reference to fossil fuels, but subsequent developments clearly show that the Conservatives had the upper hand, with a raft of incentives for onshore oil and gas development announced in 2013 (HM Government, 2010, p. 16; HM Revenue & Customs, 2013, pp. 1–2). Viking UK Gas's application to North Yorkshire County Council places a great deal of emphasis on this government support, noting that "the Government wishes to ensure that the economic production of declining oil and gas reserves is maximised" and that "there is a strong drive from the Government to explore for indigenous oil and gas resources" (Viking UK Gas, 2012b, pp. 16–17).

This emphasis on the policies of a Conservative-led government might well have been looked upon favourably by the councillors of North Yorkshire County Council, a local authority that has been under Conservative control since 2001, and, excluding eight years of no overall control from 1993-2001, has never not been controlled by the Conservatives. The council that had been elected in the

[53] A "community group opposed to hydraulic fracturing, known as 'fracking' within the Ryedale Area" (Frack Free North Yorkshire, 2013).

English local elections of 2009 was overwhelmingly Conservative and this was reflected in the makeup of the Planning and Regulatory Functions Committee that considered the application.

The matter of whether the committee's political makeup affected their decision-making is very difficult to deduce. However, it is worth noting that all the applications made to North Yorkshire County Council would be accepted with relative ease, while the applications in neighbouring Lancashire would be most contested during its period of no overall control from 2013-2017.

The government's policy as cited in the application reflected broader energy security concerns. In 2012, crude oil import costs in the United Kingdom reached $112.6 per barrel, an increase of 52% since the 2008 financial crisis (International Energy Agency, 2016). This sharp price increase was accompanied by continued production decline in the North Sea, with output falling every year since 1999 (Scottish Parliament Information Centre, 2013, p. 5).

The increasing oil price was attributed to the events of the Arab Spring, and the previous year's Libyan Civil War. At the time of the application, analysts did not expect the conflagrations in the Middle East and North Africa to threaten energy supplies, but it was expected that energy import costs would remain volatile for some time to come (Stevens, 2012, p. 1). The implications for energy security were likewise a key concern for government at the time, with the Secretary of State for Energy and Climate Change providing a written statement to parliament noting that "[t]he global economy is still emerging from recession, and it is essential that this recovery is not endangered by oil supply disruptions or shortages" (Huhne, 2011).

During this time of increasing energy security concerns in the United Kingdom, the United States was experiencing a sharp increase in domestic natural gas production, alongside a trend of decreasing imports for the first time since the mid-80s (US Energy Information Administration, 2019b, 2019c). Indeed, it was this movement that would later prompt Barack Obama to declare that "America is closer to energy independence than we've been in decades" (Neuhauser, 2014).

In short, it could be held that at this point, external events were highly in favour of those seeking to develop shale gas. The earthquakes had happened sometime before, and, while they went some way towards raising popular opposition to onshore oil and gas development, their effect in Kirby Misperton was muted. This is despite there being clear evidence, here and elsewhere, that opponents of fracking would – whether knowingly or unknowingly – conflate conventional developments with unconventional and hydraulic fracturing.

Fortunately for Viking UK Gas, the application would be accepted shortly before the high-profile anti-fracking protests in Balcombe in 2013, though the local opposition motivated by these protests

would soon cause them problems. Nevertheless, with the application occurring during a very slight lull between the earthquakes and the summer protests, the key external events were related to the economy and energy security. Here, the views of Viking UK Gas and the Coalition government were in concert.

Public opinion

O'Hara et al began collecting data of public perceptions of shale gas in March 2012, shortly before this application was submitted. However, at this stage public views of shale gas were relatively benign: despite almost 70% of respondents associating it with earthquakes in December 2012, over 50% associated it with cheap energy too (O'Hara et al., 2015b, pp. 6, 10). A clear majority also concluded that shale gas should be allowed[54] (O'Hara et al., 2015b, p. 13). The impact of concerns about shale gas was diluted even further for this application because, while there was clear evidence that people conflated all onshore developments with shale gas and that Viking had intentions to look into shale gas, this application did not actually concern shale gas.

Here, as in other cases, a baseline of public opposition to shale gas was required for an anti-shale coalition to form and attract members. Without it, Viking UK Gas unsurprisingly had an easy time getting their application accepted. Had the application been a few months later, coinciding with the summer 2013 protests, things might have been different.

Perhaps broader political priorities may have been of more significance. With a stumbling recovery from the financial crisis, and austerity continuing to bite, a large majority of people reported the economy as being one of their three top political issues, while the proportion doing so for the environment would never rise above 9% throughout 2012 (YouGov, 2015, pp. 4–5). Viking UK Gas focused much of their application on national energy security and in this instance it was the economic matters that broke through.

Resources

Viking UK Gas were a North Yorkshire-based company, and had held licenses in the Ryedale area – including Kirby Misperton – since 2003 (Viking UK Gas, 2012b, pt. 3.1). With much opposition to onshore developments targeting on companies coming from outside the area allegedly disinterested in the impact on local residents, Viking's establishment in the area perhaps worked to their advantage. What Viking UK Gas did not have (unlike Cuadrilla, for example) was backing from rich investors and senior management with contacts and industry experience.

[54] Although the extent to which the different factors shaped this view is unclear.

One of Third Energy's directors, John Dewar had vast technical experience, having worked as a petroleum engineer for over 40 years, including almost 30 years at Shell. He would later refer to his work at Kirby Misperton as his "last opportunity" and an "opportunity to put a lot back", suggesting something almost valedictory about his leadership of the company. Their Chief Financial Officer, David Robottom, was the chair of United Kingdom Onshore Oil and Gas (Ukoog, sometimes referred to as the UK Onshore Operators Group), the representative of the British onshore oil and gas industry (United Kingdom Onshore Oil and Gas, 2013). This suggests that he had some level of respect from his peers, yet, while there would later be evidence of Ukoog and the government working together, at this point the group was insular and little-known. This suggests that while Dewar and Robottom were experienced and respected within their industry, their ability to access and influence policymaking beyond that was limited, certainly compared to Cuadrilla and their backers such as John Browne. Nevertheless, there was some recognised expertise within the company.

Even though Viking UK Gas were already producing gas in order to generate electricity for sale to Scottish Power, their financial situation was dire (Viking UK Gas, 2013, p. 2). Their meagre 2012 turnover of £826,624 was offset by a loss in excess of £6 million, and but for interest-free loans from Third Energy their solubility might well have been in doubt (Viking UK Gas, 2013, pp. 2, 6). Indeed, the company's own financial statements note that the company's ongoing capital projects are not guaranteed to succeed, and that meeting future financial liabilities could be challenging (Viking UK Gas, 2013, p. 2). This financial uncertainty would cause problems for Third Energy's plans at Kirby Misperton in future, but for now, it was largely unimportant. Facing minimal opposition, Viking UK Gas just had to ensure that they got the application accepted, and this they were able to do. If there had been organised opposition to this application at this stage, it is by no means guaranteed that the limited resources possessed by Third Energy at the time would have been sufficient for them to succeed. By the time of the next application, Third Energy would have strengthened significantly, but so would their opposition.

Relationships with policymakers

While they had shared priorities there was no meaningful, obvious or consequential engagement between the UK government and Third Energy or Viking UK Gas. There does appear to be slightly more engagement at the local level. As a company that had been long-established in the area, with a number of sites, it can be assumed that Viking UK Gas was well known to local councillors (Haarhoff et al., 2018, p. 129). Indeed, the parish council of Kirby Misperton regarded Viking UK Gas's presence so benignly – perhaps even favourably – that they mention their nearby well site on the "about the village" section of their website (Kirby Misperton Parish Council, 2016).

Viking UK Gas pro-actively conducted pre-application consultations with a number of key bodies, including a number of departments of North Yorkshire County Council, the Environment Agency and Natural England. This appears to have been a wise choice: a number of these groups did raise concerns, but Viking UK Gas were able to make commitments and offer conditions to alleviate them. This undertaking appears to have led to a relatively frictionless application process, with much less of the back-and-forth correspondence between operator and consultee that tends to be present in other applications (North Yorkshire County Council, 2019; Viking UK Gas, 2012b, pt. 3.3).

For the most part, Viking UK Gas's attempts to build relationships with policymakers appear to have been effective: they were not the difference between the application being accepted or rejected, but their efforts to quickly identify and mitigate problems certainly streamlined the process.

Summary of findings

This conventional drilling application was one of the more straightforward processes encountered by an onshore developer around this period. It seems likely that Viking UK Gas's establishment in the area helped them, as did governmental support for the principle of onshore development and reducing energy dependence. Nevertheless, Viking UK Gas's resources and those of their owner Third Energy compared unfavourably to Cuadrilla's. Furthermore, while government views and Viking UK Gas's intentions coincided, there is no evidence that they had a relationship of any more substance.

Ultimately, however, limited resources or limited access to policymakers would be of little consequence for this application. Similar to the first application in the Grange Road case study, the public opposition to onshore development was too limited to support the development of an anti-shale coalition. Additionally, there were no external events that could spark the development of such a coalition. Again, it must be stressed that the anti-fracking imperative might have been distanced somewhat from this conventional application, though Viking UK Gas were open about their intentions to pursue shale drilling in future (Viking UK Gas, 2012b, p. 21).

The greater publicity arising from protests in Lancashire and Balcombe, coupled with the fear that fracking was around the corner at Kirby Misperton, would inspire the creation of Frack Free North Yorkshire, alongside other Yorkshire-based groups such as Frack Free Cleveland, Frack Free Scarborough and Frack Free South Yorkshire (radix, 2013). While this application would not in itself be of great significance, the tumult at Kirby Misperton over the next few years could be traced directly to its acceptance.

Applications 2, 3 and 4 (2015)

As outlined in the introduction, these applications will be addressed concurrently due to their concordance in subject matter and the overlapping of the periods in which they were being decided.

The applications, on these occasions made by Third Energy themselves, were as follows:

Table 7.2: Details of Kirby Misperton applications 2, 3 and 4

Application number	Nature of application	Date made	Date accepted
2	"Erection of a 2.7m high security fence, access gates and two pedestrian emergency access gates" (Third Energy, 2015d, p. 1).	20 February 2015	13 May 2015
3	"Installation of up to five (5) water monitoring boreholes comprising three shallow boreholes (approximately 10 metres in depth) within the KM8 Wellsite, one intermediate borehole (approximately 50 metres in depth) and one deep borehole (approximately 220 metres in depth) within the adjoining KM1 Wellsite" (Third Energy, 2015e, p. 1)	30 March 2015	4 September 2015
4	"To hydraulically stimulate and test the various geological formations previously identified during the 2013 KM8 drilling operation, followed by the production of gas from one or more of these formations into the existing production facilities, followed by wellsite restoration." (Third Energy, 2015c, p. 3).	29 July 2015	27 May 2016

These followed a sequence: the first was to prevent protestors from gaining access to the site, the second was to implement safeguards for anticipated hydraulic fracturing procedures and the third was for the fracking itself. Third Energy beginning the process with the construction of a security fence underlines the importance operators placed on deterring protestors – often to an extent that opponents found excessive.

In any case, anti-fracking protestors were convinced that Third Energy would not wish to put up a fence just for the sake of putting up a fence. They were also aware that Third Energy sought to monitor groundwater in anticipation of forthcoming fracking operations. As a result, this sequence of applications faced opposition right from the start, though this would intensify to a far greater extent by the time of the final application.

Nevertheless, North Yorkshire County Council accepted all three applications relatively quickly. Unlike neighbouring Lancashire, the increase of anti-shale activity did not result in rejections. Instead, the delay would come at the hands of the government, with a fracking permit withheld to Third Energy's financial situation – something that was already raised as a concern during the consideration of the 2012 application. Eventually, Third Energy gave up and sold their North Yorkshire business.

Actors and alignments

Table 7.3: Actors in Kirby Misperton applications 2,3 and 4

Pro-shale coalition	Anti-shale coalition	Uncertain/unaligned
Third Energy	Frack Free Ryedale	North Yorkshire County Council
UK Government	3 objections to application 2	
Backing Fracking	Greenpeace	
Several oral and written statements in support	3,907 representations objecting to application 3	
Ukoog	Malton Town Councillor and Habton Parish Council Chairman Paul Andrews	
Onshore Energy Services Group	Frack Free Kirby Misperton	
Envireau Water	2932 petition signatories	
Lancashire for Shale	Anne McIntosh (a Conservative peer)	
	Friends of the Earth	
	Ryedale District Council	
	Kirby Misperton Parish Council	
	Malton Town Council	

	Marishes Parish Meeting	
	Great & Little Barugh Parish Council	
	Pickering Town Council	
	Rillington Parish Council	
	Habton Parish Council	
	Normanby Parish Meeting	
	Heslerton Parish Council	
	Yorkshire Wildlife Trust	

Pro-shale

Third Energy, having absorbed Viking UK Gas, were the company making these applications. At the time of the application they held six petroleum licenses granted by the Department for Energy and Climate change, permitting them to "search, bore and get petroleum within the licence boundary", provided planning permission is granted by the local authority (Third Energy, 2015b, p. 4). As previously mentioned, Third Energy operated a number of conventional production sites in North Yorkshire. They could not be regarded as shale gas specialists: this was their only proposal concerning shale gas and hydraulic fracturing.

2015 was a year of transformation for the **UK Government**. In the 2015 election the Liberal Democrats lost 49 of their 57 seats, allowing the Conservatives a majority to govern by themselves, resulting in a more pro-shale government. The implications of this will be discussed later in this chapter.

Backing Fracking are, in their own words, "a national pressure group, set up by UK residents to campaign in support of the responsible extraction of on-shore natural gas in order to create better jobs, with better pay and better prospects" (Backing Fracking, 2015). In supporting this application, they placed an emphasis on North Yorkshire's established history of fossil fuel drilling and the way they think issues such as traffic, noise and climate change could be mitigated. Backing Fracking have been labelled by anti-fracking groups as "astroturfers"[55], with a leaked email showing a membership of PR advisers, business owners, recipients of funding from shale companies and social media "fracktivists" (Refraktion, 2017).

United Kingdom Onshore Oil and Gas, the industry association, were represented by their chief executive Ken Cronin who gave an oral statement to the planning committee alongside John Dewar,

[55] Astroturfers are organisations "purporting to be broad based but in actuality run by industry lobbyists" (Hacker and Pierson, 2010, p. 180).

the director of Third Energy and Jonathan Foster, the founder of the Onshore Energy Services Group, an association of SME companies in the onshore oil and gas supply chain.

Others giving evidence in support of the application included Phil Ham, the managing director of Envireau Water, a consultancy providing advice on water management; Nigel Rockliffe, a landscape consultant; Lee Petts, the chair of Lancashire for Shale; a local farmer and a local B&B owner who believed the anti-fracking cause "is a magnet to the type of people who live on the edge of normal society" and would "kill house prices" (Gillespie, 2017).

Cumulatively, the speakers gave around seven pages of reasons for supporting shale gas development. Who said what and the extent of coordination between speakers is not always clear, but the wide range of issues being covered gives the impression of a careful attempt to rebut the large number of specific reasons given for opposing the development: many of the reasons given specifically target a contention made by the anti-shale coalition. For example, several speakers emphasised the stringent regulation of shale gas, and the "unfounded" nature of concerns raised about issues in the US shale production (North Yorkshire County Council, 2016a, pp. 18–25).

Anti-shale

Frack Free Ryedale objected to the application, labelling it an "unacceptable development within a rural location" (North Yorkshire County Council, 2016b, pt. 4). Frack Free Ryedale were the key anti-fracking group active in these applications, and the circumstances of their formation and their structure is testament to the importance placed upon forming coalitions and coordinating activity among anti-fracking actors. Describing themselves as "a peaceful organisation of concerned residents and friends of Ryedale, many of whom are retired people, mothers and local business people", Frack Free Ryedale was formed as a result of talks organised in the local area by Frack Off in July 2014 and have overseen and supported the development of ten further localised groups under their umbrella (Frack Free Ryedale, 2015). They were active in objecting and opposing each of the three applications made by Third Energy in 2015.

Frack Free Ryedale played a further important role in coordinating objections. Of the 3,907 individual representations made against Third Energy's proposals, around 64% of these were based on templates, with Frack Free Ryedale providing one of the four templates used[56] (North Yorkshire County Council, 2016b, pt. 5.5.).

In light of the broad range of their activities, Frack Free Ryedale issued a large number of different objections on a broad range of grounds. For the most part, these objections could be grouped under

[56] The others were 38 Degrees, Greenpeace and Friends of the Earth.

the headings of local planning policy, operational issues, climate change, hydrology and hydrogeology, ecology, landscape, air quality, health, highways and traffic, noise, lighting, infrastructure, heritage, seismicity, ground vibrations, socio-economic factors, cumulative factors, restoration and legacy (North Yorkshire County Council, 2016b, pp. 84–110).

This approach was markedly different from the approach taken by a number of other anti-fracking groups at other applications, whose responses were typically far more limited in terms of scale and quality. Indeed, it seems clear here that Frack Free Ryedale were determined to stop this application any way they could, throwing hundreds of applications at the council and hoping one of them would be taken up. It seems likely that this broad range of objections attracted a wide support: environmental activists could support them for the climate change goals, while local residents could support Frack Free Ryedale because of their opposition on the grounds of effects on house prices [57]. This is an important example of coalition activity and coordinated behaviour arising between actors with different core beliefs.

Frack Free Kirby Misperton were one of the anti-fracking groups within the Frack Free Ryedale stable. This smaller organisation appears to consistently have taken Frack Free Ryedale's line, and there is clear evidence of strong support networks with other groups.

Greenpeace, an organisation of international renown and significant resources, played a major role as a national-level spokesperson in opposing fracking. Newspaper stories on fracking would regularly feature a comment from a Greenpeace campaigner or scientist. Greenpeace played a similar role at Kirby Misperton, as well as publicising their national anti-fracking fundraising programme and hinting at direct action. However, their direct role in attempting to influence policy was somewhat more limited. They created a letter template for those wishing to object to the application but did not engage in appealing to and sharing information with the committee to the same extent as Frack Free Ryedale. However, as a national level representative they played a major role in building awareness of the anti-fracking cause and there is clear evidence of coordination with other members of the anti-shale coalition, whether it be media representation or organising demonstrations on their behalf.

Friends of the Earth have typically been the environmental organisation with the most extensive involvement in opposing fracking throughout the United Kingdom at a local level. This has seen

[57] House prices, while one of the issues most commonly raised in objections, were also – in theory at least – not allowed to be considered by the planning committee when determining an application (North Yorkshire County Council, 2016b, pt. 5.37; Third Energy, 2015f). Nevertheless, the members of the planning committee depended on these very homeowners for votes and often expressed concern for house prices during committee meetings.

lengthy, detailed objections to planning applications – an approach that other nationwide or global organisations such as the World Wide Fund for Nature and Greenpeace typically avoided. During the consultation process for Preston New Road in Lancashire, for instance, Friends of the Earth's objections were so lengthy and detailed that Cuadrilla's planning consultants Arup sent a 27-page letter to Lancashire County Council attempting to rebut each of them (Arup, 2014b). This continued to be the case in Kirby Misperton, with Friends of the Earth having made a number of submissions to the council planning committee. The committee report made around thirty references to points brought up by Friends of the Earth, showing that their work was being taken seriously. Yet, while it certainly induced some hesitancy in the decision makers, it was not sufficient to prevent the application being granted (North Yorkshire County Council, 2016b).

Friends of the Earth also played an important role as a coordinator for the anti-shale coalition, bringing together coalition members and supporting them. In the hydraulic fracturing application made a representation on behalf of Frack Free Ryedale (which also received a lengthy response from the applicant) (North Yorkshire County Council, 2016b, p. 40). Friends of the Earth also prepared and shared one of the most widely used templates for the objection letters used by local residents, while one of their locally based campaigners gave evidence on their behalf at the committee meeting in May 2016 (North Yorkshire County Council, 2016a, p. 15, 2016b, p. 5).

Ryedale District Council is the body responsible for Ryedale, one of the seven subdivisions of the area under the control of North Yorkshire County Council. Geographically, it is the largest of North Yorkshire's districts, but the population represents only 55,000 of the 615,000 living in the county. Broadly reflecting the characteristics of North Yorkshire and a rural area, the elected district councillors are overwhelmingly Conservative. The 2015 election resulted in twenty Conservatives, three Liberals, two Liberal Democrats, two from the Ryedale First Independent Group and three from the Independent Group. The latter two parties represent a schism – and a schism within a schism – but all five concerned were formerly Conservative councillors. Yet, despite almost all the councillors being affiliated with the nationwide party of government, they could not always count on Ryedale District Council's support. The district council appeared unconcerned by the first two applications, providing no objection to either. However, this had changed by the time of the third application – the one that specifically concerned permissions to conduct hydraulic fracturing. Here, Ryedale District Council issued a prompt, uncompromising objection: it was an "unacceptable development within a rural location" (North Yorkshire County Council, 2016b, pt. 4). For a local authority, it was unsurprising that the concerns were particularly localised. Larger scale issues such as climate change or economic matters were eschewed for a report that primarily focused on noise and air quality as well as matters of heritage and building conservation, in particular a grade II listed

bridge that would be used by Third Energy to access the site (North Yorkshire County Council, 2016b, pp. 54–55).

Kirby Misperton Parish Council sits at the lowest tier of local government, a representative authority for a village of 370 with involvement of the provision of the most local services, such as litter bins and defibrillators. They are also a mandatory consultee for all planning applications within their area. Here, Kirby Misperton followed a similar pattern to Ryedale District Council: making no observations for the first two applications but objecting to the third. While making a very short submission – understandable given their limited resources – they objected on the basis of traffic, air quality and water quality (North Yorkshire County Council, 2016a, pt. 4.6). Of all the issues highlighted, traffic was the one given the most attention. The parish council were concerned that HGV traffic would drive through the village and that it could interfere with school bus activity.

Curiously, **Malton Town Council**, representing the nearby community of 4,900, took a different approach in their objection. Unlike the district council and Kirby Misperton Parish Council's responses, no mention was made of traffic. Instead, they stated that "it will oppose applications for permission to conduct fracking operations on the grounds that concerns in respect of the environmental effects remain unresolved". While they were worried about potential groundwater contamination this was held on an equal footing to visual impact and its potential impact on the "visitor/tourism economy" (North Yorkshire County Council, 2016a, p. 55).

Marishes Parish Meeting[58] represents a very small community in Ryedale, in which Third Energy possesses another conventional field that had been producing since 1995. The issues covered in their response to the third consultation are almost identical to those brought up by Malton Town Council, suggestive of coordination in responses. While concerned about fracking's threat to water supplies, far more of their response focused on impacts to tourism and "industrialisation of the open countryside" (North Yorkshire County Council, 2016b, p. 56). The parish meeting were upset that Third Energy had not, in their opinion, considered the impact on property prices and also questioned the experience and knowledge of regulatory agencies, doubting their capability to understand the geology of Ryedale.

Great & Little Barugh Parish Council represented another small village close to the Kirby Misperton site. Despite their small size, part-time councillors and – one would imagine – highly limited

[58] A parish meeting is distinct from a parish council in that it is a meeting that all electors in a civil parish can attend. It is a form of direct democracy that typically occurs in a parish or group of parishes with fewer than 200 electors. They have the same role and statutory powers – including the requirement to be consulted on nearby developments – of a parish council.

resources, they produced one of the more substantial objections to Third Energy's proposals. Their response is an interesting melange of the parochial and the global. Complaints about effects on house prices, traffic and light pollution sit alongside disputations of shale gas's supposed benign effect on climate change, with the parish council giving the opinion that "renewable sources would be a far more effective as a long term solution" (North Yorkshire County Council, 2016b, p. 57). It is interesting, and somewhat unusual, to see a council at the lowest tier of local government taking on a narrative that is typically found at a national or supranational level of policymaking. The relative brevity of their response on this issue – as well as the sheer volume of objections on more local matters – suggests that the parish council's appropriation of this narrative may be part of an attempt to oppose fracking on all possible grounds. The use of this narrative is an example of learning within the anti-shale coalition, of coalition activity with actors who have different core beliefs such as Frack Free Ryedale and Friends of the Earth.

Pickering Town Council[59] are the representatives of Pickering, one of the larger communities within North Yorkshire County Council's boundaries, with a population of around 6,800. Much like Great & Little Barugh Parish Council, Pickering Town Council highlighted concerns about carbon emissions, referring to "the mounting carbon debt that future generations would inherit were shale gas to be added to the fossil fuels already being used" (North Yorkshire County Council, 2016a, p. 60). Interestingly, one member of the town council objected to this submission on energy security grounds, arguing that hydraulic fracturing could "lessen the country's dependency for its energy supplies from abroad" (North Yorkshire County Council, 2016a, p. 60).

Rillington Parish Council are yet another small local body, this time serving a civil parish with a population of just over one thousand. Their response to the consultation was somewhat forceful, "returning an objection stating that 'the application has received a storm of protests with everyone bitterly apposed [sic.] to any Fracking taking place at all, including every one of the parish councillors' and 'the public have very serious concerns about the effect on the local environment both in the short term and also the long term legacy'" (North Yorkshire County Council, 2016a, p. 60).

Unlike the other authorities Rillington focused almost entirely upon the supposed dangers of fracking. Aside from a brief mention of "blighted" property prices, none of the typical concerns such as light, noise or traffic were mentioned (North Yorkshire County Council, 2016a, pp. 60–61). The way in which Rillington Parish Council raised their issues tended towards the hyperbolic: "It was well

[59] Incidentally, this series of applications is particularly notable for the sheer number of local authorities that objected to shale development, at a scale which did not occur anywhere else.

known that Fracking will permanently damage the underground geology"; "In America they have encountered serious environmental damage as a direct result of Fracking operations and they have no idea how to avoid such problems. This will happen in North Yorkshire if Fracking is allowed" and "Such operations will cause toxic chemicals to leak into drinking water supplies which will cause on-going health problems (or worse!) for the local population. If Fracking goes ahead the local drinking water supplies will have to be supplied from another part of the country unaffected by Fracking operations" (North Yorkshire County Council, 2016a, p. 60). Much of this response was based on unsubstantiated claims. Nevertheless, its existence is valuable and illustrative: it highlights how elevated fear of fracking had become for some local residents.

Habton Parish Council, was chaired by Paul Andrews, who also responded individually. Being chaired by a figure that is clearly highly engaged in the debate, Habton Parish Council were able to produce a response that was notably well thought out and considered for such a small body. It was also a more localised response, touching on potential industrialisation and impacts on tourism and traffic, while broadly eschewing matters such as energy security or carbon emissions (North Yorkshire County Council, 2016a, pp. 61–62).

Normanby Parish Meeting took a similar approach, noting concerns with water retention and purity, increased traffic movement, degradation of the night-time environment and the visual impact on the landscape.

Heslerton Parish Council were one of the more curious members of the anti-shale coalition. Indeed, it could be questioned whether they belong there at all. They claimed to have no objections to test wells being drilled provided that "no permission for fracking should be given" (North Yorkshire County Council, 2016a, p. 62). This is a peculiar response: there is little point in drilling a shale well if it is not to be fracked. Despite their apparent ambivalence to drilling, they have been assigned to the anti-shale coalition because their opposition to fracking does appear to be somewhat forthright, stating that "the public have grave concerns about the effects of Fracking on the local environment" and that they "require reassurance that no permission for actual Fracking operations will be given" (North Yorkshire County Council, 2016a, pp. 62–63). Yet, the first three words of this application stated Third Energy's intention "to hydraulically stimulate and test the various geological formations" (Third Energy, 2015c). As such, the extent to which Heslerton Parish Council truly understood what they were objecting to must be called into question. This is understandable: the councillors were, after all, working part-time with limited resources and specialist knowledge. Nevertheless, there were a variety of bodies such as Friends of the Earth who provided information used by other bodies with similar resource limitations.

Yorkshire Wildlife Trust are a local charity that manages a large number of nature reserves across Yorkshire, and part of a UK-wide partnership of 47 similar bodies. One of their sites, Low Carr Farm, was located around 1.8 kilometres from the Kirby Misperton drilling site. As a wildlife charity, Yorkshire Wildlife Trust are different in nature from the various parish and town councils. Nevertheless, being rooted in the local area, many of their concerns were the same: references to "industrialisation" of the countryside – a common theme in objections – were made. Concerns about fracking – "new and relatively untested method" – and climate change – "the current greatest threat to biodiversity in the UK" – were also used to justify their objection (North Yorkshire County Council, 2016b, pp. 80–81). The similar concerns brought up hint at possible coordination and sharing of information between Yorkshire Wildlife Trust and other members of the anti-shale coalition. Nevertheless, one of the charity's main concerns – Third Energy's alleged failure to conduct surveys for bats and great crested newts – was an issue that was not taken up by the majority of other objectors.

Anne McIntosh was the Conservative MP for Thirsk and Malton, Kirby Misperton's constituency, until standing down at the 2015 general election following her deselection. She was soon elevated to the House of Lords, where she continued to be an energetic campaigner against shale gas. Before leaving the Commons, she was chair of the environment committee, during which she expressed scepticism at Third Energy director John Dewar's claim to have public support for his plans (BBC News, 2015). She also openly dissented with her party policy in the matter, telling David Cameron that his support for fracking was because it's "not coming to Witney anytime soon"[60] (Merrick, 2014). In Third Energy's fracking application, McIntosh was one of the most notable speakers giving oral evidence in opposition, saying that the "industrialisation" would turn the "green fields and pleasant lands of England into an industrial site on a massive scale" (North Yorkshire County Council, 2016a, p. 4; Reed, 2016).

Paul Andrews was the chair of nearby Habton Parish Council and a Malton town councillor who was particularly energetic in his opposition to fracking. While several parish and town councils objected for their own reasons, Andrews is notable because he issued his first objection during the second, non-fracking, application, during which none of the concerned local authorities made any objections. Secondly, Andrews openly allied himself with Frack Free Ryedale, explicitly taking their line in making his objection (North Yorkshire County Council, 2015b, pt. 5.11).

[60] Witney was Cameron's Oxfordshire constituency, situated a long way from any prospective shale resource. Cameron responded to McIntosh by saying "I would be quite happy if it did".

The thousands of miscellaneous objections to the applications defy easy categorisation. The majority were coordinated by Frack Free Ryedale, 38 Degrees, Greenpeace and Friends of the Earth. Further representations objected to the development at Kirby Misperton, while others objected to fracking in general and regardless of location. Some of these were made by local residents, some were made on behalf of anti-fracking groups or environmental organisations. Others came from local authorities and parish councils. There was even a submission from Flamingo Land, a nearby holiday village and theme park (North Yorkshire County Council, 2016b, pt. 5).

The extent to which these thousands of objections should be considered proved contentious throughout the decision process: some members of the planning committee considered the weight of objections to be a "material consideration" that must be taken into account, while others questioned the extent to which the concerns were raised were rational and stressed the difference between opinion and expertise (North Yorkshire County Council, 2016a, p. 33). In general, there was much concern about the scale of public opposition, though it was emphasised that "the decision was not based on weight of numbers, and the decision was not a referendum (North Yorkshire County Council, 2016a, p. 36). The fact that Third Energy were issued planning permission suggests that the committee at large shared this view, and that the focus on sheer numbers taken by opponents failed to have the intended impact.

Uncertain/unaligned

North Yorkshire County Council are the only actor in this category. The 2013 elections had adjusted the council's balance of power very slightly. The Conservative and Liberal Democrats each lost three seats while Labour gained seats. Nevertheless, the result was still a Conservative-dominated council, with 45 of 72 seats, though this majority was won with 40.6% of the vote. However, this does not by any means guarantee a council that would be submissive to government on local matters: former MP Anne McIntosh is perhaps the most notable of several Conservative politicians that were willing to stand up to the government on these matters.

The council's Planning and Regulatory Functions Committee, the body responsible for making the decision, had a composition that was broadly reflective of party lines and was chaired by the Conservative councillor Peter Sowray. The role of the committee in these three applications is curious: in spite of massed opposition from a large number of local residents and district, parish and town councils, they decided to grant planning permission to Third Energy. Nevertheless, there seems to have been a certain amount of reluctance in doing so. Members of the committee agonised about the extent to which public opposition should shape their decision – even if the objections from the public were not particularly well researched or scientifically accurate. This reluctance is perhaps best

exemplified in the council's statement following Third Energy receiving permission to conduct fracking, where they claimed that "North Yorkshire did not choose to be the first authority to make a decision on fracking within this policy framework" (North Yorkshire County Council, 2017).

The council dedicated a page to the fracking operations on their website, designed to alleviate concerns among locals. On the one hand, the page gives the impression that the decision was out of the council's hands: "local councils must work within the national policy that indigenous oil and gas are key to energy security, while facilitating the reduction of greenhouse gas emissions". Yet it also stresses that local concerns will be the "overriding factor" in future planning decisions on hydraulic fracturing (North Yorkshire County Council, 2017).

North Yorkshire County Council were undeniably in a difficult position. Lancashire County Council faced a cluster of shale gas applications around this time, with similar reasons behind the objections. However, several of these, such as Grange Road, were rejected. These rejections came in the face of some public opposition, but with the intensity of research or mobilisation seen in North Yorkshire County Council. One possible reason may be the political composition. It was only when the formerly Conservative Lancashire County Council entered no overall control in 2013 that they began rejecting applications – though this also did coincide with peak public concern. North Yorkshire County Council were consistently under Conservative control, and never rejected an application.

It may have been the case that the council had a closer level of engagement with Third Energy than that seen in Lancashire with Cuadrilla. Third Energy planned for a community liaison group with "the aim of building an open and constructive relationship with the local community" (Third Energy, 2015f, p. 22). With the council included in this group from the start, it gave them an opportunity to build a working relationship with Third Energy and address issues in informal manner outside the official application process. However, the presence of parish council representatives, Ryedale District Council and the tourism community did not prevent these bodies from making their own objections.

Coalitions and coordination

There are sufficient examples of coordination and shared beliefs to justify bringing these disparate pro-shale and anti-shale actors into clear coalitions. On the pro-shale side, the so-called "astroturf" group Backing Fracking advocated shale gas development at Kirby Misperton on the same grounds as Third Energy, but with the appearance of being an independent group. Ukoog, the industry association which Third Energy were part of, were robust in their advocacy, with their CEO appearing in front of the committee to lend his support. The extent to which the government were an active part of this coalition is far more debatable.

Things are far more complex for the anti-shale coalition, mainly as a result of the sheer number of actors involved. The previous section has outlined the differing extents to which the main bodies opposed to shale development in Kirby Misperton had similar discourse and grounds for objecting applications. It also discussed the way in which research and standard letters produced by the likes of Friends of the Earth and Frack Free Ryedale – both of which made use of expert consultants – enabled smaller, less resourced actors to actively participate. Another curiosity was the melding of two different categories reasons for opposing shale gas – the localised issues of house prices, traffic and noise, and the national (or even global) issues such as energy security and climate change. This is suggestive of collaboration between groups with differing objectives and member profiles, such as the heavily localised anti-fracking groups, often representing communities of only a few thousand, and environmental organisations such as Greenpeace and Friends of the Earth.

External events

The period during which these applications were considered, spanning just over a year from February 2015 to May 2016, was a curious period for shale gas development. It began with assertiveness from Lancashire County Council who, in parallel to the developments at Kirby Misperton, rejected a number of applications from Cuadrilla – one of which was covered in the Grange Road case study. However, any optimism this might have brought the anti-shale coalition or shale-sceptic local authorities had evaporated by February 2016, with each rejection being overturned on appeal to the Planning Inspectorate.

While this process had significantly inhibited Cuadrilla's plans by inflicting greater costs and delays upon them, the anti-shale coalition also had little to show after having undergone the same lengthy and costly process. Reluctance to follow this example might have accounted for the more timid approach taken by North Yorkshire County Council. Indeed, the council's official decision following their granting of planning permission is suggestive of a body that was deeply conflicted about the decision they were taking but did not have the stomach for a fight: they "did not choose" to be the first authority to make a decision on fracking under the new policy framework[61] and that they are required to consider energy security and economic development when assessing applications (North Yorkshire County Council, 2017).

[61] This is a reference to the National Policy Planning Framework, introduced in 2012, which states that minerals "are essential to support sustainable economic growth and our quality of life" and that a "sufficient supply" is required for energy, buildings and infrastructure (Department for Communities and Local Government, 2012, para. 142). Local authorities are required to "give great weight to the benefits of mineral extraction", though a number of caveats are made, such as the avoidance of "unacceptable adverse impacts" on human health or the natural environment (Department for Communities and Local Government, 2012, para. 144).

The question of shale gas in 2015 and 2016 was notably less febrile than it had been a year or two previously. While public opinion was some way off being favourable – as will be addressed further in the public opinion section – much of the opposition was far less intense. There were sporadic, large-scale eruptions, such as the 450 people who mobilised outside Lancashire County Hall in June 2015 to oppose Cuadrilla's application at Preston New Road. Yet even this protest was in a different category to the vehement opposition that could be found in 2013 and 2014, with relaxed protestors in fancy dress and no noticeable police presence. There was none of the camping, trespassing or mass arrests of few years previously.

This decline in anti-shale activity served to keep fracking off the front pages of the newspapers, a situation that almost certainly worked in the interests of the pro-shale coalition. After all, one of the key reasons their applications in 2009 and 2010 were so successful was that the low levels of awareness of shale gas and fracking resulted in their planning applications of this period receiving remarkably little scrutiny (see chapter 6 and application 1 of this chapter).

Political changes since the first application also helped to create a more supportive environment for the pro-shale coalition. As previously highlighted, North Yorkshire County Council saw minor losses for the Conservatives in the 2013 local elections, but the 45 seats (out of 72) that they retained were more than enough to ensure dominance of the council and the planning committee.

The 2015 general election was even more significant, as the Conservatives won an unexpected, albeit slender, majority and found themselves as the sole governing party for the first time since 1997. This was significant, as the former coalition government assigned the crucial environment and climate change portfolio to the Liberal Democrats, who were far more sceptical of shale gas. Chris Huhne, who served as Secretary of State for Energy and Climate Change from 2010-2012 was openly sceptical of the potential of shale gas while his Conservative cabinet colleagues were far more supportive. Edward Davey became energy secretary in 2012 following Huhne's imprisonment[62]. Davey's positions are somewhat more difficult to discern. Unlike Conservative ministers, Davey's statements in support of shale gas were typically made in tempered language that emphasised a safety-first approach to shale gas development, using language such as "safe and responsible" and "rigorous regulation" while stating that we "can't bank on shale gas" (Department of Energy and Climate Change, 2013b). Speaking to a friendly audience at the Liberal Democrat conference in 2014, Davey took the opportunity to openly criticise his Conservative counterparts, claiming that the tendency of Eric Pickles, the Secretary of State for Communities and Local Government, to call in planning applications "is in danger of bringing the planning system into disrepute" and of "abusing

[62] For perverting the course of justice over a 2003 speeding case.

ministerial power". He criticised Conservatives for believing "shale gas is the answer - to everything" and that voting "blue will never get you green" (Liberal Democrats, 2014).

The 2015 election enabled the formation of the wholly Conservative government formed in May 2015. This should be regarded – both in perception and reality – as being beneficial to the pro-shale coalition. With the Conservative Amber Rudd replacing Ed Davey as energy secretary, ministerial rhetoric changed from caution and stressing safety and responsibility to stressing the "national need" to explore and develop shale gas, while the sustainability narrative – used to support the development of renewable energy by Liberal Democrat ministers – was repurposed for shale gas by the Rudd, who claimed that "access to clean, safe and secure supplies of natural gas for years to come is a key requirement if the UK is to successfully transition in the longer term to a low-carbon economy" (Department of Energy and Climate Change, 2015a).

Of particular consequence to reluctant local authorities such as North Yorkshire County Council was the assertion – jointly issued by both the Department of Energy and Climate Change and the Department for Communities and Local Government – that appeals against local authority rejections of shale gas planning applications will "be treated as a priority for urgent resolution". This, and an accompanying commitment to identify "underperforming local planning authorities that repeatedly fail to determine oil and gas applications within statutory timeframes" would certainly have served as a boost to a pro-shale coalition that had recently been refused planning permission for a trio of applications in Lancashire (Department of Energy and Climate Change and Department for Communities and Local Government, 2015).

This application was submitted two weeks after the general election. As such, it was a genuinely different subsystem to that of a few months before. These developments, particularly in view of the lack of success of Lancashire County Council during the appeals process, may have weakened the resolve of planning committee members otherwise unconvinced by the application.

In energy security terms, the government's narrative of a "national need" for shale gas did not quite reflect the reality of the situation. In 2014, oil prices import costs for the United Kingdom were around 100 USD per barrel. A year later this price had been driven down to 54 USD per barrel thanks to a number of factors including the US shale boom and increased OPEC production as an attempt to kill it off (Van de Graaf and Verbruggen, 2015, p. 459). Prices would not return above 70 USD per barrel until 2018 (International Energy Agency, 2020).

As a result, the pro-shale coalition's continuing arguments that domestic gas production was necessary for energy security reasons – a narrative that had some traction in 2011-2013 when prices were routinely above 100 USD per barrel – referred to an issue that was no longer quite as pressing.

The extent to which this may have affected the prospects of the pro-shale coalition is difficult to discern. At this time, shale gas and oil were significantly more expensive to produce than conventional resources, and the extent to which oil and gas could be produced profitably from shale was in some doubt. In the United States shale gas production continued to rise, but this was largely thanks to the fields established during the boom years of the previous decade (US Energy Information Administration, 2018). In the United Kingdom massive capital costs, long regulatory and planning permission delays and non-existent infrastructure served up a risky prospect for investors and it became even more so in the face of such low prices. In previous years companies such as IGas and Cuadrilla sold stakes in their licenses to Total and Centrica respectively (Cuadrilla Resources, 2013; Nottinghamshire County Council, 2017). Third Energy were unable to attract any such support in 2015.

On the surface, it seems clear that a decrease in oil prices would work to the pro-shale coalition's disadvantage: lower potential returns, decreased investment prospects and the perceived "need" for shale gas could fall down the political agenda. However, the latter point was not quite true. As previously covered, the government's support for shale gas had by no means tailed off, and on a practical level fluctuations of this nature were somewhat irrelevant, as planning decisions continued to be made on the basis of the National Policy Planning Framework devised in 2012, a time when secure and affordable energy supplies were much more of a "national need".

Additionally, the effect of the oil price crash appears to have played a negligible role in affecting popular perceptions of shale gas. The fall in the oil price did not make a significant difference for consumers, with electricity prices continuing to rise and petrol prices only falling slightly (Department for Business, Energy & Industrial Strategy, 2020c; Statista, 2019). As such the potential of cheaper energy – even though such an outcome was an unlikely – might have continued to resonate, and indeed a majority of people continued to associate shale gas with cheaper energy in September 2015 (O'Hara et al., 2015b, p. 9).

The political situation and the socio-economic background had significantly changed since the last application at this site, while it might have been assumed that the collapse of the oil price could have sent shale gas plummeting down the government's list of priorities. Nevertheless, they continued to act and talk as if shale gas development was imperative for the United Kingdom's energy and

economic security. As such, the fall in the oil price does not appear to have upset the pro-shale coalition's momentum as profoundly as it could have.

Indeed, the only area where momentum appeared to cease was the one area that could have helped the anti-shale coalition most: shale gas was no longer headline news, and protests and active resistance had dried up. Protests continued, but they were contained at a local level. The anti-shale coalition attempted to redeploy their priorities to direct engagement with decisionmakers, but – as will be outlined in the following section – this approach was not entirely successful.

Public opinion

This application came at a curious time for public opinion regarding shale gas. Knowledge of what shale gas was increased gradually, while a survey conducted by O'Hara et al (2016) in October 2016, the first to be conducted since permission was granted, recorded 37.3% of respondents in favour and 41% opposed to shale gas development. This was notable as it was the first in this series of surveys to record more respondents opposing shale development. Curiously, respondents to this study who knew what shale was were twice as likely to support shale development (Stedman et al., 2016, p. 146). However, on the basis of the "knowledge gap thesis"[63], Bradshaw and Waite (2017, p. 29) argued that this trend was unlikely to persist and that government and industry should not assume that providing more pro-shale information to undecided people would result in greater support.

It certainly seems that there was less popular interest in the issue. In 2013, British newspapers mentioned the terms "shale gas", "fracking" or "hydraulic fracturing" 6,577 times. By 2016, the number of mentions had fallen to 3,253.

[63] Broadly speaking, the idea that people with higher levels of education learn at a faster rate than people with lower levels of education as a result of differential communication skills, pre-existing knowledge, social networks and access to media (Tichenor et al., 1970).

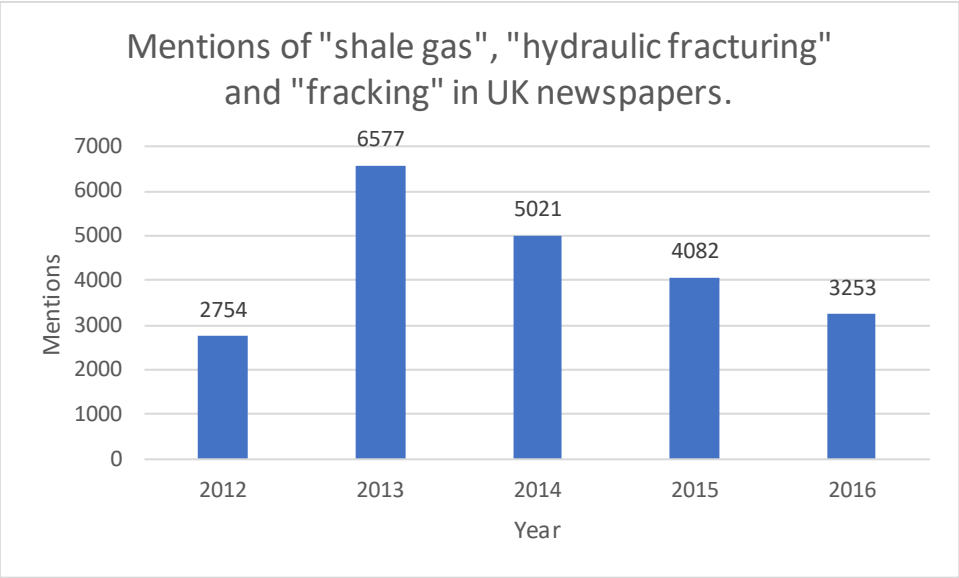

Figure 7.1: Mentions of "shale gas, "hydraulic fracturing" and "fracking in UK newspapers (2012-2016)(source for mentions: Lexis Library News, 2020)

Unsurprisingly, things went in an opposite direction at a local level, with the Yorkshire Post mentioning these terms 108 times in 2013, 170 times in 2015 and 212 times in 2016.

Public opinion both nationally and locally was moving against shale gas, but these opinions were becoming less intense nationally and more intense locally. The clear opposition shale gas faced in North Yorkshire translated into thousands of objections and one major protest aimed at the county council. However, at the national level (an increasingly important point of decision-making during this period as more and more powers were being taken away from local authorities) coverage was diminishing. As such, public opinion had a limited impact in determining this application. More people than ever were opposed to shale gas development, but most of them were not opposed to it to the extent that they would attempt to change government policy.

While, broadly speaking, the lack of strong feelings towards shale gas development was clearly beneficial for a pro-shale coalition which had previously thrived in getting applications accepted when knowledge of shale gas development was limited, public opinion could hardly be said to be working in their favour.

There was a latent scepticism to many of the claims the pro-shale coalition were making about the potential of shale gas. In September 2015, just as North Yorkshire County Council had accepted the application for installing water monitoring boreholes and while they were considering the application to carry out hydraulic fracturing, O'Hara et al (2015b, p. 8) found that only 30% of respondents associated shale gas with clean energy. Slightly fewer than 50% of survey participants continued to associate shale gas with cheap energy and energy security (O'Hara et al., 2015b, p. 10).

This is a significant proportion, but it appears that the strength of feeling among respondents on these matters was relatively week. Over time the proportion of respondents associating shale gas with energy security and cheap energy remained relatively consistent while the proportion of those saying shale gas extraction should not be allowed continued to increase, something that O'Hara et al attributed to the "firming up of views among women" (2016, 2015b, p. 14).

Interestingly, in the same study, O'Hara et al (2015b, p. 14) suggest that if "the government pushes forwarded with its plans to fast track shale gas developments it must be prepared for significant levels of opposition from grass roots activists". Based on their data and what had gone before, this was a perfectly reasonable prediction. However, such large-scale protests underwent something of a hiatus for several months after the publication of this report.

Things would pick up, but only after permission to frack at Kirby Misperton had already been granted. However, the only subsequent occasion where anti-fracking protests could truly be considered to be of the same scale of those in 2013 would be the blockage of a convoy of trucks bringing equipment to Cuadrilla's site in Blackpool, a protest that would lead to the first jail sentences for anti-fracking activism.

In summary, public opinion only played a limited role in influencing the decision-making process in this application. There were aspects that could have benefited and hindered both coalitions, but none of them seem significant enough to make a meaningful difference. Opposition to shale gas continued to increase, but few of these new opponents appear to have been exercised enough to carry out forceful opposition. This may have been because other issues were taking over: concerns about the economy, both in terms of personal and family wellbeing and country, had tailed off since 2013. This suggests that concerns about energy prices, and the potential of cheap shale gas, might have become less appealing. Meanwhile, voters began to take more interest in Europe and immigration as the referendum on the UK's membership of the European Union approached, while concern for the environment remained limited (YouGov, 2020, 2015).

Resources

This is an area where the anti-shale coalition were very strong, although their failure to optimise them in influencing national and local government decisionmakers played a significant part in their failure to prevent planning permission. They committed substantial resources to this application. Occurrences of local anti-fracking groups commissioning their own extensive expert-led research were remarkable compared to the means of similar groups in previous applications. For example, Frack Free Ryedale submitted separate reports on issues such as air quality, transport, hydrogeology, as well as critiques of the impact assessments carried out by Third Energy (North Yorkshire County

Council, 2016b, pt. 5.9). In previous applications it had not been unusual for the anti-shale coalition to submit scientific evidence. However, this was largely provided by larger organisations such as Friends of the Earth and had never previously been so specialised or extensive.

However, it cannot be forgotten that this evidence, assembled at such great expense, was ultimately unsuccessful in achieving the anti-shale coalition's aims, and did little beyond prolonging the debate – though of course prolonging the application had some effect through the constraints it put the pro-shale coalition under. To some extent, this demonstrates that the presence of resources alone may not be enough for the anti-shale coalition to be successful: something else, such as supportive public opinion or a favourable external event has to exist in order to ensure these resources can be used effectively.

While the provision of expert evidence is the clearest example of the resources of the anti-shale coalition, it can also be demonstrated in the large number of members and organisations that were involved. They certainly had a great deal of personnel at their disposal. Again, it has to be questioned whether the coalition were putting these resources to their best use: could they have done something more effective than lining up sixty people to talk to the planning committee, one after the other, about broadly the same issues, after the committee had already indicated their broad unwillingness to be swayed by sheer numbers?

For instance, one of the indications of anti-shale coalition resources that is worth considering is the publicity the coalition is able to obtain. In this case there was very limited publicity, certainly not compared to the drilling applications of 2013 and 2014. They were very well known to local decisionmakers, but this was not where power lay during this application. At a national level, Kirby Misperton was something of an afterthought.

As for the pro-shale coalition, Third Energy, the key actor, was only the second company to gain permission to conduct hydraulic fracturing in the United Kingdom. The first, Cuadrilla, could boast significantly more resources in terms of finance, expertise, contacts and investment.

Cuadrilla had backing from the likes of Centrica, the UK's largest gas supplier and operator of both British Gas and Scottish Gas. For Cuadrilla, this partnership would offer expertise in gas storage and transportation, as well as a straightforward means of selling the gas they produce. Even IGas Energy, a company which had yet to receive permission to frack, had the backing of Total, one of the oil and gas "supermajors" and a company with operations all over the world.

Like many of the other companies involved, Third Energy had a Byzantine ownership structure that is difficult to fully trace due to the use of tax havens and secrecy jurisdictions. Third Energy, for

example, were owned by Third Energy Holdings, based in the Cayman Islands. Such a corporate structure was somewhat incongruous with the shale developers' professed enthusiasm to support the economy and aid local communities.

In any case, Barclays, the 97% owner of Third Energy Holdings, could not offer the specific expertise of Centrica and Total. Nor were they inclined to offer the continued support that Riverstone Holdings provided to Cuadrilla: in 2015 they sidelined their interest in Third Energy and declined to inject further capital (Kleinman, 2018).

Without investment support, Third Energy were in an awkward position. Like Cuadrilla, Third Energy made a loss during this period: £3.85 million in 2015 and £3.4 million in 2016. Unlike Cuadrilla, however, Third Energy had no meaningful investment support to mitigate these losses.

This is demonstrative of the difference in scale between the companies. Cuadrilla and IGas both applied to explore for shale gas at a number of locations. Kirby Misperton was Third Energy's first and only attempt, though even this was too much for them to sustain. Third Energy's financial shortcomings did not prevent them from gaining permission from the local government, though it would ultimately derail them in the long run, with their financial concerns leading to their permission to frack being postponed, directors leaving and the ultimate sale of the company in May 2019.

In the long run, it was a lack of financial resources and the mismanagement of those they had that would lead to Third Energy's failure. Yet, even in 2015 and 2016 it is clear that these problems already existed.

Third Energy were also hampered by their personnel. They had no figures such as Cuadrilla's John Browne that could boast a close relationship with government and renown throughout the industry. John Dewar, the figure discussed in the first application, continued to be the main public face of Third Energy – he was a credible figure due to his decades of experience but did not have the organisational and strategic background possessed by his counterparts at Cuadrilla.

Broadly speaking, we can see that the anti-shale coalition were able to apply far more resources to resisting this application than other anti-shale coalitions, while Third Energy faced severe limitations. This suggests that the presence of resources by itself is of little importance when it comes to getting an application accepted. The anti-shale coalition had resources but didn't have meaningful relationships with policymakers or helpful external events.

Relationships with policymakers

To some extent, the activities of the anti-shale coalition during shale gas applications in 2013 and 2014 could be described as taking an "outsider" approach, while more of an "insider" approach began to be attempted by 2015 and 2016. Previously, attempts to engage with decisionmakers were by no means uncommon, but it was only in from 2015 onwards that applications began receiving thousands of objections[64].

In Kirby Misperton, Third Energy were clearly expecting extensive opposition from protestors. Indeed, their first application, for the construction of a security fence, was justified on the basis of protest activity at wellsites across the UK (Third Energy, 2015a). This was, incidentally, something that Frack Free Ryedale objected to on the basis of Third Energy's consultations with counter-terrorism advisers, resenting the implication that members of their "peaceful organisation" were "classed as 'terrorists'"[65] (Frack Free Ryedale, 2015).

In any case, the expected protest activity at the wellsite was limited[66]. Indeed, the only major protest to occur was directed at North Yorkshire County Council in May 2016, with hundreds of protestors demonstrating outside as the planning committee considered the application. However, the real action was happening inside, with almost as many speakers giving evidence to the councillors. Here, the anti-shale coalition were clearly the majority, with 71 speakers opposed to the development and only 16 speaking in support of it.

Broadly speaking, the anti-shale coalition in Kirby Misperton, while highly active, were notable in that they largely eschewed protests and activism in favour of insider methods. This may have been to their detriment, in that a much less visible form of opposition gave them less coverage and limited opportunities to grow the coalition, but it also brought positives for them. Issues that rarely featured in protests such as house prices, traffic and noise pollution were brought to the attention of decisionmakers and were deliberated to a greater extent than many other applications.

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[64] For instance, applications at Preese Hall and Becconsall in 2013 and 2014 received 508 and 244 objections respectively (Lancashire County Council, 2014, p. 16, 2013c, p. 43). In 2015 and 2016, applications at Roseacre Wood, Preston New Road and Kirby Misperton received 8924, 11127 and 4200 objections respectively (Lancashire County Council, 2015b, 2015a, pp. 22–24; North Yorkshire County Council, 2016a, p. 5).

[65] North Yorkshire Police clarified that "anti-fracking protesters are not seen as a terrorist threat by the police in North Yorkshire" and that "groups of local protesters have been nothing but peaceful and respectful of the law. Not one arrest has been made in connection with protest action associated with the issue in our area" ("North Yorkshire fracking protesters 'not terrorist threat,'" 2016).

[66] A protest camp would be created at the site in 2016, after planning permission had already been granted. It was dismantled in 2018, with a spokesperson claiming that Third Energy's inability to commence work at the site was as a result of the "campaign working tirelessly together" (BBC News, 2018).

It also meant that decision-makers – none of whom appeared to have expertise in shale gas – had an even greater volume of information to consider, further prolonging the application and putting the loss-making Third Energy under pressure from their investors.

In spite of the outcome of the application, the pro-shale coalition may also have had some success in shaping perceptions. Members of the committee acknowledged that both sides had evidence provided by experts, while there were also disagreements among councillors about the extent to which the large number of objections were a material consideration.

This application was a significant development in terms of the coalitions' relationships with policymakers, which is perhaps best illustrated by comparing what was going on inside the hall with the protest outside. The protest might have been effective at drawing attention to the issue (and as a result its effectiveness should not be discounted when considering other factors) . But it was the action inside, with the committee listening to the scientific evidence provided by the anti-shale coalition and weighing it up against the evidence provided by the pro-shale coalition and government agencies that clearly demonstrates that the anti-shale coalition possessed access to local government decision-makers. Compared to approaches taken by anti-shale coalitions in previous years, this represented an improvement of relationships with policymakers.

However, it was still lacking. As previously outlined, the council reluctantly assented to Third Energy's application due to the need to adhere with national government frameworks, a need that was further intensified due to the government's threats made against "underperforming" local authorities. Unfortunately for the anti-shale coalition, they had no such relationship with the government of the United Kingdom, and even if they did it would probably have been insufficient, with the guidance and instructions to local authorities dealing with shale gas having long since been set in motion.

Third Energy were not particularly close with the Conservative government either, although they would later – and after the application had been accepted – appoint Jitesh Gadhia, a Conservative party peer and donor, and Keith Cochrane, acting chief executive of public service outsourcer Carillion, as non-executive directors[67]. In any case, for Third Energy the matter of building relationships with government was less imperative, as their interests and the interests of the government were already aligned.

[67] Cochrane's appointment would end up doing more harm than good for Third Energy, as Carillion's 2018 liquidation with £7 billion of liabilities would lead to additional scrutiny being applied to Third Energy's own financial situation and the government's decision to postpone drilling at Kirby Misperton (Helm, 2018)

They also had a reasonable amount of success with local government decision-makers, holding four pre-application consultations with county, district and parish councillors to ensure they were informed prior to the public announcement of the application (Third Energy, 2015g, pt. 9). In addition to this, they formed a community liaison group "with the aim of building an open and constructive relationship with the local community" which featured councillors from all tiers of local government as well as farming and tourism representatives (Third Energy, 2015f, p. 22). Furthermore, there were those in the planning committee that respected the pro-shale coalition more than the anti-shale coalition. Much of the debate about the value to accord to public opinion implied that the issue was one of whether to accord more value to a small quantity of expert opinion or a large amount of concerns that were not necessarily evidence-based or within the scope of the application. This carries the implication that the pro-shale coalition were considered significantly more credible by some members of the committee.

Of course, the account given of the pro-shale coalition's relationships with policymakers up to this point is somewhat incomplete, as the UK government themselves were part of the pro-shale coalition. Perhaps they weren't as directly active as they were in other cases, particularly those where the applications were appealed to government, but they and the rest of the pro-shale coalition had beliefs that were sufficiently aligned, namely that shale gas would be beneficial for the energy security, the economy and the environment.

Coordination between government and the rest of the pro-shale coalition was loose, but government discourse demonstrates that they were aligned with the developers on the policies to be pursued. In practice, this was perhaps best exemplified when David Cameron took the side of Third Energy when Anne McIntosh, then the local MP for Kirby Misperton, said her constituents were worried about fracking and called for tighter regulations. In response, Cameron claimed companies were already faced with an "enormous amount" of hurdles and that "[a]rguably, we are making it too complicated" (Merrick, 2014).

North Yorkshire County Council being staunchly Conservative appears to have made little difference. None of David Cameron or George Osborne's enthusiasm for shale gas would be replicated among the county, district or parish councillors. Those councillors who supported the application were at pains to stress that they did so reluctantly, while several others went as far as giving evidence in opposition of the application. Furthermore, the government's timely commitment to "identifying underperforming local planning authorities that repeatedly fail to determine oil and gas applications" served as an unsubtle reminder of the Secretary of State for Communities and Local Government's power to "call in" planning applications (Rudd, 2015).

In summary, this variable demonstrates a mixed record for each coalition. The anti-shale coalition changed focus from an outsider approach to an insider strategy. In doing so they were able to ensure greater access to councillors and were able to ensure that their key concerns and scientific research were thoroughly deliberated. Ultimately, however, little weight would be given to the research or numbers of people making a case, with the anti-shale coalition being unable to convince the committee at large that the development would have an unacceptable adverse impact on human health or the natural environment. Furthermore, these efforts may have been at the expense of forgoing opportunities to build visibility and attract wider attention to their cause.

The activities of the anti-shale coalition appear to be demonstrative of a good level of access. They had plenty of opportunities to engage with policymakers and did so. The pronouncements of the coalition clearly gave the planning committee a lot to think about, but the outcome of the application shows that they were unable to transfer their generous level of access into influence. They anti-shale coalition made no headway with the national government. The lack of communication at this level impeded them, particularly as this was a period where the UK government seemed determined to make shale gas happen through sheer force of will. The pro-shale coalition had a more low-key approach. They were hugely outnumbered at committee meetings and when submitting consultation responses. Nevertheless, they engaged with councillors early and prudently, ensuring that at least a few were sympathetic to their intentions.

Most important of all was the ability of the UK government to threaten and cajole renegade local authorities into following their guidance, an issue that was clearly on the minds of the members of the council planning committee as they made their decision.

Conclusion

The difference between the first application and the second, third and fourth applications at Kirby Misperton mirrors the different between initial and subsequent applications at Grange Road, albeit with a far more pronounced failure for the anti-shale coalition in Kirby Misperton. The period before the Preese Hall earthquakes was a less scrutinised period for the pro-shale coalition. Indeed, whether a pro-shale coalition even existed during this period was debatable: it was only in the face of opposition that the shale developers needed to find allies.

It was a time when applications – many of them highly consequential – could be processed in a matter of weeks. Consider Cuadrilla's 2009 application to drill at Preese Hall, the operation that eventually led to the earthquakes. The application, consisting of only three documents, did not even make any specific reference to hydraulic fracturing. Indeed, it almost made the operation seem exciting and novel – a tantalising opportunity for Lancashire County Council: "The well is to be drilled

as a shale gas well, one of the first of its kind in Europe" (Cuadrilla Resources, 2009, p. 3). In spite of promising 24-hour drilling operations for a six week period, the application -submitted on 20 July, was given planning permission on 31 July – less than a fortnight later – with no objections (Cuadrilla Resources, 2009, p. 7; Lancashire County Council, 2009b, 2009c, p. 4).

Contrast this with Kirby Misperton in 2015, where gaining permission to frack required three separate planning applications and thousands of documents, with over a year passing between the submission of the first application in February 2015 and the receipt of planning permission for the third in May 2016. This is without even counting the two futile years of waiting for permission to frack from the Secretary of State for Business, Energy and Industrial Strategy.

This underlines the importance of resources in this application. The anti-shale coalition had a great deal of resources and contributed a large amount of scientific evidence. This prolonged the application and, even though Third Energy was successful it was a Pyrrhic victory, as they were in no financial state to commence work once it had been completed. The anti-shale coalition was able to obtain these resources through its formation and growth following from favourable external events and shifts in public opinion. This underlines the importance of pro-shale coalition resource limitations and favourable external events and public opinion for the anti-shale coalition combining as an explanation for the failure of shale gas in the UK.

It also underlines how much things had changed when one considers that the planning applications portion of the Kirby Misperton development in 2015-2016 could be considered a resounding success for the pro-shale coalition[68]. It might have taken a bit of time, but ultimately applications were made, they were deliberated and Third Energy came away successful. Indeed, this stands out as the harbinger of a new trend in shale gas applications. In 2013 and 2014, rejections from Lancashire County Council had brought Grange Road, Roseacre Wood and Preston New Road to appeal and cauedCuadrilla to withdraw from Anna's Road entirely. This impelled the tougher rhetoric and threats to call in applications from the government, and a reluctant North Yorkshire County Council were in the awkward position of being the first to face a fracking application following the 2015 election and consequently the first to give permission to conduct hydraulic fracturing since the Preese Hall earthquakes. This was just a matter of timing, however, and Nottinghamshire County Council's subsequent granting of permission at Tinker Lane and Springs Road is suggestive of a true rupture in the policy system.

[68] It was assessed as such for the fsQCA study, being given a 1.0 score.

Case study 3 – Tinker Lane

Background

This case study comes at a crucial point for shale gas in the United Kingdom and is particularly important when considering the overall research question of why shale gas failed to develop in the United Kingdom. In addition to providing more evidence of resource limitations on the part of the pro-shale coalition it also highlights a growing detachment from shale gas on the part of the UK government – something that was not tested for in this thesis but appears to have had some impact on the outcome, as well as the usefulness of a coalition having strong relationships with policymakers.

Tinker Lane moves things on slightly from Kirby Misperton. The sole application at the site was made on 11 May 2016 and was accepted just over a year later, on 24 May 2017. As of June 2021, it remains the most recent shale drilling application to be accepted in the United Kingdom. The application was made by IGas Energy, a reasonably long-established onshore conventional producer that had professed an interest in shale gas for some time. However, it wasn't until 2015 that they made their first planning application at Springs Road, also in Nottinghamshire. The applications at Springs Road and Tinker Lane were both made to Nottinghamshire County Council and both were awarded planning permission on the same day.

With their application being accepted, IGas became the third and – at present – final shale developer to gain planning permission. IGas stood out from Cuadrilla and Third Energy by offering a noticeably slicker and more professional approach to public engagement. Like Third Energy, however, they had somewhat erratic financial arrangements. Like Cuadrilla, they successfully cleared all hurdles to commence drilling operations but found no success. Tinker Lane would be abandoned in December 2018 after IGas failed to find any gas. Springs Road, ten miles away, produced "highly encouraging core analysis results" and an indication that hydraulic fracturing would be successful from exploratory drilling in June 2019 (IGas Energy, 2019). The government's fracking ban, issued three months later, puts the future development of this site into doubt.

The Tinker Lane and Springs Road sites are near Retford, a market town in Nottinghamshire. Retford has a population of 22,013 and is situated between Nottingham and Lincoln. It is administered by Bassetlaw District Council and Nottinghamshire County Council. Bassetlaw District Council also spent much of this application period deliberating whether to become a full member of the Sheffield City Region, an initiative in which they were already a non-constituent member. This is something that could potentially have had further implications, given the region had some powers regarding transport and economic development and has announced an ambition to become the "Green Heart

of Great Britain" with a "clean, efficient and resilient energy system" (Sheffield City Region, 2019, p. ii).

Aside from the city region, the decision-making structure was similar to that of Lancashire County Council and North Yorkshire County Council. Retford District Council had the power to consider most planning applications, but shale applications went to Nottinghamshire County Council as they were the minerals planning authority. The applications were considered by the council's planning and licensing committee, a body consisting of councillors from different parties, appointed on a broadly proportional basis.

This application is of interest for a number of reasons. First of all, unlike Grange Road or Kirby Misperton, there was only one application. As a result, the total period where pro-shale and anti-shale coalitions could attempt to influence the decision was significantly truncated in comparison. This meant that the residual, national level anti-shale coalition, composed of the Green party, Campaign to Protect Rural England, Frack Off, Friends of the Earth, WWF UK and the Tyndall Centre (Cairney et al., 2016, p. 11), had to quickly establish a presence in the Retford area in order to mobilise as much local opposition as possible. Some of these actors, such as Friends of the Earth, formed part of the localised coalition centred on Tinker Lane. Others, such as the Green party, did not (see table 8.1).

Secondly, this case stands out because it is illustrative of the decreasing salience of shale gas policy. External shocks had a fairly limited effect for either coalition as time moved on from the defining events of the 2011 earthquakes, 2013 protests and 2015 general election. Meanwhile, public opinion was hardening against shale gas development but was largely inert. If anything, activism against shale gas had actually decreased as the population became more anti-shale. The pro-shale coalition maintained government support though this was largely implied rather than direct, as was the case in Kirby Misperton. Nevertheless, again like Kirby Misperton, this level of support was still significant.

This case also bucks the trend of ever-increasing resources being committed to opposing shale development. The development received 793 objections, a relatively small number compared to the 11,127 seen at Preston New Road, 8,924 at Roseacre Wood or the 4,000 received at Kirby Misperton in 2014 and 2015 (Lancashire County Council, 2015a, pp. 22–24, 2015b; North Yorkshire County Council, 2016b, p. 5; Nottinghamshire County Council, 2017, para. 363). Preston New Road, Roseacre Wood and Kirby Misperton each had a nationwide organisation, such as Friends of the Earth, Greenpeace of Frack Off coordinating and encouraging objections. In doing this, they were responsible for the majority of objections submitted. Tinker Lane had no such initiative.

Huge numbers of objections can work in the anti-shale coalition's favour. For instance, some decisionmakers in Kirby Misperton considered the sheer number of objections to be a material consideration (North Yorkshire County Council, 2016a). However, these huge quantities of objections are more valuable for what they say about the resources of the anti-shale coalition: the three cases with thousands of objections had a major actor with resources and expertise in mobilisation and advocacy playing an active role in the anti-shale coalition. It is possible, of course, that the smaller number of objections at Tinker Lane was down to there only being one application at this site, but either way, it is indicative of a more limited mobilisation of opposition.

Meanwhile, the pro-shale coalition were also lacking in resources. IGas were heralded as the UK's "biggest shale gas explorer" following their 2014 acquisition of Dart Energy for £120 million (Macalister, 2014). However, this did not reflect reality as IGas's financial situation was highly tenuous, a weakness that would repeatedly be targeted by the anti-shale coalition who routinely pointed to their falling share price and lack of experience in extracting shale gas (Frack Free Nottinghamshire, quoted in Nottinghamshire County Council, 2017)

It is the relative weakness of the two coalitions that makes this application, possibly the last shale drilling application to be decided in the United Kingdom, particularly notable. As a whole, this seems to be an application where the minds of those involved seemed to be elsewhere. Friends of the Earth provided a perfunctory objection. They did not drive, chivvy or coordinate as they had done just a year previously in Kirby Misperton. While the anti-shale coalition was less active during the application phase at Tinker Lane, protests continued at sites after planning permission had been granted.

Actors and alignments

As in the previous case studies, the actors were assigned to coalitions on the basis of their level of shared beliefs and coordinated activity. This formed the basis to evaluate each coalition's relations with policymakers, their resources, how they were affected by external events and public opinion and how each of these variables contributed to the outcome of the application.

Table 8.1: Actors and coalitions at Tinker Lane

Pro-shale	**Anti-shale**	**Uncertain/unaligned**
IGas Energy	Bassetlaw District Council	Nottinghamshire County Council
United Kingdom Onshore Oil and Gas (Ukoog)	Babworth Parish Council	Health & Safety Executive
East Midlands Chamber	Blyth Parish Council	Environment Agency
GDF Suez/Engie	Barnby Moor Parish Council	Anglian Water
Total	Sutton Parish Council	Public Health England

Kerogen Capital	Torworth Parish Council	Highways England
	Nottinghamshire Wildlife Trust	Historic England
	Campaign to Protect Rural England (Nottinghamshire branch)	Natural England
	Frack Free Nottinghamshire	Peel Airports
	Frack Off	Civil Aviation Authority
	Friends of the Earth (national and Nottinghamshire branches)	National Air Traffic Services Ltd
	Bassetlaw Against Fracking	Netherthorpe Airfield
		National Planning Casework Unit
		Severn Trent Water

Pro-shale

IGas Energy were the operator and license holder, although this application was made in the name of Dart Energy, a company IGas had acquired in 2014. Dart Energy were an Australian company with a UK base in Airth, near Falkirk. They had a number of coalbed methane[69] interests in central Scotland, an issue that had caused friction between the UK and Scottish governments. With estimated UK reserves of 9,838 Bcf[70] of gas in coalbed methane and 63,010 Bcf in shale, Dart Energy were a significant operator in their own right (Dart Energy, 2012, p. 6). The licenses of IGas and Dart Energy combined to produce a portfolio of one million acres of licensing, making them by that measure the UK biggest shale gas operator (Macalister, 2014). However, the sheer expanse of this land they held licenses for was no guarantee that there were shale gas resources there, that it was commercially viable or that they would even get planning permission to explore the sites.

Nevertheless, IGas were reasonably well established, producing 3,000 barrels of oil and gas a day from 110 sites in the UK. They had also prior experience of being targeted by anti-fracking protestors, with a protest camp forming outside their site in Barton Moss in Autumn 2013.

The Barton Moss site was "for coal bed methane appraisal and production" though much of the media coverage of the development conflated shale gas and coal bed methane, meaning that for narrative purposes it might as well have been a shale gas site (Salford City Council, 2010). A notable example of this is a BBC article on the development which mentions "shale" twice but doesn't refer to "coal bed methane" once (BBC News, 2014). Another interesting aspect of the Barton Moss

[69] Coalbed methane (CBM), also known as coal seam gas, refers to natural gas produced from coal beds. The gas collects in pores and fractures within coal. Releasing the gas will sometimes, but not always, require hydraulic fracturing.
[70] Billion cubic feet

development is that it is far less rural in nature than most other shale applications: it was only about half a mile from Salford, a city of over 100,000 people, and by extension the Greater Manchester metropolitan area.

When IGas completed exploration work at the site in April 2014, the ten remaining protestors – or "protectors", as they styled themselves – saw them off with a celebration, with one of them promising "[w]hen Igas come back, we'll come back" (Flanagan, 2014). IGas never came back.

Despite this halting first step in the limelight, a number of major investors soon provided support to IGas. **Total**, the French company regarded as one of the six oil and gas "supermajors" alongside BP, Chevron, Eni, ExxonMobil and Shell, took a 40% stake in IGas's licenses in the Gainsborough Trough. In return for this, they committed to paying $1.6 million back costs while fully funding (for $46.5 million) the work programme at Springs Road and Tinker Lane (Whiterow, 2014). In addition to this, in buying Dart Energy IGas inherited that company's support from the French utilities giant **GDF Suez**[71]. In 2013, GDF Suez committed to buying a 25% share of Dart Energy's East Midlands licenses – that would later become IGas's licenses – for £7.4 million plus £16.7 million to be paid on an ongoing basis (BBC News, 2013c). There had been several suggestions that major oil and gas companies such as Shell, Chevron (who launched an unsuccessful venture in Poland) and Statoil might be interested in shale gas in the United Kingdom, but Total was the first to get involved[72].

In addition to these shares in their licenses, around 28% of IGas itself was owned by the private equity fund manager Kerogen Capital and 13.75% by Trans European Oil & Gas. IGas could boast a lot of support, both in themselves as a company and in their shale gas exploration projects. In spite of this, their financial situation was one of the main issues focused upon by the anti-shale coalition in their efforts to have the application rejected.

[71] Renamed to ENGIE in 2015. Can trace its origins to Gaz de France, the former French national gas company.
[72] Even attracting one of these companies was noteworthy: the US shale boom had shown the supermajors to be risk-averse when it came to this new and (at the time) uncertain development. Much of their most successful properties came as a result of buying up much smaller companies once they had already proven to be successful. In the UK, this was best exemplified by Shell's statement that they had "no desire to be the company that tries to find out" if shale gas will be successful in the UK (Gosden, 2013).

While noting that Total were part-funding IGas's exploration work at Tinker Lane, Frack Free Nottinghamshire cast doubt on their willingness to take financial or legal responsibility in the event of something going wrong. They also suggested that it might be appropriate to reject the application on the basis of IGas's falling share price and their lack of experience in extracting shale gas

> In a company update released in December 2016, three months before the application was to be considered, IGas stated the following:
>
> 1. " The Company has recently met with certain of the Company's bondholders and potential strategic investors to discuss its capital restructuring options and valuation of the Company, as it continues to assess options which will allow a new capital structure for the Company that is sustainable in the current oil price environment and enables IGas to capitalise on value accretive opportunities".
>
> 2. The Company continues to hold significant cash resources of c.US$32 million as at 22 December 2016. As previously announced, the Company expects that it will remain compliant with its daily liquidity covenant until late March 2017, based on current forecasts.
>
> 3. As previously disclosed, the Company confirms that its current forecasts project non-compliance with its leverage covenants as at 31 December 2016. The Company's position, following receipt of legal advice, remains that in the event of a breach of the leverage covenants, an equity cure provision exists within the bond agreements, such that a breach can be cured within 25 business days of the delivery of the compliance certificate for that period."

Figure 8.1: IGas remarks on their financial situation in December 2016

(Nottinghamshire County Council, 2017, pt. 273). Supported by Friends of the Earth, Frack Free Notthingham contended that "IGas is a loss-making business whose financial structure and ongoing performance continues to cast doubts as to its future ownership and viability" (Nottinghamshire County Council, 2017, pt. 274).Attempts to cast doubt on IGas's financial heaktg were made by the anti-shale coalition throughout all their applications during this period. An objection issued against their concurrent Springs Road application claimed that "the Company has been over-reliant on debt financing and its revenues have been reduced by the fall in global oil pricing such that it has been operating at a loss. The company's share price has fallen from 150p in January 2014 to less than 20p in December 2015" (Nottinghamshire County Council, 2016a).

This situation had the potential to be severely debilitating for IGas. In the last case study I outlined how Third Energy's application to drill in North Yorkshire fell apart due to the government's lack of confidence with their financial situation.

United Kingdom Onshore Oil and Gas (Ukoog) are, as covered in the previous chapter, the trade association representing the likes of IGas Energy, Cuadrilla and Third Energy. Ukoog promoted "best practice standards" for their members. They also seem to have had a comfortable working relationship with regulators, as the Health and Safety Executive cited these standards as an example of "how HSE regulates shale gas activity" (Nottinghamshire County Council, 2016a, pt. 358). Unsurprisingly, Ukoog were highly supportive of IGas's application., but they also took a favourable view of existing shale gas regulation, stating that the UK has "a formidable regulatory framework with no gaps" (Nottinghamshire County Council, 2017, pt. 354). Ukoog made familiar arguments about energy security and economic efficiency, but also claimed that there were moral and environmental benefits to domestically produced shale gas, supporting the contention of the GMB Union that "we need to honestly consider the moral and environmental issues about transporting gas across oceans and continents and being increasingly dependent on gas from countries with regulatory and environmental and human rights standards lower than ours" (Nottinghamshire County Council, 2017, pt. 355). With this claim, supported by their argument that the United Kingdom has an "environmental need" for shale gas, Ukoog seem to be attempting to frame the argument towards the causes that those in the environmental wing of anti-shale coalition care most about.

East Midlands Chamber are an organisation representing businesses through lobbying and campaigning in Derbyshire, Nottinghamshire and Leicestershire. As such, they were highly in favour of the application, expressing their belief that shale development would lead to investment and job creation in the local region. They also argued that other businesses would benefit from shale development, as their energy security concerns would be alleviated with the UK "much less exposed to rising prices and volatile foreign markets" (Nottinghamshire County Council, 2017, pt. 359).

GDF Suez were one of IGas's major investors. The French-based company are involved in almost every field of energy production and distribution. Andrew Austin, the Chief Executive of IGas, said that his company's partnership with GDF Suez was a crucial factor in enabling the company to complete the takeover of Dart Energy which gave them the licenses covering Tinker Lane and Springs Road (Proactive Investors, 2014). Despite their share in the development, GDF Suez do not appear to have played an especially active lobbying role during the application process.

Total are one of the largest oil and gas producers in the world. As such, their support was seen as something of a coup for IGas given the number of small operators looking for financial backing and seal of legitimacy that investment from a more established company would bring. However, as highlighted earlier, Total's involvement was not entirely positive: the only reference made to them

in the report provided to the planning committee concerned the contention that they might attempt to shirk any legal or financial responsibility. Much like GDF Suez, Total played a very limited role in the planning process, but their financial backing remained an issue of high salience.

Kerogen Capital were the third of IGas's major backers. Managing around $2 billion in investments in the oil and gas industry. Their London and Hong Kong operations are part of Kerogen Holdings, an operation based in the British Virgin Islands. Their executive board included Mark Malloch Brown, a Foreign Office minister from 2007-2009, who also worked in a number of senior roles at the United Nations and World Bank. A figure with such experience could have been useful to IGas, but Kerogen Capital do not appear to have played a major direct role in the application process.

Anti-shale coalition

Bassetlaw District Council is the local district council, and the second highest tier of local government for the Tinker Lane area. Possessing reasonably extensive powers, they are the planning authority for most matters, though applications regarding oil and gas development must always be considered at county council level due to the wider economic, security and environmental implications. Nevertheless, the council retains the right to be consulted on such developments. The council highlighted their concerns at potential contamination and lack of 3D seismic testing, as well the impact HGVs would have on traffic in the nearby small villages. The council also argued that IGas's past conduct of breaching planning control by erecting cabins without permission should be held against them. It is also worth noting the planning officer who prepared a report for the Bassetlaw Planning Committee recommended that the committee did not object, suggesting that the decision to do so was a political one.

Babworth Parish Council represents the small nearby parish of Babworth, with a population of around 1,300. Babworth Parish Council's concern – in line with Bassetlaw District Council – focused on the area's mining heritage: it was feared that high pressure testing could cause the collapse of underground coal mines.

Blyth Parish Council is of similar proximity and size to Babworth Parish Council. The reasons they gave for objecting to the application are a bit more detailed, with the issues covered demonstrative of some form of coordination with other opposed councils, Frack Free Nottinghamshire and Friends of the Earth. Like these two, they claimed to be sceptical of IGas's financial wellbeing, suggesting IGas offer some form of bond or guarantee before their applications is even considered for approval. In addition to this, they objected on the basis of high volumes of traffic, seismic disturbances arising from fracking or drilling and noise pollution.

Barnby Moor Parish Council, about a kilometre away from the proposed site, represents a far smaller community: the village of Barnby Moor only has a population of around 278. The parish council conducted a poll amongst residents in order to inform their consultation response. Around 75% of residents objected, with the only reason for objection given being traffic.

Sutton Parish Council represents another small parish, this time with a population of 673. They also conducted a survey of residents, with 89% objecting, though they conceded that this in itself does not constitute a material planning consideration. However, they also claimed that "it is essential for the safety of the local community and potentially for the future of the shale gas industry that a 3D seismic survey is undertaken before proceeding" (Nottinghamshire County Council, 2017, pt. 89).

Torworth Parish Council, with a population of 263, was the smallest parish council to object. They are particularly important, however, because it was in this parish that IGas proposed to develop their exploratory wellsite, 1.5 kilometres from the centre of Torworth. Unsurprisingly, their objection was significantly more thorough than that of any other parish council. Many of their grounds for objection had been taken up by other councils, such as concerns about underground coal mining works, the lack of a 3D seismic survey and implications for traffic. Torworth, however were the only parish council to devote much time to ecological issues: they expressed concern for water survey and at the lack of or perceived poor quality of bird, bat amphibian and floral surveys. While there is sufficient evidence of information sharing – particularly with Nottinghamshire Wildlife Trust – to consider Torworth Parish Council as a member of the anti-shale coalition, their consultation response suggests that the coalition was not entirely united: they expressed their dismay at the "failure of Bassetlaw District Council to act swiftly" in response to the unauthorised erection of a security cabin at the site (Nottinghamshire County Council, 2017, pt. 110). The conduct of Torworth Parish Council also provides further evidence for coordinated activity of coalition members with different core beliefs.

Nottinghamshire Wildlife Trust is the local wildlife conservation charity, a campaigning organisation that also manages 41 nature reserves throughout the county. Underlining their experience, resources and membership, Nottinghamshire Wildlife Trust gave a far more detailed and thorough response than any of the parish councils, offering critiques of IGas's surveys and the implications of the development on animal habitats, hydrogeological regimes, birds, bats and other fauna as well as conducting their own research.

Campaign to Protect Rural England is a pressure group with over 40,000 members and supporters. They have historically campaigned for sustainable management of the English countryside but have also been criticised for alleged "nimby" tendencies. Understandably, much of their Nottinghamshire

branch's objection revolves around the risks shale gas might pose to a countryside area. Some of the more uncharacteristic aspects focused are suggestive of information sharing with the parish councils. However, the CPRE also placed a greater emphasis upon matters such as noise, and light pollution. Similar to the Nottinghamshire Wildlife Trust, the CPRE highlighted issues affecting wildlife and local ecology – something that was generally of a lesser priority to parish councils, whose concerns lay mostly with local residents.

Frack Free Nottinghamshire were one of the local anti-fracking groups that formed part of the wider Frack Off network. Much like Frack Free Ryedale during the applications at Kirby Misperton, Frack Free Nottinghamshire played an important role in bringing the two main wings of the anti-fracking movement – local residents concerned with noise, traffic and property prices and environmentalists concerned with ecological impacts and sustainability – together. As such, Frack Free Nottinghamshire's involvement in the process was far more extensive, touching on almost every area of contention brought up by the local councils, but also focusing on the climate change implications. Being plugged into a national network and serving as a major coordinator in the anti-shale coalition, Frack Free Nottinghamshire could boast a reasonable amount of expertise and resources. Nevertheless, they still made elementary mistakes that harmed their credibility and perhaps that of the anti-shale coalition as a whole, claiming that the application was for the drilling of a horizontal borehole when it was, in fact, proposed to be a vertical borehole (Nottinghamshire County Council, 2017, pt. 1016). There were, however, the group at the forefront of the arguments being made about IGas's financial viability, something that proved to be an important aspect of the application.

Friends of the Earth have played a major role in opposing shale gas drilling applications throughout the UK. With their nationwide presence and large membership, they had the resources to conduct research and gain national coverage in a way that many of the smaller and less established local anti-fracking groups could not. As such, Friends of the Earth was an important source of information for these groups. They provided information and used their campaigning and lobbying experience to provide guidance on conducting direct activism and participating in more institutionalised settings such as consultations or committee hearings. Indeed, Friends of the Earth's activities in other areas was of such significance that the claim for judicial review they lodged against North Yorkshire County Council's decision to grant Third Energy permission at Kirby Misperton was one of the matters noted by the planning committee (Nottinghamshire County Council, 2017, pt. 1028). No other member of the anti-shale coalition – not even Frack Off, who were more of an umbrella for a host of decentralised groups – played such an extensive role at the local and national level.

Both Friends of the Earth themselves and their Nottinghamshire branch participated in this process. With similar nous to Frack Free Nottinghamshire, Friends of the Earth focused on the issues that were likely to energise the environmental and "nimby" sides of the coalition, talking about disruptions to school traffic and traffic congestion in addition to their more traditional concerns around climate change and ecology.

Bassetlaw Against Fracking were another anti-fracking group with extensive involvement in the process. More than any other group, Bassetlaw Against Fracking left no potential area of contention untouched. They made reference to the 2015 Paris climate change commitments, questioned IGas's financial stability, suggested that IGas's association with INEOS would mean that the gas produced could be used for plastic production rather than energy generation, highlighted concerns about the production of bad smells and – an issue that was somewhat downplayed compared to the other case studies – the impact on house prices, noting that "residents will, and are, finding it difficult to sell properties. No compensation is being provided" (Nottinghamshire County Council, 2017, pt. 346).

Uncertain/unaligned

Nottinghamshire County Council, or more specifically, their planning and licensing committee, were the body responsible for taking the decision on this application. The planning committee at the time of the application was finely balanced, reflecting the nature of the council itself. With Labour holding 34 of 67 seats following the 2013 local elections, they only held the narrowest of majorities. The Bassetlaw district, where IGas intended to drill, was overwhelmingly Labour – they held seven of the district's nine seats. This was something of an anomaly in comparison to many of the other areas targeted for shale development, where their rural setting was reflected in a predominance of Conservative councillors. This application was one of the very last to be considered by the council prior to the 2017 local elections, during which Labour suffered eleven losses, including two in Bassetlaw.

The voting behaviour of the committee is curious when compared to the concurrent development at Springs Road. Three of the five Labour members voted in favour of the Springs Road development, while four of them voted for Tinker Lane. Meanwhile all three Conservative representatives supported Springs Road while opposing Tinker Lane. This does not appear to have been influenced by constituency: both developments were in Bassetlaw, though none of the planning committee represented wards within that district.

Clearly, the situation within the council was highly complex, and even though they granted planning permission, their scepticism and reservations were of such prominence that it would not be accurate to say that the council was a pro-shale actor. Indeed, the extensive number of conditions attached to

planning permission suggests that the anti-shale coalition, though unsuccessful in their ultimate aim of having the application rejected, made some headway with their arguments against the development.

The other actors listed, such as the Health and Safety Executive, and the Environment Agency offered advice and conducted impact assessments[73], but they did not actively lobby for one outcome or another, and as such are not considered as coalition members or to have had a significant impact in determining the outcome of the application.

External events

External events are the key means of policy change within the advocacy coalition framework for the purposes of this study. The absence of external events with the significance of the Preese Hall earthquake or Balcombe protests appear to account for the more perfunctory nature of this planning application process.

The period during which this application was considered, from May 2016 to March 2017, was a curious one for shale gas. There seemed to be an element of fatigue, or perhaps jadedness, among both coalitions. By this point, shale gas development had turned into an interminable stalemate, with the pro-shale coalition usually – eventually – gaining planning permission but hardly making any progress due to resource limitations, procedural and technical delays, as well as continuing obstruction from the anti-shale coalition who rarely saw a granted planning application as a reason to give up. The relatively low number of 797 representations made to the council – 793 in opposition and 4 in support – is perhaps reflective of this. Just a couple of years previously these developments would routinely attract thousands of responses.

Indeed, this section is perhaps most notable for the lack of external events. While there was a small scale gathering of opponents at the county hall on the day of the decision meeting, there was little of the concurrent protest action at other developments that had played such an important role in strengthening the anti-shale coalition at the Grange Hill case.

Meanwhile, the Conservative government continued to promote shale gas development at a national level. In a statement made in parliament on 21 November 2016, around halfway through the application process at Tinker Lane, Jane Ellison, the Financial Secretary to the Treasury, reconfirmed that "the government are backing the safe development of shale gas" and that "the

[73] The Environment Agency, for example, outlined the different permits that IGas would require, while the Health and Safety Executive set out the way in which they regulate shale gas activity (Nottinghamshire County Council, 2017, paras. 116–152).

shale gas resources beneath Britain could contribute to our security of supply, to jobs, and to increasing tax revenue, while providing a bridge to the greener future we all support" (Hansard, 2016). However, the fact that this was the only parliamentary debate on the subject in 2016 – as well as the absence of new provisions from the 2016 Autumn Statement – underline the extent to which shale had slipped down the government's list of priorities.

This declining support affected the dynamics of Tinker Lane: with lukewarm support at national level the local councillors had less of an impetus to support the policy out of reasons of party unity or support for the government. The Conservative councillors at Nottinghamshire County Council, who uniformly opposed the Tinker Lane application while supporting that at Springs Road. At a national level, support for shale development and its supposed economic benefits was not a keystone of Conservative party identity in the way it had been just a few years previously. This appears to have empowered the conservative councillors to take a more nuanced approach.

There was a heightened focus on energy security during this period, but much of this was trained upon the proposed £18 billion nuclear power station at Hinkley in Somerset. While the government eventually approved the project, much of the debate surrounding it highlighted its apparent irrelevance – the guaranteed price of £92.50/MWh was around double the wholesale prices for electricity at the time. 2016 was still a period of low energy security concerns, and, just as few were convinced that Hinkley offered good value for money, the arguments about energy security made by the pro-shale coalition failed to carry much weight. Furthermore, 2017 was the first year that the United States would export LNG to the United Kingdom, ensuring the supply of gas from a diverse range of sources (US Energy Information Administration, 2020f).

However, the political climate had changed in one significant way. The earlier shale gas applications were carried out in the wake of the 2008 financial crisis and consequent instability. At this point, pro-shale arguments about energy security and economic benefits such as lower energy bills and more jobs could carry real weight. By early 2017, these issues had subsided somewhat: unemployment had fallen and there was less concern about the economy. Following the referendum on the United Kingdom's European Union membership in June 2016, this, and connected issues such as immigration, established themselves as the dominant policy concerns (YouGov, 2020). More directly, the key economic arguments for shale gas found a less favourable backdrop: unemployment, reaching 8.5% in 2011, had tailed off to around 4.5%, while the economy had been displaying hesitant growth following the intermittent troughs of a few years previously (Office for National Statistics, 2020a, 2020b).

There were regional inequalities to this, with the north and midlands of England – the areas targeted for shale development – displaying a far more stilted economic recovery than elsewhere. However, the bigger picture was one of greater – if not restored – confidence in the economy. This coupled with secure energy supplies and a distracted and increasingly lukewarm government, meant that the socio-economic backdrop of 2016-2017 was not the most beneficial for the arguments about energy security and economic efficiency being made by the pro-shale coalition. However, there were also no large shocks such as the 2011 Preese Hall earthquake or the mass protests of Summer 2013 serving to increase awareness of the shale gas or drive people towards supporting the anti-shale coalition. Instead, the circumstances surrounding the application were relatively placid, offering no great impetus for either coalition to seize the initiative. With the status quo narrowly favouring the pro-shale coalition, one can understand why they were able to succeed in this process with relatively little effort. There was nothing meaningful for the anti-shale coalition to grab hold of that might have shifted the balance of power or caused undecided or pro-shale actors to question their pre-existing beliefs.

Public opinion

By the period in which this application was being considered, awareness of shale gas and hydraulic fracturing had increased, from less than 40% of respondents being able to correctly identify it in March 2012 to over 70% by September 2016 (O'Hara et al., 2016, p. 5). This, to some extent, was something that the pro-shale developers were hoping for: following the first large scale opposition of 2011-2013 there was an assumption that greater awareness of shale gas would a long way towards assuaging public concerns, and this was the impetus behind their intention to "educate" the public (Blaymires, 2013; Egan, 2013). Initial research in this area suggests that this might not be the case, with greater knowledge of hydraulic fracturing leading to more polarised views, both for and against it (Howell, 2018).

As knowledge of shale gas increased over time, so too did the proportion of respondents saying that it should not be allowed to be extracted in the UK. O'Hara et al's survey of September 2016 was the first to demonstrate a lead for those opposed to shale gas extraction. This lead remained very narrow, with a differential of less than five percentage points (O'Hara et al., 2016, pp. 7–8). The anti-shale coalition had found some success in their efforts to shape the narrative of risk versus reward, but their lead was only small.

O'Hara et al's data also demonstrates the declining power of the earthquake narrative for the anti-shale coalition. Five years after the seismic activity at Preese Hall, a narrow majority of respondents – around 53% - continued to associate shale gas with earthquakes, but this had fallen significantly

from its peak of over 70% in April 2012 (O'Hara et al., 2016, p. 9). Meanwhile, neither coalition appeared to be making much headway with their arguments that shale gas would result in lower or higher carbon emissions, with almost 50% of respondents in the don't know category (O'Hara et al., 2016, p. 12). The only anti-shale line that had shown clear progress for the anti-shale coalition was in the percentage of respondents associating shale with water contamination, where those who thought there was an association had an imposing 26.1 percentage point lead over those who did not (O'Hara et al., 2016, p. 10).

One curiosity of O'Hara et al's data is that even as support for shale gas continued to decrease, a plurality of respondents continued to believe that shale gas would provide cheap energy, be beneficial for energy security and provide economic benefits (O'Hara et al., 2016, pp. 13–15). Howell (2018) remarked upon this apparent contradiction, stating that "rejection of fracking is apparently not due simply to lack of acceptance that there will be such benefits". While O'Hara's study is a valuable resource, it does not offer any information about the intensities with which respondents hold their beliefs, although it could reasonably be concluded that views on economic outcomes are held less strongly than those concerning environmental risks: perhaps explaining why the pro-shale coalition's "reward" narrative failed to gain traction to the same extent as the anti-shale "risk" narrative".

O'Hara et al's study covers the United Kingdom as a whole, with no data for specific areas. However, given that people are significantly less supportive of shale gas when asked about local developments in their area, it seems likely that the number of people opposed to shale gas in the Bassetlaw District would be much larger than O'Hara et al's nationwide figure (Howell, 2018).

Even accepting this, something still seems amiss. Even though the public were more anti-shale than ever, local opposition was very limited. There were no large protests while there were several in Lancashire just a few years previously. Only 793 objections were submitted while over 4,000 were received at Kirby Misperton in 2015 and 11,127 at Preston New Road in 2014.

Lacking reliable survey data to explain this, I would be inclined to argue that this is because the public had "moved on" from shale gas. In addition to the decreasing attention shale gas received in parliament, this can be demonstrated by the way in which Google searches for "shale gas" and "fracking" from the United Kingdom began to fall significantly – with the exception of a few spikes – from August 2015 (see figure 5.1). This also coincided with a period in which the question of the United Kingdom's European Union membership, and then the manner of its departure, took over the political agenda, squeezing out discussion of many previously prominent political issues (YouGov, 2020).

Just as the anti-shale gas coalition appeared to have made a breakthrough, the matter of public opinion in shale gas had ceased to be as important as it once was. More people were opposed to shale gas than in favour of it, but for most these views appeared to be weakly held. There was no question of shale gas returning to the obscurity the pro-shale coalition enjoyed in 2010 and 2011, but things had certainly moved in that direction, and decision-makers knew they could approve a drilling application without facing opposition on the scale they might have faced a couple of years previously.

Resources

The resources of the pro-shale coalition – or, more specifically, IGas – are difficult to quantify in this case, as they have a number of strengths and weaknesses. This dichotomy is easily demonstrated by IGas's finances: they had the backing from wealthy investors that much of the industry were desperate for, but in spite of this the anti-shale coalition emphasised IGas's financial vulnerabilities and cash flow problems, and it is clear that this had an impact on the planning committee.

Despite their financial worries, IGas had the resources to launch a formidable public relations and lobbying campaign. though it is clear that only one narrative about their finances carried through carried through: nobody on the committee talked about IGas's powerful investors. Rather, they were discussing the worrying prospect of IGas carrying out work on the site and not having enough money to clean it up. For the majority of the committee, these concerns were not enough to lead to the application being rejected, but it did lead them to impose several stringent conditions on the application.

In spite of their cash flow problems, IGas did endeavour to put the resources at their disposal towards productive ends. There was the usual suite of thorough research into the implications for air pollution, noise, light, ecology and various other matters – although it is worth noting that some parish councils opposed this on the basis of the ecology surveys not being wide ranging enough. More importantly, perhaps, was the time and money IGas spent engaging local residents. Their approach here was noticeably more focused and personal than the other shale developers. They held – and were keen to ensure that the councillors knew they held – individual face-to-face meetings with local residents to "talk through concerns and plan for any mitigation" several months before the application was submitted (IGas Energy, 2016). This was in addition to the usual public exhibitions, meetings, letters and advertisements.

IGas's efforts in this area were bolstered by the Let's Talk About Shale project, an industry-wide project overseen by Ukoog. This project targeted towns in Lancashire and the East Midlands and invited locals to submit questions about shale gas. These would be answered "with the help of

numerous experts" and uploaded to the website. Over 1,500 questions and comments were received in total. (Let's Talk About Shale, 2020)

IGas were keen to advertise this project to decisionmakers, advertising that it was "verified by independent experts" (IGas Energy, 2015a, pt. 1.1.4). They also built upon this by creating their own website, IGas Engage, a website dedicated to community engagement. It contained minutes of meetings and a form for visitors to ask questions and leave comments. IGas also put together a list of key community stakeholders to be targeted, consisting of local residents, educational establishments, parish councils, Nottinghamshire County Council, Bassetlaw District Council, local businesses, local interest groups and local MPs (Nottinghamshire County Council, 2016a, pt. 2.5.2). Their engagement strategy also led to the creation of a Community Liaison Group, where each parish council in Bassetlaw was invited to nominate one person from the council and one from the local community for monthly meetings. This was arranged in June 2014 – almost two years before IGas submitted the application (Nottinghamshire County Council, 2016a, p. 3.2).

IGas, perhaps more than any other shale developer, grasped the importance of public engagement at an early stage and invested the most in gaining acceptance from the local community. In doing so, they came closer than any other pro-shale actor to treating public support as a resource which could determine the outcome of an application. At a presentation given to the UK onshore oil and gas industry in 2013 – long before their first application to drill for shale gas – the IGas COO John Blaymires (2013) focused on "Increasing transparency with the public on fracking procedures to improve relations and reduce difficulties in gaining permits". Here, he told the rest of the industry what IGas were saying in response to common questions on earthquakes, fracking fluids, water use and groundwater protection. At this same event, the Cuadrilla CEO Francis Egan (2013) also discussed his company's strategy for gaining public acceptance but the limited extent and general nature of the issues he covered underlined IGas's role as the industry leader in public engagement.

The central importance IGas placed upon community engagement as a means of getting applications accepted was perhaps best expressed through the existence of a community support officer, a person employed by IGas to act as an identifiable means of contact for communities neighbouring a shale gas development. Through these approaches, as well as several others such as support for local charities and community initiatives, IGas were able to associate themselves with positive community initiatives and advertise the community benefits scheme[74].

[74] £100,000 per fracked well and 1% of revenues to be distributed to local communities

This appears to have worked in IGas's favour in two main ways. First of all, while IGas faced opposition from many parish councils, these were mainly based on logistical matters, such as traffic – the kind of opposition that can be mitigated through guarantees or planning conditions. Compared to the other two case studies, IGas faced far less opposition based on a fundamental objection to shale gas and hydraulic fracturing, or that motivated by climate change. Opposition in this manner is far more fundamental, with compromises being harder to achieve. IGas's thorough community engagement may have helped them avoid this.

Secondly, there were fewer objections in total. While the figure of 797 is significant, it is some way off the thousands that would typically be received during the other applications around this time. Furthermore, only 132 of these objections came from the local area, and of these most of the most popular issues were those which could be mitigated through conditions: 96 featured noise pollution, 94 mentioned proximity to aquifers and 94 referred to the increase in traffic. Only 31 objected because of a "general opposition to fracking" or on grounds of climate change, while seven objected because they felt renewable energy development should be pursued instead (Nottinghamshire County Council, 2016b).

While shale gas could by no means be described at a popular policy – only four pro-shale gas letters received during the consultation process attests to this – IGas were broadly successful in their efforts to get people to stop talking about hydraulic fracturing, poor regulation, earthquakes and, indeed, damage to house prices – something that only 16 local residents remarked upon (Nottinghamshire County Council, 2016b). This ran counter to growing national opposition to fracking.

IGas's resources provoked some doubts. They had very rich investors, but the extent to which they would take responsibility for IGas's fragile finances was unknown. They had some experience of onshore production in the United Kingdom, but were smaller and had fewer supporters in government than Cuadrilla. In spite of this, while Cuadrilla hardly seemed able to avoid pitfalls such as earthquakes and mass protests – their greater renown certainly attracting more of the latter – IGas adeptly focused the limited resources they had on community engagement, doing just enough so that a sceptical planning committee – feeling little pressure from the UK government to grant permission – were just about convinced.

As in the other cases, the key resource for the anti-shale coalition lay in membership and mobilisation: ensuring that as many different groups as possible, ideally with large memberships, objected to the development. This was certainly the case for the anti-shale coalition at Tinker Lane, which boasted the usual mix of environmental organisations and local residents' groups, as well as a significant number of local councils. Each of these bodies were active in the process, sending

information to be considered by the planning committee, attempting to increase the size of their coalitions, giving presentations and attending meetings with IGas and local politicians.

Friends of the Earth and the groups under the Frack Off umbrella once more played an important role in coordinating activity across the anti-shale coalition, conducting research and sharing information with the rest of the coalition. A key example of this was the crucial argument made regarding IGas's finances, which began with these groups and spread from there, being taken up by the parish councils and ultimately being the subject of serious consideration from the planning committee itself. The spread of this argument among a large number of bodies underlines the priority the anti-shale coalition placed on mobilising a large number of groups making the same arguments.

It has been seen at Grange Hill and Kirby Misperton that anti-shale groups with a nationwide presence, most notably Friends of the Earth, had access to a great deal of information, extensive lobbying experience, valuable contacts and the means to carry out this research. In those cases this information became truly valuable when it was shared with local activists – with the residents upon whom the councillors depended for votes and whose interests they were supposed to serve.

At Tinker Lane, this transfer of information appears to have happened at a greatly reduced rate, and while Friends of the Earth played a significant role, far fewer other members of the anti-shale coalition referenced them or their work compared to those at Grange Hill or Kirby Misperton. The anti-shale coalition possessed significant resources, but the failure to use them effectively goes some way towards explaining why IGas – even with their many failings – were able to achieve the bare minimum required to gain planning permission.

The anti-shale coalition had other struggles when it came to resources. There was no bespoke research commissioned. Kirby Misperton demonstrated that such research was expensive and was by no means guaranteed to be successful. In addition to this, the anti-shale coalition seemed unable or unwilling to engage in the protest action that had been seen at a number of other cases. While it seems unlikely that protest action in the other cases played a significant role in determining the outcome of an application, it often had a profound indirect impact, ensuring that the development and shale gas remained on the agenda and the front pages.

Broadly speaking, the pro-shale coalition primarily benefits from resources in the shape of money[75] and contacts, while the anti-shale coalition will look at increase the size and breadth of their membership. In this instance, the anti-shale coalition clearly excelled in their pursuit of resources

[75] And, as we have seen in this case, confidence in the reliability of that money.

compared to that of the pro-shale coalition, even if the absolute value of resources remained higher for the pro-shale coalition. However, the anti-shale coalition were unable to weaponise their resources to anywhere near they extent that they had done in many previous cases – many of which, of course, they had lost anyway. This relieved the pressure on IGas and opened up the opportunity for them to focus on their community engagement networks – the one resource they possessed that was a clear strength.

Relationships with policymakers

While IGas's reputation may have suffered due to rumours about its financial position, they placed a notable effort into getting local politicians on their side that may have made a difference. IGas had benefited from being able to observe other shale companies – notably Cuadrilla – and observe where they went wrong when working with local politicians. They provided all county councillors with an information pack, which clearly set out who IGas were and their intentions for Nottinghamshire. This described the process of exploratory drilling, steps being taken to protect the environment, outlined the regulatory framework and promoted the community benefits of shale gas, as well as highlighting IGas's existing community work (IGas Energy, 2015b). They also emphasised that local authorities with shale sites would receive 100% of the business rates paid rather than the typical 50%. The report skirts around fracking – an inevitable step if shale gas is eventually to be produced – stating: "for the avoidance of doubt, no hydraulic fracturing will take place as a part of this application (IGas Energy, 2015b).

IGas's engagement strategy with local politicians also extended to the local Labour MP John Mann, who received regular progress reports from IGas's chief executive (IGas Energy, 2016). Attempts to woo Mann only appear to partially successful. In a letter written to the council, he said the application should be delayed until local people have a "final say", highlighting traffic as an area of concern (Hayhurst, 2017). But he did not object to the principle of the application.

IGas put a great deal of work into managing relationships at a local level. This was particularly important, as many councillors took an unfavourable view of IGas's unauthorised construction of security cabins in October 2015[76]. Even following their engagement, several councillors continued to take an unfavourable view of IGas at the decision meeting, with the Conservative councillor Sue Saddington saying that "the failure to enforce the lack of planning permission for the cabins does not give much confidence to the committee", while another told IGas Chief Operating Officer John Blaymires that "local residents want assurance that those conditions will be adhered. Because we've

[76] IGas claimed that they were unaware planning permission would be required for these cabins. (Hayhurst, 2017)

seen one instance of it going wrong, we fear there something could go wrong again" (Hayhurst, 2017). The Ukoog Chief Executive Ken Cronin, supporting IGas, was also criticised for his attempts to demonstrate the safety of hydraulic fracturing, with the Liberal Democrat councillor Stan Heptinstall remarking:

> "We have been treated to a treatise on fracking. This application is not for fracking. As a committee, we have been told the only issues we can consider are about planning.
>
> …
>
> I will not be voting on whether fracking is a good idea. I will be voting on what the impact of this application on the local community.
>
> Your speech was totally inappropriate for this particular application." (Hayhurst, 2017)

The committee meeting, and particularly the questioning of IGas COO John Blaymires, shows that IGas's attempts to win over local councillors was not able to entirely overcome the bad impression given by the unauthorised cabins. While the application was accepted, it was only by a margin of 6 to 5, following the attachment of 52 conditions. IGas's engagement may have been sufficient to cajole some councillors over the line, they did not get the application accepted on the terms they wanted, and it was clear that several councillors continued to be distrustful.

Compared to the warm reception that shale developers would have received a few years previously, IGas also struggled to get the attention or support of the UK government. By the end of 2016, fracking supporters like David Cameron and George Osborne had left government. Andy Morrison, a former vice-president of business development at Shell and then CEO of Zeta Petroleum, suggested the government had lost their appetite for shale gas: "given the splits in the government about Brexit and other things they do not want to revive any more divisive issues like fracking just now" (Dalby, 2017). Mark Abbott, the CEO of Egdon Resources[77] seconded this, saying that "it probably is true that because of the divisions the government is not being as robust as it might be in promoting shale extraction." (Dalby, 2017)

While their enthusiasm had clearly decreased, government policy remained in favour of shale gas. Nevertheless, scrutiny of the committee meetings suggests that there was little of the agonised deliberation that faced North Yorkshire County Council when making the decision for Kirby Misperton. The Nottinghamshire County Council planning committee acknowledged government support for shale gas, but it did not appear to be a compelling factor in their decision-making. Perhaps aware of the government's more withdrawn role – or perhaps just because they did not

[77] A partner of IGas with a 14.5% interest in two wells at their Springs Road site.

have the access of Cuadrilla – IGas appear to have made little effort to engage with the UK government.

The anti-shale coalition – largely comprising small, localised groups – did not target Whitehall for lobbying either. However, their efforts to engage with the county council appear to have made some headway, and they clearly had some allies on the planning committee. In terms of pure access, the anti-shale coalition outperformed the pro-shale coalition: there were more organisations opposed to shale development, and they were all keen to ensure that they were heard. This led to significantly more consultations opposing the development than supporting it. While lacking the membership or specialist knowledge of the anti-fracking groups or Friends of the Earth, the many parish councils opposed to the development played a special role here: as statutory consultees they had privileged access to the planning committee. In addition to this, representatives of parish and district councils are likely to be familiar to those on the committee, having cooperated on this and several other issues.

In any case, access to the committee during their deliberations does not appear to have been too difficult to obtain. It is surely significant that on the afternoon of the meeting, when those with an interest were invited to give evidence, only two people gave evidence in favour of the development while four gave evidence in opposition. The questions faced by the pro-shale coalition were also far more probing and – at times – hostile. This is perhaps to be expected, given that they were the party making the application, but it does also imply that the anti-shale coalition enjoyed warmer relations with the local decision-makers.

Conclusion

Compared to most of the other applications across the United Kingdom, Tinker Lane was relatively eventless. There were none of the prolonged confrontations and court battles seen at Grange Road and none of the extensive data collection carried out by both sides that occurred at Kirby Misperton. This can partly be explained by this only being the first application at the site, but the evidence of this case study suggests that it was largely because shale gas had sunk down the agenda: it no longer commanded a great deal of parliamentary attention or regularly made the news. In the meantime, the public had become more opposed to shale development, but the intensity with which these views were held had decreased also.

This situation was highly convenient for IGas, applying to drill a shale well for the first time. They possessed few of the virtues of Cuadrilla, an organisation with more experience of unconventional production, greater resources and better contacts with government. And, given that Cuadrilla had routinely seen their applications get rejected, it would be reasonable to assume that IGas would face

a similar outcome. On top of all this, IGas were facing a planning committee that had already been antagonised by their unauthorised erection of security cabins and were highly suspicious of their financial position.

IGas were able to overcome this awkward position thanks to three different factors, only one of which was within their control. The first of these was the efforts they placed on working with local residents and building relationships with them. This was by no means a unanimously successful effort: there were still a reasonably large number of objections and a number of parish councils opposed. It did ,however, limit the scale of the opposition, and kept discussion away from matters such as earthquakes, climate change or hydraulic fracturing – all of which would have imposed an existential threat to the application, rather than merely requiring a condition to be added, as was the case for the traffic, ecological and financial matters being discussed.

The second thing that worked in IGas's favour was the general lack of activity of the anti-shale coalition. The anti-shale coalition was large and well resourced, but compared to other cases, where there was large-scale direct action, research being commissioned and information being shared, not very much appeared to happen. The practice whereby the local residents wing of the anti-shale coalition and the environmental activists wing took up the narratives of the other did not occur, leaving the application to be debated on broadly mundane, procedural matters.

The third favourable factor, and perhaps one that also contributed to the lack of activity from the anti-shale coalition, was shale gas's gradual retreat from the top of the political agenda. The committee displayed none of the anxious soul searching found in previous applications They knew they could grant planning permission without facing the widespread uproar they would have encountered just a year or two earlier, and they knew that a rejection would be unlikely to face great repercussions from a divided government with new priorities that was beginning to be less confident in its support for shale gas.

Drilling eventually began at Tinker Lane in November 2018. Shortly after drilling began, two protestors were arrested for locking themselves together outside the site. In February 2013, IGas reported having found the "highest ever levels of shale gas in the UK" – reported as "US levels of gas" (Whitfield, 2019). By this stage, IGas had also gained the support of the multinational chemical company INEOS, potentially putting them in a stronger position than ever before. However, since the fracking moratorium introduced in November 2019, any effort to further develop the site has been placed on hold. The future of IGas, and the UK shale industry as a whole, is in great doubt, with a gas analyst at S&P Global claiming the decision "effectively kills off" the industry. In spite of this,

the IGAS CEO said his company was “committed to working with regulators to demonstrate that we can operate safely and environmentally responsibly” (Elliott, 2019).

Discussion of results

Each of the shale gas applications being considered took place in very different circumstances. The applications to drill at Grange Road, Kirby Misperton and Tinker Lane were made by different companies. They were considered by different local authorities and at different times. Each of these applications were also affected in different ways and to different degrees by external events, some favouring the pro-shale coalition and others favouring the anti-shale coalition. From place to place, the coalitions themselves differed greatly, possessing greater resources in some places and being better at accessing decisionmakers in others.

Nevertheless, a number of common themes could be identified in the case studies and fsQCA study. Each of these applications were determined by a combination of factors. The relative importance of these factors varied from case to case, but in general the limited resources of the pro-shale coalition were sufficient for the periods in which there were no anti-shale coalition, but the occurrence of favourable external events and public opinion lead to the formation and acquisition of resources of anti-shale coalitions, delaying applications and putting pro-shale coalitions. Even when the pro-shale coalition gained planning permission it was after a lengthy process, putting them under pressure as they had investors expecting results but no way of commencing operations. This followed in them being unable to develop any of the sites, even though they eventually – after appeals in some cases – gained permission at all of them.

This section is intended to serve as an overview of the themes explored in the three case studies and and fsQCA study. I will outline the role of coalitions, as well as discussing the characteristics and actions of local authorities. Following this, I will review each of the four variables and the four hypotheses. Finally, I will consider some implications for the advocacy coalition framework.

The role of coalitions

There were many occasions, such as the applications at Grange Road and Kirby Misperton prior to 2011, where no anti-shale coalition existed. Here, the pro-shale coalition – often poorly prepared, lacking meaningful resources and making no real effort to engage with policy makers – received planning permission in a matter of days. The handful of scattered objectors might have been lacking in terms of their resources or access to policymakers to effect policy change. More fundamentally, however, they were denied through their lack of coordinated activity preventing them from forming anything that could be described as an advocacy coalition. This supports my argument in chapter 3 that coordination must be considered more fully in the ACF – in situations like these it is must be explicitly addressed to enable these distinctions between fully-formed – or at least nascent – coalitions and disparate actors with the same beliefs.

Contrast this to the later applications, where anti-shale coalitions did exist. No matter how disorganised, inexpert, shunned or poorly resourced that anti-shale coalition happened to be, the pro-shale coalition knew that much more effort had to be expended in order to receive planning permission. This can be seen in the drastically increased number of documents by the coalitions in the post-2011 applications. The folder for Cuadrilla's 2010 application at Grange Road has 22 documents. The folder for their 2014 application contains 74 documents. Though not part of a case study, the folder for Cuadrilla's application at Preese Hall in 2009[78] only contains six documents: the application, the supporting statement, a location plan and three documents issued by the council. Third Energy's application to carry out fracking in Kirby Misperton in 2015 included 874 documents, and this was just one of the three applications they made concerning the Kirby Misperton site that year. More documents means more time spent preparing them, signalling more research has been carried out and more resources have been expended.

Greater levels of opposition meant that local authorities had to consider and respond to objections, and this also saw the time taken to issue a decision increase accordingly. It was this, rather than a willingness to obstruct, that led to application processes taking so long. Cuadrilla made their first application at Grange Road in 2010 and permission was given within two months. Their final application at the site was made in on 15 May 2014, yet it was over a year later, on 20 May 2015. This decision led to several more months of appeals. Cuadrilla's application to frack Preese Hall in 2009 was granted a mere eleven days after it was submitted, yet it took North Yorkshire County Council ten months to consider Third Energy's application in 2015 and 2016, and this came after threats from the government about repercussions for local authorities taking too long to decide shale drilling applications. For a pro-shale coalition eager to live up to its ambitious well-drilling targets and under pressure from investors, these delays were almost as bad as a rejection.

It was the emergence of an anti-shale coalition that ensured the pro-shale coalition had to work a lot harder, and that even when they did work harder they were by no means assured of success, or likely to have a decision made quickly. In every situation where there was no anti-shale coalition, the pro-shale coalition were able to gain planning permission swiftly and with ease.

Characteristics of the local authority

I hypothesised that the local authority did not obstruct shale gas development. This appears to generally have been the case, with most applications being accepted. I found some evidence

[78] The application that would eventually lead to the 2011 earthquake.

suggesting that applications were more likely to be accepted by Conservative-controlled councils, but not enough to make a definitive conclusion.

The presence of a Conservative council stands out in applications made to Lancashire County Council. Here, the Conservative controlled council of 2009-2013 gave planning permission to every shale application put in front of it. Following the 2013 local elections, and council leadership transitioning to a Labour minority with Liberal Democrat support, the council rejected the majority of applications it received, subjecting itself to a number of lengthy appeals.

The Kirby Misperton case further confirms this, but for quite different reasons. Here, the heavily Conservative and largely rural North Yorkshire County Council approved each of the shale applications submitted to them, though expressed their reluctance in doing so: the chair of the planning committee remarked the threats made by the recently installed majority Conservative government were one of the reasons why he was keen to approve the decision. In situations like this, where national government attempts to push local authorities into deciding one way or the other, the government can wield greater power over councillors of the same party: they control the party machinery and play a role in vetting and vetoing candidates for election at all levels. It is possible that the role of these councils as a veto player does not seem as meaningful as their formal role suggests.

However, activity at Nottinghamshire County Council suggested that support or opposition at a local level might not be entirely party based. Unlike the other two county councils studied, the Labour party enjoyed a strong position in Nottinghamshire, holding thirteen more seats than the Conservatives following the May 2013 elections. There was no clear relationship between party affiliation and votes in IGas Energy's application at Springs Road and Tinker Lane. In fact, several councillors who voted in favour of the Springs Road development voted against that at Tinker Lane – and vice versa. It was on the back of Labour votes that the Tinker Lane application was approved, with several Conservatives voting against.

In any case, none of these councils – regardless of party makeup – could be considered to be overly keen at the prospect of shale gas development. However, there was also very limited evidence of attempts to obstruct or delay planning applications, despite claims of that nature from the UK government. Indeed, many of them appeared fearful or cowed by such assertions. As time went on, applications for planning permission took longer and longer, but all evidence suggests that this was because of the growing volume of technically complex information – largely as a result of the increasing resources of the anti-shale coalition – that they had to consider before making a decision.

With local authorities not appearing to have made much active difference, the following sections focusing on each of the variables will attempt to highlight some more plausible explanations behind the outcomes of these local applications. There will also be some discussion on the implications these applications may have had for shale gas at the national leve.

External events

External events were an important variable in determining whether the anti-shale coalition would be successful. Without external shocks, there would be no impetus for an anti-shale coalition to form. Without an anti-shale coalition an application will not be rejected. Furthermore, the anti-shale coalitions played a large role in shaping views of shale gas at a national level – views which became more unfavourable as time went on and would in turn have an impact on subsequent applications made to local authorities.

However, external events were important for reasons other than creating an impetus for an anti-shale coalition to form – they continued to be shape outcomes after such coalitions had developed. The fsQCA study supports this, demonstrating that the pro-shale coalition is more likely to be successful in the absence of unfavourable external events[79]. The case studies show that the two events most central to the period being studied were the 2011 Preese Hall earthquakes and the 2013 Balcombe Protests. The 2011 earthquakes were the first many heard of shale gas, and they played a central role in the formation of the anti-shale coalition, a protest that was accelerated by the 2013 Balcombe Protests. These protests, particularly high-profile events such as the arrest of Green party MP Caroline Lucas, put shale gas at the top of news bulletins.

For a cause that thrives on publicity and a narrative of threat, these events played a vital role in attracting new members and resources to the anti-shale gas coalition. Following the 2011 earthquakes, the anti-shale coalition was ready to engage in the planning process. After the 2013 protests, these coalitions were able to commit far greater resources, in the shape of expertise, increased size of membership and expenditure on research and advertising.

Were it not for these two events that strengthened the anti-shale coalition, weakened the credibility of the pro-shale coalition and caused decisionmakers to rethink their preconceived beliefs, it is quite likely that the final application at Grange Road would have passed as quickly and easily as the previous two. However, the passions aroused by these two key events were by no means guaranteed to endure. Objections to the developments at Kirby Misperton and Tinker Lane made from 2015-2017 showed continued references to earthquakes, but these carried less weight. The

[79] For the purposes of the fsQCA these are considered as external events that are favourable to the anti-shale coalition.

proportion of people associating shale gas with earthquakes peaked at above 70% in April 2012 but had fallen to 50% by September 2015 (O'Hara et al., 2015b, p. 6). Moreover, the Preese Hall earthquake happened in Lancashire: the council that allowed fracking at the sight was the same as the one charged with deciding the Grange Hill application. More distant from the event – both by time and geography – the decisionmakers at North Yorkshire County Council and Nottinghamshire County Council are likely to have been less impacted by this.

Similarly, memories of the Balcombe protests receded too, but the coalitions they helped spawn did not seem keen to repeat these methods. Protests did continue, but they were more often than not limited to a handful of people. The anti-shale coalition at Kirby Misperton prioritised producing research, while the coalition at Tinker Lane favoured working with local councillors. While these approaches were by no means the wrong ones to take, the move away from direct action meant that there was no new external shock to reignite interest in shale gas as the summer of 2013 grew more and more distant. The presence of these two events was at its peak in 2014, and they played a crucial part in the application at Grange Road being rejected.

There were, of course, developments that empowered the pro-shale coalition. Yet the pro-shale actors were far less dependent on external events than the anti-shale coalition, and accordingly the events that favoured them had far less impact.

Nevertheless, the 2015 election appears to have played some part in putting a stop to the brief period of rebellion following the Balcombe protests, where councils might have felt empowered to reject applications. This election gave the Conservative party complete control of government, with the slightly more shale-sceptic Liberal Democrats vacating the minister's office at the Department of Energy and Climate Change. This led to the government becoming moderately more pro-shale. This was by no means a paradigm shift – after all, the Coalition government was already pro-shale. However, the unexpected election victory empowered the Conservatives and led to some developments that might not otherwise have happened.

The new shale gas and oil policy outlined in September 2016 by Amber Rudd, the government's new Secretary of State for Energy and Climate Change, stated the government's expectations that every planning application would be "dealt with as soon as possible", and that "underperforming" local authorities may face repercussions, such as having future applications determined by the Secretary of State (Department of Energy and Climate Change, 2015a). This, as previously noted, was one of the issues at the forefront of the minds of the planning committee of North Yorkshire County Council when determining the Kirby Misperton application.

The impetus from this new government did not last long. Less than a year later, the EU referendum would occur, returning a leave vote. Two of the leaders of the remain campaign and two of the biggest supporters of shale gas – David Cameron and George Osborne, would be gone from parliament and government. Shale gas applications were disproportionately likely to be made in rural areas, and thus disproportionately likely to be in Conservative constituencies. Many of these MPs had spoken out against such development. While nominally still in favour of it, in the face of party turmoil and minority government shale gas had gone from a flagship policy to something the Conservative party almost seemed reluctant to discuss.

The impacts of this were clear. While the planning committee at Nottinghamshire County Council narrowly approved the Tinker Lane development, it was done in very different circumstances from Kirby Misperton a year earlier. There was no evidence of any committee member being fearful of government repercussions. Indeed, the government was barely mentioned at all.

These four events were the most prominent external shocks. The background energy security and socio-economic issues fluctuated in their importance and were affected by events but never at any point proved to be decisive to the outcome. Despite energy shocks and large fluctuations in oil and gas prices, the rhetoric surrounding energy security and the weight placed on it by the coalitions did not meaningfully change. Planning permission was rejected at Grange Road when energy prices were high; planning permission was given at Kirby Misperton and Tinker Lane when energy prices were low. Energy security concerns proved a key aspect of the arguments made by the pro-shale coalition, but there is no evidence to suggest they were taken any more seriously when these concerns were at their height.

External shocks proved to the key enabling variable. This means that the presence or absence of an external shock would play a huge role in determining how meaningful a coalition's resources would be in shaping the outcome. As outlined in the literature review, it is generally assumed that business interests will benefit from limiting such events while environmental and local campaign groups will do best when external shocks upset the balance of the power. The data from the case studies at Grange Road, Kirby Misperton and Tinker Lane support this.

Public opinion

Public opinion can vary in terms of quality: it can be pro-shale or anti-shale. It can vary in terms of intensity: respondents can be, for example, strongly pro-shale or moderately anti-shale. It can also vary in terms of awareness: respondents may or may not know what shale gas or hydraulic fracturing is.

Over time, awareness of shale gas grew, and the proportion of the public opposed to shale development gradually increased. However, as the quantity of people opposed to shale gas increased, the strength of their opposition decreased. It is well-established that public opinion can lead to policy change (Brownell and Warner, 2009, p. 260; Sabatier, 1988, pp. 132–3; Van De Graaf et al., 2018, p. 1278). This is borne out by the case studies: Cuadrilla succeeded at Grange Road in 2010 when awareness of shale gas was minimal; Third Energy gained planning permission at Kirby Misperton as greater numbers of the population became anti-shale, but also less intense in their feelings. This pattern continued at Kirby Misperton but was also compounded by the 2016 EU referendum relegating shale gas even further down the list of political priorities. However, at Grange Road public opinion began to benefit the anti-shale coalition: large numbers of people were aware of shale gas, enough (but not most of them) were opposed to it while the proximity of the Balcombe protests and the Preese Hall earthquakes ensured that the intensity of feeling was as high as it would get.

Overall, I find that these shifts in public opinion were beneficial for the anti-shale coalition – were it not for growing awareness and opposition to shale gas there would not be anti-shale coalitions but only isolated opponents. The way public opinion combines with external events was also of great importance, with these trends coinciding with the Preese Hall earthquake in 2011 and the Balcombe protests in 2013. Furthermore, the apparent decrease in intensity of feeling that occurred from around 2016 could be attributed to the fact that time had moved on from such significant events, with only smaller scale protests happening in the meantime, while other political developments such as the UK's vote to leave the European Union distracting attention away.

Resources

Resources meant very different things for the two coalitions. The pro-shale coalition privileged finances and industry experience, while the anti-shale coalition prioritised organisational abilities and the size of their membership. Both coalitions valued expertise, with the importance of this growing as time went on.

The three pro-shale coalitions fared similarly with regards to financial resources. Each could boast rich – yet impatient – investors, but all three were lossmaking entities, with IGas being in a more perilous position than Third Energy, who were themselves less financially sustainable than Cuadrilla. Cuadrilla's greater resources can be demonstrated by their far greater level of activity: they made applications at six different shale sites, while IGas made two and Third Energy only had one. Cuadrilla, as the only company to have conducted a hydraulic fracturing operation in the UK, with

gas production in the Netherlands and employees with decades of experience throughout the world, also professed greater expertise than the other operators.

Indeed, in the absence of an external event favourable to the anti-shale coalition, a reasonably resourced pro-shale coalition is overwhelmingly likely to gain planning permission. This, when considered alongside the external events variable, explains the subsequent failure of Cuadrilla in 2014 and the successes of Third Energy and IGas in 2016 and 2017. In addition to this, it was Cuadrilla's resources that enabled them to pursue a lengthy and costly appeal process for each of their rejections and ultimately gain planning permission. Nevertheless, resource constraints also meant that they were unable to meaningfully develop any of the sites after the appeals were completed.

As the planning process became more contentious, the amount of resources committed by each coalition increased significantly. At Kirby Misperton both coalitions submitted enormous amounts of expert studies to planning committees. At Tinker Lane, both coalitions invested heavily in engaging and building support amongst local people. The anti-shale coalition appear to have been more successful at this, but the pro-shale coalition did just enough to get planning permission, even If they were rarely able to do much beyond that.

The anti-shale coalition had to use their resources more effectively than the pro-shale coalition if they were to succeed. The resources also need to be deployed when public opinion is opposed to shale gas or when an external shock has occurred, otherwise their value decreases rapidly. Grange Road demonstrates that the most important resource for the anti-shale coalition is the ability to organise and build a large membership. Friends of the Earth played an invaluable role in coordinating different actors and instigating protests and this – supported by convenient timing – paid off, even though the coalition placed little emphasis on demonstrating expertise. The anti-shale coalition at Kirby Misperton – who were, if anything, even better resourced than that at Grange Hill – attempted far more of an insider approach and were unsuccessful.

Resources are an important variable. However, for both coalitions the extent to which resources will achieve success depends on the balance of external shocks and public opinion. If there are no external shocks and public interest is low, the pro-shale coalition will succeed with resources alone. However, the pro-shale coalition were still limited with financial resources and in technical expertise – nobody had produced shale gas in the UK before – and their limitations meant that they repeatedly were able to overcome planning opposition only to be unable to develop the sites.

Relationships with policymakers

Amongst its opponents, shale gas policy was often portrayed as a collusion between business interests and government. At first glance, this makes perfect sense: the idea of an "economic feasibility coalition" dominated by energy companies and their political allies in opposition to environmental campaigners was well-established (Sabatier, 1988, p. 140). When we think of the political activities of oil and gas companies, we often think of ExxonMobil's messaging on climate change or the repercussions of the 2010 BP oil spill in the Gulf of Mexico (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; Supran and Oreskes, 2017). Cuadrilla Resources, IGas Energy and Third Energy, while oil and gas companies, operated on an entirely different level from these companies. Expertise has been established as an important means by which actors can gain access to policymakers (see Culpepper and Reinke, 2014, p. 442; Pappi and Henning, 1999, p. 265; Rasmussen, 2015, p. 370). Moreover, it has been acknowledged as being as important aspect of the ACF (see Leifeld, 2013, p. 181; Rozbicka, 2013, p. 848; Sabatier, 1988, p. 143) With unconventional oil and gas production and large-scale hydraulic fracturing being relatively new developments, none of these three companies had much expertise to offer. Indeed, when the government wanted more information, they approached actors such as the British Geological Survey, the Royal Society or the Royal Academy of Engineering.

The three companies studied were highly dependent upon the UK government to create favourable conditions for them but had little they could offer in return until they were able to achieve commercial development of shale gas. With the exception of Cuadrilla, who could demonstrate more meetings and better access than anyone else, the relationship between government and company was largely one way. When it came to getting applications accepted by the local authority, Cuadrilla's somewhat privileged relationship with the UK government did not appear to make a meaningful difference: Cuadrilla, after all, had their Grange Road application rejected.

Similarly, a privileged relationship with local politicians was something the companies pursued but rarely achieved. When achieved, however, it may make a slight difference. At Tinker Lane, IGas made a far more concerted attempt to ingratiate policymakers than Cuadrilla and Third Energy at Grange Road and Kirby Misperton respectively. This may have paid off: councillors began the process highly disgruntled at IGas's previous unauthorised building activity, but the company's efforts to meet all local politicians and offer site visits – as well as their ability to explain their work and intentions in a far clearer and more compelling way than Cuadrilla and Third Energy – appears to have done just enough to get them planning permission. That being said, the fsQCA demonstrates that relationships with policymakers, while nice for the pro-shale coalition to have, was not

necessary in all cases. It becomes more necessary, however, when the pro-shale coalition has limited resources.

The anti-shale coalition initially pursued an "outsider strategy" (Binderkrantz, 2005). For the most part, they attempted to build a movement, assembling a large and varied coalition of environmental campaigners and local residents, with the occasional use of disruptive and confrontational tactics. The "bad governance" frame, in which the anti-shale coalition government's determination to railroad shale gas development was held as a threat to democracy and accountability, was an important aspect of the anti-shale coalition's arguments (Bomberg, 2015, p. 11). This innate scepticism meant that in many cases engaging policymakers was, initially, a secondary concern for the anti-shale coalition. Meeting with the UK government, who gave every impression of being immovable in their support for shale gas, was barely even attempted.

However, "insider strategies" became more important to the anti-shale coalition as time moved on and as they gained more resources in the form of technical expertise. The focus shifted to providing their own research to committees and actively participating in committee meetings and oral evidence sessions. This was most marked at Kirby Misperton and Tinker Lane, where the anti-shale coalition were unable to achieve their stated goal of preventing planning permission being granted, but the delays brought about by their participation can be considered a partial success considering the reputational damage inflicted upon shale developers and their ultimate inability to follow up planning permission with development.

Summary of variables

The four variables cannot easily be considered separately, with their interactions as well as the characteristics of the variables themselves playing an important part in determining results. In fact, this is the reason for my conclusion that the outcome of shale gas applications can be attributed to a combination of different factors.

Generally speaking, if there is an external event that helps confirm the idea of shale gas as dangerous or anti-democratic, such as an earthquake or a protest with mass-arrests, it will shift the dimensions of public opinion in a direction that favours the anti-shale coalition. This will increase their membership, giving them greater resources. The exercise of these resources, plus the fallout of the external shock itself, will cause decisionmakers to question their pre-existing beliefs, as well as the viability of decision frameworks slanted in favour of the pro-shale development.

Without these developments, and their corresponding impacts on public opinion, the anti-shale coalition needs to do little in order to win. Exercising a moderate amount of resources will be

enough. However, there was a very small window of opportunity in which this could be achieved. The importance of the totemic events declined rapidly.

With a recent external shock, the anti-shale coalition is much stronger, and this requires a stronger pro-shale coalition. However, with moderate distance from the event and enough resources or enough access to policymakers, the shale coalition will usually be able to succeed, even if the anti-shale coalition uses their resources efficiently. However, this process was more often than not enough to exhaust the pro-shale coalition's limited resources. In all three cases studies planning permission was granted after a lengthy process but the site remained undeveloped due to the operator's technical and financial limitations.

Hypotheses

Hypothesis 1: Local authorities were not responsible for delays in the application process.

My first hypothesis was that the delays in the application process were not because of the actions – or inaction – of local authorities. The research conducted here supports this contention. Local authorities were not regularly obstructing, delaying or refusing applications. Many of them were certainly concerned about the high levels of unpopularity of shale gas among their constituents, but they were also generally aware that the mere unpopularity of a development was not sufficient grounds for it to be refused. There was a brief flurry of defiance where Lancashire County Council rejected a flurry of applications in 2014, but the resigned attitude of the planning committee at Kirby Misperton was far more reflective of local authority planning committees both before and after this period. Many of the committee members expressing doubts also knew that refusing a planning application would only set them up for a drawn-out appeal process or have the application called in by the Secretary of State for Communities and Local Government.

Lancashire County Council were the only local authority to refuse planning permission for an application. However, given that the most resistant local authority was also the only one that had applications proceed to fracking, it seems clear that local governments were not the roadblock they were perceived to be. The failure of developments to progress in Nottinghamshire and North Yorkshire cannot be attributed to local government opposition. In these locations applications were accepted with relative ease, but operators made little progress beyond this point.

Of course, the shale developers were already unable to make much progress before this change of circumstances. Here, the pro-shale coalition might once more point to obstructive local authorities or protestor activity, but this does not explain the failure to develop sites which were granted planning permission or those where the police stepped in to clear protestors and give developers

access to the site. Instead, this failure seems more likely to have arisen from the developers' lack of expertise, their financial problems or ability to identify locations that were geologically and technically unsuitable for shale production.

Hypothesis 2: Public opinion did not directly impact a shale gas application's likelihood of success.

Hypothesis 3: Public opinion had an indirect impact on an application's likelihood of success by shaping the membership and resources of advocacy coalitions.

Both the fsQCA and the case studies support hypothesis 2. The fsQCA showed that the public opinion played a somewhat muted role across applications and was not heavily correlated with the success or failure of an application. The case studies supported this by documenting that decision-makers were aware of public opinion, but that in general they were aware that this was not something they were supposed to consider when deciding to grant or refuse planning permission.

However, public opinion should not be dismissed entirely, as there is a great deal of evidence supporting hypothesis 3. The case studies showed that strong anti-shale coalitions tended to form where opposition to shale gas was fierce. An external event – most importantly the Preese Hall earthquake and Balcombe protests – increased public awareness of shale gas. There was always, at the very least, a significant minority of those aware of shale gas who were opposed to it. This increased the pool of potential "recruits" for anti-shale coalitions. The strength of the anti-shale coalition – represented by the resources variable – affected their likelihood of success, but this was relatively muted. An application where an anti-shale coalition existed could be rejected – this never happened where an anti-shale coalition did not exist – but strengthening an anti-shale coalition did not necessarily guarantee rejection. Instead, where a coalition augmented its resources by attracting members or hiring consultants to conduct research, the pro-shale coalition would increase the resources it devotes to the application service by increasing the volume of its own research and public engagement. This led to a sort of "arms race" between coalitions, meaning that increasing resources beyond a certain point failed to shift the balance between them. This means that while public opinion played an important part in shaping the resources of coalitions, it only made the anti-shale coalition slightly more likely to succeed in the application process. However, the attrition this opposition inflicted upon the pro-shale coalition during this severely stretched their resources and limited their ability to develop the site after gaining permission.

Hypothesis 4: The pro-shale coalition's relationships with policymakers did not affect an application's likelihood of success.

The fsQCA study showed that the pro-shale coalition did not need a strong relationship with policymakers – either at a local or national level – to be successful. The case study of Tinker Lane supports this, showing that IGas succeeded despite muted interest from the UK government and a local government that was openly scathing of their previous conduct. However, while this played little part in determining the outcome of applications, it does not mean that the anti-shale coalition's fears about developers benefiting from friends in government were entirely unfounded. It was largely outside the scope of this research, but it is possible that this relationship might have influenced the rules by which applications were to be decided, even if it did not influence the decision-making process of individual applications.

Implications for the advocacy coalition framework

In this research I altered the advocacy coalition framework in three major ways. Firstly, I replaced policy core beliefs as the glue holding a coalition together with secondary beliefs. Secondly, I stated that coordination would be defined as the sharing of information. Thirdly, by focusing on application processes I reduced the emphasis placed on observing subsystems over a decade or more – sometimes reducing it to a period of a couple of years. In addition to these alterations to the framework itself, I also set out a more systematic means of studying policy change stemming from external events, studying the events themselves and how they trigger and interact with other variables.

There is a great deal of research which has demonstrated that shared policy core beliefs can play an important role in coalition formation. However, this research demonstrates that shared secondary beliefs can go far beyond producing mere "coalitions of convenience". People opposing shale gas development on environmental grounds and those opposing it on "nimby" grounds such as traffic and house prices, were shown to have cooperated intensely, often over a period of several years. They shared information, conducted research together, adopted the other's beliefs into their discourse (and perhaps into their own beliefs) and adopted lobbying practices that might be more commonly associated with the other group, with "nimbys" joining environmental activists on protests and environmental activists participating in local government committee meetings. This demonstrates that shared secondary beliefs – if accompanied by a sufficient level of coordination, such as extensive information sharing – can be sufficient for an advocacy coalition to be formed.

As discussed in the advocacy coalition framework chapter, there is little consensus on how coordination should be defined or the extent to which it should be considered. Clearly, some form of coordination is required in order to ensure that an advocacy coalition is more than a collection of like-minded individuals and organisations but the way coordination is measured will by necessity

vary - evidence of internal interactions is not always easy to obtain and the researcher will often have to make use of what is available. For advocacy coalitions in the shale gas subsystem, information sharing proved sufficient. The technical nature of debates ensured that there was a lot of information being shared, and the motives for it being shared could be identified. Coordination measured through information sharing alone is far too weak a means of identifying an advocacy coalition. Information was also shared with planning committees to influence their decisions and with the public to win their support. However, my research here demonstrates that when information was shared between actors with shared secondary beliefs it was with the aim of helping them turn these beliefs into policy outcomes.

Avoiding Sabatier's emphasis on policy change over a decade or more was initially done more through necessity rather than choice. There is clear value in setting such a broad time perspective, though I have demonstrated in this study that the advocacy coalition framework can prove valuable even in situations where considering policy across a decade or more is not possible. Shale gas in the United Kingdom is a relatively new policy area, and many of the coalitions studied – particularly the anti-shale coalitions – only began to emerge between 2011 and 2015. However, while Sabatier's requirement makes sense when considering the entire policy process – including analysis and review of policies – I was only interested in the decision-making phase of shale gas applications. As such, the focus on a shorter time frame did not hinder my work.

Finally, using external events, relationships with policymakers, resources and public opinion as explicit variables was not a great departure from advocacy coalition framework orthodoxy. Sabatier (1988, p. 148) states than an external shock can change other external conditions – such as public opinion – and impact the resources and constraints – such as relationships with policymakers – of an advocacy coalition. These can all combine to produce policy change.

Choosing to focus on these as discrete variables allowed the ACF to be compatible with the fsQCA, and I carried it into the case studies to enable easier comparisons. Using the advocacy coalition framework to identify coalitions and identify an event-based pathway to policy change proved to combine well with the fsQCA. Together, this helped identify policy change and the actors involved in, as well as the variables driving that change and the extent to which they were responsible.

Conclusion

Summary of thesis and findings

The aim of this thesis was to find the factors shaping the outcome of shale development applications made to local authorities. The UK government's suggestions that delays in this process – and in turn the overall failure of shale gas – could be attributed to local government intransigence were not convincing, and based on my preliminary research it seemed that the activities and interactions of the broad range of actors active at the local level could provide a better explanation for this outcome. To better explain coalition dynamics I added two sub-questions: 1) what role did coalitions play in the outcome of applications and 2) to what extent did factors external to coalitions affect their behaviour and influence outcomes?

I answered these questions by using an adapted advocacy coalition framework (ACF). The ACF is a useful framework for understanding policy subsystems featuring a large number of actors and the ways they can influence policy change. However, there were some aspects of the ACF that were ill-suited for answering my research questions, leading me to offer three amendments. Firstly, I assigned actors to coalitions on the basis of shared secondary beliefs rather than shared core beliefs as this better reflected the ways in which actors with different worldviews and backgrounds collaborated with each other. Secondly, I considered coordination in a more deliberate manner, requiring clear and obvious signs of information sharing. Thirdly, I argued that the ACF's requirement to consider policy change "over a decade or more" could be overlooked and that the ACF can be a useful means of assessing policy change in new and emerging subsystems or established subsystems with new and emerging coalitions. Having reviewed the ACF I then introduced four hypotheses:

H1. Local authorities were not responsible for delays in the application process.

H2. Public opinion did not directly impact a shale gas application's likelihood of success.

H3. Public opinion had an indirect impact on an application's likelihood of success by shaping the membership and resources of advocacy coalitions.

H4. The pro-shale coalition's relationships with policymakers did not affect an application's likelihood of success.

To test my hypotheses and answer the research question I conducted an fsQCA study in chapter 5. I used this methodology to determine the extent to which external events, relationships with policymakers, resources and public opinion – or combinations of these variables – enabled pro-shale and anti-shale coalitions to influence planning committee decisions at nine sites in the UK. Afterwards, I carried out case studies of applications made by Cuadrilla Resources at Grange Road in Lancashire, Third Energy at Kirby Misperton in North Yorkshire and IGas Energy at Tinker Lane in

Nottinghamshire (chapters 6-8). The fsQCA outlined broad combinations of variables that were necessary or sufficient for pro-shale and anti-shale coalitions to succeed or fail during the application process. The case studies helped me evaluate these results more thoroughly, providing causal explanations for the relationships identified by the fsQCA. In chapter 9, I brought together the fsQCA and case studies and to reviewed these combined results.

The presence and strength of coalitions proved to be critical in shaping the outcomes of the applications under review. This was most obvious on the part of the anti-shale coalition. Indeed, the absence or presence of these coalitions was itself significant: in the cases studied the pro-shale coalition were always successful where an anti-shale coalition did not exist. The emergence of an anti-shale coalition challenged limited resources of the pro-shale coalition, who devoted increasingly more time and effort to countering the anti-shale coalition's arguments and attempting to win over the public. The anti-shale coalition was helped by its ability to establish coordination across a wide range of actors, with local residents and environmental campaigners – two groups with different motivations for opposing shale gas – effectively sharing information and co-opting the others' reasons for opposing shale development.

However, the outcomes of planning applications cannot be explained by the characteristics of coalitions alone. It was the combination of external events that raised the profile of shale gas or made it seem unsafe and bolstered the anti-shale coalition. As discussed in chapters 5-8 the Preese Hall earthquake and public concerned manifested through the Balcombe Protests led to the formation of anti-shale coalitions and drove more members and resources towards them. I demonstrated how the failure of shale gas in the UK can be explained as arising from a combination of factors in internal to the coalition and external factors. More specifically, I addressed four related hypotheses linked to explanations for the stagnation of UK shale policy.

Evidence from the fsQCA and case studies supported hypothesis 1: that the prolonged application process could not be attributed to obstructionism from local authorities. Local governments, while often sceptical towards shale development, rarely refused planning applications. Indeed, many of them were fearful of being seen as intransigent by the UK government and were careful to clarify that public opinion, the level of opposition and impact on house prices (one of the most energising reasons behind opposition) could not be material factors in their deliberations. It is true that the length of planning processes increased greatly from 2013 onwards, but this is because this period coincided with a sharp increase in anti-shale coalition resources. They used these resources to submit objections, supply their own scientific research and appear at committee meetings, while the pro-shale coalition responded to this in kind. This meant planning committees had enormous

volumes of technically complex information to consider, and it was this rather than a willingness to obstruct development that resulted in prolonged planning processes.

Public opinion had received a great deal of attention in studies of shale gas (see Evensen et al., 2017; Howell, 2018; Stedman et al., 2016). This coverage, as well as the gradual shift of public perceptions from positive to negative, illustrated the importance of discerning the extent to which public opinion had an impact on policy outcomes. In hypothesis 2, I outlined my expectation that public opinion did not have a direct impact on shale gas application's likelihood of success. This was supported by my case studies – particularly the Kirby Misperton study – where I found that councillors were aware of public opposition but did not treat it as a material factor in their decision-making. The case studies also made it clear that the balance of public opinion moved decisively against shale gas from 2015 – 2017, yet this was a period where no applications were rejected.

Despite the absence of this direct impact, I found strong evidence in the case studies and fsQCA confirming hypothesis 3: that public opinion had an indirect impact on application outcomes by shaping the membership and resources of advocacy coalitions. The initial stages of shale gas development had no anti-shale coalitions. This meant that the pro-shale coalitions were unopposed during the application process and even very significant applications – such as that to carry out hydraulic fracturing at Preese Hall – were accepted with very little delay. Over time, larger sections of the public became aware of shale gas, and views of shale gradually moved from positive to negative, with more of the public holding negative views than positive by 2016 (O'Hara et al., 2016, 2015a, 2015b). Even when views of shale gas were mostly favourable, the increasing awareness meant that the absolute number of opponents increased. This opposition led to the formation of anti-shale coalitions which gradually became more powerful and obtained more resources over time, allowing them to contest applications. The anti-shale coalitions only had a limited number of successes in actually preventing planning permission from being granted, but at the very least they were able to inflict serious delays on the pro-shale coalition.

In hypothesis 4 I suggested that the pro-shale coalition's relationships with policymakers did not affect an application's likelihood of success. This was primarily confirmed by the fsQCA, where I found that the main determining factors for success were pro-shale coalition resources and the absence of favourable public opinion and external events for the anti-shale coalition. Relationships between producers (the main component of the pro-shale coalition) and policymakers produce positive policy outcomes if the producer can demonstrate technical expertise and successful past collaboration. This was not the case for the pro-shale coalition: they were new to technically demanding areas and were unable to develop their sites after gaining planning permission. They

lacked the technical expertise and past collaboration that would enable them to have meaningful outcomes from their closeness to policymakers.

The combination of these hypotheses helps me arrive at an answer to the overall research question. The outcome of shale gas applications can be explained by a specific combination of factors linked to coalition resources, coalition dynamics and the way coalitions were affected by external events and public opinion. Resources, particularly money and technical expertise, proved important. There was a lack of resources on the part of the pro-shale coalition, exacerbated by the role of external events and public opinion in augmenting the resources of the anti-shale coalition. Despite gaining planning permission more often than not, meaningful development rarely occurred: the pro-shale coalition got what they wanted from the regulators but lacked the financial resources and technical expertise to go much further beyond gaining planning permission, while the delays inflicted by the anti-shale coalition put them under pressure from their investors and creditors and caused reputational damage. This opposition from the anti-shale coalition required more investment from the pro-shale coalition during the planning phase, and the act of overcoming it put them under a great deal of strain.

I have noted that resources were important for the anti-shale coalition too. In particular, their acquisition of technical expertise that allowed them to move "inside" and start being taken seriously by planning committees. This access did not necessarily result in them achieving their goal of having planning permission refused, but it went some way towards delaying and drawing out the application process, which was just as successful for them in the long run due to the resource constraints of the pro-shale coalition and the fact that the developers relied on investors with limited patience (Carrington, 2016).

They were able to do mount this opposition thanks to external events. Initially, interest in shale gas was so limited and the pro-shale coalition had no difficulty in achieving planning permission during the early phase of this study. It was only after the Preese Hall earthquake in 2011 that anti-shale coalitions began to form, while the 2013 Balcombe protests drove even more resources to the anti-shale coalitions. The result was a sort of application "arms race" as the pro-shale coalition invested more resources into their applications in turn. The case studies regularly refer to the importance of these events, with the Preese Hall earthquake embedding the risk of earthquakes and groundwater pollution the minds of shale opponents and the Balcombe protests making front page news and providing an early example of collaboration between local residents and environmental campaigners.

In addition to shaping the arguments and providing inspiration for the anti-shale coalition, these events contributed to decisive shifts in public opinion. As more people learned about shale and as people began to oppose it, more of them joined anti-shale coalitions. This can be observed in the dramatic increase in anti-shale coalition activity brought about by external events and public opinion.

In summary, the outcome of local shale developments can be explained by a combination of factors occurring at the local level. Shale developers were unable to develop the sites they gained access to. This was partially because they lacked the financial resources and technical resources to do so, but also because these resources were diluted by those in the anti-shale coalition, who contested and prolonged planning applications. The anti-shale coalitions formed and obtained their own resources through the combination of external events and public opinion.

Empirical contribution

There has been some significant research into UK shale gas, generally focusing on the three themes of public perceptions, discourse, and planning and regulation (Evensen, 2018). Much of this work, particularly in the first two categories, proved highly useful when writing this thesis. However, comparatively little has focused on developments at the local level. The findings of this thesis will contribute to this body of work by combining what is already known about national-level developments with a detailed exploration of shale gas politics at the local level, across a variety of times and locations.

This thesis supported the findings of several of the studies of UK shale that I relied upon. First, and most importantly, my study supports previous findings that pro-shale and anti-shale coalitions existed and were active (Bomberg, 2015; Cairney et al., 2016). Additionally, the fact that rhetoric around energy security remained consistent regardless of fluctuations in oil import prices supports Van De Graaf et al's (2018) contention that energy security is not related to shale gas policy outcomes. Furthermore, my findings on public opinion leading to the formation of anti-shale coalitions supports Van De Graaf et al's conclusion that rising public concern is associated with anti-shale policy outcomes.

I found that the patterns of information sharing identified by Cairney et al (Cairney et al., 2016) were also evident throughout my cases. Technical information was shared widely within coalitions. In particular, the lengthy rebuttal letters sent to and from opposing coalition members following their consultation responses provides a great deal of evidence of technical information being shared between coalitions. Political information was kept within coalitions, where it was shared widely, with better resourced groups such as Friends of the Earth playing an important role in disseminating

lobbying and campaigning strategies. Finally, my findings support work by Cotton et al (2014) who find that government rhetoric on shale gas focuses on economic opportunities, strong regulation and benefits for local communities yet downplays environmental implications. My case studies in particular supported this finding but would also extend it to the rhetoric of the pro-shale coalition more generally.

My own empirical contribution is to build upon this work in order to provide more detail on the local developments. The most important part of the planning process was the application made to local authorities, so providing more information on the factors shaping these decisions is of value. Indeed, the importance of the local level was recognised by the UK government, who placed the blame for setbacks on local governments (see Department of Energy and Climate Change, 2015a). This contention was supported by Whitton et al (2017, p. 16), who wrote about a "sluggish County level planning system" which "frustrates industry", though the extent to which local government was responsible for these outcomes was contested by Cotton (2017), who instead attributed delays to the UK government's austerity regime.

I agree that the planning process inflicted several delays upon the pro-shale coalition and potentially proved decisive in their failure to develop sites. However, I found little evidence local authorities wilfully delaying planning applications or underperforming. Instead, I found significant evidence of local authorities that were careful to consider evidence from both sides and were wary of being perceived as biased or obstructive. In short, my findings do not support the claim that local governments were responsible for these delays, or the failure of UK shale gas policy more generally. My primary empirical contribution is to outline alternative explanations for the outcome of applications by highlighting the role of coalitions, their characteristics and factors affecting these coalitions and the way in which these aspects combined and led to the failure of UK shale gas policy.

Public perceptions of shale gas and hydraulic fracturing are another important theme of UK shale gas research. Scholarship comparing knowledge and support for shale gas and fracking across the UK and US by Stedman et al (2016) and data collection of perceptions of shale gas across a wide range of themes such as energy security and environmental sustainability by O'Hara et al (2016, 2015a, 2015b) forming an especially important basis for this thesis. My contribution in this area is to build on this work by examining the extent to which there was a relationship between public perceptions of shale gas and policy outcomes.

I found that public opinion had limited direct impact on application outcomes – decisionmakers noted that it should be excluded from their deliberations and the fsQCA confirms that they did so – but it did play an important indirect role, bringing about greater awareness of the anti-shale

coalition's cause. More people became aware of shale gas and its risks, which increased the pool of potential coalition members even though the public was not largely opposed to shale gas at first. The spike in awareness of shale gas following the 2011 Preese Hall earthquake underlines the importance of external events: the impact this had on public opinion was responsible for the formation of many anti-shale coalitions (see chapter 6 in particular). While I find evidence from 2009-2015 that confirms Stedman et al's (2016) finding that increased knowledge of shale is associated with increased support, I also found that opposition to shale increased in absolute terms and this was sufficient for anti-shale coalitions to form, supporting the similar conclusion from Bradshaw and Waite (2017)

Conceptual contribution

The adaptations I made to the ACF have helped expand our understanding of the framework and its application, particularly regarding how it should be applied to nascent and controversial policy areas characterised by emerging coalitions and expert dissensus. This application need not only be in the field of shale gas or energy or environmental politics. These revisions could also be applied to other contested and emerging fields such as biotechnology, artificial intelligence and machine learning, and the policy implications of the ongoing coronavirus pandemic. These the kind of new and emerging policy areas that are likely to have coalitions that are still forming or are not fully formed.

In this thesis I offer four important amendments to the ACF:

1. In this study transferring the belief requirement for an advocacy coalition from core beliefs to secondary beliefs provided an approach that is conceptually neater and can result in a more reliable explanation of outcomes. Privileging secondary beliefs contrasts with Sabatier's (1998, p. 109) argument that shared policy core beliefs are the principal "glue" of coalitions. Previous allusions to "coalitions of convenience" show that the notion of actors with different core beliefs cooperating has been accepted by scholars (Sabatier and Jenkins-Smith, 1993, p. 27). However, such cooperation was generally understood to be more short-term. I changed the parameters of coalition membership for this thesis because – as I explain in chapter 3 – I was not convinced by the ACF's assertion that actors with differing core beliefs could not form coalitions and that any cooperation between them would be short-term.

I decided to make this adjustment on the basis of anomalies raised by Cairney (1997, p. 892) and Olson (2009, p. 172), who both found examples of cooperative activity from actors with differing core beliefs. This did not easily fit within the parameters of Sabatier's framework. Indeed, referring to fracking in 2015, Cairney et al (2016, p. 9) noted that "it is not easy to say if early cooperation

represents short term 'coalitions of convenience', based on very specific beliefs about current developments in fracking, rather than advocacy coalitions that remain stable for many years". Following my study, I still would not definitively conclude that the advocacy coalitions I observed will remain stable for years. But assigning actors to coalitions on the basis of secondary beliefs produced coalitions that had much more explanatory power than those that would have arisen if the requirements of the ACF were followed strictly. Had I stuck to the conventional requirement for coalitions to be limited by core beliefs, I would not have had an anti-shale coalition but a "nimby" coalition and an anti-pollution/climate change coalition. Given the amount of cooperation between these two factions, placing them in different coalitions would not be an accurate reflection of observed coalition behaviour.

2. There is a risk that creating coalitions on the basis of shared secondary beliefs could be too inclusive and unwieldy to study. This leads to my second conceptual contribution: coalition coordination. Measuring coordination by information sharing is by no means new (see Stritch, 2015, for example). However, as highlighted by Weible et al (2009, p. 131), ACF studies have all too often overlooked coordination altogether. I argue that coordination should be brought to the forefront in advocacy coalition scholarship. There must be a state of mind serving as the motivation for getting involved, but there must also be some form of action for coalition membership to be meaningful. Coordination provides one important measure of that action.

Coordination is dealt with in most ACF studies in a tangential or implicit manner. Coordination must be considered more explicitly, otherwise an ACF study has no explicit limiting factor beyond beliefs when assigning actors to coalitions. This could potentially lead to coalitions featuring – for example – highly active campaigners and passive observers watching the news and agreeing with their actions. This does not happen in ACF studies, implying that some measure of coordination is being used. However, a review of uses of the ACF by Weible et al (2009, p. 332) found that very few of these studies even mentioned coordination. The fact coordination is applied but there is no real explanation of how it is being assessed, defined or measured causes problems when attempting to test or replicate studies.

My chosen method of identifying coordination is through the sharing of technical and political information, which was useful in this study due to the volume of exchanges of this nature. It was also relatively easy to identify and measure in a systematic manner. This sort of measurement need not be the only approach taken to coordination. For instance, Weible (2007, p. 106) asked actors

who they regarded as allies in order to identify coalitions. However, the approach I took offers an alternative measure which does not rely on actors' own perceptions or memories.

3. My third contribution challenges Sabatier's requirement to only consider advocacy coalitions and subsystems only over a "decade or more". There are valuable reasons to consider things over such a horizon – to have critical distance, to study slow-moving developments, to understand the impact of gradual socio-economic fluctuations or to evaluate policy post-implementation. However, some policy areas may not last ten years, and these should not be excluded from evaluation. It is of clear interest to find out why shale gas, following such intensive government interest, fizzled out so quickly, and the presence of a wide range of actors and exchanges of information make the advocacy coalition framework a promising means of studying this. Yet, the shale gas policy subsystem barely lasted ten years, and depending on where the line is drawn between nascent coalitions and fully-formed advocacy coalitions, it may have been significantly less than that. Policy change can be long and drawn out, but it can change also in an instant. The reasons for considering policy change over a decade or more are compelling, but my study has demonstrated that it is not necessary for a thorough and useful advocacy coalition framework study.

4. Finally, in this study I have expanded upon the external events route to change of the advocacy coalition framework. To review, this route refers to situations where external perturbations such as changes in socio-economic conditions or governing coalitions affect the resources of coalition actors and the constraints they operate under (Sabatier, 1988, p. 148). I have expanded this dynamic by considering how these external events interact with three other variables: public opinion, relationships with policymakers and resources. External events can trigger ramifications, but these can loop back on each other and continue to influence each other long after the initial external event. For instance, long after the 2011 Preese Hall earthquake occurred, its aftershocks were still affecting the other variables and the way these variables affected each other. I have tried to model that by considering the other three variables alongside external events and using the fsQCA to show how different combinations of these variables can lead to policy change.

Limitations of the study

In this study I relied entirely upon documentary evidence. My decision to do so, rather than conduct interviews, could be questioned. Interviews have commonly been used for assessing issues such as access to policymakers and coalition networks. Indeed, many of the studies I refer to in the conceptual framework rely on interviews in order to derive their conclusions. For instance, Weible

(2007, p. 103, 2005, p. 465) used interviews to identify potential coalition members and to understand the relationship between control of financial resources and the ability of a coalition to influence policymakers. Dolan (2003, p. 223) used interviews to find the preferred strategies of coalition members.

These approaches were useful, but my focus was less on the perceptions of actors and more on attempting to establish – as closely as possible – an objective reflection of resource dependencies, coordination and other coalition dynamics. The consultation responses and other documentary sources I used instead of interviews were more suitable for my purposes. They provided more systematic data; they were available across different cases and they were less dependent on my own access to interview subjects. Moreover, some time had passed since several of the applications being studied were lodged. There is strong evidence that the behaviour and views of actors change over time and interviews cannot easily be separated from the context in which they are given (Burawoy, 1998). I wanted to find out what the views of the actors were during the approval process rather than what they were at the time of an interview. Consultation responses, outlining actors' reasons for supporting or opposing shale applications seemed to be a reliable assessing contemporaneous views.. Moreover, consultation responses across different applications illustrated changes in beliefs over time, while the way in which similar details appeared in different groups' responses and objections offered good evidence of coordination.

There are also potential limitations in my decision to carry out three case studies. This thesis is not a population study and there will undoubtedly be important occurrences at other drilling sites that have been omitted. However, I would contest this on two grounds. Firstly, my selection of cases is representative: the three case studies cover three companies across three local authorities. Secondly, I considered every proposed shale drilling site in the UK for my fsQCA. As a result of this, data collection was equally thorough for the sites addressed in the case studies and those that were not. It was on the basis of this information gathering that I was able to make an informed decision about which case studies to consider, while issues pertaining to other sites are represented in the

The fsQCA is also a method which brings with it a number of potential limitations. For instance, the categorising of outcomes and the four variables is inherently subjective. In the fsQCA chapter I set out the criteria by which each of these would be given a value between 0 and 1 (generally on the basis of the extent to which it was beneficial to a given coalition). I have attempted to make this process and my reasoning as accountable and transparent as possible. To achieve this I include Appendix 1 which provides brief explanations of my reasoning for every valuable assigned across the eighteen cases considered. Appendix 2 lists documents used to inform these decisions for each

planning application. If I were doing this as a collaborative project rather than as a doctoral thesis I would have benefitted from getting collaborators and co-authors to verify my calibrations, as this has been widely used as a means of safeguarding fsQCA studies.

Areas for future research

In this thesis I identify several key factors linked to local applications and the involvement of advocacy coalitions at that level. It is possible that these developments might have played a decisive role in the failure of UK shale gas as a whole. However, I also find that local developments alone are unlikely to explain this failure. Much of the material in the case studies suggests that the national government losing interest was also significant. The role of government interest is not something I tested for or initially expected but evidence for this arose as I conducted my research. Further study exploring internal reasons for the government's shifting attention and agenda would be welcome. Matters such as party politics, administrative capacity and/or agenda setting are all areas that could be approached more directly.

In addition to looking at another level of government, future research could also broaden the geographic scope of investigation. At the outset of my research I planned to examine to shale gas in Scotland, where the government's proposed fracking moratorium was under review. I eventually decided not to include this as my focus moved towards studying areas where drilling applications had actually been made, but the reasons for the Scottish government decision could be studied in future. This wide range of consultations submitted, as well as the professed interest of many Scottish coalbed methane[80] operators in shale gas, suggest that this could be a fertile area for an ACF study. Such a study could also provide a promising opportunity to further test the variables identified in this thesis.

Another area of interest prompted by my study is the role of national government's power over local government. Establishing shale gas was the professed reason for the government's use of its calling-in power[81]. Although not frequently invoked, this power remains, and the prospect of its use has continued to be contentious. Further research could study subsequent use of the government's power to call in applications. The 11 March 2021 decision to call in the planning application for the West Cumbria Coal Mine is a recent high-profile use of this power. It would be of interest to find out about the other uses of this power, namely why it was used and its implications for centralisation.

[80] Another form of unconventional production, where gas is extracted from coal beds. There is some production in central Scotland.

[81] This is the power enabling the Secretary of State for Housing, Communities and Local Government to take planning decisions that would normally be considered by local governments.

My study also raises prospects for further conceptual research. In particular, the changes made to the advocacy coalition framework also point to some potentially intriguing avenues. In this thesis I found that the anti-shale coalition consisted of "Nimby" members and environmental campaigner members. While they had shared secondary beliefs, they entered the process with different core beliefs. Nevertheless, there was evidence of both types of coalition members adopting the discourse of the other. One area ripe for further research is the extent to which this adoption was for the purpose of achieving their policy goals, or because they genuinely had their beliefs altered through cooperation with people with differing views and exposure to their beliefs. Such an investigation would probe further into movements opposing shale gas but it would also provide information about coalition behaviour as a whole.

Finally, my study has raised questions and avenues relevant for other policy areas. In chapter 2 I identified three pillars of energy policy. Pro-shale actors believed shale would be good for energy security, economic efficiency and environmental sustainability. Anti-shale actors believed the opposite. With hydraulic fracturing and shale oil and gas production at a large scale being a relatively new topic, there was a lack of conclusive research on several of these points. What research existed was often too complex and technical to be interpreted by decision-makers or coalition actors. I see parallels with this and other emerging and controversial technologies where there is expert dissensus and limited understanding among policymakers. Governments across the world are currently adopting and revising regulatory frameworks in areas such as artificial intelligence, gene editing, cybersecurity and cryptocurrencies. On each of these issues it is possible to identify a "light touch regulation" coalition and a "heavy regulation" coalition, based on different perceptions of risk and, at times, a complex array of beliefs. Scholars could use the framework developed here to explore these areas.

Bibliography

Albright, E.A., 2011. Policy Change and Learning in Response to Extreme Flood Events in Hungary: An Advocacy Coalition Approach. Policy Stud. J. 39, 485–511. http://dx.doi.org/10.1111/j.1541-0072.2011.00418.x

Anderson, B., Böhmelt, T., Ward, H., 2017. Public opinion and environmental policy output: a cross-national analysis of energy policies in Europe. Environ. Res. Lett. 12, 114011. https://doi.org/10.1088/1748-9326/aa8f80

Anderson, K.M., Hassel, A., 2015. Winner-Take-All Politics in Europe? The Political Economy of Rising Inequality in Germany and Sweden (SSRN Scholarly Paper No. ID 2610653). Social Science Research Network.

Andrews, I.J., 2013. The Carboniferous Bowland Shale gas study: geology and resource estimation. British Geological Survey for Department of Energy and Climate Change, London.

Andruleit, H., Bahr, A., Babies, H.G., Franke, D., Meßner, J., Pierau, R., Schauer, M., Schmidt, S., Weihmann, S., 2013. Reserves, Resources and Availability of Energy Resources.

Arup, 2014a. Statement of Community Involvement (Roseacre Wood) [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj02NTkxJmZpbGVuYW1lPVxcQ29ycGRhdGEwMlxkYXRhd3JpZ2h0JFxQbGFubmluZ1xMQ0MtMjAxNC0wMTAxXDAwOSBTdGF0ZW1lbnQgb2YgQ29tbXVuaXR5IEludm9sdmVtZW50IGZvciBSb3NlYWNyZSBXb29kIEV4cGxvcmF0aW9uIFNpdGUgYW5kIE1vbml0b3JpbmcgV29ya3MucGRmJmltYWdlX251bWJlcj00ODgmaW1hZ2VfdHlwZT1wbGFubmluZyZsYXN0X21vZGlmaWVkX2Zyb21fZGlzaz0wOC8wOS8yMDE1IDE1OjAwOjI0 (accessed 3.19.19).

Arup, 2014b. FOE Letter [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj02NTg2JmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcQ29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcUGxhbm5pbmdcTENDLTIwMTQtMDA5NlxMY2MuMjAxNC4wMDk2IEZPRSBMZXR0ZXItUE5SICAzMCAwOSAxNCBGaW5hbCBJc3N1ZS5wZGYmaW1hZ2VfbnVtYmVyPTI1MyZpbWFnZV90eXBlPXBsYW5uaW5nJmxhc3RfbW9kaWZpZWRfZnJvbV9kaXNrPTA1LzExLzIwMTQgMTU6MjM6MDM= (accessed 6.27.18).

Arup, 2013. Application withdrawal [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj02MjIzJmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcQ29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcMDUtMTMtMDAyMVwwNS4xMy4wMDIxIExDQyBMZXRfUmUgRXh0ZW5zaW9uIG9mIFRpbWVfVmFyaWF0aW9uIG9mIENvbmRpdGlvbl9Bbm5hcyBSb2FkXzExXzEyLTEzIC0gRmluYWwucGRmJmltYWdlX251bWJlcj04OCZpbWFnZV90eXBlPXBsYW5uaW5nJmxhc3RfbW9kaWZpZWRfZnJvbV9kaXNrPTExLzEyLzIwMTMgMTA6NTU6MjE= (accessed 3.11.19).

Asche, F., Oglend, A., Osmundsen, P., 2012. Gas versus oil prices the impact of shale gas. Energy Policy 47, 117–124. https://doi.org/10.1016/j.enpol.2012.04.033

Atkinson, K., Maslen, S., Lancashire County Council, 2016. Town and Country Planning Act 1990 (as amended) Section 78 Appeal.

Backing Fracking, 2015. Support for Third Energy plans at Kirby Misperton.

Bakhsh, N., 2014. Shale Gas Halted in U.K. by Six-Month Permit Wait: Energy [WWW Document]. Bloomberg.com. URL http://www.bloomberg.com/news/articles/2014-02-20/drill-permits-26-times-slower-than-texas-halt-u-k-shale (accessed 11.22.15).

Bandelow, N.C., Kundolf, S., 2011. Belief systems and the emergence of advocacy coalitions in nascent subsystems: a case study of the European GNSS program Galileo. Ger. Policy Stud. 7, 113–139.

Barnes, L., Hicks, T., 2018. Making Austerity Popular: The Media and Mass Attitudes toward Fiscal Policy. Am. J. Polit. Sci. 62, 340–354. https://doi.org/10.1111/ajps.12346

Baudet, M.-B., 2012. Le gaz de schiste se heurte à une forte opposition des Français [WWW Document]. Le Monde. URL https://www.lemonde.fr/planete/article/2012/09/13/le-gaz-de-

schiste-se-heurte-a-une-forte-opposition-des-francais_1759878_3244.html (accessed 11.29.20).
BBC East Yorkshire and Lincolnshire, 2019. Fracking firm Third Energy sells business [WWW Document]. URL https://www.bbc.com/news/uk-england-york-north-yorkshire-48084036 (accessed 5.23.19).
BBC News, 2019. Andrew Marr Show, 14 July 2019 [WWW Document]. URL http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/14071903.pdf (accessed 10.22.19).
BBC News, 2018. Anti-fracking activists dismantle camp [WWW Document]. BBC News. URL https://www.bbc.com/news/uk-england-york-north-yorkshire-43243843 (accessed 1.23.20).
BBC News, 2015. Fracking firm claims public support. BBC News.
BBC News, 2014. Barton Moss: Views on fracking [WWW Document]. BBC News. URL https://www.bbc.com/news/uk-england-manchester-25713163 (accessed 2.3.20).
BBC News, 2013a. Candidates asked to oppose fracking. BBC News.
BBC News, 2013b. Minister defends fracking comments [WWW Document]. BBC News. URL https://www.bbc.com/news/uk-23565258 (accessed 10.28.19).
BBC News, 2013c. French firm funds UK shale gas hunt [WWW Document]. BBC News. URL https://www.bbc.com/news/business-24620791 (accessed 8.6.19).
BBC News, 2011a. Firm begins shale gas drilling [WWW Document]. BBC News. URL https://www.bbc.com/news/uk-england-lancashire-12886987 (accessed 10.14.19).
BBC News, 2011b. Firm finds "vast" gas resources [WWW Document]. BBC News. URL https://www.bbc.com/news/uk-england-lancashire-14990573 (accessed 10.22.19).
BBC News, 2011c. Anti-fracking protesters target tower [WWW Document]. BBC News. URL https://www.bbc.com/news/uk-england-lancashire-14431512 (accessed 10.23.19).
BBC News: York and North Yorkshire, 2018. Fracking decision postponed for checks [WWW Document]. URL https://www.bbc.com/news/uk-england-york-north-yorkshire-42789835 (accessed 7.1.19).
BBC News: York and North Yorkshire, 2017. Third Energy fracking company has "open door policy" for Kirby Misperton protestors [WWW Document]. BBC News. URL http://www.bbc.co.uk/news/uk-england-york-north-yorkshire-39134372 (accessed 3.27.17).
Bell, D., Gray, T., 2002. The Ambiguous Role of the Environment Agency in England and Wales. Environ. Polit. 11, 76–98. https://doi.org/10.1080/714000630
Bennett, W.L., Segerberg, A., 2012. The Logic of Connective Action. Inf. Commun. Soc. 15, 739–768. https://doi.org/10.1080/1369118X.2012.670661
Binderkrantz, A., 2005. Interest Group Strategies: Navigating Between Privileged Access and Strategies of Pressure. Polit. Stud. 53, 694–715. https://doi.org/10.1111/j.1467-9248.2005.00552.x
Binderkrantz, A.S., Pedersen, H.H., Beyers, J., 2016. what is access? a discussion of the definition and measurement of interest group access. Eur. Polit. Sci. https://doi.org/10.1057/eps.2016.17
Blaymires, J., 2013. Increasing transparency with the public on fracking procedures to improve relations and reduce difficulties in gaining permits.
Blewett, T.A., Weinrauch, A.M., Delompré, P.L.M., Goss, G.G., 2017. The effect of hydraulic flowback and produced water on gill morphology, oxidative stress and antioxidant response in rainbow trout (Oncorhynchus mykiss). Sci. Rep. 7, 46582. https://doi.org/10.1038/srep46582
Bloomfield, L.P., 1975. Nuclear Spread and World Order. Foreign Aff. 53, 743–755. https://doi.org/10.2307/20039543
Bocora, J., 2012. Global Prospects for the Development of Unconventional Gas. Procedia - Soc. Behav. Sci., International Congress on Interdisciplinary Business and Social Sciences 2012 (ICIBSoS 2012) 65, 436–442. https://doi.org/10.1016/j.sbspro.2012.11.145

Bomberg, E., 2017. Fracking and framing in Transatlantic perspective: A comparison of shale politics in the US and European Union. J. Transatl. Stud. 15, 101–120. https://doi.org/10.1080/14794012.2016.1268789
Bomberg, E., 2015. Shale We Drill? Discourse Dynamics in UK Fracking Debates. J. Environ. Policy Plan. 0, 1–17. https://doi.org/10.1080/1523908X.2015.1053111
Boudet, H., Clarke, C., Bugden, D., Maibach, E., Roser-Renouf, C., Leiserowitz, A., 2014. "Fracking" controversy and communication: Using national survey data to understand public perceptions of hydraulic fracturing. Energy Policy 65, 57–67. https://doi.org/10.1016/j.enpol.2013.10.017
Bradley, D., Huber, E., Moller, S., Nielsen, F., Stephens, J.D., 2003. Distribution and Redistribution in Postindustrial Democracies. World Polit. 55, 193–228.
Bradshaw, M., Waite, C., 2017. Learning from Lancashire: Exploring the contours of the shale gas conflict in England. Glob. Environ. Change 47.
British Geological Survey, 2020. Hydraulic Fracturing and Induced Seismicity [WWW Document]. Br. Geol. Surv. URL http://www.earthquakes.bgs.ac.uk/research/FrackingInducedSeismicity.html (accessed 11.25.20).
Brownell, K.D., Warner, K.E., 2009. The Perils of Ignoring History: Big Tobacco Played Dirty and Millions Died. How Similar Is Big Food? Milbank Q. 87, 259–294. https://doi.org/10.1111/j.1468-0009.2009.00555.x
Buchan, D., 2013. Can shale gas transform Europe's energy landscape? Centre for European Reform.
Burawoy, M., 1998. The Extended Case Method. Sociol. Theory 16, 4–33.
Burn, C., 2019. Fracking fears reignited for Yorkshire village as US firm buys shale gas company Third Energy [WWW Document]. URL https://www.yorkshirepost.co.uk/news/latest-news/fracking-fears-reignited-for-yorkshire-village-as-us-firm-buys-shale-gas-company-third-energy-1-9869770 (accessed 12.7.19).
Burton, G.A., Basu, N., Ellis, B.R., Kapo, K.E., Entrekin, S., Nadelhoffer, K., 2014. Hydraulic "Fracking": Are surface water impacts an ecological concern? Environ. Toxicol. Chem. 33, 1679–1689. https://doi.org/10.1002/etc.2619
Cabinet Office, 2018. Public bodies [WWW Document]. GOV.UK. URL https://www.gov.uk/guidance/public-bodies-reform (accessed 12.9.20).
Cairney, P., 1997. Advocacy Coalitions and Policy Change, in: Stanyer, J., Stoker, G. (Eds.), Contemporary Political Studies, 1997. Political Studies Association of the United Kingdom, [Nottingham], pp. 884–894.
Cairney, P., Fischer, M., Ingold, K., 2018. Fracking in the UK and Switzerland: why differences in policymaking systems don't always produce different outputs and outcomes. Policy Polit. 46, 125–147. https://doi.org/10.1332/030557316X14793989976783
Cairney, P., Fischer, M., Ingold, K., 2016. Hydraulic fracturing policy in the UK: coalition, cooperation and opposition in the face of uncertainty, in: Heikkila, T., Ingold, K., Fischer, M. (Eds.), Comparing Coalition Politics: Policy Debates on Hydraulic Fracturing in North America and Western Europe. Palgrave, London.
Cairney, P., Studlar, D.T., Mamudu, H., 2012. Global tobacco control: power, policy, governance and transfer. Palgrave Macmillan, Basingstoke.
Calanni, J.C., Siddiki, S.N., Weible, C.M., Leach, W.D., 2015. Explaining Coordination in Collaborative Partnerships and Clarifying the Scope of the Belief Homophily Hypothesis. J. Public Adm. Res. Theory J-PART 25, 901–927.
Capano, G., 2009. Understanding Policy Change as an Epistemological and Theoretical Problem. J. Comp. Policy Anal. Res. Pract. 11, 7–31.
Cardwell, M.R., 2013. Josh Fox: anti-fracking protests could stop drilling in the UK. The Guardian.
Carpenter, D.P., 2002. Groups, the Media, Agency Waiting Costs, and FDA Drug Approval. Am. J. Polit. Sci. 46, 490–505. https://doi.org/10.2307/3088394

Carrington, D., 2016. Fracking investors losing patience with planning delays, says industry boss [WWW Document]. the Guardian. URL http://www.theguardian.com/environment/2016/may/19/fracking-investors-losing-patience-with-planning-delays-says-industry-boss (accessed 6.25.21).

Cart, J., 2015. State issues toughest-in-the-nation fracking rules [WWW Document]. Los Angel. Times. URL https://www.latimes.com/local/lanow/la-me-ln-state-issues-fracking-rules-20150701-story.html (accessed 11.29.20).

Chaudry, M., Wu, J., Jenkins, N., 2013. A sequential Monte Carlo model of the combined GB gas and electricity network. Energy Policy 62, 473–483. https://doi.org/10.1016/j.enpol.2013.08.011

Christopoulos, D., Ingold, K., 2015. Exceptional or just well connected? Political entrepreneurs and brokers in policy making. Eur. Polit. Sci. Rev. EPSR 7, 475–498. http://dx.doi.org/10.1017/S1755773914000277

Cinema Management Group, 2010. Gasland Trailer 2010.

Cobb, R., Ross, J.-K., Ross, M.H., 1976. Agenda Building as a Comparative Political Process. Am. Polit. Sci. Rev. 70, 126–138. https://doi.org/10.2307/1960328

Companies House, 2019a. TANSHO LIMITED - Overview [WWW Document]. URL https://beta.companieshouse.gov.uk/company/02301347 (accessed 10.8.19).

Companies House, 2019b. CUADRILLA RESOURCES HOLDINGS LIMITED - Filing history (free information from Companies House) [WWW Document]. URL https://beta.companieshouse.gov.uk/company/07147040/filing-history?page=5 (accessed 10.11.19).

Companies House, 2010a. Cuadrilla Resources Certificate of Incorporation [WWW Document]. URL https://s3.eu-west-2.amazonaws.com/document-api-images-live.ch.gov.uk/docs/JpQ6KdkR8iN7oRL92XaR2yKKHExQr5r1M4v62l3Xjh8/application-pdf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Content-Sha256=UNSIGNED-PAYLOAD&X-Amz-Credential=ASIAWRGBDBV3ASL7P2X7%2F20191008%2Feu-west-2%2Fs3%2Faws4_request&X-Amz-Date=20191008T171455Z&X-Amz-Expires=60&X-Amz-Security-Token=AgoJb3JpZ2luX2VjEKb%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCWV1LXdlc3QtMiJHMEUCIAx91qXj%2FYzl7mU3EvFGd9AhIb7hLpMp8E8gA1vw%2F82%2BAiEA1z94BeAyOatFwcrY5Edl5WexE6%2BjfeM4opNrZlkWnw4q4wMIj%2F%2F%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARACGgw0NDkyMjkwMzI4MjIiDIUaELJN5eUKFcLdMSq3A2ueLnkvqsHrRCKiD4TdKZ8AiKSqmK7q3l6xWIWLR0HPmYL4NQulrSIZ%2F7cOzwhCu%2Bc1an87ayEbQr1nRKFjrNWTZPN9islLCzgM1mo3OIqY7CuvN4RjaIvHl0hSURBUK84WSxW4OQoKydO1odTZR66tzjoVIyUzCELGYfE75%2FBKN1uWaqH7X%2B8L28PHpBW39w9uIwmChPRN4hyNoEp%2BHElDPLUGQ3S5Ef3vOuW0oB%2BGTwXBHtZWEtghmJUdJst7e1Uxaro8PbNUkUj%2FF1gBo5aiBKtzIPPHLxQdOFNuxo66gvZotRF5%2F9m%2FiS9K2HCokRL0BJ%2F1%2FufnwAe9iF0ELJJp0Xv7osm%2BFrmZH4sbNFynoEfZiashVJ1FQl%2FJmOTHgQP3jjcrSDqobGztMMoqmBHXNGS4TZuGQqsYfO%2FImt4B41TOgRh1D0uHiymq9VQDidlP2mnPh1S8hT2Z83AnlG9qOKEXRaYLJFiyJY0TfkEhc%2FLYvCufnhUA3%2B10ytD8eSdPmrGuahzn6Eifkh0DY4D9A8HujxlRZ0ef375rRO7fytyDSGTVRZ2noiX9dz0yPTtcpAuLGjUwp5zy7AU6tAGiull5uCEMF%2FIWNvYlghdvN%2Fin4P7yVV7nDIZ4%2BncxTpa3xsT%2Bsk4ZkGOEQDqluhnmjZiL4l2ub5UhHYAqUQ08N3AY96PBQSTTeD%2BhuTcgWSqU5vQAvP6UGAUfgkflxTl%2Bi2B8GKd3zhA%2FGVADFOxtFexmgBL8l8aIC7fhyo90RYAAR21Zh3XfGFjmR4I%2BAAE9445Nq1D2UYhHJLvLxkmTDa3QJqoSLShZFUNj3Iy0WWspnSI%3D&X-Amz-SignedHeaders=host&X-Amz-Signature=0d78606b25360f5bd76e59c9311228e3e70fcb103798a6c0a113eacb787f5d8a (accessed 10.8.19).

Companies House, 2010b. Return of allotment of shares [WWW Document]. URL https://s3.eu-west-2.amazonaws.com/document-api-images-live.ch.gov.uk/docs/M6dW18NFmS6-JMJGLGEwx4a5chQ1YX4EtDzQ5ZVXa3c/application-pdf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Content-Sha256=UNSIGNED-PAYLOAD&X-Amz-

Credential=ASIAWRGBDBV3LLEB3Q4H%2F20191011%2Feu-west-2%2Fs3%2Faws4_request&X-Amz-Date=20191011T181021Z&X-Amz-Expires=60&X-Amz-Security-Token=AgoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCWV1LXdlc3QtMiJHMEUCIQDutCnGGmcry4%2BDgZnOimTDXpJPrg7TXewpEBfvy0s2ogIgY2paYNEfnBYeFLCRxCu0kHaxMOURZOyWdDTXIzWkNFkq4wMI2f%2F%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARACGgw0NDkyMjkwMzI4MjIiDMfYsBeVcobDDA9TlCq3A04QLBquUE4iz9VtbnY82T8QGqwvBCIAG0oZJ3otZ4JxDkG95sn2JF%2FigdTtRomQDQviQCnL0L%2BMN0J1bNAFVDLwvy5Ep8nmBkk2QZnBuuxGLu2J60C6aed0RUGOeXJJ6tLoUP4nfuOQHSjhMGIz93RT0%2Foc4CGDFzpzcSZnsk%2FuDBJXZt5IZLKkLkKxwl6MjnXe%2FOU3rkTuItSTqS5aH0R7EzOeCuUe8mtHbZ5zrCsur7dFXhl3EUFoU5XlWZgfYhHgs9P2scDehvZT7BN%2BiuXqTHsD4WPTvLXLQ2eYw3tjpXO2etJUJbSgY9UYWLpZWvEGYNYZxJF%2BPACOPRrtkk6IPWrxXlUeLuklI7dmERKtko0%2FouPxSNXxp0zr0DiCqbbN60lyxP4GWyXMVDQbPXt6nNLnCyd5myAByoLRxKVFNPeNKiIpCv4kUithk5rTu969ujkhcvIIzIJUtHm1gtFLeBK4HfhTkSKcwPB5Dh9A6enhTQHqL6V3k8zdHCN%2BpougHmy5cY%2FxMNhagO87o%2F2m35Gf7TuNmoI3cnJcIkgQu9Xu%2FAsCXTDz1HIISrwejedjsiQqtJQww8yC7QU6tAGf8p%2F99we0ThWO3qzM4g57mhfS2ircEhZQ%2FWrwzN%2BRTPmTDxHg5FcIA%2BdrW%2FvKVJ%2BfBc8wtUlFekrshHZu7uEWv4BZ489TSYM%2FZ%2BOJHIfWNXbRdwl%2BNo%2Fm%2BBVFbJRp%2FgqvL%2FZgl2rxZnFSnX0fj3cr8838ezsPGKJW1XA87bvvok94H%2BQUA%2FgumhrchbAaxQaDsGrRckazuziAcH9h6psKSJE6TdzL2N7EcxaE94XvhFT9p6c%3D&X-Amz-SignedHeaders=host&X-Amz-Signature=ae1bd6a39dd72d859e072b52f03e7215bac310ef7216c4903ec1dd0fe7fcfd63 (accessed 10.11.19).

Conservative Party, 2015. The Conservative Party Manifesto 2015 [WWW Document]. URL https://www.conservatives.com/manifesto (accessed 5.4.16).

Cotton, M., 2017. Fair fracking? Ethics and environmental justice in United Kingdom shale gas policy and planning. Local Environ. 22, 185–202. https://doi.org/10.1080/13549839.2016.1186613

Cotton, M., Rattle, I., Van Alstine, J., 2014. Shale gas policy in the United Kingdom: An argumentative discourse analysis. Energy Policy 73, 427–438. https://doi.org/10.1016/j.enpol.2014.05.031

Cuadrilla Resources, 2019. Grange Hill, Near Singleton [WWW Document]. Cuadrilla. URL https://cuadrillaresources.com/site/singleton-grange-hill/ (accessed 10.7.19).

Cuadrilla Resources, 2018. Restoration work complete at shale exploration site [WWW Document]. Cuadrilla. URL https://cuadrillaresources.com/media-resources/press-releases/restoration-work-complete-at-shale-exploration-site/ (accessed 10.25.19).

Cuadrilla Resources, 2017. Balcombe [WWW Document]. Cuadrilla. URL https://cuadrillaresources.com/site/balcombe/ (accessed 3.26.17).

Cuadrilla Resources, 2014a. Planning statement Preston New Road [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj02NTg2JmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcQ29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcUGxhbm5pbmdcTENDLTIwMTQtMDA5NlxQTlJfUExfUGxhbm5pbmcgU3RhdGVtZW50X0V4cGxvcmF0aW9uIFdvcmtzLnBkZiZpbWFnZV9udW1iZXI9MiZpbWFnZV90eXBlPXBsYW5uaW5nJmxhc3RfbW9kaWZpZWRfZnJvbV9kaXNrPTI4LzA1LzIwMTQgMjE6MDY6MDE= (accessed 6.26.18).

Cuadrilla Resources, 2014b. Application form (Grange Hill 2014).

Cuadrilla Resources, 2014c. Planning Statement (Grange Road 2014).

Cuadrilla Resources, 2014d. Withdrawal letter (Grange Hill 2011).

Cuadrilla Resources, 2014e. Annual report and consolidated financial statements: Year ended 31 December 2014.

Cuadrilla Resources, 2013. Cuadrilla welcomes Centrica as new investment partner in Lancashire [WWW Document]. Cuadrilla. URL https://cuadrillaresources.com/media-resources/press-releases/cuadrilla-welcomes-centrica-as-new-investment-partner-in-lancashire/ (accessed 10.26.19).

Cuadrilla Resources, 2011. Planning application to vary planning condition to extend the development from the permitted (18) months to (36) months.
Cuadrilla Resources, 2010. Supporting Statement to the Application (Grange Hill 2010) [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj01MzE3JmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcY29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcMDUtMTAtMDA5MVwwNS0xMC0wMDkxLTAwNC5wZGYmaW1hZ2VfbnVtYmVyPTQmaW1hZ2VfdHlwZT1wbGFubmluZyZsYXN0X21vZGlmaWVkX2Zyb21fZGlzaz0wOS8wMi8yMDEwIDE0OjEzOjU1 (accessed 3.15.18).
Cuadrilla Resources, 2009. Supporting statement to the application (Preese) [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj01MTU1JmZpbGVuYW1lPVxcQ29ycGRhdGEwMlxkYXRhd3JpZ2h0JFxQbGFubmluZ1wwNS0wOS0wNTcyXDA1LjA5LjA1NzIgUHJlZXNlIEhhbGwgUGxhbm5pbmcgU3RhdGVtZW50LnBkZiZpbWFnZV9udW1iZXI9OCZpbWFnZV90eXBlPXBsYW5uaW5nJmxhc3RfbW9kaWZpZWRfZnJvbV9kaXNrPTI4LzEwLzIwMTUgMTU6MDI6MTE= (accessed 6.13.18).
Culpepper, P.D., 2011. Quiet politics and business power: corporate control in Europe and Japan.
Culpepper, P.D., Reinke, R., 2014. Structural Power and Bank Bailouts in the United Kingdom and the United States. Polit. Soc. 42, 427–454. https://doi.org/10.1177/0032329214547342
Dalby, S., 2017. IGas Energy eagerly anticipates the resumption of its stalled fracking-for-gas programme in the UK. GreenBarrel.com. URL http://greenbarrel.com/2017/12/01/igas-energy-eagerly-anticipates-the-resumption-of-its-stall-fracking-for-gas-programme-in-the-uk/ (accessed 5.7.20).
Dart Energy, 2012. Annual Financial Report for the year ended 30 June 2012 [WWW Document]. URL http://clients.weblink.com.au/news/pdf/01332876.pdf (accessed 1.31.20).
Dasgupta, S., De Cian, E., 2018. The influence of institutions, governance, and public opinion on the environment: Synthesized findings from applied econometrics studies. Energy Res. Soc. Sci., Sustainable energy transformations in an age of populism, post-truth politics, and local resistance 43, 77–95. https://doi.org/10.1016/j.erss.2018.05.023
Davies, R.J., Almond, S., Ward, R.S., Jackson, R.B., Adams, C., Worrall, F., Herringshaw, L.G., Gluyas, J.G., Whitehead, M.A., 2014. Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation. Mar. Pet. Geol. 56, 239–254. https://doi.org/10.1016/j.marpetgeo.2014.03.001
Department for Business, Energy & Industrial Strategy, 2020a. Energy Consumption in the UK (ECUK) 1970 to 2019.
Department for Business, Energy & Industrial Strategy, 2020b. Natural gas imports (ET 4.4 - monthly) [WWW Document]. URL https://www.gov.uk/government/statistics/gas-section-4-energy-trends (accessed 4.10.20).
Department for Business, Energy & Industrial Strategy, 2020c. Weekly road fuel prices [WWW Document]. GOV.UK. URL https://www.gov.uk/government/statistical-data-sets/oil-and-petroleum-products-weekly-statistics (accessed 1.22.20).
Department for Business, Energy and Industrial Strategy, 2018. Digest of United Kingdom Energy Statistics 2018: Annexes E – J and longterm trends tables.
Department for Communities and Local Government, 2016. Decision Notice.
Department for Communities and Local Government, 2012. National Policy Planning Framework.
Department of Energy and Climate Change, 2015a. Shale Gas and Oil Policy (Written Statement made by: Secretary of State for Energy and Climate Change (Amber Rudd) on 16 Sep 2015).
Department of Energy and Climate Change, 2015b. Guidance on fracking: developing shale oil and gas in the UK [WWW Document]. URL https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking/developing-shale-oil-and-gas-in-the-uk (accessed 11.20.15).

Department of Energy and Climate Change, 2013a. UK onshore production: Michael Fallon [WWW Document]. Gov.uk. URL https://www.gov.uk/government/speeches/uk-onshore-production-michael-fallon (accessed 11.3.15).
Department of Energy and Climate Change, 2013b. Davey: UK shale gas development will not be at expense of climate change targets.
Department of Energy and Climate Change, Department for Communities and Local Government, 2015. Shale gas and oil policy statement by DECC and DCLG [WWW Document]. GOV.UK. URL https://www.gov.uk/government/publications/shale-gas-and-oil-policy-statement-by-decc-and-dclg/shale-gas-and-oil-policy-statement-by-decc-and-dclg (accessed 1.28.19).
Doherty, C., 2010. The great NED hunt. Accountncy 146, 98–99.
Dolan, C.J., 2003. Economic Policy and Decision Making at the Intersection of Domestic and International Politics: The Advocacy Coalition Framework and the National Economic Council. Policy Stud. J. 31, 209–236. https://doi.org/10.1111/1541-0072.00012
Downs, A., 1972. Up and Down with Ecology-the Issue-Attention Cycle. Public Interest 0, 38–50.
DueDil, 2019. Cuadrilla Resources Holdings Limited [WWW Document]. URL https://www.duedil.com (accessed 10.11.19).
Dunn, D.H., McClelland, M.J.L., 2013. Shale gas and the revival of American power: debunking decline? Int. Aff. 89, 1411–1428. https://doi.org/10.1111/1468-2346.12081
Dür, A., De Bièvre, D., 2007. Inclusion without Influence? NGOs in European Trade Policy. J. Public Policy 27, 79–101.
Egan, F., 2013. Planning for Success: Shale gas in the UK.
Elliott, S., 2019. UK shale gas industry vows to continue efforts to prove safety | S&P Global Platts [WWW Document]. URL https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/110419-uk-shale-gas-industry-vows-to-continue-efforts-to-prove-safety (accessed 5.15.20).
Energy Institute, 2014. Geology of conventional and unconventional oil and gas. Adapted from: US Energy & Information Administration (EIA) [WWW Document]. URL https://knowledge.energyinst.org/search/record?id=86443 (accessed 11.25.20).
Evensen, D., 2018. Review of shale gas social science in the United Kingdom, 2013–2018. Extr. Ind. Soc. 5, 691–698. https://doi.org/10.1016/j.exis.2018.09.005
Evensen, D., Stedman, R., Brown-Steiner, B., 2017. Resilient but not sustainable? Public perceptions of shale gas development via hydraulic fracturing. Ecol. Soc. 22. https://doi.org/10.5751/ES-09022-220108
Everley, S., 2013. From Flaming Faucet to Flaming Hose: The Continuing Fraud of Gasland [WWW Document]. Energy Depth. URL https://www.energyindepth.org/the-continuing-fraud-of-gasland/ (accessed 11.25.20).
Fairfield, T., 2010. Business Power and Tax Reform: Taxing Income and Profits in Chile and Argentina. Lat. Am. Polit. Soc. 52, 37–71. https://doi.org/10.1111/j.1548-2456.2010.00081.x
Fan, Y., Xu, J.-H., 2011. What has driven oil prices since 2000? A structural change perspective. Energy Econ. 33, 1082–1094. https://doi.org/10.1016/j.eneco.2011.05.017
Fisher, D.R., Leifeld, P., Iwaki, Y., 2013. Mapping the ideological networks of American climate politics. Clim. Change 116, 523–545. https://doi.org/10.1007/s10584-012-0512-7
Flanagan, E., 2014. Anti-fracking protesters hold farewell party at Barton Moss camp [WWW Document]. men. URL http://www.manchestereveningnews.co.uk/news/greater-manchester-news/salford-anti-fracking-protesters-hold-farewell-6982726 (accessed 2.3.20).
Fortson, D., 2013. You painted the world pink, now you're fracking useless; Cuadrilla's Allan Campbell believes shale gas could transform Britain. But the Australian can't understand why we're so lame about exploiting it [WWW Document]. Sunday Times Lond. Engl. URL https://link-galegroup-com.ezproxy.is.ed.ac.uk/apps/doc/A352091895/AONE?sid=lms (accessed 10.11.19).
Fox, J., 2010. Gasland. HBO.

Frack Free North Yorkshire, 2013. First Community Group Meeting.
Frack Free Ryedale, 2015. Frack Free Ryedale objection letter.
Frack Off, 2019a. Map of UK Fracking Sites [WWW Document]. URL https://frack-off.org.uk/locations/ (accessed 12.9.19).
Frack Off, 2019b. Kirby Misperton 1 Wellsite (East) [WWW Document]. URL https://frack-off.org.uk/sites/kirby-misperton-1-wellsite-east/ (accessed 12.9.19).
Frack Off, 2016. Singleton Against a Fracked Environment (SAFE) [WWW Document]. URL https://frack-off.org.uk/local-group/singleton-against-a-fracked-environment-safe/ (accessed 10.26.19).
Frackoffuk, 2012. Frack Off! 500 ft high Banner Drop Off Blackpool Tower [WWW Document]. URL https://www.youtube.com/watch?v=ft7Y7hTTCtY (accessed 10.23.19).
Friends of the Earth, 2013. Cuadrilla: the true face of fracking in the UK.
Fylde Borough Council, 2019. Shale Gas Information [WWW Document]. URL http://fylde.web-labs.co.uk/business/shalegasinfo/ (accessed 10.7.19).
Gamble, A., 2009. British politics and the financial crisis. Br. Polit. Lond. 4, 450–462. http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1057/bp.2009.25
Gearhart, S., Adegbola, O., Huemmer, J., 2019. Where's the fracking bias?: Contested media frames and news reporting on shale gas in the United States. Energy Res. Soc. Sci. 51, 168–175. https://doi.org/10.1016/j.erss.2019.01.010
Gerring, J., 2004. What Is a Case Study and What Is It Good for? Am. Polit. Sci. Rev. 98, 341–354.
Gillespie, J., 2017. Geriactivists to fight fracking very, very slowly. Sunday Times.
Gligor, D.M., Golgeci, I., Rego, C., Russo, I., Bozkurt, S., Pohlen, T., Hiatt, B., Garg, V., 2021. Examining the use of fsQCA in B2B marketing research: benefits, current state and agenda for future research. J. Bus. Ind. Mark. ahead-of-print. https://doi.org/10.1108/JBIM-09-2020-0436
Google Trends, 2019. Interest over time: "Shale gas" and "Fracking" in the United Kingdom from 2013-19 [WWW Document]. Google Trends. URL https://trends.google.com/trends/explore?date=2013-01-01%202019-11-26&geo=GB&q=fracking,shale%20gas (accessed 11.26.19).
Gordalla, B.C., Ewers, U., Frimmel, F.H., 2013. Hydraulic fracturing: a toxicological threat for groundwater and drinking-water? Environ. Earth Sci. 70, 3875–3893. https://doi.org/10.1007/s12665-013-2672-9
Gosden, E., 2013. Shell shuns UK shale gas industry [WWW Document]. URL https://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/10034550/Shell-shuns-UK-shale-gas-industry.html (accessed 2.3.20).
Gray, J., 2012. Frack Free Somerset Launches! Frack Off. URL https://frack-off.org.uk/frack-free-somerset-launches/ (accessed 10.14.19).
Guber, D.L., 2003. The grassroots of a green revolution polling America on the environment. MIT Press, Cambridge, Mass.
Gustafson, T., 2020. The bridge: natural gas in a redivided Europe. Harvard University Press, Cambridge, MA.
Haarhoff, M.Q., Hughes, F., Heath-Clarke, M., Harrison, D., Taylor, C., Ware, D.L., Emms, G.G., Mortimer, A., 2018. The history of hydrocarbon exploration and development in North Yorkshire, in: Craig, J., Gerali, F., MacAulauy, F., Sorkhabi, R. (Eds.), History of the European Oil and Gas Industry. Geological Society of London.
Hacker, J.S., Pierson, P., 2010. Winner-Take-All Politics: Public Policy, Political Organization, and the Precipitous Rise of Top Incomes in the United States. Polit. Soc. 38, 152–204. https://doi.org/10.1177/0032329210365042
Hanegraaff, M., van der Ploeg, J., Berkhout, J., 2020. Standing in a Crowded Room: Exploring the Relation between Interest Group System Density and Access to Policymakers. Polit. Res. Q. 73, 51–64. https://doi.org/10.1177/1065912919865938

Hansard, 2020. Search Hansard [WWW Document]. URL https://hansard.parliament.uk/search?startDate=2016-06-23&endDate=2020-06-23&searchTerm=%22shale%20gas%22&house=Commons&partial=False (accessed 4.12.20).
Hansard, 2016. Shale Wealth Fund [WWW Document]. URL https://hansard.parliament.uk/Commons/2016-11-21/debates/24513625-9A62-4702-9654-F849D33DAA59/ShaleWealthFund?highlight=shale#contribution-C3944292-4489-4FDA-8306-BF1A16B4415C (accessed 5.5.20).
Hansard, 2010. Foreign Policy - 01 July 2010 [WWW Document]. URL https://hansard.parliament.uk/Lords/2010-07-01/debates/10070128000649/ForeignPolicy?highlight=%22fundamental%20in%20altering%20the%20energy%20vista%20in%20every%20continent%22#contribution-10070128000410 (accessed 10.15.19).
Harvey, F., 2014. UK shale gas viability check will take five years, says Cuadrilla boss. The Guardian.
Harvey, F., Walker, P., 2013. Caroline Lucas among dozens arrested in Balcombe anti-fracking protest [WWW Document]. The Guardian. URL https://www.theguardian.com/environment/2013/aug/19/caroline-lucas-arrest-balcombe-anti-fracking (accessed 3.26.17).
Hayhurst, R., 2018a. Residents claim victory against fracking with restoration of Cuadrilla's Becconsall shale gas site [WWW Document]. DRILL DROP. URL https://drillordrop.com/2018/05/25/residents-claim-victory-against-fracking-with-restoration-of-cuadrillas-becconsall-shale-gas-site/ (accessed 5.20.19).
Hayhurst, R., 2018b. Chapter closes on Cuadrilla's early fracking plans – shale gas site returned to farmland nearly seven years after original deadline. DRILL DROP. URL https://drillordrop.com/2018/12/05/chapter-closes-on-cuadrillas-early-fracking-plans-shale-gas-site-returned-to-farmland-nearly-seven-years-after-original-deadline/ (accessed 10.7.19).
Hayhurst, R., 2017. Live updates: Decision meeting on IGas shale plans for Tinker Lane, Notts. DRILL DROP. URL https://drillordrop.com/2017/03/21/live-updates-decision-meeting-on-igas-shale-plans-for-tinker-lane-notts/ (accessed 5.5.20).
Helboe Pedersen, H., 2013. Is measuring interest group influence a mission impossible? The case of interest group influence in the Danish parliament. Interest Groups Advocacy Basingstoke 2, 27–47. http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1057/iga.2012.19
Helm, T., 2018. Carillion links put fracking firm's scheme in doubt [WWW Document]. The Observer. URL https://www.theguardian.com/environment/2018/feb/10/carillion-links-north-yorkshire-fracking-third-energy (accessed 7.1.19).
Henley, J., 2013. Fracking protest: who's who in the battle of Balcombe? The Guardian.
Henry, A.D., 2011. Ideology, Power, and the Structure of Policy Networks. Policy Stud. J. 39, 361–383. https://doi.org/10.1111/j.1541-0072.2011.00413.x
HM Government, 2010. The Coalition: our programme for government.
HM Revenue & Customs, 2013. UK oil and gas fiscal regime: new onshore allowance.
HM Treasury, 2014a. Autumn Statement 2014.
HM Treasury, 2014b. HMT Ministers' meetings, hospitality, gifts and overseas travel: 1 October to 31 December 2014 [WWW Document]. GOV.UK. URL https://www.gov.uk/government/publications/hmt-ministers-meetings-hospitality-gifts-and-overseas-travel-1-october-to-31-december-2014 (accessed 11.1.19).
HM Treasury, 2014c. HMT Ministers' meetings, hospitality, gifts and overseas travel: 1 July to 30 September 2014 [WWW Document]. GOV.UK. URL https://www.gov.uk/government/publications/hmt-ministers-meetings-hospitality-gifts-and-overseas-travel-1-july-to-30-september-2014 (accessed 11.1.19).
HM Treasury, 2013. Investing in Britain's future - Publications - GOV.UK.

Howell, R.A., 2018. UK public beliefs about fracking and effects of knowledge on beliefs and support: A problem for shale gas policy. Energy Policy 113, 721–730. https://doi.org/10.1016/j.enpol.2017.11.061
Huhne, C., 2011. Oil Stock Release [WWW Document]. Hansard. URL https://hansard.parliament.uk/Commons/2011-06-23/debates/11062324000022/OilStockRelease?highlight=libya%20oil#contribution-11062324000062 (accessed 12.10.19).
Huntingdon, H., 2013. EMF 26: Changing the Game? Emissions and Market Implications of New Natural Gas Supplies | Energy Modeling Forum (No. 26). Energy Modelling Forum.
Hyde, K.F., 2000. Recognising deductive processes in qualitative research. Qual. Mark. Res. Int. J. 3, 82–90. https://doi.org/10.1108/13522750010322089
IGas Energy, 2019. Springs Road SR-01 Shale Exploration Well Results [WWW Document]. URL https://ir1.q4europe.com/asp/ir/IGas/NewsRead.aspx?storyid=14360140&ishtml=1 (accessed 1.30.20).
IGas Energy, 2016. Statement of Community Involvement (Tinker Lane).
IGas Energy, 2015a. Supporting Statement (Spings Road 2015(b)).
IGas Energy, 2015b. Community Information: Tinker Lane Exploratory Well.
Information Commissioner's Office, 2013. Freedom of Information Act: Definition document for principal local Authorities (county councils, unitary authorities, metropolitan district councils borough councils, city councils and district councils, the council of the Isles of Scilly and local authorities in Wales).
Ingold, K., 2011. Network Structures within Policy Processes: Coalitions, Power, and Brokerage in Swiss Climate Policy. Policy Stud. J. 39, 435–459. http://dx.doi.org/10.1111/j.1541-0072.2011.00416.x
Ingold, K., Fischer, M., Cairney, P., 2017. Drivers for Policy Agreement in Nascent Subsystems: An Application of the Advocacy Coalition Framework to Fracking Policy in Switzerland and the UK. Policy Stud. J. 45, 442–463. https://doi.org/10.1111/psj.12173
International Energy Agency, 2020. Monthly OECD oil price statistics – Analysis [WWW Document]. URL https://www.iea.org/reports/monthly-oecd-oil-price-statistics (accessed 1.22.20).
International Energy Agency, 2019. Statistics data browser [WWW Document]. URL https://www.iea.org/statistics/?country=GBR&isISO=true (accessed 10.9.19).
International Energy Agency, 2016. Monthly oil price statistics (April 2016).
International Energy Agency, 2014. End-use oil product prices and average crude oil import costs - December 2013 [WWW Document]. URL https://www.iea.org/classicstats/monthlystatistics/monthlyoilprices/ (accessed 10.15.19).
International Energy Agency, 2010a. End-use petroleum product prices and average crude oil import prices - May 2010 [WWW Document]. URL http://www.iea.org/stats/surveys/Prices/2010/MEMMAY10.XLS (accessed 10.9.19).
International Energy Agency, 2010b. World Energy Outlook 2010. Organisation for Economic Co-operation and Development, Paris.
International Energy Agency, 2009. World Energy Outlook 2009. Organisation for Economic Co-operation and Development, Paris.
Jang, S., Weible, C.M., Park, K., 2016. Policy processes in South Korea through the lens of the Advocacy Coalition Framework. J. Asian Public Policy 9, 274–290. https://doi.org/10.1080/17516234.2016.1201877
Jenkins-Smith, H.C., Nohrstedt, D., Weible, C.M., Ingold, K., 2017. The advocacy coalition framework: An overview of the research program, in: Weible, C.M., Sabatier, P.A. (Eds.), Theories of the Policy Process. Routledge, Boulder, CO, pp. 145–182.
Jenkins-Smith, H.C., Sabatier, P.A., 1993. The Study of Public Policy Processes, in: Sabatier, P.A., Jenkins-Smith, H.C. (Eds.), Policy Change and Learning : An Advocacy Coalition Approach, Theoretical Lenses on Public Policy. Westview, Boulder.

Jennings, W., Lodge, M., Ryan, M., 2017. Comparing Blunders in Government.
Johnson, B., 2012. Ignore the doom merchants, Britain should get fracking.
Jones, B.D., Baumgartner, F.R., 2012. From There to Here: Punctuated Equilibrium to the General Punctuation Thesis to a Theory of Government Information Processing: Jones/Baumgartner: Punctuated Equilibrium Theory. Policy Stud. J. 40, 1–20. https://doi.org/10.1111/j.1541-0072.2011.00431.x
Jones, M.D., Jenkins-Smith, H.C., 2009. Trans-Subsystem Dynamics: Policy Topography, Mass Opinion, and Policy Change. Policy Stud. J. 37, 37–58. http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1111/j.1541-0072.2008.00294.x
Kefferpütz, R., 2010. Shale Fever: Replicating the US gas revolution in the EU? Centre for European Policy Studies.
Kent, R., 2008. Using fsQCA: A Brief Guide and Workshop for Fuzzy-Set Qualitative Comparative Analysis.
Keranen, K.M., Weingarten, M., Abers, G.A., Bekins, B.A., Ge, S., 2014. Sharp increase in central Oklahoma seismicity since 2008 induced by massive wastewater injection. Science 345, 448–451. https://doi.org/10.1126/science.1255802
Kinney, N.T., 2005. Engaging in "Loose Talk": Analyzing Salience in Discourse from the Formulation of Welfare Policy. Policy Sci. 38, 251–268.
Kirby Misperton Parish Council, 2016. About the village [WWW Document]. URL https://web.archive.org/web/20160319170540/https://kirbymisperton.ryedaleconnect.org.uk/about/about-the-village/ (accessed 12.10.19).
Kirk, J., Miller, M.L., 1986. Reliability and validity in qualitative research, Qualitative research methods ; v. 1. SAGE, Beverly Hills, Calif. ; London.
Kleinman, M., 2018. Barclays-backed fracker Third Energy courts rivals for cash [WWW Document]. Sky News. URL https://news.sky.com/story/barclays-backed-fracker-third-energy-courts-rivals-for-cash-11287180 (accessed 1.25.20).
Kraus, S., Ribeiro-Soriano, D., Schüssler, M., 2018. Fuzzy-set qualitative comparative analysis (fsQCA) in entrepreneurship and innovation research – the rise of a method. Int. Entrep. Manag. J. 14, 15–33. https://doi.org/10.1007/s11365-017-0461-8
Krauss, C., 2011. Oil in Shale Sets Off a Boom in Texas. N. Y. Times.
Krogslund, C., Choi, D.D., Poertner, M., 2015. Fuzzy Sets on Shaky Ground: Parameter Sensitivity and Confirmation Bias in fsQCA. Polit. Anal. 23, 21–41.
Kuzemko, C., 2014. Ideas, power and change: explaining EU–Russia energy relations. J. Eur. Public Policy 21, 58–75. https://doi.org/10.1080/13501763.2013.835062
Labour Party, 2015. Labour's Green Plan.
Lancashire County Council, 2019. Planning Application Display - 05/10/0091 [WWW Document]. Lancashire.gov.uk. URL http://planningregister.lancashire.gov.uk/PlanAppDisp.aspx?recno=5317 (accessed 11.3.19).
Lancashire County Council, 2015a. Committee report (Preston New Road 2014) [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj02NTg2JmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcQ29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcUGxhbm5pbmdcTENDLTIwMTQtMDA5NlxJdGVtIDMgTENDLjIwMTQuMDA5NiBQcmVzdG9uIE5ldyBSb2FkLnBkZiZpbWFnZV9udW1iZXI9MzI2JmltYWdlX3R5cGU9cGxhbm5pbmcmbGFzdF9tb2RpZmllZF9mcm9tX2Rpc2s9MjEvMDEvMjAxNSAxMTozMzo0NA== (accessed 6.28.18).
Lancashire County Council, 2015b. Development Control Committee: Meeting to be held on 29th January 2015 (Roseacre Wood).
Lancashire County Council, 2015c. Refusal of Planning Permission (Grange Road 2014).
Lancashire County Council, 2015d. Planning Officers' February 2015 report to Development Control Committee.

Lancashire County Council, 2015e. Planning Officers' May 2015 report to Development Control Committee.
Lancashire County Council, 2015f. Minute of Item 5 to the Development Control Committee meeting of 25 February 2015.
Lancashire County Council, 2014. Becconsall (2014): Development Control Committee Report.
Lancashire County Council, 2013a. Becconsall (2012): Development Control Committee Report.
Lancashire County Council, 2013b. Committee Report (Anna's Road 2013).
Lancashire County Council, 2013c. Planning Application Delegated Report (Preese Hall).
Lancashire County Council, 2010a. Committee Report Grange Road 2010 [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj01MzE3JmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcY29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcMDUtMTAtMDA5MVwwNS4xMC4wMDkxIEl0ZW0gNCBDb21taXR0ZWUgMjEuMDQuMTAucGRmJmltYWdlX251bWJlcj0yNCZpbWFnZV90eXBlPXBsYW5uaW5nJmxhc3RfbW9kaWZpZWRfZnJvbV9kaXNrPTE5LzA0LzIwMTAgMTU6Mjc6MjE= (accessed 3.15.18).
Lancashire County Council, 2010b. Development Control Meeting Minutes 21 April 2010.
Lancashire County Council, 2009a. Declared result for election held on 04 June 2009 [WWW Document]. URL http://www3.lancashire.gov.uk/lccelections/results/2009/elected.asp (accessed 10.8.19).
Lancashire County Council, 2009b. Planning Permission.
Lancashire County Council, 2009c. Planning Application Delegated Report [WWW Document]. URL http://planningregister.lancashire.gov.uk/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj01MTU1JmZpbGVuYW1lPVxcYWQubGFuY3NjYy5uZXRcY29ycG9yYXRlXERhdGF3cmlnaHRcUGxhbm5pbmdcMDUtMDktMDU3MlwwNS4wOS4wNTcyIFByZXNzYWxsIFJlcG9ydC5wZGYmaW1hZ2VfbnVtYmVyPTEmaW1hZ2VfdHlwZT1wbGFubmluZyZsYXN0X21vZGlmaWVkX2Zyb21fZGlzaz0zMC8xMC8yMDA5IDE1OjMyOjE5 (accessed 6.25.18).
Lawson, N., 2012. Thought we were running out of fossil fuels? New technology means Britain and the U.S. could tap undreamed reserves of gas and oil [WWW Document]. Mail Online. URL https://www.dailymail.co.uk/debate/article-2244822/Thought-running-fossil-fuels-New-technology-means-Britain-U-S-tap-undreamed-reserves-gas-oil.html (accessed 10.23.19).
Leftly, M., 2013. Revealed: Fracking industry bosses at heart of coalition [WWW Document]. The Independent. URL http://www.independent.co.uk/news/uk/politics/revealed-fracking-industry-bosses-at-heart-of-coalition-8707589.html (accessed 10.22.19).
Leifeld, P., 2013. Reconceptualizing Major Policy Change in the Advocacy Coalition Framework: A Discourse Network Analysis of German Pension Politics. Policy Stud. J. 41, 169–198. https://doi.org/10.1111/psj.12007
Let's Talk About Shale, 2020. Let's talk about shale [WWW Document]. URL http://www.talkaboutshale.com/index.php (accessed 5.11.20).
Lexis Library News, 2020. Lexis® Library: Results - News [WWW Document]. URL https://www.lexisnexis.com/uk/legal/news/search?q=%22shale%20gas%22&aq1=OR%7CAnywhere%7C%22fracking%22&aq2=OR%7CAnywhere%7C%22hydraulic%20fracturing%22&sortOrder=relevance%3Ad&dedupeLevel=off&startDate=01%2F01%2F2016&endDate=31%2F12%2F2016&contentTypeId=news&countryId=1002 (accessed 1.26.20).
Li, P., Bathelt, H., 2021. Spatial Knowledge Strategies: An Analysis of International Investments Using Fuzzy Set Qualitative Comparative Analysis (fsQCA). Econ. Geogr. 97, 366–389. https://doi.org/10.1080/00130095.2021.1941858
Liberal Democrats, 2015. Manifesto 2015.
Liberal Democrats, 2014. Ed Davey's speech to Autumn Conference [WWW Document]. Lib. Democr. URL http://www.libdems.org.uk/ed_davey_s_speech_to_autumn_conference (accessed 5.4.16).

Ligtvoet, A., Cuppen, E., Di Ruggero, O., Hemmes, K., Pesch, U., Quist, J., Mehos, D., 2016. New future perspectives through constructive conflict: Exploring the future of gas in the Netherlands. Futures 78–79, 19–33. https://doi.org/10.1016/j.futures.2016.03.008
Lilley, J., Firestone, J., 2013. The effect of the 2010 Gulf oil spill on public attitudes toward offshore oil drilling and wind development. Energy Policy 62, 90–98. https://doi.org/10.1016/j.enpol.2013.07.139
Lowe, P., Goyder, J., 1983. Environmental Groups in Politics. Allen & Unwin, London.
Macalister, T., 2014. IGas acquires Dart Energy to create UK's biggest shale gas explorer [WWW Document]. The Guardian. URL https://www.theguardian.com/environment/2014/may/09/igas-acquires-dart-energy-biggest-shale-gas-explorer (accessed 1.31.20).
Mason, R., 2009. Shale gas – a fossil fuel with a future.
Mas-Verdú, F., Ribeiro-Soriano, D., Roig-Tierno, N., 2015. Firm survival: The role of incubators and business characteristics. J. Bus. Res., Special Issue on Global entrepreneurship and innovation in management 68, 793–796. https://doi.org/10.1016/j.jbusres.2014.11.030
Matti, S., Sandström, A., 2011. The Rationale Determining Advocacy Coalitions: Examining Coordination Networks and Corresponding Beliefs. Policy Stud. J. 39, 385–410. http://dx.doi.org.libproxy.ucl.ac.uk/10.1111/j.1541-0072.2011.00414.x
Merrick, J., Chorley, M., 2012. Osborne accused over gas lobbyist father-in-law [WWW Document]. The Independent. URL http://www.independent.co.uk/news/uk/politics/osborne-accused-over-gas-lobbyist-father-in-law-7985001.html (accessed 10.15.19).
Merrick, R., 2014. North Yorkshire MP clashes with PM over fracking [WWW Document]. North. Echo. URL https://www.thenorthernecho.co.uk/news/11670731.north-yorkshire-mp-clashes-with-pm-over-fracking/ (accessed 12.18.19).
Milhorance, C., Le Coq, J.-F., Sabourin, E., 2021. Dealing with cross-sectoral policy problems: An advocacy coalition approach to climate and water policy integration in Northeast Brazil. Policy Sci. 54, 557–578. https://doi.org/10.1007/s11077-021-09422-6
Montefrio, M.J.F., Sonnenfeld, D.A., 2011. Forests, Fuel, or Food? Competing Coalitions and Biofuels Policy Making in the Philippines. J. Environ. Dev. 20, 27–49. https://doi.org/10.1177/1070496510394321
National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011. Deep water: the Gulf oil disaster and the future of offshore drilling: report to the President. National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling : For sale by the Supt. of Docs., U.S. G.P.O, Washington, D.C.
Neuhauser, A., 2014. SOTU: Obama Doubles Down on Natural Gas, Promises Stronger Environmental Protections [WWW Document]. US News World Rep. URL https://www.usnews.com/news/articles/2014/01/28/sotu-obama-doubles-down-on-natural-gas-promises-stronger-environmental-protections-2 (accessed 12.10.19).
Nohrstedt, D., 2011. Shifting Resources and Venues Producing Policy Change in Contested Subsystems: A Case Study of Swedish Signals Intelligence Policy. Policy Stud. J. 39, 461–484. http://dx.doi.org/10.1111/j.1541-0072.2011.00417.x
Nohrstedt, D., 2008. The Politics of Crisis Policymaking: Chernobyl and Swedish Nuclear Energy Policy. Policy Stud. J. 36, 257–278. https://doi.org/10.1111/j.1541-0072.2008.00265.x
Nohrstedt, D., 2005. External shocks and policy change: Three Mile Island and Swedish nuclear energy policy. J. Eur. Public Policy 12, 1041–1059. https://doi.org/10.1080/13501760500270729
Nohrstedt, D., Weible, C.M., 2010. The Logic of Policy Change after Crisis: Proximity and Subsystem Interaction. Risk Hazards Crisis Public Policy 1, 1–32. https://doi.org/10.2202/1944-4079.1035
North Yorkshire County Council, 2019. Planning application - NY/2012/0338/FUL [WWW Document]. URL

https://onlineplanningregister.northyorks.gov.uk/register/PlanAppDisp.aspx?recno=8620 (accessed 12.10.19).
North Yorkshire County Council, 2017. Kirby Misperton fracking operations [WWW Document]. North Yorks. Cty. Counc. URL https://www.northyorks.gov.uk/kirby-misperton-fracking-operations (accessed 12.5.19).
North Yorkshire County Council, 2016a. Committee meeting minutes (Kirby Misperton 2015(c)).
North Yorkshire County Council, 2016b. Committee Report (Kirby Misperton 2015(c)).
North Yorkshire County Council, 2016c. Decision notice (Kirby Misperton 2015(c)).
North Yorkshire County Council, 2015a. Site visit report (Kirby Misperton 2015(c)).
North Yorkshire County Council, 2015b. Committee report (Kirby Misperton 2015(b)).
North Yorkshire County Council, 2015c. Committee Report (Kirby Misperton 2015 (a)).
North Yorkshire County Council, 2015d. Decision Notice (Kirby Misperton 2015(b)).
North Yorkshire County Council, 2013. Decision notice (Kirby Misperton 2012).
North Yorkshire County Council, 2012a. RE: Planning Application Consultation NY/2012/0338/FUL.
North Yorkshire County Council, 2012b. RE: NY/2012/0338/FUL - Kirby Misperton PROW.
North Yorkshire fracking protesters "not terrorist threat," 2016. . BBC News.
Nottinghamshire County Council, 2017. Report to Planning and Licensing Committee (Tinker Lane).
Nottinghamshire County Council, 2016a. Committee Report (Springs Road 2015(b)).
Nottinghamshire County Council, 2016b. Public Consultation Responses - Objections and Support Data [WWW Document]. URL https://www.nottinghamshire.gov.uk/planningsearch/DisplayImage.aspx?doc=cmVjb3JkX251bWJlcj02ODEzJmZpbGVuYW1lPSU1YyU1Y25zMDEtMDAyOSU1Y2ZpbGVkYXRhMiUyNCU1Y0RCMDMtMDAzMCU1Y1NoYXJlZEFwcHMlNWNETEdTJTVjUGxhbnMlNWNQTEFOTklORyU1Y0VTLTM1MjQlNWNDb21taXR0ZWUrcmVwb3J0K0FwcGVuZGl4IucGRmJmltYWdlX251bWJlcj00NTMmaW1hZ2VfdHlwZT1wbGFubmluZyZsYXN0X21vZGlmaWVkX2Zyb21fZGlzaz0wMS8wMS8wMDAxIDAwOjAwOjAw (accessed 5.11.20).
Office for National Statistics, 2020a. Unemployment rate (aged 16 and over, seasonally adjusted) - Office for National Statistics [WWW Document]. URL https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/timeseries/mgsx/lms (accessed 5.7.20).
Office for National Statistics, 2020b. Gross Domestic Product: Quarter on Quarter growth: CVM SA % - Office for National Statistics [WWW Document]. URL https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/ihyq/qna (accessed 5.7.20).
Office for National Statistics, 2019. LFS: ILO unemployment rate: North West (GOR): All: %: SA - Office for National Statistics [WWW Document]. URL https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/timeseries/ycnd/lms (accessed 10.22.19).
Ofgem, 2020. Electricity generation mix by quarter and fuel source (GB) [WWW Document]. Ofgem. URL https://www.ofgem.gov.uk/data-portal/electricity-generation-mix-quarter-and-fuel-source-gb (accessed 12.7.20).
O'Hara, S., Humphrey, M., Andersson-Hudson, J., Knight, W., 2016. Public Perceptions of Shale Gas Extraction in the UK: From Positive to Negative.
O'Hara, S., Humphrey, M., Andersson-Hudson, J., Knight, W., 2015a. Public Perceptions of Shale Gas in the UK September 2015 [WWW Document]. Univ. Nottm. URL https://www.scribd.com/doc/131787519/public-perceptions-of-shale-gas-in-the-UK-September-2015-pdf (accessed 8.22.16).
O'Hara, S., Humphrey, M., Andersson-Hudson, J., Knight, W., 2015b. Public Perception of Shale Gas Extraction in the UK: Two Years on From the Balcombe Protests.

Olsson, J., 2009. The Power of the Inside Activist: Understanding Policy Change by Empowering the Advocacy Coalition Framework (ACF). Plan. Theory Pract. 10, 167–187. https://doi.org/10.1080/14649350902884425
Osborne, G., 2015. George Osborne demands rapid progress on fracking – full letter.
Osborne, G., 2012. George Osborne's speech to the Conservative conference: full text [WWW Document]. URL https://www.newstatesman.com/blogs/politics/2012/10/george-osbornes-speech-conservative-conference-full-text (accessed 10.15.19).
Oxford Economics, 2014. Can consumers continue to lean against the real wage squeeze? Econ. Outlook 38, 5–13. https://doi.org/10.1111/1468-0319.12117
Oyemomi, O., Liu, S., Neaga, I., Alkhuraiji, A., 2016. How knowledge sharing and business process contribute to organizational performance: Using the fsQCA approach. J. Bus. Res. 69, 5222–5227. https://doi.org/10.1016/j.jbusres.2016.04.116
Pappi, F.U., Henning, C.H.C.A., 1999. The organization of influence on the EC's common agriculturalpolicy: A network approach. Eur. J. Polit. Res. 36, 257–281. https://doi.org/10.1111/1475-6765.00470
Parsons, D.W., 1995. Public policy: an introduction to the theory and practice of policy analysis. Edward Elgar, Aldershot.
Pearson, P.J.G., Watson, J., 2012. UK Energy Policy 1980-2010: a history and lessons to be learned (Monograph).
Peters, B.G., Hogwood, B.W., 1985. In Search of the Issue-Attention Cycle. J. Polit. 47, 238–253. https://doi.org/10.2307/2131074
Pierce, J.J., Peterson, H.L., Hicks, K.C., 2020. Policy Change: An Advocacy Coalition Framework Perspective. Policy Stud. J. 48, 64–86. https://doi.org/10.1111/psj.12223
Pierce, J.J., Peterson, H.L., Jones, M.D., Garrard, S.P., Vu, T., 2017. There and Back Again: A Tale of the Advocacy Coalition Framework. Policy Stud. J. 45, S13–S46. https://doi.org/10.1111/psj.12197
Power, H., 2012. Cuadrilla's Francis Egan on why fracking is the future [WWW Document]. URL https://www.telegraph.co.uk/finance/newsbysector/energy/9715169/Cuadrillas-Francis-Egan-on-why-fracking-is-the-future.html (accessed 10.22.19).
Press Association, 2013. Fracking protesters gather for six-day camp as Balcombe drilling suspended [WWW Document]. The Guardian. URL https://www.theguardian.com/environment/2013/aug/16/fracking-protesters-camp-balcombe-drilling (accessed 10.28.19).
Proactive Investors, 2014. IGas Energy boss highlights GDF relationship as key in Dart acquisition.
Rácz, K., Wilde-Ramsing, J., 2013. Cuadrilla Resources Ltd: Quick Scan. Centre for Research on Multinational Corporations, Amsterdam.
radix, 2013. Fracking Yorkshire: Cuadrilla`s Bit On The Side. Frack Off. URL https://frack-off.org.uk/fracking-yorkshire-cuadrillas-bit-on-the-side/ (accessed 12.8.19).
Ragin, C.C., 2014. The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies. Univ of California Press.
Ragin, C.C., 2009. Qualitative Comparative Analysis using Fuzzy Sets (fsQCA), in: Rihoux, B., Ragin, C.C. (Eds.), Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques. SAGE Publications, Inc., 2455 Teller Road,?Thousand Oaks?California?91320?United States? https://doi.org/10.4135/9781452226569
Ragin, C.C., 2008. Redesigning Social Inquiry: Fuzzy Sets and Beyond. University of Chicago Press.
Ragin, C.C., 2006. Set Relations in Social Research: Evaluating Their Consistency and Coverage. Polit. Anal. 14, 291–310. https://doi.org/10.1093/pan/mpj019
Ragin, C.C., Davey, S., 2019. Fuzzy-Set/Qualitative Comparative Analysis 3.1b. Department of Sociology, University of California, Irvine, California.
Rasmussen, M.K., 2015. The Battle for Influence: The Politics of Business Lobbying in the European Parliament. JCMS J. Common Mark. Stud. 53, 365–382. https://doi.org/10.1111/jcms.12156

Rawcliffe, P., 1998. Environmental pressure groups in transition. Manchester University Press, Manchester.
Reed, J., 2016. Baroness Anne McIntosh: Fracking plans could "devastate" North Yorkshire economy [WWW Document]. URL https://www.yorkshirepost.co.uk/news/latest-news/baroness-anne-mcintosh-fracking-plans-could-devastate-north-yorkshire-economy-1-7923421 (accessed 12.18.19).
Reed, S., 2012. Britain Approves Fracking for Shale Gas Exploration. N. Y. Times.
Refraktion, 2017. So who exactly is Backing Fracking – unmasking the astro-turfers |. URL https://www.refracktion.com/index.php/so-who-exactly-is-backing-fracking-unmasking-the-astro-turfers/ (accessed 12.16.19).
Residents Action on Fylde Fracking, 2012. 108 signatures.
Riches, C., 2014. Dashed hopes of cheap gas as fracking giant Cuadrilla scales back [WWW Document]. Express.co.uk. URL https://www.express.co.uk/news/uk/456251/Dashed-hopes-of-cheap-gas-as-fracking-giant-Cuadrilla-scales-back (accessed 10.22.19).
Rihoux, B., Marx, A., 2013. QCA, 25 Years after "The Comparative Method": Mapping, Challenges, and Innovations — Mini-Symposium. Polit. Res. Q. 66, 167–235. https://doi.org/10.1177/1065912912468269
Rose, C., 1993. Beyond The Struggle For Proof: Factors Changing The Environmental Movement. Environ. Values 2, 285–298.
Rozbicka, P., 2013. Advocacy coalitions: influencing the policy process in the EU. J. Eur. Public Policy 20, 838–853. https://doi.org/10.1080/13501763.2013.781820
Rudd, A., 2015. Shale Gas and Oil Policy: :Written statement - HCWS202.
Sabatier, P.A., 1998. The advocacy coalition framework: revisions and relevance for Europe. J. Eur. Public Policy 5, 98–130. https://doi.org/10.1080/13501768880000051
Sabatier, P.A., 1988. An advocacy coalition framework of policy change and the role of policy-oriented learning therein. Policy Sci. 21, 129–168. https://doi.org/10.1007/BF00136406
Sabatier, P.A., 1986. Top-Down and Bottom-Up Approaches to Implementation Research: a Critical Analysis and Suggested Synthesis. J. Public Policy 6, 21–48. https://doi.org/10.1017/S0143814X00003846
Sabatier, P.A., Jenkins-Smith, H.C., 1993. Policy Change Over a Decade or More, in: Sabatier, P.A. (Ed.), Policy Change and Learning : An Advocacy Coalition Approach, Theoretical Lenses on Public Policy. Westview, Boulder, Colo; Oxford, pp. 117–168.
Sabatier, P.A., Weible, C.M., 2007. The Advocacy Coalition Framework: Innovations and Clarifications, in: Sabatier, P.A. (Ed.), Theories of the Policy Process. Westview Press, Boulder, Colo.
Saini, D., Wright, J., Mantas, M., Gomes, C., 2019. Unlocking the Potential of the Monterey Shale Resource: An Analysis of Geological Characteristics, Completion Techniques, and Production Behaviors. SPE Reserv. Eval. Eng. 22, 219–237. https://doi.org/10.2118/180446-PA
Salford City Council, 2010. Planning – Application Summary [WWW Document]. URL http://publicaccess.salford.gov.uk/publicaccess/applicationDetails.do?activeTab=summary&keyVal=KXKZHXNP00B00 (accessed 2.3.20).
Saward, M., 1992. The civil nuclear network in Britain, in: Marsh, D., Rhodes, R.A.W. (Eds.), Policy Networks in British Government. Oxford University Press, Oxford, pp. 75–99.
Schaps, K., Chestney, N., 2015. Britain changes rules to fast-track shale gas permits [WWW Document]. Reuters UK. URL http://uk.reuters.com/article/2015/08/13/uk-britain-shale-legislation-idUKKCN0QH2QS20150813 (accessed 11.22.15).
Schlager, E., 1995. Policy making and collective action: Defining coalitions within the advocacy coalition framework. Policy Sci. 28, 243–270. https://doi.org/10.1007/BF01000289
Schneider, C.Q., Wagemann, C., 2013. Set-theoretic methods for the social sciences: a guide to qualitative comparative analysis. Cambridge University Press, Cambridge; New York.

Schneider, C.Q., Wagemann, C., 2010. Standards of Good Practice in Qualitative Comparative Analysis (QCA) and Fuzzy-Sets. Comp. Sociol. 9, 397–418. https://doi.org/10.1163/156913210X12493538729793
Scott, A., 2013. UK Shale Summit 2013: Research interviews.
Scott, J., 1990. A matter of record : documentary sources in social research. Polity, Cambridge.
Scottish Parliament Information Centre, 2013. Scottish North Sea oil and gas industry (No. SB 14-28). Scottish Parliament, Edinburgh.
Shanahan, E.A., Jones, M.D., McBeth, M.K., 2011. Policy Narratives and Policy Processes. Policy Stud. J. 39, 535–561. https://doi.org/10.1111/j.1541-0072.2011.00420.x
Sheffield City Region, 2019. DRAFT ENERGY STRATEGY: Clean Growth & Our Low Carbon Future [WWW Document]. URL https://moderngov.sheffieldcityregion.org.uk/documents/s1379/Appendix%202.pdf (accessed 1.30.20).
Simon, H.A., 1957. Models of man: social and rational; mathematical essays on rational human behavior in society setting. Wiley, New York.
Simon, H.A., 1955. A Behavioral Model of Rational Choice. Q. J. Econ. 69, 99–118. https://doi.org/10.2307/1884852
Singleton Parish Council, 2019. Council Functions [WWW Document]. URL http://www.singletonparishcouncil.co.uk/council/council-functions (accessed 10.7.19).
Smith, A., 2000. Policy Networks and Advocacy Coalitions: Explaining Policy Change and Stability in UK Industrial Pollution Policy? Environ. Plan. C Gov. Policy 18, 95–114. https://doi.org/10.1068/c9810j
Sorrell, S., 2007. Improving the evidence base for energy policy: The role of systematic reviews. Energy Policy 35, 1858–1871. https://doi.org/10.1016/j.enpol.2006.06.008
Sotirov, M., Memmler, M., 2012. The Advocacy Coalition Framework in natural resource policy studies - Recent experiences and further prospects. For. Policy Econ. 16, 51–64.
Spence, A., Venables, D., Pidgeon, N., Poortinga, W., Demski, C., 2010. Public Perceptions of Climate Change and Energy Futures in Britain: Summary Findings of a Survey Conducted from January to March 2010, Understanding Risk Working Paper 10-01.
Statista, 2019. UK: Electricity prices for households 2010-2019 [WWW Document]. Statista. URL https://www.statista.com/statistics/418126/electricity-prices-for-households-in-the-uk/ (accessed 1.22.20).
Stedman, R.C., Evensen, D., O'Hara, S., Humphrey, M., 2016. Comparing the relationship between knowledge and support for hydraulic fracturing between residents of the United States and the United Kingdom. Energy Res. Soc. Sci., Risks, the Social Sciences, and Unconventional Hydrocarbons 20, 142–148. https://doi.org/10.1016/j.erss.2016.06.017
Stevens, P., 2013. Shale Gas in the United Kingdom. Chatham House.
Stevens, P., 2012. The Arab Uprisings and the International Oil Markets, Energy, Environment and Resource Governance. Chatham House, London.
Stritch, A., 2015. The Advocacy Coalition Framework and Nascent Subsystems: Trade Union Disclosure Policy in Canada. Policy Stud. J. 43, 437–455. https://doi.org/10.1111/psj.12112
Supran, G., Oreskes, N., 2017. Assessing ExxonMobil's climate change communications (1977–2014) [WWW Document]. URL https://iopscience.iop.org/article/10.1088/1748-9326/aa815f (accessed 8.8.19).
Sweney, M., Carrington, D., 2017. Friends of the Earth ticked off over claims in anti-fracking leaflet [WWW Document]. The Guardian. URL https://www.theguardian.com/environment/2017/jan/04/friends-of-earth-ticked-off-claims-anti-fracking-leaflet (accessed 3.26.17).
Taylor, J., Van Doren, P., 2008. The energy security obsession. Georget. J. Law Public Policy 6, 475–485.
The Economist, 2009. Leaders: How long till the lights go out?; Econ. Lond. 392, 11.

The Planning Inspectorate, 2016. Appeal Decision (Grange Road 2014).
The Royal Society, The Royal Academy of Engineering, 2012. Shale gas extraction in the UK: a review of hydraulic fracturing.
Third Energy, 2018. Assets & Operations [WWW Document]. URL http://www.third-energy.com/assets-operations (accessed 12.5.19).
Third Energy, 2015a. Supporting information (Kirby Misperton 2015(a)).
Third Energy, 2015b. Planning statement (Kirby Misperton 2015(b)).
Third Energy, 2015c. Planning application for development relating to the onshore extraction of oil and gas.
Third Energy, 2015d. Application for planning permission (Kirby Misperton (2015a)).
Third Energy, 2015e. Planning application (Kirby Misperton 2015 (b)).
Third Energy, 2015f. Statement of Community Involvement (Revision 1).
Third Energy, 2015g. Statement of Community Involvement.
Thompson, H., 2018. Oil and the Western economic crisis. Springer International Publishing, Cham.
Tichenor, P.J., Donohue, G.A., Olien, C.N., 1970. Mass Media Flow and Differential Growth in Knowledge. Public Opin. Q. 34, 159–170.
Truman, D.B., 1951. The governmental process: political interests and public opinion. Knopf, New York.
Tsebelis, G., 1999. Veto Players and Law Production in Parliamentary Democracies: An Empirical Analysis. Am. Polit. Sci. Rev. 93, 591–608. https://doi.org/10.2307/2585576
Uchtenhagen, A., 2011. The Role Of Coalitions In Drug Policy. Some Theoretical And Observational Considerations. Adicciones Palma Mallorca 23.
United Kingdom Onshore Oil and Gas, 2013. Onshore oil and gas group expands as new era begins for industry [WWW Document]. UKOOG - Press Releases. URL http://www.ukoog.org.uk/about-ukoog/press-releases/53-onshore-oil-and-gas-group-expands-as-new-era-begins-for-industry (accessed 12.11.19).
United Kingdom Onshore Operators Group, 2013. Community Engagement Charter: Oil and Gas from Unconventional Reservoirs.
Urwin, R., 2013. Meet the frackers [WWW Document]. Lond. Evening Stand. URL https://link-galegroup-com.ezproxy.is.ed.ac.uk/apps/doc/A335750754/ITOF?sid=lms (accessed 10.11.19).
US Energy Information Administration, 2020a. Texas Field Production of Crude Oil (Thousand Barrels) [WWW Document]. URL https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfptx1&f=a (accessed 11.29.20).
US Energy Information Administration, 2020b. North Dakota Dry Natural Gas Reserves Estimated Production (Billion Cubic Feet) [WWW Document]. URL https://www.eia.gov/dnav/ng/hist/rngr20snd_1a.htm (accessed 11.29.20).
US Energy Information Administration, 2020c. Annual Energy Outlook 2020.
US Energy Information Administration, 2020d. California Field Production of Crude Oil (Thousand Barrels per Day) [WWW Document]. URL https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfpca2&f=a (accessed 11.29.20).
US Energy Information Administration, 2020e. France [WWW Document]. URL https://www.eia.gov/international/overview/country/FRA (accessed 11.29.20).
US Energy Information Administration, 2020f. U.S. Natural Gas Exports by Country [WWW Document]. URL https://www.eia.gov/dnav/ng/ng_move_expc_s1_a.htm (accessed 5.5.20).
US Energy Information Administration, 2019a. Bakken Region Drilling Productivity Report - October 2019.

US Energy Information Administration, 2019b. U.S. Natural Gas Imports (Million Cubic Feet) [WWW Document]. US Energy Inf. Adm. URL https://www.eia.gov/dnav/ng/hist/n9100us2a.htm (accessed 12.10.19).
US Energy Information Administration, 2019c. U.S. Natural Gas Marketed Production (Million Cubic Feet) [WWW Document]. US Energy Inf. Adm. URL https://www.eia.gov/dnav/ng/hist/n9050us2a.htm (accessed 12.10.19).
US Energy Information Administration, 2018. U.S. Shale Production [WWW Document]. URL https://www.eia.gov/dnav/ng/hist/res_epg0_r5302_nus_bcfa.htm (accessed 10.14.19).
US Energy Information Administration, 2015. World Shale Resource Assessments [WWW Document]. URL https://www.eia.gov/analysis/studies/worldshalegas/ (accessed 11.29.20).
US Energy Information Administration, 2014. UK became a net importer of petroleum products in 2013 [WWW Document]. URL https://www.eia.gov/todayinenergy/detail.php?id=16971 (accessed 12.7.20).
US Energy Information Administration, 2005. Annual Energy Outlook 2005 (No. DOE/EIA-0383(2005)).
Van De Graaf, T., Haesebrouck, T., Debaere, P., 2018. Fractured politics? The comparative regulation of shale gas in Europe. J. Eur. Public Policy 25, 1276–1293. https://doi.org/10.1080/13501763.2017.1301985
Van de Graaf, T., Verbruggen, A., 2015. The oil endgame: Strategies of oil exporters in a carbon-constrained world. Environ. Sci. Policy 54, 456–462. https://doi.org/10.1016/j.envsci.2015.08.004
Van Der Heijden, H.-A., 1997. Political opportunity structure and the institutionalisation of the environmental movement. Environ. Polit. 6, 25–50. https://doi.org/10.1080/09644019708414357
Vasi, I.B., Walker, E.T., Johnson, J.S., Tan, H.F., 2015. "No Fracking Way!" Documentary Film, Discursive Opportunity, and Local Opposition against Hydraulic Fracturing in the United States, 2010 to 2013. Am. Sociol. Rev. 80, 934–959. https://doi.org/10.1177/0003122415598534
Vaughan, A., 2016. Fracking given UK go-ahead as Lancashire council rejection overturned [WWW Document]. The Guardian. URL https://www.theguardian.com/environment/2016/oct/06/uk-fracking-given-go-ahead-as-lancashire-council-rejection-is-overturned (accessed 3.26.17).
Velástegui, P.G., 2018. Diverse causes, similar outcomes: reassessing the means and ends of development policy employing multiple causality and capabilities. Rev. Gest. Pública 7, 171–202.
Verdon, J., Kendall, M., 2015. Call For Evidence on the Environmental Risks of "Fracking" from the Commons Environmental Audit Committee: Submission of evidence from Dr. James Verdon and Prof. Michael Kendall.
Vidal, J., 2019. Ex-BP boss John Browne: 'It's going to take a long time to take oil and coal out of the energy system.' The Observer.
Viking UK Gas, 2013. Financial Statements for the year ended 31 December 2012.
Viking UK Gas, 2012a. Kirby Misperton (2012): Planning application.
Viking UK Gas, 2012b. Kirby Misperton (2012): Planning statement and appendices.
Vis, B., 2012. The Comparative Advantages of fsQCA and Regression Analysis for Moderately Large-N Analyses. Sociol. Methods Res. 41, 168–198. https://doi.org/10.1177/0049124112442142
Vis, B., 2011. Under which conditions does spending on active labor market policies increase? An fsQCA analysis of 53 governments between 1985 and 2003. Eur. Polit. Sci. Rev. 3, 229–252. https://doi.org/10.1017/S1755773910000378
Voltolini, B., Eising, R., 2017. framing processes and lobbying in EU foreign policy: case study and process-tracing methods. Eur. Polit. Sci. EPS 16, 354–368. http://dx.doi.org.ezproxy.is.ed.ac.uk/10.1057/eps.2016.18

Wainwright, J., Mann, G., 2018. Climate Leviathan. Verso, London.
Warleigh, A., 2000. The hustle: citizenship practice, NGOs and "policy coalitions" in the European Union - the cases of Auto Oil, drinking water and unit pricing. J. Eur. Public Policy 7, 229–243. https://doi.org/10.1080/135017600343179
Watt, N., 2014. Fracking in the UK: "We're going all out for shale," admits Cameron. The Guardian.
Weible, C.M., 2007. An Advocacy Coalition Framework Approach to Stakeholder Analysis: Understanding the Political Context of California Marine Protected Area Policy. J. Public Adm. Res. Theory 17, 95–117. https://doi.org/10.1093/jopart/muj015
Weible, C.M., 2005. Beliefs and Perceived Influence in a Natural Resource Conflict: An Advocacy Coalition Approach to Policy Networks. Polit. Res. Q. 58, 461–475. https://doi.org/10.1177/106591290505800308
Weible, C.M., Heikkila, T., Ingold, K., Fischer, M., 2016. Policy Debates on Hydraulic Fracturing: Comparing Coalition Politics in North America and Europe.
Weible, C.M., Ingold, K., 2018. Why advocacy coalitions matter and practical insights about them. Policy Polit. 46, 325–343. https://doi.org/10.1332/030557318X15230061739399
Weible, C.M., Nohrstedt, D., 2012. The Advocacy Coalition Framework: Coalitions, Learning, and Policy Change., in: Araral, E., Fritzen, S., Howlett, M., Ramesh, M., Wu, X. (Eds.), Routledge Handbook of Public Policy. Routledge, New York. https://doi.org/10.4324/9780203097571
Weible, C.M., Sabatier, P.A., Jenkins-Smith, H.C., Nohrstedt, D., Henry, A.D., deLeon, P., 2011. A Quarter Century of the Advocacy Coalition Framework: An Introduction to the Special Issue. Policy Stud. J. 39, 349–360. https://doi.org/10.1111/j.1541-0072.2011.00412.x
Weible, C.M., Sabatier, P.A., McQueen, K., 2009. Themes and Variations: Taking Stock of the Advocacy Coalition Framework. Policy Stud. J. 37, 121–140. https://doi.org/10.1111/j.1541-0072.2008.00299.x
White, G., 2011. Cuadrilla admits drilling caused Blackpool earthquakes.
Whiterow, P., 2014. Total completes its buy into IGas, Egdon and Dart shale assets [WWW Document]. Proactiveinvestors UK. URL https://www.proactiveinvestors.co.uk/companies/news/55383/total-completes-its-buy-into-igas-egdon-and-dart-shale-assets-65490.html (accessed 7.30.19).
Whitfield, D., 2019. Highest ever levels of shale gas in the UK are found at Notts site, says firm [WWW Document]. nottinghampost. URL https://www.nottinghampost.com/news/business/highest-ever-levels-shale-gas-2548725 (accessed 5.15.20).
Whitton, J., Brasier, K., Charnley-Parry, I., Cotton, M., 2017. Shale gas governance in the United Kingdom and the United States: Opportunities for public participation and the implications for social justice. Energy Res. Soc. Sci. 26, 11–22. https://doi.org/10.1016/j.erss.2017.01.015
Wilson, J.Q., 1989. Bureaucracy: what government agencies do and why they do it. Basic Books, New York].
Winzer, C., 2012. Conceptualizing energy security. Energy Policy 46, 36–48. https://doi.org/10.1016/j.enpol.2012.02.067
Yandle, B., 1983. Bootleggers and Baptists - The Education of a Regulatory Economists Viewpoint. Regulation 7, 12–16.
Yergin, D., 1988. Energy Security in the 1990s. Foreign Aff. 67, 110–132.
Yin, R.K., 1994. Case study research : design and methods, Second edition. ed, Applied social research methods series ; v. 5. Sage, Thousand Oaks, Calif; London.
YouGov, 2020. Most important issues 2016-2020 [WWW Document]. URL https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/s7d4bpxjcw/YG%20Trackers%20-%20Top%20Issues_W.pdf (accessed 5.27.20).
YouGov, 2015. Most important issues 2010-2015 [WWW Document]. URL https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/zbudh4ut8e/YG-

Archives-Pol-Trackers-Issues%282%29-Most-important-issues-280415.pdf (accessed 10.9.19).

Appendix 1: fsQCA data

Case information					Outcome		Variables							
							External shocks		Relationships with policymakers		Resources		Public opinion	
Coalition	Location	Local Authority	Dates*	Membership	Score	Reasoning	Score	Reasoning	Score	Reasoning	Score	Reasoning	Score	Reasoning
Pro-shale	Grange Road	Lancashire CC	2010-16	Lancashire County Council Planning Committee (until 2013); HM Government; Cuadrilla Resources; Councillor Rigby	0.7	Initial application in 2010 accepted with ease, but subsequent applcation (not for fracking) in Nov 2014 refused, finally being allowed after appeal on April 2016, where Cuadrilla were refused an award of costs.	0.4	2015 general election resulted in Conservative (pro-shale) majority and departure of former Liberal Democrat (lukewarm) energy secretary. Limited significance as government policy was already pro-shale.	1	Significant government support in form of pledge of support to industry and promise to treat appeals against refusals as a "priority for urgent resolution" - the means by which permission was eventually granted.	0.6	Use of City law firm to conduct appeal and a planning consultancy to make in latter application testify to availability of resources and ability to use them when required. Application made great deal of supportive studies from Institute of Directors, Royal Society and Royal Academy of Engineers suggesting shale gas would create jobs and have limited risk. By this point Cuadrilla had attained significant backing from investors.	0	Appeal being allowed coincided with study reporting more members of public opposing rather than supporting shale gas for the first time, and fewer people associating it with economic benefits.

Anti-shale	Grange Road	Lancashire CC	2010-16	Local residents; Lancashire County Council Planning Committee (2013-16); Ribble Estuary Against Fylde Fracking; Friends of the Earth; Singleton Against a Fracked Environment (all 2014-16)	0.3	Following initial application passing with little resistance, anti-shale coalition mobilised effectively for subsequent applications, where planning permission was refused by Lancashire County Council. Efforts were ultimately unsuccessful, but imposed significant delays upon pro-shale coalition	1	External shocks played significant role: earthquakes, fracking moratorium and large protests in Balcombe led to the formation of a coalition for the final application where none previously existed, meaning application struggled for success where it previously sailed through.	0.6	Lancashire CC Planning officer recommended accepting application, but committee rejected after 12 presentations from speakers opposed to application and only two in favour; planning inspector also said there was an "element of subjectivity" in the council's decision. No evidence of constructive engagement with UK government, and local villagers complained about lack of consultation from LCC.	0.6	Sheer quantity of engagement was highly significant: 301 objections in 2014 compared to 3 in 2010. 220 of these letters were identical: suggestive of some resources for mobilising coalition members. It was the issues highlighted in these letters that were mentioned by LCC when refusing permission.	0.2	A gradual decline of favourability and increasing knowledge of shale gas coincided with the application's refusal. Anti-shale gas overtook pro-shale (though only by small margin) around the same time as appeal being allowed. Activities of a few highly engaged protestors might have influenced things at a local level, but not wider public opinion.
Pro-shale	Preese Hall	Lancashire CC	2009	Lancashire County Council (until 2013); HM Government; Cuadrilla Resources;	1	All applications accepted without appeal in relatively little time, including application for fracking, which was accepted after 11 days.	0.2	Oil price was relatively high at time of original application in 2009 and backdrop of financial crisis created favourable climate for application offering potential of job creation and economic development. Shale	0.4	Expressed (but non-specific) government policy in favour of extraction of all economically-viable hydrocarbons. Conservatives in power locally until 2013, only major party to expressly support shale gas development, though they were	0.6	Cuadrilla had investment support from Riverstone Holdings and AJ Lucas and staff members with experience in US shale gas, but had yet to attract the level of investment or academic and political support	0	Public largely ignorant to shale gas or fracking, to the extent that no polls were collected and there was little knowledge of distinction between fracking and drilling.

								gas beginning to establish itself in USA.		undergoing David Cameron's "hug a husky" period at the time.		they'd have by 2013.		
Anti-shale	Preese Hall	Lancashire CC	2009	none	0	Almost entirely unsuccessful: second application took slightly longer to be accepted, but it was largely inconsequential and didn't involve drilling or fracking.	0	No external events favourable to anti-shale coalition were remarked upon by committee in allowing fracking. (It was AFTER allowing fracking at Preese Hall that the earthquake happened.)	0	No coalition to form relationships with policymakers.	0	No coalition; no resources.	0	As above. Also, public opinion not a matter of concern to extent that there were no objections prior to drilling commencing.

Pro-shale	Preston New Road	Lancashire CC	2014-17	Cuadrilla Resources; HM Government; The North and Western Chamber of Commerce; Chamber of Commerce East Lancashire; 200 representations	0.7	Application eventually allowed on appeal to Secretary of State for Communities and Local Government. However, this was an intensive process requiring the production of extensive evidence against large and well-mobilised opposition. Initial application was in April 2014; permission was finally granted on appeal over two years later.	0.4	2015 general election resulted in Conservative (pro-shale) majority and departure of former Liberal Democrat (lukewarm) energy secretary. Limited significance as government policy was already pro-shale.	1	Significant government support in form of pledge of support to industry and promise to treat appeals against refusals as a "priority for urgent resolution" - the means by which permission was eventually granted.	0.8	Cuadrilla employed planning consultants to conduct research and issue responses to letters from FoE, Natural England and CPRE. Also boasted governmental support and representations from local chambers of commerce.	0	Appeal being allowed coincided with study reporting more members of public opposing rather than supporting shale gas for the first time, and fewer people associating it with economic benefits.
Anti-shale	Preston New Road	Lancashire CC	2014-17	Lancashire County Council Planning Committee; Fylde Borough Council; Westby-with-Plumptons Parish Council; Medlar-with-Wesham Parish Council; Kirkham Town Council; The Wildlife Trust; Wildfowl & Wetlands Trust; Roseacre Awareness Group Friends of the Earth; Preston New Road	0.3	Anti-shale coalition mobilised effectively. Friends of the Earth and anti-fracking groups coordinated a mass response (11,127 representations v 200) and Lancashire County Council eventually refused to grant permission. Ultimately unsuccessful,	1	External shocks played significant role: earthquakes, fracking moratorium and large protests in Balcombe led to the formation of a large coalition. These external shocks created a narrative of shale gas being dangerous/dirty which dominated much of the discourse of those opposing it.	0.4	Anti-shale coalition certainly had great deal of access to LCC planning committee, and planning permission was refused for reasons highlighted by anti-shale coalition. However, the appeal decision notice makes far more limited reference to their presence, and is generally	0.8	Very high quantity of well-organised engagement. There are some areas that are more likely to be highlighted by parish and borough councils and some that are more likely to be raised by campaign groups, but there is significant overlap. That, and the number of template letters	0.2	A gradual decline of favourability and increasing knowledge of shale gas coincided with the application's refusal. Anti-shale gas overtook pro-shale (though only by small margin) around the same time as appeal being allowed. Activities of a few highly engaged protestors might

				Action Group; Frack Free Lancashire; Roseacre Awareness Group; 11,127 representations (827 individual letters, 4727 FoE templates, 5573 other templates)		however, as Cuadrilla were successful on appeal.				dismissive of their submissions.		used, are suggestive of high levels of coordination.		have influenced things at a local level, but not wider public opinion.
Pro-shale	Anna's Road	Lancashire CC	2010-15	Cuadrilla Resources; UK government; Westby-with-Plumptons Parish Council (until 2013); 1 local resident (from 2013)	0.3	Initial application for drilling in 2010 accepted within three months. Second application from 2013 for drilling, but not fracking, withdrawn - perhaps in expectation of Lancashire County Council rejecting it.	0.2	2010 election gave power to somewhat more pro-shale Tory-Lib Dem coalition (but with a shale-sceptic Lib Dem Secretary of State for Energy). Also backdrop of higher energy prices and energy security concerns.	0.4	Government policy was moderately pro-shale (though not yet enthusiastic). Lancashire County Council were mindful of government policy in considering applications.	0.2	Limited support for Cuadrilla compared to other applications.	0.2	Significant numbers of people associated shale gas with cheaper energy and (to a slightly lesser extent) lower greenhouse gas emissions, but far greater numbers associated it with earthquakes and water contamination.

Anti-shale	Anna's Road	Lancashire CC	2010-15	Only one resident opposed in 2010. But from 2013: Friends of the Earth; Longview Animal Centre (RSPCA); Residents' Action On Fylde Fracking (RAFF); Nats (En Route); 100+ objections	1	No coalition for first application, so won't be assessed. However, there is clear evidence of widespread coordinated activity opposing Cuadrilla's 2013 application, which was ultimately withdrawn.	0.8	Objections from local residents and Friends of the Earth made constant references to the Balcombe earthquake, as well as issues (or supposed issues) related to hydraulic fracturing in the United States. This was particularly noteworthy as the drilling application expressly stated no fracking was planned.	0.2	Relationships with policymakers generally quite fraught: frequent complaints about lack of access to council and of limited engagement throughout the planning process.	1	Extensive information sharing and letter copying mostly from local residents but some from further away (e.g. Shetland, Sheffield and London). Clear evidence of coordinating activity from RAFF and Friends of the Earth, with some more limited activity from the Longview Animal Centre. Objections generally focused on the same issues, with many noting that application wasn't for fracking but choosing to object on that basis anyway. Focus on fracking seems to be a clear strategic decision that paid off.	0.8	The second application was made in January 2013, a month after the moratorium was lifted but before the government had yet to offer strong support for shale gas. Unsurprisingly, this was a point at which public opinion was particularly opposed to shale, with around 70% associating in with earthquakes and 45% with water contamination - both issues that featured prominently in objections. 65% of respondents knew what shale gas was. At the time, this was the highest total yet received. This correlates strongly with the increased level of opposition.

Pro-shale	Roseacre Wood	Lancashire CC	2014-19	Cuadrilla Resources, HM Government; North and Western Chamber of Commerce; Chamber of Commerce of East Lancashire; 173 representations to Lancashire County Council	0	Initial application was rejected in June 2015. Was rejected on appeal by planning inspector on appeal in March 2016. Secretary of State gave Cuadrilla another chance and reopened inquiry, but was refused again on February 2019. Drawn-out process and ultimately unsuccessful.	0.4	Economic benefits and energy security continued to be cited in favour of applicaton but this was with a backdrop of relatively low gas prices and a low unemployment rate. Conservative government after 2015 election which was more shale friendly.	0.8	Government policy continued to be very pro-shale. The Secretary of State might have rejected Cuadrilla's application in the end but this was after giving them another chance to provide further evidence after a process which opponents claimed had come to a "clear conclusion". Furthermore, Cuadrilla received site visits from several MPs, a Commons committee and an energy minister.	0.8	Cuadrilla had the resources to actively and quickly issue responses to objections, hire planning consultants, conduct numerous public engagements and persist with a long, and perhaps doomed, process.	0.4	Cuadrilla made a determined attempt to change the balance of public opinion with extensive consultation and a non-technical environmental statement, perhaps intended to "educate" the public. This did produce a relative high of 173 representations in support, but this was some way off the peaks reached by the anti-shale coalition.

Anti-shale	Roseacre Wood	Lancashire CC	2014-19	Lancashire County Council; Fylde Borough Council; Medlar-with-Wesham Parish Council; Kirkham Town Council; Newton-with-Clifton Parish Council; Roseacre, Wharles and Treales Parish Council; The Woodland Trust; The Wildlife Trust; Wildfowl and Wetlands Trust; RSPB; Friends of the Earth; Roseacre Awareness Group; 8924 representations (1242 from with Fylde area; 5495 from outside Lancashire); Broughton Parish Council; Woodplumpton Parish Council; Elswick Parish Council; Greenhaigh-with-Thistleton Parish Council; Inskip-with-Sowersby Parish Council	1	It was a long process but Cuadrilla weren't successful at any point and faced constant opposition.	0.6	Earthquakes and fears about fracking continued to play a large role, driving a large number of objections. Meanwhile, low gas prices reduced strength of energy security argument. However, this was a process dominated by local concerns - traffic and noise - so exernal shocks didn't wield as much of an impact here, other than as a potential means of early mobilisation.	0.4	Opponents of shale gas were enthusiatic in engaging with the government's request for responses, but there is no evidence of any closer engagement.	1	Clear evidence of coordination on a tightly focused issue: traffic and noise. Several parish and town councils formed the Roseacre Action Group, producing a thorough report contesting several of the claims in Cuadrilla's application. Friends of the Earth and Frack Free Lancashire both played a major role in coordinating thousands of representations to Lancashire County Council on a number of different grounds. The expectation of large scale protest and the traffic disruption it might cause was even cited as grounds for rejecting the application.	0.6	When the application was being decided, awareness of shale gas and associations of it with water contaminations increased, while associations with earthquakes decreased. The awareness probably resulted in the huge number of objections from outside Lancashire, but given that application was decided on "local" issues of noise and traffic the direct effect of public opinion may be more limited than it appears.

Pro-shale	Becconsall	Lancashire CC	2010-18	Cuadrilla, HM Government, 1 representation	1	Cuadrilla submitted three applications for this site. The first was accepted; the second was withdrawn and quickly replaced with a third, which was accepted. (Cuadrilla were later compelled by the council to clean up the site, with strong evidence pointing to activity of local groups in forcing this, but this falls outside the scope of an application so ought not to be considered)	0.2	Little beyond ongoing concern about energy security and prices and potential for domestic energy supply to improve situation in both of these.	0.8	Aside from HM government support, Lancashire County Council were pro-active in assisting Cuadrilla with application. For instance, LCC asked Cuadrilla for answers to questions they expect to receive in objections to assist them in answering them.	0.6	The vast amounts of preparation and studies conducted by Cuadrilla for this application (and others) is testament to meaningful organisational, technical and financial resources. However, there is little evidence of much activity beyond that.	0.6	A mixed picture: throughout the period of the applications more people consisently said that shale gas should be allowed, but the gap between pro-shale and anti-shale gradually decreased. Meanwhile, numbers associating shale gas with earthquakes decreased (though remaining at quite a high level), while numbers associating it with water contamination decreased. Large numbers continued to associate shale gas with cheaper energy. Overall, the trajectories were slightly in favour of the pro-shale coalition throughout this period.

Anti-shale	Becconsall	Lancashire CC	2010-18	244 representations against, Friends of the Earth, Ribble Estuary Against Fracking, Sefton Green Party	0	Lancashire County Council note that objections rose some questions that made them want to conduct a site visit, but this only led to delays rather than applications being refused. (Cuadrilla were later compelled by the council to clean up the site, with strong evidence pointing to activity of local groups in forcing this, but this falls outside the scope of an application so ought not to be considered)	0.6	Most contested applications occurred in wake of moratorium being lifted. It is clear that Lancashire County Council took concerns about fracking (earthquakes etc) seriously.	0.4	There is clear evidence of engagement with policymakers making a difference: LCC state that engagement from FOE and others gave them cause for hesitation and advocated a site visit rather than immediately accepting Cuadrilla's application. However, the application was, ultimately, successful.	0.4	There was energy objection from Friends of the Earth, Ribble Estuary Against Fracking and Sefton Green Party, who seem to have played some role in coralling some 240 other objections. However, this is significantly lower than other applications, which had thousands of objections. Perhaps crucially, none of the mandatory consultees, including parish and borough councils, objected at any point.	0.4	A mixed picture: throughout the period of the applications more people consisently said that shale gas should be allowed, but the gap between pro-shale and anti-shale gradually decreased. Meanwhile, numbers associating shale gas with earthquakes decreased (though remaining at quite a high level), while numbers associating it with water contamination decreased. Large numbers continued to associate shale gas with cheaper energy. Overall, the trajectories were slightly in favour of the pro-shale coalition throughout this period.

Pro-shale	Kirby Misperton	North Yorkshire CC	2012-16	Third Energy/Viking UK Gas; Friends of Ryedale Gas Extraction; Backing Fracking; UKOOG	1	It is worth nothing that this application faced significant opposition and that the government refused to allow Third Energy to proceed until they satisfy financial checks (Third Energy have since removed equipment from the site and sold their business). However, what is being assessed here - success in local authority planning applications - happened within a year of each submission.	0.4	2015 general election resulted in Conservative (pro-shale) majority and departure of former Liberal Democrat (lukewarm) energy secretary. Limited significance as government policy was already pro-shale.	0.8	Some on the planning committee noted that the planning officer's report "relied too heavily" on Third Energy's submissions. In addition to this, HM government continued to support overall goal of development.	0.4	Third Energy were able to commission research, and while some groups supported them their involvement was fairly limited. Given that application was eventually abandoned due to financial issues it's possible this may have been issue during application period itself.	0.2	Application coincided with trend of decreasing support for shale gas development.

Anti-shale	Kirby Misperton	North Yorkshire CC	2012-16	Frack Free Ryedale; District Councillor Paul Andrews; Frack Free Kirby Misperton; Ryedale District Council; Kirby Misperton Parish Council; Malton Town Council; Marishes Parish; Great & Little Barugh Parish Counci; Pickering Town Council; Rillington Parish Council; Habton Parish Council; Normanby; Yorkshire Wildlife Trust; Frack Free Ryedale, 38 Degrees, Greenpeace, Friends of the Earth; Frack Free Kirbymoorside' (FFK), 'Frack Free Malton & Norton' (FFM&N), 'Frack Free North Yorkshire' (FFNY), Campaign for the Protection of Rural England (CPRE); Thixendale Parish Council, Edstone Parish Council, Helmsley Town Council and Brawby Parish Meeting, Ryedale Liberal Party, Pickering & District	0.3	Were ultimately unable to prevent applications being granted, but they won the support of a number of county councillors: including some of those on the planning committee.	0.4	Earthquake continued to command attention but local issues - such as house prices - seemed to be of more concern,	0.2	Relatively little weight was given to the research of those opposed to the application and the numbers of people involved.	0.8	Campaign groups were highly effective in coordinating and providing templates for objections from thousands of people. However, opinion was split in the planning committee as to the extent to which the sheer number of objections should be considered when making a decision. Campaign was highly successful in obtaining objections from local parish, district and town councils. Frack Free Ryedale commission their own research from "expert consultants".	0.6	Number of people opposed to shale gas was gradually overtaking those in support but issue was becoming less salient. However, planning meetings featured large protests, suggesting intense local opposition.

				Civic Society, Cyclists' Touring Club (North Yorkshire), Flamingo Land, Ampleforth Abbey & College; County Councillor Lindsay Burr, County Councillor John Clark, County Councillor Elizabeth Shields, County Councillor Val Arnold; Professor Nick Cowern										

Pro-shale	Springs Road	Nottinghamshire CC	2015-16	Igas, Total, Ukoog, East Midlands Chamber	1	Relatively minor delay, but ultimately application went through uncontested.	0.4	Recently installed pro-shale majority government, but at the same time devevelopments were hamstrung (as remarked in documents) by low oil price.	0.8	Igas worked closely with Nottinghamshire County Council to establish environmental and technical requirements - an "iterative" process. Focused on "early engagement" to streamline process.	0.8	Igas had a "dedicated project Community Engagement Officer to liaise with local people, business and the community." Great deal of resources dedicated to engaging with locals, but perhaps of limited success: they still faced significant opposition. More importantly perhaps, IGas was backed by Total who had a 40% stake in the license.	0.2	Despite best efforts of Igas, a (admittedly dubious) poll of local residents found 87% of local residents opposed, while nationally views had hardened against shale gas.
Anti-shale	Springs Road	Nottinghamshire CC	2015-16	Misson Parish Council, Blaxton Parish Council, John Mann MP, Councillor Liz Yates, The Ramblers, Bassetlaw Against Fracking (BAF), Frack Free Notts, Friends of the Earth, Nottingham Friends of the Earth, Misson Community Action Group (MCAG), CPRE Nottinghamshire	0	Relatively minor delay, but ultimately application went through uncontested.	0.4	Compared to some other applications, many of the arguments put forward were less parochial and more focused on dimate change, oil price etc.	0.4	Councillors made fully aware of full extent of FoE and district and parish council objections, but limited evidence of any particularly special relationship.	0.6	Wide range of opponents: the usual environmental and anti-fracking groups accompanied by parliamentary and council opposition. However, likes of Friends of the Earth don't appear to have been as active as in other cases.	0.8	Despite best efforts of Igas, a (admittedly dubious) poll of local residents found 87% of local residents opposed, while nationally views had hardened against shale gas.

Pro-shale	Tinker Lane	Nottinghamshire CC	2015-17	Igas Energy; Ukoog; East Midlands Chamber, GDF Suez, Total, Kerogen Capital	1	Permission granted approximately one year after submission of application	0.4	Recently installed pro-shale government,	0.6	Igas provided information packs for county councillors and briefings for MPs. Still maintained government support.	0.6	Dedicated Community engagement officer, backing from Total, extensive and resource-intensive research and funding from GDF Suez. However, objections focused on Igas's ongoing financial difficulties.	0.2	Despite best efforts of Igas, a (admittedly dubious) poll of local residents found 87% of local residents opposed, while nationally views had hardened against shale gas.
Anti-shale	Tinker Lane	Nottinghamshire CC	2015-17	Bassetlaw District Council; Babworth Parish Council; Blyth Parish Council; Barnby Moor Parish Council; Sutton Parish Council; Torworth Parish Council; Nottinghamshire Wildlife Trust; CPRE Nottinghamshire; Frack Free Nottinghamshire; Nottingham Friends of the Earth; Friends of the Earth; Bassetlaw against fracking	0	Permission granted approximately one year after submission of application	0.4	Standard objections based on climate change, opposition to fossil fuels etc but outomes didn't seem to be shaped greatly by external events - perhaps events such as Brexit had pushed shale gas off the agenda somewhat.	0.4	Limited evidence of any meaningful engagement.	0.6	Wide range of opponents: the usual environmental and anti-fracking groups accompanied by parliamentary and council opposition. However, likes of Friends of the Earth don't appear to have been as active as in other cases. Fewer objections and petititions opposing development than in many other cases.	0.8	Despite best efforts of Igas, a (admittedly dubious) poll of local residents found 87% of local residents opposed, while nationally views had hardened against shale gas.

Appendix 2: List of documents consulted

This section lists all the documents for each of the drilling sites. These documents were used to assign actors to coalitions by measuring beliefs and coordination. They were also used to study coalition behaviour and the way in which the variables shaped outcomes. I have not listed all the documents consulted – this list runs often runs to many hundreds of documents – but I have provided the link to access them for each application.

Anna's Road

Application 1 (2010)
https://planningregister.lancashire.gov.uk/Planning/Display/05/10/0634

Application 2 (2013)
https://planningregister.lancashire.gov.uk/Planning/Display/05/13/0021

Becconsall (2010 – 2015)

http://planningregister.lancashire.gov.uk/PlanAppDisp.aspx?recno=6527

Grange Road

Application 1 (2010)
https://planningregister.lancashire.gov.uk/Planning/Display/05/10/0091

Application 2 (2011 – 2012)
https://planningregister.lancashire.gov.uk/Planning/Display/05/12/0003

Application 3 (2014 – 2016)
https://planningregister.lancashire.gov.uk/Planning/Display/LCC/2014/0084

Kirby Misperton

Application 1 (2012)
https://onlineplanningregister.northyorks.gov.uk/register/PlanAppDisp.aspx?recno=8620

Application 2 (2015 – fence)
https://onlineplanningregister.northyorks.gov.uk/register/PlanAppDisp.aspx?recno=9598

Application 3 (2015 – boreholes)
https://onlineplanningregister.northyorks.gov.uk/register/PlanAppDisp.aspx?recno=9645

Application 4 (2015 – 2016 – fracking)
https://frack-off.org.uk/sites/kirby-misperton-1-wellsite-east/

Preese Hall

Application 1 (2009)
https://planningregister.lancashire.gov.uk/Planning/Display/05/09/0572

Application 2 (2011)
https://planningregister.lancashire.gov.uk/Planning/Display/05/11/0431

Application 3 (2014)
https://planningregister.lancashire.gov.uk/Planning/Display/LCC/2014/0123NM1

Preston New Road

Application 1 (2014a)
https://planningregister.lancashire.gov.uk/Planning/Display/LCC/2014/0097

Application 2 (2014b)
https://planningregister.lancashire.gov.uk/Planning/Display/LCC/2014/0096

Appeal (2015)
https://acp.planninginspectorate.gov.uk/ViewCase.aspx?Caseid=3130923&CoID=0

Roseacre Wood

Application (2014 – 2015)
https://planningregister.lancashire.gov.uk/Planning/Display/LCC/2014/0101

Appeal (2015 – 2019)
https://acp.planninginspectorate.gov.uk/ViewCase.aspx?CaseID=3130924&CoID=0

Springs Road

Application 1 (2015)
https://www.nottinghamshire.gov.uk/planningsearch/plandisp.aspx?AppNo=F/3321

Application 2 (2015 – 2016)
https://www.nottinghamshire.gov.uk/planningsearch/plandisp.aspx?AppNo=ES%2f3379

Tinker Lane

Application (2016 – 2017)
https://www.nottinghamshire.gov.uk/planningsearch/plandisp.aspx?AppNo=ES/3524