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The Politics of Scottish Government Policy  
on  
Unconventional Oil and Gas

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## Abstract

The UK government is responsible for UK energy policy and has signalled a firm commitment to hydraulic fracturing for shale gas as part of its energy strategy. Yet, the Scottish Government imposed an indefinite moratorium on fracking in 2017. To explain this puzzling outcome, this thesis uses the Advocacy Coalition Framework to examine the Scottish unconventional oil and gas debates and demonstrate that Scotland possesses an analytically separate fracking subsystem, with its own actors and coalitions, 'nested' in a UK subsystem. The study identifies key actors, their stated beliefs, and drivers of policy change.

In this thesis, I combine qualitative content analysis with the case study approach to capture the dynamic unconventional oil and gas policy process in Scotland and explain this major shift. I provide an in-depth examination of the Scottish hydraulic fracturing debates between 2011 and 2019. The timespan of eight years was enough for advocacy coalitions to emerge with relatively well-formed belief systems, and for policy learning to occur. The findings showed that the Scottish hydraulic fracturing subsystem was conditioned by multiple external events and instances of policy-learning that not only influenced the Scottish Government's final decision, but also its ability to make that decision.

This study makes an original contribution to knowledge in the field of public policy by providing a longitudinal analysis of hydraulic fracturing policy development in Scotland. It also contributes to further development of the Advocacy Coalition Framework as a public policy theory by applying it in a multi-level governance context and expanding the concept of 'nestedness'.

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# Table of Contents

<b>Abstract</b> .....	<b>3</b>
<b>Acknowledgments</b> .....	<b>4</b>
<b>Table of Contents</b> .....	<b>5</b>
<b>List of Tables and Figures</b> .....	<b>9</b>
<b>List of Abbreviations</b> .....	<b>10</b>
<b>CHAPTER 1 Introduction</b> .....	<b>11</b>
1.1 Research Questions and Study Objectives .....	11
1.2 Fracking for Unconventional Oil and Gas.....	13
1.3 Case Study Background.....	14
1.3 The Advocacy Coalition Framework .....	19
1.4 Findings and Expected Contributions .....	21
1.5 Thesis Structure and Overview.....	22
<b>CHAPTER 2 Theoretical Background: Advocacy Coalition Framework</b> .....	<b>24</b>
2.1 Chapter Introduction .....	24
2.2 Unpacking the ACF.....	26
2.3 Belief System .....	28
2.4 Policy Subsystems.....	29
2.4.1 Defining Subsystems .....	29
2.4.2 Formation of Policy Subsystems .....	30
2.4.3 Overlapping, Interrelated, and Nested Subsystems .....	31
2.4.4 Conditioning of the Subsystem Dynamics .....	34
2.4.5 Relatively Stable Parameters .....	36
2.5 Subsystem Actors .....	37
2.5.1 Defining Advocacy Coalitions.....	37
2.5.2 Policy Advocates and Policy Brokers.....	37
2.5.3 Political Veto Players .....	39
2.5.4 Coalition Structures and Policy Change.....	40
2.6 Drivers of Policy Change.....	41
2.6.1 Causal Mechanisms.....	41
2.6.2 External events .....	42
2.6.3 Internal events .....	43
2.6.4 Negotiated Agreement.....	43
2.6.5 Analytical Debate and Learning .....	44

2.7 Policy Learning.....	45
2.7.1 Defining Policy Learning .....	45
2.7.2 Learning What?.....	46
2.7.3 Agent of Learning.....	46
2.7.4 Policy Learning Typology in ACF.....	47
2.8 Strengths and Limitations .....	48
2.9 “Fracking” in the Advocacy Coalition Framework .....	51
2.9.1 Practical Applications .....	51
2.9.2 Coalitions and Beliefs .....	53
2.9.3 Organisational Affiliation.....	54
2.9.4 Basic Attributes: Biophysical.....	55
2.9.5 Basic Attributes: Resource Economics .....	56
2.9.6 Political Structures and Regulatory Regimes.....	57
2.10 Chapter Summary .....	60
<b>CHAPTER 3 Research Design and Methodology .....</b>	<b>63</b>
3.1 Chapter Introduction .....	63
3.2 Methods in ACF Studies .....	66
3.2.1 Overview of the Common Methods.....	66
3.2.2 The Case study approach.....	67
3.2.3 Content Analysis .....	68
3.2.4 Interviews and Surveys.....	71
2.11 3.3 Research Methods.....	72
3.3.1 Research Design.....	72
3.3.2 Data Sourcing and Processing Methods.....	74
3.3.3 Data Validity.....	78
3.3.4 Data Analysis Methods.....	78
3.3.5 Methodological Limitations.....	80
3.3.6 Other Research Barriers .....	82
3.4 Chapter Summary .....	83
<b>CHAPTER 4 The Case Study Background.....</b>	<b>86</b>
4.1 Chapter Introduction .....	86
4.2 The Background: The Scottish Political System and Devolution .....	87
4.2.1 The Devolution of Decision-making in Scotland .....	87
4.2.2 Political Behaviour in Scotland.....	90
4.2.3 Reserved and Devolved Responsibilities in Energy.....	93
4.2.4 Energy Governance in Practice .....	97

4.3 The Case: Unconventional Oil and Gas in Scotland .....	99
4.3.1 The Brief History of Oil and Gas Industry .....	99
4.3.2 Unconventional Oil and Gas Extractions Scenarios.....	100
4.3.3 Economic Scenarios.....	101
4.3.4 Public Health and Community Factors .....	102
4.3.5 Environmental Impacts .....	103
4.3.6 Climate Change Pressure.....	105
4.3.7 Current Regulatory Framework and Mitigation Options .....	106
4.4 Chapter Summary.....	108
<b>CHAPTER 5 Results and Discussion .....</b>	<b>111</b>
5.1 Chapter Introduction .....	111
5.2 Fracking Debates .....	112
5.2.1 The Debate Process.....	112
5.2.2 The Formative Stage of the Policy Subsystem .....	117
5.2.3 The Limbo Phase of the Evidence-based Approach.....	118
5.2.4 The Pre-Moratorium Period of Stabilising Coalitions.....	120
5.2.5 The Post-Moratorium Period of Legislative Conflicts.....	121
5.2.6 General Trends.....	124
5.3 The Policy Subsystem.....	126
5.3.1 Key Actors.....	126
5.3.2 Advocacy Coalitions .....	131
5.3.3 The Politics of Fracking.....	133
5.3.4 Distinct Subsystem Characteristics .....	136
5.4 Policy Beliefs.....	138
5.4.1 Belief System .....	138
5.4.2 Narrative Arguments.....	144
5.4.3 Socioeconomics .....	145
5.4.4 Energy Security .....	146
5.4.5 Community Factors .....	147
5.4.6 Health and Environment .....	148
5.4.7 Constitutional and Democratic Frame .....	148
5.5 Public Participation.....	149
5.5.1 Public Opinion and the Talking ‘Fracking’ Consultation.....	149
5.5.2 Community Impacts .....	151
5.5.3 Economic Impacts .....	153
5.5.4 Climate Change and Energy Mix .....	155

5.5.5 Environmental impacts.....	157
5.6 Drivers of Regulatory Change.....	159
5.6.1 External Events .....	159
5.6.2 Negotiated agreement .....	163
5.6.3 Policy-oriented Learning.....	167
5.7 Solving the Puzzle .....	173
<b>CHAPTER 6 Conclusion .....</b>	<b>178</b>
6.1 Chapter Introduction .....	178
6.2 Key Findings.....	179
6.3 Answering Research Questions .....	181
6.2.1 Question One: on the Policy Subsystem .....	181
6.2.2 Question Two: on Actors and Beliefs .....	182
6.2.3 Question Three: on Narratives.....	185
6.2.4 Question Four: on Policy Change.....	186
6.4 Contributions and Further Research.....	189
6.5 Concluding Thoughts .....	191
<b>APPENDIX I .....</b>	<b>193</b>
<b>REFERENCES.....</b>	<b>199</b>



## List of Tables and Figures

Figure 1: Types of overlapping subsystems (Sewell, 2005) .....	33
Figure 2: The ACF Flow Diagram. Source: Weible et al., 2009 .....	35
Figure 3: Statements on Fracking Over Years .....	126
Figure 4: Group statements on fracking (%). N=1,968 (excludes unspecified statements and unclassified actors).....	127
Figure 5: Statements on fracking by Scottish political parties, 2011-2019 .....	134
Figure 6: Scottish Government's statements on fracking over time.....	136
Figure 7: Categories of supportive and opposing narratives on fracking.....	145
Table 1: Belief systems according to the ACF .....	29
Table 2: Total number of sample articles and statements .....	75
Table 3: Organisational types identified.....	76
Table 4: Groups of arguments (on fracking) identified .....	77
Table 5: Strengths and limitations of the Media Content Analysis.....	81
Table 6: UK and Scottish Governments since 1998. Adapted from Webb and Van Der Horst (2021). 91	
Table 7: Devolution of energy-related powers in the UK. Adapted from Cowell et al. (2018).....	94
Table 8: Distribution of Energy Decision-Making Competences. Adapted from Cairney et al. (2019) 95	
Table 9: Onshore oil and gas operations, full process (LUC, 2018). .....	101
Table 10: Projected impacts of UOG production in Scotland. Adapted from LUC (2018). .....	104
Table 11: Policy Timeline for UOG Development in Scotland.....	115
Table 12: Statements on Fracking by Frequency of Occurrence.....	125
Table 13: Group statements on fracking .....	127
Table 14: Key Actors in the Policy Subsystem.....	131
Table 15: Advocacy Coalitions in the Scottish UOG Subsystem.....	132
Table 16: Belief tiers of the Scottish UOG advocacy coalitions .....	138
Table 17: Policy preferences of advocacy coalitions .....	140
Table 18: Narrative arguments used by advocacy coalitions.....	144
Table 19: YouGov Opinion Poll on Shale Gas Extraction in Scotland, 2015-16.....	150

## List of Abbreviations

ACF	Advocacy Coalition Framework
BGS	British Geological Survey
COMAH	Control of Major Accident Hazards Regulations
DECC	Department of Energy & Climate Change
EIA	Environmental Impact Assessment
EU	European Union
EY	Ernst & Young
GHG	Greenhouse Gas
HIA	Health Impact Assessment
HSE	Health and Safety Executive
IoD	Institute of Directors
MP	Member of Parliament
MSP	Member of the Scottish Parliament
NGO	Non-Governmental Organisation
OGIP	Original Gas in Place
POS	Political Opportunity Structures
PPC	Pollution and Prevention and Control
PWC	PricewaterhouseCoopers
SEA	Strategic Environmental Assessment
SEPA	Scottish Environmental Protection Agency
SMAUG	SNP Members against Unconventional Oil and Gas
SNP	Scottish National Party
UK	United Kingdom
UOG	Unconventional Oil and Gas
US	United States of America
WWF	World Wide Fund for Nature

# CHAPTER 1

## Introduction

### 1.1 Research Questions and Study Objectives

How can we explain Scotland's decision to impose an effective ban on unconventional oil and gas extraction in the face of Westminster's commitment to develop "fracking" nationwide?

In 2014, the former UK Prime Minister, David Cameron, declared that the country is "going all out for shale" (The Guardian, 2014). Scotland is part of the multi-faceted UK energy governance system, and this declaration marked the beginning of new policy considerations for the nation. As per Scotland Act (1998), most control over Scottish energy policy was practically reserved to the UK, before the Scotland Act 2016 extended parliamentary and ministerial responsibilities in this area.

In the face of Westminster's decision to develop unconventional oil and gas (UOG) industry nationwide, the Scottish Government instigated a temporary moratorium on UOG exploration and development in 2015, and an indefinite moratorium just two years later. Shale reserves in Scotland are governed at both national and devolved levels, whereby Holyrood holds meaningful authority over energy policy matters. This, in turn, gave Scotland legal grounds to rule out fracking on its territory. As of today, there is no legislative ban on UOG extraction in Scotland, but the indefinite moratorium acts as an "effective ban" through devolved planning and licencing powers.

This difference between rhetoric and action only helps explain slow policy move towards commercial fracking in the country, but it does not explain how and why the devolved government in Scotland contradicted UK policy in an area that is reserved to the UK. The devolution system allows this possibility, but *how* and *why* did the Scottish Government pursue it? Existing literature provides enough insight into the unique political climate and dynamics in Scotland, but fewer studies have investigated the UOG policy process. To address this gap, I will explore the Scottish UOG policy subsystem and the main drivers of significant changes in onshore oil and gas policy and regulation in Scotland between 2011 and 2019 in this thesis.

The Scottish case represents a very salient change in a policy area that has traditionally been reserved to Westminster. The study therefore seeks to explain the multi-faceted and fluid nature of reserved national and devolved Scottish policy responsibilities, and to demonstrate the extent of the Scottish autonomy in energy policymaking. To achieve that, I will dive into the puzzle of Westminster's past

political commitment versus Scotland's reluctance to support UOG exploration and development, in the context of contradictory policy measures and outcomes on both sides.

This research was conducted based on the informed expectation that the Scottish policy subsystem has its own balance of power. I treated Scotland as a separate case study of a devolved subsystem within the UK with its own geographical and political boundaries. At its heart is the Scottish Government, which showed reluctance to declare a firm stance to fracking from the beginning, advocating for an "evidence-based approach" to energy policy decisions, and eventually chose not to support UOG exploration. I specifically selected research methods that would help me capture changes in policy and discourse in Scotland over time.

To explore the factors motivating these dynamics, this thesis relies on the Advocacy Coalition Framework (ACF), examining, in particular, the key sources of policy change as identified by Weible and Nohrstedt (2013): external events, internal events, policy learning and negotiated agreement. In short, external events refer to changes in socioeconomic conditions, public opinion, discourse, or in the systemic governing coalition (Sabatier and Weible, 2007, pp. 198–199). Internal events, in turn, are those that bring changes in the policy sector in question, such as major developments in the relevant industry. Policy-oriented learning is not an event as such, but rather a process, or an impact that policy development and technical information have on actors' beliefs and strategies. Finally, negotiated agreement consists of "agreements involving policy core changes [that] are crafted among previously warring coalitions" (Sabatier and Weible, 2007 p. 205). The study uses well-established methods in ACF to define and identify the key elements of the Scottish UOG policy subsystem, actors involved in competing coalitions, and how they influence and/or respond to these drivers of policy change.

Based on what is described above, I have formulated four questions to be answered by this thesis:

1. What makes the Scottish subsystem distinctive? More specifically, this question sets out to explore the nature of political system versus the nature of the policy issue in the Scottish context.
2. Who were the main actors in the Scottish UOG subsystem, and what were their goals and beliefs?
3. What arguments did advocacy coalitions use to support their case, and which narratives were the most prominent?
4. What were the key drivers of the changes in UOG policy in Scotland?

In addition, despite its well-established status among public policy theories, the scientific advancement of the ACF is not yet finished. Multiple scholars have pointed out that extensive applications of the framework revealed both its strengths and shortcomings (Weible et al. 2011), which will be discussed in detail in Chapter 2. This thesis aims to address some of these gaps by (a) advancing the discussion on understudied subsystem categories, namely ‘nascent’ and ‘nested’ policy subsystems; (b) revisiting the concept of *relatively stable parameters* that condition policy subsystems, as described by the ACF, and testing it in the devolved political system characterised by dynamic constitutional development; and (c) by expanding the discussion on the key drivers of policy change within the ACF and using practical indicators to identify instances of negotiated agreement and policy learning.

Scotland provides an interesting case study to explore policy processes and public policy theories. It is an excellent case study for testing the ACF because of the high Scottish ministerial autonomy in policymaking, including in energy sector, leading to unique policy subsystems and public policy developments. But why shale oil and gas? And why specifically the ACF model? The next few subsections within this Chapter will explain the relevance of “fracking” as a policy issue, and the relevance of the ACF in studying such complex policy processes.

## 1.2 Fracking for Unconventional Oil and Gas

First of all, what is “fracking” for shale oil and gas and why is it so politicised? Unconventional energy sources come in a number of different forms. As defined by KPMG (2016), these include: gas and associated liquids extracted from onshore shale sources (i.e. rocks) using hydraulic fracturing methods; and coal bed methane (CBM). However, while shale oil and gas are produced from shale rocks, CBM is produced from coal seams. This study focuses on shale gas and oil alone, but not CBM, as it is produced from different reservoir sources and that would require different analytical considerations for this research if they were grouped together.

The term “unconventional”, in this instance, refers to the type of geology in which natural gas and oil are found. Oil and gas industry uses a range of techniques to extract natural resources from underground reserves, depending on geological conditions. Conventional deposits are contained in rocks with porous properties, such as limestone and sandstone (Scottish Government, 2019). These types of rocks have interconnected spaces, which are permeable enough to allow oil and gas to effectively flow through the reservoir to the industrial well (Scottish Government, 2019).

On the other hand, to extract oil and gas from impermeable types of rocks, techniques such as hydraulic fracturing – ‘*fracking*’ – are used. Unconventional deposits lay in rocks with very low permeability, including shale or coal deposits (Scottish Government, 2019). Hydraulic fracturing is a drilling technique used to fracture rocks to release the deposits contained in those rocks (Scottish Government, 2019). The rock gets fractured from injection of pressurised fluids into the rock to prise open small spaces in them, which in turn release the oil or gas (Scottish Government, 2019). The onshore shale deposits remain unexplored in Scotland.

Historically, petroleum resources have played a significant role in the economic development of the UK, and Scotland in particular, being worth about 8.5% of country’s GDP as of 2016 (Scottish Government, 2016). However, with the North Sea oil and gas production declining, both the UK and Scottish Governments are looking to diversify countries’ energy mixes. This comes as a consequence of fewer wells being drilled offshore and of companies targeting smaller, less risky resource locations (Oil & Gas UK, 2015). Resource depletion therefore presents a serious challenge to both governments.

### 1.3 Case Study Background

The UK government, being largely responsible for country’s energy policy, had previously signalled a firm commitment to shale industry as part of country’s energy strategy. However, hydraulic fracturing for shale oil and gas remains a controversial issue both politically and scientifically. Pro-development energy companies compete with anti-development environmental groups to set their agenda for this policy issue. There has been limited movement towards commercial drilling in the UK, and it has been restricted largely to tentative development in England, until a UK-wide moratorium on UOG extraction was introduced in 2019.

Cotton et al. (2021) identified three major stages of shale gas policy development in the UK: precaution, promotion, and abatement. The first politically significant move towards developing shale industry came in 2010 when Cuadrilla, onshore gas exploration and development company, started drilling Britain’s first shale exploration well at Preese Hall, and began fracturing the well in 2011 (Cotton et al., 2021). This operation triggered multiple earthquakes, the largest having magnitudes of 2.3 and 1.5 ML (De Pater and Baisch, 2011). These events led to an initial moratorium on fracking that lasted from April 2011 until December 2012. The *precautionary phase* of contemporary UK shale gas policy began with the first moratorium on fracking.

The UK Conservative-Liberal Democrat Coalition put forward a technocratic policy response, with subsequent decision-making on shale policy development being driven principally by engineering

expert opinion (Cotton et al., 2021). Bickle et al. (2012) identified Royal Society and Royal Academy of Engineering report into the control of seismic impacts as a core research base for the UK onshore oil and gas policymaking during that phase. Subsequently, the UK government put in place regulatory control mechanisms for the monitoring of seismic activity. This decision was technocratic because at this stage no other types of stakeholders were consulted on the social impacts of allowing shale industry to continue in the affected regions (Cotton et al., 2021).

Once these control measures were put in place, the UK Government moved to the *promoter phase* of the policy development. This phase lasted between 2012 and 2019 and was characterised by the creation of a strategic policy platform to support shale industry development and a domestic market for unconventional hydrocarbons (Cotton et al., 2021). This policy platform involved different forms of incentives and policy mechanisms within the broader promotion strategy, including the following: supply push mechanisms, such as 100% business rate recovery for local council for shale industry development (Cotton et al., 2021); demand pull to encourage market uptake (Weijermars and McCredie, 2011), for instance economic incentivisation of affected communities; promotion of social engagement in an effort to encourage public acceptance of shale industry at both national and local-regional scales (Bradshaw and Waite, 2017; Smith and Richards, 2015); and assurance through regulation, such as the government public communications strategy to promote a ‘robust’ regulatory system for shale industry to build confidence within the broader civil society actors that the technology was safe (Hawkins, 2020; Kotsakis, 2012).

However, these measures to incentivise shale industry, according to Cotton et al. (2021, p. 4), “persistently failed to foster what social scientists term a local social license to operate”. What this means is that shale industries and energy companies involved are not trusted by the public to act in the best interests of the communities in which they operate and extract resources (Bradshaw and Waite, 2017; Luke et al., 2018). As shale companies began resource exploration and the UK Government introduced its pro-shale policy platform, this stimulated negative media reporting and a rapid development of environmental activism networks in the UK, as well as social activism at proposed unconventional gas exploration sites, notably at Preston New Road in Lancashire (Cotton et al., 2021; Bomberg, 2017; Cotton et al., 2014). Groups such as Frack Off became influential in shaping the public attitudes towards fracking (Neil et al., 2018).

This sustained social opposition to shale industry at well sites and declining broader public support for fracking was consolidated in 2019 when a magnitude 2.9 earthquake was recorded in Lancashire (Cotton et al., 2021). At this time, an interim report by the Oil and Gas Authority found challenges in predicting the probability and magnitude of any potential seismic activity linked to shale operations

(OGA, 2019). This prompted the UK Government to instigate a moratorium on further shale resource exploration and extraction. In June 2020, then Conservative UK Energy Minister Kwasi Kwarteng MP stated in a BBC interview that “fracking is over”, signalling a formal shift in policy strategy from promotion to abatement.

Another important factor leading to the *abatement policy phase* was the introduction of moratoriums across devolved administrations (Cotton et al., 2021). Hydraulic fracturing for shale oil and gas had become a highly politicised issue between authorities, with each of administrations of the UK taking a different route to assessing impacts and viability of the new industry. Scotland was the first nation to instigate an indefinite moratorium on fracking in 2017. In turn, Wales conducted a public consultation on petroleum extraction in 2018, with most responses raising concerns about the long-term effects of the industry (Welsh Government, 2018). After considering the feedback, in December 2018 the Welsh Government announced that they will adopt their proposed policy to “not undertake any new petroleum licensing in Wales” (Welsh Government, 2018). All in all, both Scottish and Welsh administrations adopted a consultative and precautionary approach to shale policy, leading to moratoriums in both nations, whereas the UK Government focused on seismic activity monitoring (Cotton et al., 2021). But how are devolved administrations able to adopt these policies?

The UK allows for devolved systems of government with delegated powers, which in turn creates multiple subnational policy subsystems. The Scottish Government is one example of a devolved government for Scotland, having a range of powers and responsibilities in various sectors including the health, education, and others. Welsh and Northern Ireland Assemblies also have a varying range of legally devolved powers on these matters (Cotton et. al, 2021). Reserved and devolved responsibilities within the UK are discussed in greater detail in Chapter 4.

The government was established in 1999 as the Scottish Executive under the Scotland Act 1998. This Act created a devolved administration for Scotland in line with the result of the 1997 referendum on Scottish devolution. The Scottish Parliament is now made up of all elected members of Holyrood and is the legislative body for devolved matters. The Scotland Act 2012 and Scotland Act 2016 have extended Scottish parliamentary or ministerial responsibilities. Scotland Act 2016 in particular extended ministerial powers and responsibilities in energy policy, among other things. In Scotland, shale gas as a policy issue has become a devolved matter in its own right (Cotton et al., 2021).

The Scottish UOG policy subsystem is placed within a “nesting doll” of a UK subsystem, having powers over planning and licencing regimes in onshore oil and gas policy. Devolved administrations have powers to grant permission to onshore oil and gas development applications under an umbrella of the Nationally Significant Infrastructure Planning regime (Cotton et al., 2021). The Scotland Act 1998



created the Scottish Parliament and devolved the planning regime over energy development to Holyrood, while Scotland Act 2016 devolved the licencing regime over onshore oil and gas (see Chapter 4 for more details). This allowed the Scottish Government to impose a temporary moratorium in 2015 and an indefinite moratorium on hydraulic fracturing in 2017, while the UK Government was adhering to the promotion policy strategy.

While the literature on the ACF applications and hydraulic fracturing debates in the UK is growing (e.g. Cairney et al., 2016a; Cairney et al., 2016b; Bomberg, 2017), more research is needed on beliefs, structures, and activities of policy actors in devolved nations. This study offers an analysis of the policy development surrounding one of the most controversial issues – shale oil and gas extraction using hydraulic fracturing - in modern energy development, and an insight into the policymaking in one of the strongest of devolved governments in the UK.

The case of UOG policy in Scotland is a particularly distinct and appropriate test of the ACF for several reasons. First, to continue developing the ACF, the framework should continue to be applied to new contexts (Jenkins-Smith et al., 2014). This case study allows researchers to consider the influence of policy actors at multiple levels of governance in a unique context. In light of devolved arrangements, the case study of the subnational UOG policy in Scotland offers a series of distinct characteristics: high level of policy subsystem devolution and proliferation of interest groups; focus on the devolved policy agenda, rather than lobbying UK national institutions; and distinct beliefs and narrative arguments used by competing coalitions, in which relevant issues are defined from a territorial perspective and are clearly distinguished from the UK policy agenda. These could potentially lead to constant juxtaposition of the two in politics. The policy style in Scotland involves ways in which the Scottish Government makes policy based on public consultations and negotiations with Scottish policy actors, such as interest groups, local government organisations and others (Cairney, 2011). Scottish politics is distinctive from that of the UK and other countries, yet at the same time shares the same complex governance system features as any country.

Secondly, the choice to focus on hydraulic fracturing in this case study offers a great opportunity to research into the causes of policy-oriented learning both within and across coalitions. Jenkins-Smith et al. (2018, p. 151) suggested that, although policy learning is a central concept to ACF analysis, its causes often remain understudied, and thus unclear. One of the key pre-requisites for learning *within* advocacy coalitions is its members using new evidence to inform and adjust their beliefs (Jenkins-Smith and Sabatier, 1993; Cairney, 2020). The novelty of hydraulic fracturing as a policy issue means that many of its impacts are subject to scientific uncertainty and debates. The critical question underlying the debates about hydraulic fracturing is the extent to which it poses a threat to

the environment and public health. Even though the technology by itself is not new, it only became widely adopted worldwide around 2008 (Weible et al., 2016). This can and has evidently contributed to high political saliency of hydraulic fracturing across the globe (discussed in Chapter 2), especially compared to conventional oil and gas development. Debates over the risks and benefits of shale development resulted in extensive scientific and political discussions globally and at multiple levels of government, creating a rich soil for studying policy-oriented learning and the drivers behind policy change.

Thirdly, the key facilitator for policy learning *across* coalitions are policy brokers with ‘moderate beliefs’, seeking to encourage compromise (Cairney, 2020; Ingold and Gschwend, 2014; Ingold and Varone, 2012; Heikkila et al, 2014; Moyson, 2017). As such, the Scottish Government positions itself as having a set of institutions designed to produce democratic consensus, as opposed to the UK majoritarian democracy. The “Scottish policy style” rests on the consultative approach by the Scottish Government, and the willingness of interest groups to engage constrictively in decision-making (Cairney, 2011; Cairney, 2012). The UOG policy debate in particular has been shaped by the Scottish Government’s insistence on the “evidence-based approach” to policymaking and several extensive public consultations. This case study thus provides an opportunity to put the ACF premise of policy-oriented learning to test in the context of UOG policy development.

Finally, shale industry is a particularly interesting case study in Scotland due to strong competing narratives over the country’s energy future, and a set of specific external policy events that put the potential new development under even more scrutiny. As Stephan (2017, p. 165) argued, the Scottish Government uses a “dual discursive strategy”, being both a major oil and gas producer and committed to developing renewable energy industry. Scotland has a long history of oil and gas production. This industry is strategically important for the nation and has traditionally been a significant contributor to the Scottish economy, almost double of the low carbon and renewable energy sectors. Yet many offshore fields are in the state of depletion and industry’s profitability is falling (discussed in Chapter 4). Despite declining profits of the petrochemical industry, all forms of prospective UOG development in Scotland were heavily criticised by the public, including hydraulic fracturing and the Coal-bed Methane extraction. The case study of the UOG policy issue in Scotland provides a perfect case of a dynamic policy development, shaped by a variety of narratives and driven by several external events and technical studies.

This research examines UOG policy development in Scotland over the course of eight years, starting in 2011 when the first licence for UOG exploration was granted and finishing in 2019 when the Scottish

Parliament finalised the “no support” policy on UOG extraction. It divides the UOG policy development into four major stages timewise and intellectually:

- The Forming stage of the policy subsystem (between 2011 and 2013)
- The Limbo phase of the evidence-based approach to fracking (between 2014 and 2015)
- The Pre-moratorium period of active debate (between 2016 and 2017)
- The Post-moratorium period of legal development and policy learning (between 2018 and 2019).

### 1.3 The Advocacy Coalition Framework

The ACF, being one of the most established approaches to analyse the process of policy continuity and change, provided the theoretical basis for this study. The ACF begins with the simple story that people engage in politics to translate their beliefs into policy. To do so, they form coalitions with people who share their beliefs, and compete with coalitions containing actors with competing beliefs. This belief-driven feeling of belonging to a coalition, and antagonism towards other coalitions who threaten their beliefs, help bind actors together (Sabatier et al., 1987). ‘Advocacy coalition’ is the metaphor to describe a non-trivial amount of cooperation between actors, and a coalition typically contains “people from a variety of positions (elected and agency officials, interest group leaders, researchers) who share a particular belief system - i.e. a set of basic values, causal assumptions, and problem perceptions” (Sabatier, 1988, p. 139). This model emphasizes the crucial role of beliefs, advocacy coalitions and their interaction over time in the process of policy change and takes into account the multiplicity of policy actors and arenas involved in policy developments.

I have discussed why the UOG policy in Scotland is an excellent case study to test the ACF, but why is this model appropriate for this case? There are three main reasons. First, this theoretical approach acknowledges the complexity of policy processes by incorporating multiple factors in its framework of analysis. More specifically, the ACF allows for the consideration of both normative values and material interests of policy actors as their motivations.

The framework acknowledges that self-interest will be important for material groups motivated by economic interests in contrast with purposive groups, motivated by their ideological positions (Jenkins-Smith and St. Clair, 1993). It also acknowledges instances when actors trade their policy beliefs for strategic short-term goals (Nohrstedt, 2005). However, the ACF generally predicated on the idea that actors engage in politics “to translate their beliefs, rather than their simple material interests, into action” (Cairney, 2015, p. 485). It was also found that policy core beliefs are generally a better predictor of coordinated behaviour between actors than perceptions of power (Weible, 2005), which is why the focus on belief systems is so important. The fact that

environmental debates are usually both normative and material interest-driven requires a theoretical framework that can accommodate both motives.

Secondly, the ACF was initially created to study environmental and energy policymaking in the US, which makes it well-suited for the case study of complex politics (that is shale politics) in the multi-faceted governance system marked by strong political adversity. The high level of uncertainty and complexity that characterises the UOG policy issue in this thesis, as well as the important role of for scientific and technical information in policy subsystems make the ACF model particularly useful.

Finally, policy subsystems, which are the primary unit of analysis in the ACF, were found to be a useful analytical unit as they allow analysis to remain focused on policy issues, rather than specific actors or institutions in which they occur. This provides scope for the consideration of interdependencies and overlaps between activities of many different government sectors, policy actors and even other policy subsystems. In addition, the extent of subsystem autonomy is considered on a case-by-case basis and potential overlapping subsystems must be taken into account. In this case study, Scotland is treated as a distinct policy subsystem with its own geographical and political boundaries, but at the same time I acknowledge the wider UK subsystem, in which it is “nested”, in my analysis. This approach allows for a very comprehensive observation of the policy processes and relevant interest groups involved over time.

Advocacy coalitions are groups of policy actors that share policy core beliefs and coordinate their behaviour to influence the policy process within policy subsystems (Pierce and Weible, 2016). Research regarding coalitions deals with their identification, hierarchical belief systems, coordination, and coalition stability over time. The ACF combines multiple elements, such as policy beliefs, interest groups, economic and political structures to analyse policy change and best incorporate the complexity of the policy process. The framework draws on the mutually constitutive link between agency – as expressed in coordinated efforts of actors and advocacy coalitions to achieve policy change and structure, defined by belief systems of policy actors and institutional constraints, as well as exploring drivers for policy change.

In summary, the four major concepts of the ACF model of analysis are the following (Jenkins-Smith and Sabatier, 1993):

- Policy subsystem, or “the interaction of actors from different institutions who follow and seek to influence governmental decisions in a policy area” (Sabatier, 1993, p. 16);
- Belief systems, understood as “value priorities, perceptions of important causal relationships... [and] perceptions of the efficacy of policy instruments” (Sabatier, 1993, p. 16);
- Advocacy coalitions, the aggregation of actors from “various governmental and private organizations who share a set of normative and causal beliefs and who often act in concert” (Sabatier, 1993, p. 18).
- Policy change, distinguished by *major* and *minor* changes, or changes in policy core beliefs versus secondary beliefs (Sabatier and Jenkins-Smith, 1999).

#### 1.4 Findings and Expected Contributions

While the study results all contribute to the overall objective, there are several core findings that piece together the research puzzle.

First, this study identified three distinct characteristics to the Scottish UOG subsystem. For one, it was the presence of the moderate advocacy coalition with a distinct belief system from either pro-shale or anti-fracking groups, where the Scottish Government and the SNP played the central role. Secondly, it was the prominent role of the Scottish Government in the policy subsystem itself, where it acted both as a policy advocate and a policy broker. The decentralised nature of the Scottish UOG subsystem solidified the power and resources that the Scottish Government, and by extension the moderate coalition, seeking to influence policy change. And third, it was the use of the *constitutional and democratic frame* by actors across all advocacy coalitions, which was largely focused on territorial and democratic issues in Scotland and set the Scottish UOG subsystem apart from the UK-wide subsystem.

This study also identified several drivers of policy change. The decision to impose an indefinite moratorium on fracking was conditioned by external subsystem events, as well as several instances of policy learning that impacted both the Scottish UOG subsystem and the UK nationwide subsystem. The Scotland Act 2016 in particular played a crucial role because it fundamentally altered the legal structure in Scotland and extended Scotland’s ministerial powers over onshore oil and gas licencing regime.

The research findings contribute to further development of the ACF, with all its elements incorporated. This research makes explicit empirical and conceptual contributions to public policy theory and wider literature by: *i)* applying the ACF in the devolved political setting and focusing on a *nascent*, rather than *mature*, policy subsystem;; *ii)* expanding the concept of “*nestedness*” as a

potentially useful term for public policy analysis in specific (e.g. federative) political systems; iii) developing an understanding of a policy development process conditioned by *dynamic* constitutional structure, which is theorised as a *relatively stable parameter* in the ACF literature; iv) applying new practical indicators for identifying and analysing *negotiated agreement* and *policy learning* - both defined as core drivers of policy change within the scope of the ACF; and v), offering an in-depth analysis on onshore oil and gas policy in Scotland and the impact of devolution and constitutional politics on policy development.

These efforts pave a way forward to scholars who are interested in examining policy change and applying the ACF in similar contexts and leave open the possibility of further refinements. The Scottish UOG policy development thus provides a new case for the analysis of devolved systems of government and for the application of the ACF model.

## 1.5 Thesis Structure and Overview

Chapter 1 introduced the puzzling case of Scotland's policy subsystem in the field of prospective UOG development using hydraulic fracturing, or fracking, and presented the ACF as a model for analysing public policy. After this brief introduction on the relevance of the topic and the methodological framework, the next chapter is dedicated to a detailed discussion of the theoretical basis of the ACF and its practical applications to studying UOG as a policy issue. More specifically, I will discuss the key components of the ACF, such as policy subsystems, belief tiers, advocacy coalitions and drivers of policy change, aiming to provide a solid understanding of the model. In addition, I will dive deeper into practical applications of the ACF to studying UOG as a policy issue worldwide. I will discuss how theoretical elements proposed by the ACF are used in similar studies on hydraulic fracturing. This part will put Scotland's case study to the global perspective and account for industry's strategies and political struggles around it, identifying basic attributes and discourse frames related to this policy issue. Chapter 2 will therefore not only provide a solid theoretical background for this study but will also show how this theory can be applied to similar real-life contexts.

Once the theory is discussed, I will move on to Chapter 3, where I will outline the research design and methodology for this study. First, I will provide a comprehensive overview of the common methods used in the ACF and explain the rationale for selecting qualitative content analysis of news articles in studying advocacy coalitions in Scotland. After that, I will describe the research design and specific methods, such as coding and interpretive analysis that were used to answer research

questions. A thorough explanation of research limitations and barriers is also included to show the full story of the research process.

Next, Chapter 4 is dedicated to the case study presentation. Although the Chapter 1 gave a brief overview of the case study background, a more nuanced discussion on political and legal structures in Scotland and the prospects of the UOG industry is needed for a better contextual understanding. This is essential to lay out the context of UOG debates in Scotland and technical information that policy actors use – all of which are necessary for a thorough analysis of the Scottish case.

I will dedicate the first part of Chapter 4 to explaining a multi-faceted political decision-making in Scotland, paying most attention to the Scottish devolution and how it translates to energy governance. Next, I will provide a comprehensive background on the prospects of the UOG industry in Scotland based on the Scottish Government reports, commissioned in 2016 and 2018. These publications are of primary importance to the study because, as will be evident from the analysis later, they exerted a great impact on advocacy coalitions' beliefs and policy development. This is also important because hydraulic fracturing as a method of resource extraction generates strong political opposition worldwide due to its perceived impacts on the environment and public health. By doing all that, I aim at providing an all-round of a perspective on the case study to provide a more nuanced discussion on hydraulic fracturing as a method of extraction and UOG as a policy issue.

Finally, Chapter 5 will present the study results and analysis. I will first provide an overview of the Scottish UOG debates and a policy development over an eight-year period (Subsection 5.2). I will then move on to the main results from the media content analysis in Subsection 5.3. There, I will focus on presenting evidence for competing advocacy coalitions in Scotland and key actors. The next two subsections (5.4 and 5.5) of the chapter build on these findings, identifying beliefs and arguments used by the competing coalitions in the UOG political discourse analysing the changes in UOG debates over time, and how the public opinion fits into them. After that, in Subsection, 5.6, I will discuss changes in regulations and advocacy coalitions, as well as policy learning over time. And at last, I will wrap up the chapter by discussing how these pieces of evidence complete the research puzzle. This analysis will draw on all key ACF components to explain the puzzle of Scotland's reluctance to support UOG development. I will conclude the thesis in Chapter 6 with a discussion of the findings and theoretical implications.

# CHAPTER 2

## Theoretical Background:

### Advocacy Coalition Framework

#### 2.1 Chapter Introduction

The policies are being made and implemented in complex policymaking systems, where power is dispersed, and a wide range of actors interact and compete to push forward their agenda. What is the role of interest groups, organisations and individuals in shaping policy outcomes and outputs, and what drives changes in policymaking? The ACF can help answer just that. It was developed as a means of incorporating public policy analysis into a more dynamic understanding of the elaborate systems and relationships in which policymaking occurs, focusing on competition between coalitions of policy actors, interest groups and other stakeholders seeking to influence decision-making processes and outcomes. The framework provides a meaningful theoretical perspective that helps explaining policy change and policy stagnation (Sotirov and Memmler, 2012). While the previous chapter briefly introduced the ACF and explained why it was selected as a core theoretical model for this study, it did not sufficiently unpack many of the concepts that are key to analysing and understanding this case study. This chapter has two broad aims: to provide a solid theoretical basis for the research case, and to show its practical applications by putting shale politics into the context of existing ACF applications.

First, this chapter will examine the core elements and assumptions of the ACF approach: its analytical focus and primary research concerns; the relationship between politically active actors and groups; connections between beliefs, policy processes and preferences; the ways in which advocacy coalitions and other elements influencing subsystems drive policy change; and, finally, its strengths and limitations. In doing so, this chapter presents the ACF as a practical research tool for analysing policy development in complex multi-level governance systems.

Based on Sabatier's (1998) work, the ACF has at least three basic premises. The first premise is that the analysis of policy processes requires a time perspective of a decade or more. The reason for that is because the long-term perspective is usually necessary for a policy change and policy-oriented



learning to occur. This thesis, however, advances the notion of 'nascent' subsystems and covers a shorter time span. In the Scottish UOG subsystem, the timespan of eight years was enough for policy learning to occur, and it influenced significant changes in policy despite the 'nascency' of the subsystem.

The second premise is that the most useful level of analysis is to focus on policy subsystems, i.e. the interaction of actors from different affiliations interested to influence a specific policy issue. I specifically focus on the concept of 'nestedness' to define and distinguish the scope of and dynamics within the Scottish UOG subsystem and how it is interrelated with the UK subsystem on the same issue.

The third premise is that public policies can be conceptualized in the same manner as beliefs of the actors involved, i.e. as sets of values, knowledge, and assumptions about a policy area. For Sabatier (1999), beliefs and values guide individual or group actions in their pursuit of a policy outcome. Shared values can be used to map the relationship between policy actors within a policy subsystem and draw them into 'advocacy coalitions'. Grounded in these premises, the ACF provides a causal theory about how policy positions are constructed and how they drive policy change.

The final part of Chapter 2 will be discussing practical applications of the ACF in the context of shale politics worldwide. The ACF has been meaningfully applied in various natural resources policy areas and across a multitude of geographical domains and political systems (Sotirov and Memmler, 2012). It has already been used in several hydraulic fracturing and energy policy studies (e.g. Ingold and Fischer, 2016) across the globe to help explain either the willingness of policy-makers to integrate hydraulic fracturing technology into energy systems (e.g. in the USA and Canada), or socio-political resistance to the new industry in the EU countries. In Section 2.9, I will specifically discuss policy core beliefs that are common in UOG subsystems, as well as types of actors (based on their organisational affiliation) that form advocacy coalitions around this policy issue. This part of the chapter will provide an insight into the UOG policy process from the perspective of the ACF, and hence the better understanding of the ACF methods.

The advantages of combining the theoretical discussion and the discussion of practical applications in one chapter are twofold. First, the second part of the chapter provides essential practical knowledge of the ACF concepts that builds on the theoretical discussion in the same chapter. Theoretical knowledge of the ACF is necessary to understand what the model is about, but practical knowledge is essential for understanding how these concepts should be implemented in real life case studies. Therefore, this chapter not only provides an in-depth background on the ACF, but also sets the framework in motion and demonstrates how its concepts intertwine and work together.

Secondly, this overview directly benefits the analysis of the Scottish case study, as it demonstrates how the ACF application looks in practice and in the context of shale oil and gas policy. For example, the role of structural factors - technological, economic, geographic, and regulatory in the formation of advocacy coalitions and hydraulic fracturing policy development is huge. In this review, I chose to focus mostly on *relatively stable parameters* and *long-term opportunity structures* of the policy subsystem, such the distribution of natural resources, political systems, and others, instead of dynamic drivers of policy change (discussed in more detail in Section 2.4). Those dynamic factors vary significantly from subsystem to subsystem, but common attributes among the more stable and long-term parameters are more straightforward and easier to distinguish from the literature review. This approach operationalises the theory for empirical application in the Scottish case study analysis.

Since the data collection and analysis were mostly focused on dynamic factors affecting policy change, I relied on identifying the stable parameters and long-term opportunity structures from the secondary literature. Drawing on the previous ACF studies, this Chapter discusses which specific elements might be of significance to the UOG policy development in Scotland. I will be drawing on several case studies from across the world, such as the US, Canada, Switzerland and Germany, all of which had different sectoral experience, to maximise the comparability of the Scottish case study and to supplement contextual understanding of it (which will be discussed further in Chapter 4).

## 2.2 Unpacking the ACF

In a nutshell, Jenkins-Smith et al. (2014) positioned ACF on the following seven assumptions:

1. A central role of *scientific evidence and information* in policy processes. The reason for that is because technical and scientific information is the primary force that drives policy-oriented learning (discussed in Section 2.7), which, in turn, is one of the key drivers of policy change.
2. A *time perspective* of at least a decade to understand policy change. The need for such a timeframe is selected to obtain a more accurate portrait of success and failures of policies, and it is more likely that over this period they will complete at least one formulation/implementation/reformulation cycle (Mazmanian and Sabatier, 1989).
3. *Policy subsystems* as the main unit of analysis for understanding policy processes. This means the interaction of actors from different institutions who follow, and seek to influence, governmental decisions on a given policy issue (Jenkins-Smith and Sabatier, 1994). Policy subsystems contain several interlinked components that influence policy results, namely,

- physical, and institutional characteristics, belief systems and political resources. Subsystems are semi-autonomous, but they overlap with, and/or are 'nested' in other policy subsystems.
4. Subsystems are simplified by aggregating all relevant actors and stakeholders into one or more *advocacy coalitions*. To be part of the same coalition, actors should share a specific "belief system" and demonstrate a "non-trivial degree of coordinated activity over time" (Sabatier, 1988, p. 139).
  5. *Advocacy coalitions* are groups consisting of individuals, organisations, or collective representatives from different circles. A broad set of coalition participants that includes any person regularly attempting to influence subsystem affairs, such as lawmakers, bureaucrats, activist and interest groups, scientists, skilled policy entrepreneurs, and the media actors (Mintrom and Norman 2009; Sabatier and Weible 2007; Schorn 2005; Weible 2005; Weible 2006),
  6. Policies and programs reflect the translation of actors' *policy core beliefs* (Sabatier and Jenkins-Smith, 1999). Therefore, "public policies or programs can be conceptualized in the same manner as belief systems, i.e. as sets of value priorities and causal assumptions about how to realize them" (Sabatier 1988, p. 131).
  7. A bounded rationality of policymakers with limited focus and abilities to process information (Simon, 1985). They are motivated by their belief systems and are prone to the "devil shift", i.e. demonising the opponent (Scholz and Pinney, 1995; Sabatier and McLaughlin, 1987; Sabatier and Weible, 2007).

As the framework continued to be applied, especially outside the U.S. where it was developed, there appeared to be the need for a revision in how these assumptions are presented in order to account for a variety of political systems. Instead of rooting the ACF in specific requirements or assumptions that must be met, Sabatier and Weible (2007) argued that the framework was also based on three "foundation stones."

The *first foundation stone* encompasses the processes at the macro or systemic level. It presumes that policymaking tends to occur among specialists and elites within a policy subsystem. Yet their behaviour, beliefs and resources are still constrained by broader socio-economic and political environments, such as the openness of political systems (Jenkins-Smith and Sabatier, 1993; Sabatier and Weible, 2007). The *second foundation stone* aggregates multiple actors within a subsystem into an advocacy coalition and therefore puts them at the group level based on their core beliefs and decision-making (Jenkins-Smith and Sabatier, 1993; Sabatier and Weible, 2007). The *final foundation stone* focuses on the micro or individual level and assumes bounded rationality as the model of individual behaviour (Simon, 1985; Sabatier and Weible, 2007). In other words, policymakers are not

‘comprehensively rational’, being able to obtain all relevant policy information and spread their attention evenly across policy issues or rank their preferences clearly (Sabatier and Weible 2007).

The next sections discuss these components identified in the key assumptions and foundation stones of the ACF in greater detail, as well as the four sources of policy change proposed by the framework . In addition, I will address some major strengths and limitations of the ACF and mitigation strategies that I adopted in this thesis.

### 2.3 Belief System

Belief systems provide the basis for the existence of advocacy coalitions. They are defined in three tiers, as shown in Table 1. The first level is *deep core beliefs*, which, according to Sabatier and Weible (2007, p. 194) represent “very general normative and ontological assumptions about human nature [and] the relative priority of fundamental values such as liberty and equality”. In their initial description, Sabatier and Jenkins-Smith (1993, p. 180) emphasized that deep core beliefs should “operate across virtually all policy domains”. In other words, they are almost all-encompassing in scope. Deep core beliefs, such as environmentalism and economic conservatism that are imbedded in hydraulic fracturing advocacy coalitions, however, are present only in a finite number of policy problems (Ripberger et al., 2014). Yet they still can overlap across multiple policy subsystems, such as public health and energy policy subsystems.

At the next tier are policy core beliefs over specific desired policy outcomes, or “fundamental policy positions” (Cairney, 2012, p. 205) that are based upon deep core beliefs (Jenkins-Smith et al., 2014). *Policy core beliefs* link deep core beliefs into actual policy prescriptions (Jenkins-Smith et al., 2014). For instance, core beliefs over UOG policy, derived from economic conservatism are likely to be manifested in pro-fracking campaigns based on the economic growth prospects. Finally, at the lowest level are *secondary beliefs*, usually over procedural matters that may be subject to change during political bargaining (Sabatier and Weible, 2007; Jenkins-Smith et al., 2014). Examples of secondary beliefs include funding, delivery, and implementation of policy goals (Cairney, 2012). While policy core beliefs are normative and empirical, secondary beliefs are instrumental and represent the means to an end, whereby the end is fixed, but the means are flexible so long as the end goal is achieved.

Table 1: Belief systems according to the ACF

	DEEP CORE BELIEFS	POLICY CORE BELIEFS	SECONDARY BELIEFS
<b>DEFINING CHARACTERISTICS</b>	General normative values and ontological axioms. Non-specific to policy	Normative (value priorities) and empirical (policy core) beliefs; actual policy prescriptions	Preferred instrumental means for achieving the desired outcomes
<b>EXAMPLES</b>	<ul style="list-style-type: none"> <li>• Priority over fundamental values (e.g. liberty, equality, knowledge etc.)</li> <li>• Human nature (rational, egoistic, evil etc.)</li> <li>• Society (e.g. ethnicity, religion, identity etc.)</li> <li>• Human-natural systems (e.g. environmentalism, economic conservatism etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Value priorities for the policy subsystem: Identifying core groups/population whose welfare is of primary concern</li> <li>• Empirical beliefs: Overall seriousness of the problem, basic causes of the problem, and preferred solution to the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Administrative/legislative means to implement policy goals</li> <li>• Budgetary allocations</li> <li>• Seriousness of specific aspects of the problem</li> <li>• Research needs and information sharing</li> </ul>
<b>SCOPE</b>	All-encompassing, applicable across multiple policy subsystems	Bound by scope and topic to the policy subsystem	An instrumental part of the subsystem
<b>SUSCEPTIBILITY TO CHANGE</b>	Very low and highly unlikely under any circumstances	Very low, change usually occurs under as the result of external/internal shocks	Highest among the three, as it concerns with administrative matters

Adapted from Sabatier, Theories of the Policy Process, pp.140-41

Due to the nature of core beliefs that are embedded in advocacy coalition formation, the ACF presumes a non-trivial degree of cooperation to characterize each coalition (Sabatier and Weible, 2007; Weible, 2006; Weible, 2005). Extensive cooperation between coalition actors, in turn, results in stronger belief systems and can help determine success of a policy initiative (Sabatier and McLaughlin, 1987). Nevertheless, coalition members tend to engage in minimal levels of cooperation outside their own group due to a demonizing effect of their opponents, termed as the “devil shift” (Sabatier and McLaughlin 1987; Sabatier and Weible, 2007).

## 2.4 Policy Subsystems

### 2.4.1 Defining Subsystems

Policy subsystems are the **primary** unit of analysis in the ACF studies. Weible and Sabatier (2006, p. 181) define policy subsystems by “a geographic scope, a substantive issue, and a population of hundreds of active stakeholders from all levels of government, multiple interest groups, the media, and research institutions”. Competing coalitions seek to influence the decision-making process of government authorities that affect institutional rules, specific policy outputs and outcomes. This, in

turn, feeds back into both existing policy subsystems and external subsystem affairs (Jenkins-Smith et al., 2014).

Policy subsystems exist within the overarching political structures and systemwide forces, including national political executives, cabinets, national legislatures, and courts (Sabatier and Weible, 2007). The level of subsystem autonomy is likely to vary according to the policy area and the degree of governance centralisation. Therefore, although policy subsystems are to be used as a core unit of analysis in the ACF studies, the extent of their autonomy must be considered on a case-by-case bases and potential overlapping subsystems must be taken into account. This is relevant to the Scottish UOG subsystem, as it exists in the context of an overlapping UK-wide policy subsystem.

#### 2.4.2 Formation of Policy Subsystems

It is a major assumption of the ACF that policy change, and thus advocacy coalitions influencing public policy are best studied over a pro-longed period of time of at least a decade (Sabatier, 1988, p. 131; 1999, p. 4; Sabatier and Jenkins-Smith, 1999, p. 118; Weible et al., 2009, p. 122). However, emerging issues can be substantial and polarising from the start, and even subsystems with a history of advocacy coalition activity had to have been nascent in the beginning.

The ACF (Sabatier and Jenkins-Smith, 1999, p. 135) theory distinguishes between *nascent* subsystems in the process of forming, and *mature* subsystems that have been active, or existed for a decade or more. Nascent subsystems are therefore categorised as subsystems around policy issues that emerged on the public agenda less than ten years ago, having little or no history of public policy outputs, and where advocacy has only recently become prominent (Stritch, 2015). Subsystems that arise around new policy issues as opposed to overlapping policy subsystems (see Subsection 2.4.3) are projected to have fragmented belief systems *and* higher possibility for coalition deflection due to more fluid sets of beliefs (Sabatier and Jenkins-Smith, 1999, p. 136; Sabatier, 1993, p.26). Nascent subsystems are also anticipated to have weaker coordination patterns within and across coalitions, compared to mature subsystems. Both cooperative and coordinating aspects of advocacy coalitions need to be constructed and maintained over time, and therefore they are less likely to be extensively developed in nascent subsystems (Stritch, 2015).

It is important to mention that, as previously discussed, the ACF model of analysis usually requires a time perspective of a decade or more, which poses a question of the place of nascent issues in the ACF studies. Since nascent subsystems have not attained the necessary longevity, and the long-term perspective is vital for policy learning to occur, the prospects of an all-encompassing study are more

limited. However, Stritch (2015) argued that nascent subsystems should not be ruled out of the ACF. The emergence of advocacy coalitions, beliefs and coordination between actors occur in policy subsystems of shorter duration and can be studied as well as in mature subsystems (Stritch, 2015).

This case study examines the extent to which a nascent subsystem was formed in Scotland to reflect a new policy issue. Although oil and gas companies and environmental organisations have long debated the use of fossil fuels, key factors such as the novelty of hydraulic fracturing as a method of extraction and emerging prospects for commercial drilling have promoted new debates and coalitions in countries such as the UK (Weible et al, 2016; Bomberg, 2017). The study by Ingold et al. (2016) drew on a survey of key actors in the UK to identify a nascent (at the time) UOG subsystem. They found that nascent coalitions mostly developed from previous relationships built on reliability and trust. The examples of such relationships are those actors that they knew from previous processes or venue co-participation (Ingold et al., 2016). It is therefore expected that the Scottish UOG subsystem also developed from policy processes that occurred in the UK subsystem earlier, with certain subsystem actors, such as the UK Government and DECC, playing a part in both. At the same time, it is also expected that many Scottish actors will be involved in the subsystem for the first time due to the prominence of Scotland-based actors in Scottish politics and civic society (discussed in Chapter 4, Section 4.2).

Moreover, Ingold et al. (2016) also pointed that scientific research on hydraulic fracturing was affected by the fact that it is a relatively new issue, and thus the scientific consensus on the issue was lacking. The Scottish UOG subsystem, however, is 'nested' in (discussed in the Subsection 2.4.3) and developed later than the UK-wide subsystem. Even though there are many scientific uncertainties surrounding UOG resources and prospective development in Scotland (discussed in Chapter 4, Section 4.3), Scottish advocacy coalitions are likely to have access to a range of technical and scientific information to work with, building on the existing evidence available in the UK-wide subsystem as well as gathering new evidence. Despite its nascency, the Scottish UOG subsystem is anticipated to have opportunities for policy learning based on the existing and new scientific evidence.

### 2.4.3 Overlapping, Interrelated, and Nested Subsystems

There is no uniform method to distinguish policy subsystems in terms of their size or scope. Policy process is dynamic; thus, any fragmentation and specialization of policy issues can create subsystems of varying dimensions. A defined geographical scope also does not necessarily restrict subsystems to either national, subnational, or regional politics (Pierce et al., 2017a). As Cairney and Weible (2015, p. 93) explained, policy subsystems "can occur at any level of government from local

to national and can occur cross-nationally... Policy subsystems are also nested and overlapping and semi-autonomous”.

Policy areas may be national in scope, such as onshore oil and gas policy in the UK, but at the same time focus on a specific issue relevant to subnational levels, for instance the prospective extraction of onshore oil and gas resources on the Scottish territory. If subsystems share the same or sufficiently related functional domains in a way that policies arising in one have an impact in the other, they are called *overlapping subsystems* (Sewell, 2005, p. 70).

Policy subsystems can be *interrelated* (horizontally) and *nested* (vertically) to various extents (Jenkins-Smith et al., 2014; Pierce et al., 2017a; Sewell, 2005). This distinction is modelled in Figure 1. Subsystem boundaries are artificial constructs and, besides the geographical area, do not always represent jurisdictional lines (Howlett, 2009). The level of subsystem overlap is determined by the extent to which actors are part of those subsystems, but also to what extent policies in one subsystem will influence policies in another subsystem (Sewell, 2005).

The greatest degree of overlap occurs in situations where subsystems are nested, as they share the same or very similar functional domains, plus the political boundaries of one or several are enclosed within another, larger and hierarchically superior subsystem (Sewell, 2005, pp. 70-71). Nesting is common for subsystems that have different territorial boundaries (Sewell, 2005), which is the case with Scotland and the UK-wide subsystem. Likewise, interrelated subsystems are expected to have lesser degrees of overlap. Interrelated subsystems can be defined as having different functional domains that are sufficiently related in a way that a subset of actors in one subsystem is also part of the other (Sewell, 2005, p. 71). However, unlike nested subsystems, the relationship between interrelated subsystems is not hierarchical, as they may be at the same level of government, have same geographical boundaries, or be part of entirely different political systems (Sewell, 2005).

Besides multi-level or nested policy arenas, nesting also occurs across several other levels of analysis. Policy changes altering a course of action at one level occur within an established set of rules at a deeper level. The example that I use here is the Scottish devolution process, which had led to changes in energy policy responsibilities for Scotland. Actors in such subsystems are thus functionally interdependent (Zafonte and Sabatier, 1998). This multi-level and overlapping structure of networks across multiple policy issues can be important in explaining major policy changes (Lubell et al., 2012; Brandenberger et al., 2015).



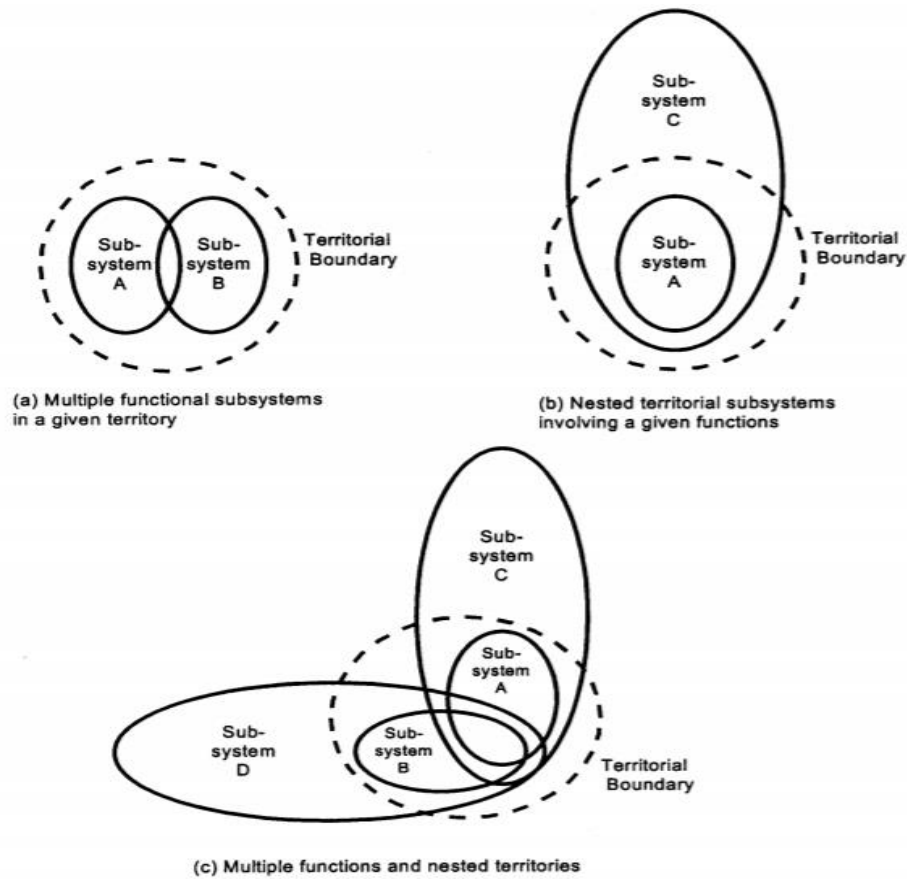


Figure 1: Types of overlapping subsystems (Sewell, 2005)

The multi-level nature of overlapping subsystems affects the resources, opportunities, and constraints of subsystem actors. Policy outcome will depend on whether dominant coalitions, substantially share a belief system (Sewell, 2005). By dominant coalitions I am referring to those coalitions that have significantly more power in decision-making, persuasion, financial and strategic resources over others within overlapping or nested subsystems (Sewell, 2005). If this is the case in horizontal overlaps, then the coordination between subsystems is expected to become easier (Sewell, 2005). In the case of vertical overlaps, that would require the dominant (nested) coalition's beliefs to be reinforced by the same overarching beliefs in a larger subsystem (Sewell, 2005). Diverging beliefs, as follows, would lead to opposite results. Instead of reinforcing the power of a dominant coalition, diverging beliefs in overlapping subsystems would create an opportunity for minority coalitions to venue-shop and frame issues fitting within a larger subsystem. Therefore, conflicts among subsystems are least likely to occur where overlapping subsystems are dominated by "parallel" coalitions sharing the same or similar beliefs and having at least complementary policy objectives (Sewell, 2005, p. 72).

Distinguishing the scope of a subsystem is particularly complicated when dealing with international treaties, which add an international level of responsibilities. A distinction is required between overlapping international subsystems, national foreign subsystems, and various domestic policy subsystems (Sewell, 2005). Delimiting a nested Scottish subsystem in this study also helps to clarify devolved and shared responsibilities in the UK, as well as available policy instruments to institute changes.

In short, I explore the idea of a Scottish subsystem 'nested' in the UK because: (a) there is high Scottish ministerial autonomy to make key decisions even if the ultimate power seems to reside in the UK Government, and (b) this autonomy leads to major divergence between subnational and national policies (Cairney et al., 2018). Although it is sometimes unclear what the main driver for ministerial autonomy is – whether it is executive devolution, political veto, or devolved planning powers - their combination reinforces our understanding of who is responsible for what (Cairney et al., 2018). These factors are discussed further in Chapter 4 that focuses on the Scottish case study.

#### 2.4.4 Conditioning of the Subsystem Dynamics

Subsystem affairs are partly conditioned by *relatively stable parameters* (discussed in detail in Section 2.4.5), normally external to the subsystem itself, such as the basic physical, environmental and economic attributes, fundamental socio-cultural values and overarching institutional context of political structures (Jenkins-Smith et al., 2014; Hofferbert, 1974). Physical and environmental conditions, in the case of hydraulic fracturing development, can also be internal to subsystem affairs due to the major role of resource availability and properties in environmental policy change (Cairney, 2012; Sabatier, 2007). Figure 2 below is the ACF flow diagram that shows all these elements.

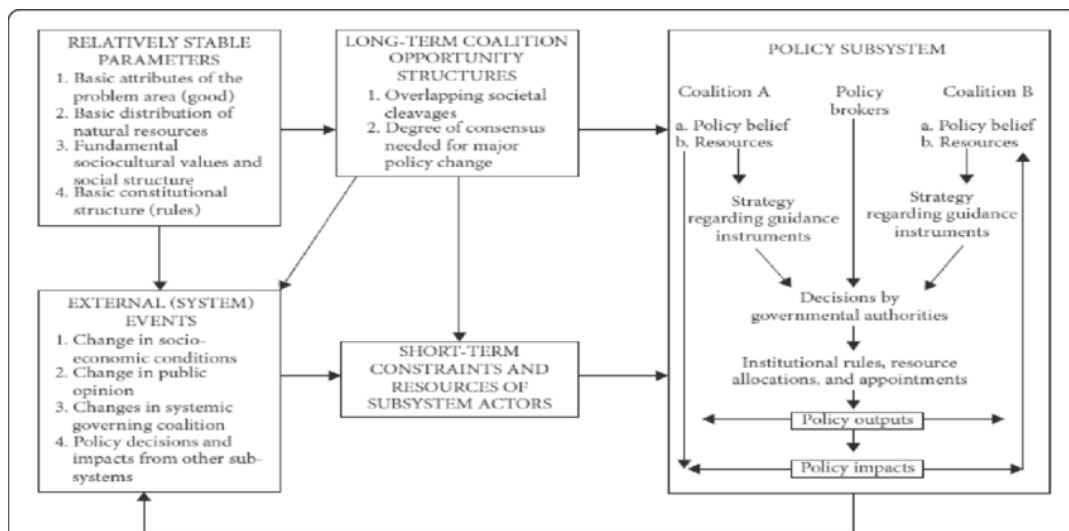


Figure 2: The ACF Flow Diagram. Source: Weible et al., 2009

*Dynamic external events* are another category of elements that conditions policy subsystems. Examples include socio-economic aspects, public opinion shifts, composition of systemic governing coalitions, or shifts in other policy subsystems – all of which are highly variable and prone to change (Jenkins-Smith et al., 2014). It is frequently argued that eventual policy change primarily comes from such external events also labelled as ‘exogenous shocks’ (Cairney, 2012; Jones and Jenkins-Smith, 2009). Some examples of these include the election of a new government or economic recession (Cairney, 2012; Jones and Jenkins-Smith, 2009). Less powerful coalitions are believed to be more likely to challenge a dominant coalition in the event of such external shocks, rather than resort to continuous strategies of policy learning, venue shopping or seeking allies (Jones and Jenkins-Smith, 2009).

Furthermore, *long-term coalition opportunity structures* can also determine advocacy coalitions’ development and dynamics. These structures establish a degree of consensus needed for a major policy change to occur in political systems, its general openness and transparency, as well as societal cleavages (Jenkins-Smith et al., 2014). For instance, it is argued that when it comes to disputed political issues like hydraulic fracturing, consensus democracies are more likely to pose significant obstacles to a major policy change due to a wide range of veto powers (Fischer, 2014; Lijphart, 1999; Tsebelis, 1995).

Finally, distinguishing a dominant coalition from a minor can be done by looking at the extent to which policy outcomes reflect the beliefs of one coalition or the other. A policy outcome that fits the belief system of a single coalition, and where little compromise has been achieved between multiple groups, that signals that the dominant coalition had significantly more power over others (Sewell,

2005). The opposite outcome would, in turn, point to a stronger balance of power across coalitions and a greater degree of compromise. Sources of power for advocacy groups include the direct sources of decision-making authority, as well as persuasion and strategic action (Sewell, 2005).

#### 2.4.5 Relatively Stable Parameters

Policy subsystems operate within macro-settings. Hence, it is important to acknowledge broader factors, such as constitutional rules, physical conditions, and the culture of a society, in studying the policy process (Ostrom, 2005; Birkland, 2010). Relatively stable parameters can be either within, or external to, the policy subsystem and are not prone to drastic changes, in contrast with dynamic factors.

There are several main types of relatively stable parameters in the ACF research (Sabatier, 1998): i) *Basic attributes* of a policy issue, or a resource (such as oil and gas), referring to the innate characteristics that may affect policy options, such as biophysical characteristics of the natural resource; ii) *distribution of natural resources*, such as the past and present resource distribution, their exploitation and economic viability; iii) *fundamental cultural values and societal norms*; and iv) *legal structure*, as fundamental legal norms are also usually resistant to major changes in most political systems. For example, constitutional and other fundamental legal structures tend to be rather stable over long periods of times.

The difficulty of changing more stable parameters of a policy subsystem discourages actors from making them the object of strategizing behaviour to influence policy outcomes (Sabatier, 1998). Yet these factors do significantly affect the context in which subsystem actors operate, thus also impacting on the range of feasible strategies or the resources available to them (Sabatier, 1998). Relatively stable parameters provide long-term opportunity structures and venues, which coalitions use to set their agenda, or influence policy developments (Weible et al., 2012). Such venues include “formal political arenas such as legislatures, executives and the judiciary, but also the media and the stock market”, as well as “scientific venues such as research institutes, think-tanks and expert committees” (Timmermans and Scholten 2006, p. 1105). Stable parameters condition the frame of the policy subsystem, but in and of themselves are not and cannot be conditioned by advocacy coalitions.

In the ACF applications, relatively stable parameters remain an understudied theme, as few studies provide a detailed analysis of how stable system parameters affect subsystem dynamics and policy change. This study contributes to the literature by revisiting the concept relatively stable parameters

and their limitations in a policy subsystem shaped by territorial politics and major constitutional developments. However, before any of this is discussed further, it is important to unpack the concept of 'advocacy coalitions' and discuss the core types of actors involved in policymaking.

## 2.5 Subsystem Actors

### 2.5.1 Defining Advocacy Coalitions

The ACF hypothesizes that complex policy issues, in this case UOG development, will usually result in the emergence of two or more distinct advocacy coalitions formed and based upon shared belief systems (Sabatier and Weible, 2007). The ACF also seeks to explain policy change by identifying the belief source supporting that change. It sees changes in public policy as the result of interaction and competition between coalitions of actors, driven by different belief systems, within a specific policy area (Cairney, 2015). Coalition members are drawn from policy subsystems that may be affected by external subsystem events such as elections, economic and environmental crises (Sabatier and Weible, 2007). These events may enhance or, on the contrary, restrain the resources and/or beliefs of these groups and provide a window of opportunity for major policy changes (Sabatier and Weible, 2007).

Following the ACF literature (Sabatier and Weible, 2007, p. 201), alterations in the resource distribution within a subsystem have a crucial impact on decision making and policy change. More specifically, the authors suggest a typology of resources focusing on formal legal authority for decision making, public opinion, information, financial resources, and political (veto) power. Different policy actors will possess a variety and/or a combination of these resources. These can come either as relatively stable parameters of the policy systems over time, or as dynamic factors prone to more alterations in the short-term period. Nohrstedt (2011, p. 468) concludes then that the redistribution of those resources alters the distribution of power within a subsystem.

### 2.5.2 Policy Advocates and Policy Brokers

Policy subsystems usually contain a large and diverse range of actors. In most subsystems, the number of advocacy coalitions will be small, usually two to four politically significant coalitions in liberal democracies (Sabatier, 1998). They possess policy core beliefs on the policy issue, sharing them with other coalition members, and compete to influence the decision-making outcome.

However, not everyone active in a policy subsystem will necessarily be part of an advocacy coalition or share their belief systems. For example, researchers may participate because they have certain

skills to offer to contribute to the policy development, but otherwise be indifferent to the policy debates (Meltsner, 1976), or not outwardly express their stance on the issue. There is another important category of actors – ‘policy brokers’ – whose primary concern is to mediate political disputes and reach some reasonable policy solution (Sabatier, 1998). This is a traditional function of some elected officials, government institutions, courts, and certain public bodies. It is important to keep in mind though, that the lines in distinction between a policy ‘advocate’ and a ‘broker’ are blurred. It can be viewed as a continuum, as many policy brokers will still have and express some policy leaning (Sabatier, 1998).

There are times in a policy process, however, when the role of policy brokers is vital. When a political issue escalates for a period of time, the coalitions may reach a *stalemate*: a situation in which neither side can win but would not withdraw in the face of opposition either (Rubin et al., 1994). In the ACF literature, such situations are called a ‘hurting stalemate’, when both coalitions perceive the status quo as unacceptable, neither has enough political resources to dominate another (Sabatier and Weible, 2007).

In such cases, *policy brokers* have the potential to facilitate, and/or mediate negotiations between coalitions to help reach a common agreement (Sabatier, 1988, p. 133). One key characteristic of policy brokers is that they usually represent a more centrist position in the network (Ingold, 2011), as public agencies, and scientists, or research organisations typically do (Sabatier and Jenkins-Smith, 1993). The broker’s principal concern is to minimise the level of conflict to help the parties reach political compromise, or the most reasonable solution (Sabatier, 1993, p. 27).

Moreover, the ACF places a key role on policy brokers in the process of policy learning. Policy brokers, serving as instrumental links between coalitions, can be viewed as most influential actors in this area (Howlett et al., 2017). Heclo (1978) propagated the idea of the significant role of brokers in learning, defining them as intermediaries between various societal actors and thus with access to various information and ideas. Based on this thinking, policy brokers are key actors in policy subsystems who have the resources to facilitate not only a mediation between, but also policy-oriented learning within and across advocacy coalitions. Yet the exact categorisation of policy brokers, and how they promote learning are not strictly defined and remains understudied (Ingold, 2011; Mintrom and Vergari, 1996; Weible et al., 2009).

### 2.5.3 Political Veto Players

Veto players are another category of particularly influential actors within policy subsystems, but the ACF does not distinguish them in its theoretical model. Despite that, I decided to include a discussion of political veto players, because they are important for nested subsystems like Scotland. Having a high ministerial autonomy in many policy areas, Scotland is thus being able to block certain top-down policies from Westminster. In addition, the ACF does pay attention to political and electoral systems as conditioning factors of a policy subsystem, which means that actors holding veto powers over policy decisions in such systems should be an integral part of the ACF analysis.

Political veto players can be individual or collective actors, whose consensus is necessary for a major policy change, i.e. a change in the status quo (Tsebelis, 2002). Individual veto players could be, for example, Presidents, monolithic majorities in a one-party system, or constitute a collective institutional player. Alternatively, they could be partisan veto players – such as parliaments, or political parties, but the individual power of the latter is likely to change over time. If a status of veto players is assigned by the constitution, like it is in the case of the Scottish Parliament, then these types of actors are referred to as *institutional veto players*, in contrast to *partisan actors* that are generated by political competition (Tsebelis, 2002).

Tsebelis (2002) identifies two major factors for a policy change where veto players have a point of influence: **the preferences** of the actors involved and **the prevailing institutions** (Tsebelis, 2002). The identity of partisan players and their preferences are variable, while institutions at their core are more stable. Therefore, policy outcomes are dependent on who controls political power as well as where the status quo is. In order to understand the relevance of different veto players, three other aspects need to be identified: their number, their congruence in relevant policy directions, and their cohesion (Tsebelis 1995, p. 301; Hallerberg, 2002). Veto player theory predicts that the level of policy continuity within a system increases with the number of veto players and their incongruence or difference in political position (Tsebelis, 2002). If a number of actors hold the same policy preferences, or, in other words – are cohesive, high cohesion between political veto players constitutes them as a collective actor (Tsebelis, 2002).

Furthermore, the number of veto players involved in devolution decisions differs from country to country. Within democratic systems, most veto players will be partisan players, acquiring their position through an election process (Tsebelis, 2002). Scottish devolution has produced a parliament with distinct political competences and veto powers, comparable to federal systems. A fundamental aspect of a decentralised model is the division of a national sovereign authority between a central government and subnational political units (Elazar, 1987). In this model, power is dispersed among

multiple centres, which have their own political arenas for decision-making (Elazar, 1997). Each level of government acts as an independent political force in at least certain policy areas, having power to counterbalance the central political order (Riker, 1975).

Regarding energy policy, the Scottish Government holds legislative competence for the licencing regime of onshore oil and gas exploration and extraction since 2016. In this instance, the Scottish Parliament assumes the role of a key veto player that must agree to and approve of policy changes in this area. I will explain distinct veto capabilities of the devolved government further in Chapter 4.

#### 2.5.4 Coalition Structures and Policy Change

As follows from the previous sections, coalitions and their members coordinate with each other to influence a policy process or facilitate policy learning and policy change negotiations (Sabatier and Weible, 2007). Advocacy coalitions most often are informal structures (Heaney, 2006) and form around a specific policy process/issue (Knoke, 2011). Coalition formation allows for greater level of coordination for group actions, joint organisational and financial resources, and expression of policy beliefs (Mahoney, 2007).

The question is - how do coalition and policy subsystems characteristics lead to or help predict either policy change or status quo outputs? Fischer (2014) argues that certain coalition structures are more prone to policy change, while others prefer status quo. Multiple studies (see Adam and Kriesi, 2007; Nohrstedt, 2010; Sandstrom and Carlsson, 2008) rely on *conflict*, *collaboration*, and *power dynamics* between advocacy coalitions to argue that certain combinations of these structures help predict specific policy outcomes. These three components indicate the degree to which interests in coalitions can reach consensus (Fischer, 2014).

In his study on policy change in Switzerland, Fischer (2014) highlights that coalitions separated by a strong conflict in consensus democracies are more likely to produce policy output closer to a status quo. The reason for that is that status quo represents the lowest common denominator amongst high variety of policy actors in consensus democracies. Yet the result can be different in other institutional contexts, or under different parameters and the influence of various subsystem events (this is discussed further in Section 2.6).

Moreover, strong collaboration within and across coalitions can enhance trust between distinct groups and facilitate better communication (see Fischer, 2014; Coleman, 1990; Putnam, 1995). It provides the basis for negotiations and can include information exchange, policy learning, resource sharing and compromise seeking (Fischer, 2014; Sabatier, 1987; Provan and Kenis, 2008). Fischer



(2014) also concludes that strong collaboration is more likely to foster policy change. Therefore, while higher degrees of conflict are predicament for a status quo, collaboration amongst actors and coalitions is a recipe for policy change.

Finally, power relations among coalitions should also be considered. In some cases, the dominant coalition, i.e. coalition possessing most influence, resources and/or reputational power might be able to enforce its preferred policy outcome even in the event of no consensus between the opposing coalitions (Fischer, 2014; Scharpf, 1997). Existence of several competing coalitions without a clear majority or leading coalition, on the contrary, might impede change as previously discussed, taking the issue back to the status quo. However, while coalition structures might help predict the policy outcome, they do not explain what actually drives policy change, and do not trace the process of how it occurs. To get a better understanding of the policy process, it is therefore also important to discuss *what* exactly is changed, and causal mechanisms behind such changes.

## 2.6 Drivers of Policy Change

### 2.6.1 Causal Mechanisms

The ACF studies focus on the *change* within policy processes that includes shifts in beliefs, coalition participation, interconnections between policy actors, and changes in policy (Henry et al., 2014). Policy change can be tied with and thus analysed in terms of belief systems of subsystem actors and the behaviours of advocacy coalitions. Major policy change is associated with changes in policy core beliefs and minor change with shifts in secondary beliefs (Sabatier and Jenkins-Smith, 1999). These developments are likely to be accompanied by changes in governmental programmes (Sabatier and Jenkins-Smith, 1999). Similar to patterns of policy change analysed in other public policy theories, the ACF argues that resistance to policy change is the norm (Henry et al., 2014). For this reason, the most frequent type of observed change is minor adjustments to policies, with major policy changes occurring less frequently (Sabatier and Jenkins-Smith 1993).

Decision-making in any political system is constrained by a variety of social, legal, and resource features of the society and the environment of which it is a part (Sabatier, 1998; Kiser and Ostrom, 1982). Certain contextual factors or drivers make major policy change more or less likely. For example, policy brokers can facilitate policy change when they intervene in high-conflict situations to mediate solutions between opponents and facilitate negotiated agreements and policy learning (Ingold and Varone, 2011). One way to approach the analysis of policy change is to distinguish between stable factors in a policy issue and more dynamic ones (Sabatier, 1999). The focus of the ACF always remains on a policy subsystem of a policy issue in question, but it is important to take into account the relationship between subsystems and the broader political environment.

To accommodate this view, Sabatier (1999) distinguishes between *relatively stable parameters* and *dynamic aspects within a subsystem* that are susceptible to significant changes over a shorter period of time (few years versus several decades). The former are rarely the subject of coalition strategies, yet relatively stable parameters are important as they structure the nature of a policy issue and shape the environment in which advocacy coalitions operate and available resources (Weible and Sabatier 2005). However, it is the latter, dynamic part of the policy issues that serves as major stimuli to policy change. By altering both the constraints and opportunities for subsystem actors, dynamic factors constitute one of the principal drivers for policy change (Sabatier, 1998). They also present a continuous challenge to subsystem actors to learn how to respond to them or anticipate and use them in their strategy in a manner consistent with their beliefs and interests (Sabatier, 1998).

Amongst these dynamic pathways, the ACF literature generally identifies four major types of causal mechanisms behind policy change: external shocks (Sabatier and Weible, 2007); internal subsystem events, such as the redistribution of resources among coalitions or change in the dominant coalition (Sabatier and Weible, 2007; Jenkins-Smith et al., 2014); negotiated agreements among coalition actors (Sabatier and Weible, 2007); and policy-oriented learning (Jenkins-Smith et al., 2014). Research focusing on policy change often targets the type of policy change and specific driver of it, yet it is also important to take more stable attributes into account.

### 2.6.2 External events

External policy events are defined in the ACF literature as changes in socioeconomic conditions, public opinion, the dominant coalition, or other overlapping policy subsystems (Sabatier and Weible, 2007, pp. 198–199). As opposed to relatively stable parameters, external events are dynamic and commonly change over a decade or less, making them essential for the analysis of policy changes (Jenkins-Smith et al., 2014). The literature considers at least four mechanisms or causal pathways through which external events drive changes in policy.

First, external events may cause the redistribution of resources among coalitions, such as changes in access to authority, or the position of power; financial resources; or vital technical information (Sabatier and Weible, 2007; Nohrstedt and Weible, 2010). Second, minority coalitions may take advantage of ‘windows of opportunity’ during particular events to promote changes (Mintrom and Vergari, 1996). Third, external shocks may lead to policy change through heightened saliency of the issue due to public and political attention (Jenkins-Smith et al., 2014). This also contributes to the possibility of the redistribution of resources and of exploitation of the event. Finally, the ACF holds

that external events lead to policy change through policy learning (Sabatier and Jenkins-Smith, 1999, p. 123), which is discussed in greater detail in subsequent sections.

### 2.6.3 Internal events

Internal events in the ACF literature relate to policy failures and a variety of policy-related crises, changes and scandals (Jenkins-Smith et al., 2014). The likelihood and the extent of internal events driving policy changes depend on two factors: **policy proximity** and **geographical proximity** to a policy subsystem (Nohrstedt and Weible, 2010, p. 20).

The former refers to the degree in which that event shares policy components with a subsystem under investigation, such as laws, specific policies and instruments, ideas etc (Nohrstedt and Weible, 2010). As follows, the latter then refers to the geographical location where the event takes place. The assumption is that the higher the geographical and policy proximity of the event, the greater the influence of an internal shock would have. Internal events may drive policy change through the same causal mechanisms as external events (Jenkins-Smith et al., 2014). The main implication of internal events would be a belief change, prompting a coalition(s) to reconsider policy beliefs, and it can also stimulate coalition defection (Nohrstedt and Weible, 2010).

### 2.6.4 Negotiated Agreement

The concept of 'negotiated agreement' is defined by the ACF as "agreements involving policy core changes [that] are crafted among previously warring coalitions" (Sabatier and Weible, 2007, p. 205). Or, in other words, situations in which competing coalitions came to negotiated agreement leading to an observable compromise between the parties involved. This concept was added to the framework after criticisms of the ACF for being US-focused and was not taking into account more consensual or corporatist European regimes, which are considered to be less adversarial than the US system (Sabatier and Weible, 2007). It should be noted, however, that negotiated agreement is not always reached by competing coalitions, but it is also important to include situations in which parties attempt to reach such an agreement.

The causal mechanisms through which negotiated agreement can drive policy change remain understudied in the ACF research. However, Sabatier and Weible (2007, pp. 205-07) proposed **nine core elements** as pathways to achieve negotiated agreement: i) a hurting stalemate, referring to a situation in which parties reach an agreement as all find the continuation of the status quo unacceptable; ii) broad representation of relevant stakeholders during negotiations; iii) leadership

taken by unbiased, or neutral policy brokers and mediators; iv) rules on decision-making and consensus, relating to inclusivity and the acceptable distribution allocation of veto powers (usually granting it to all parties); v) funding for negotiations from different coalitions; vi) continuous commitment of policy actors to participate in negotiations; vii) the importance of empirical issues, i.e. the significance or seriousness of a policy issues and its causes; viii) trust between policy actors to enable productive discussion; ix) and lack of alternative venues for negotiation, lobbying, or if other alternative courses of action apart from negotiation are exhausted.

Based on those descriptors of negotiated agreement and the availability of the data collected for this study, there are three criteria used to identify instances of negotiated agreement and its impact on policy change. First, the instances of negotiations between two or more coalitions. These include those instances where coalitions seek to influence decisions through institutional (such as amendments, judicial actions etc.) or other means and collaborative processes (e.g. talks). The process outcome (e.g. policy change, belief change or lack thereof) determines whether any compromise or agreement was reached.

Second, the type of venues used by actors during the negotiation process. The assumption here is that the more actors communicate directly or through institutional venues, such as specific governmental commissions or consultations, the more willingness there is to achieve compromise; if, however, the debate is taken to courts, or any independent agencies, this indicates less negotiation and a higher level of disagreement.

And finally, the third criterion is the identification of direct expressions of agreement and/or disagreement between actors in the media. These include statements specifically mentioning other or the opposing coalition actors, which can involve affirmation, praise, or, on the contrary – disapproval and personal attacks. This is done by quantifying frequency of occurrences of such statements in the media. The logic behind this is that these will point to either high or reduced levels of negotiated agreement.

#### 2.6.5 Analytical Debate and Learning

The final pathway to policy change in the ACF is policy-oriented learning. It is defined as “relatively enduring alternations of thought or behavioural intentions that result from experience and/or new information and that are concerned with the attainment or revision of policy objectives” (Sabatier and Jenkins-Smith, 1999, p. 123). Policy-oriented learning is expected to occur when beliefs about the causes and nature of a policy issue, and the potential impact of proposed action, change after

new information and analysis is picked up in the debate. According to Sabatier (1988, p. 155), the main pre-requisite for policy learning to occur is if “both sides have sufficient technical resources to be able to criticize the other’s causal model and data”. It is, therefore, through the causal mechanism of analytical debate between advocacy coalitions that policy actors refine their beliefs and understanding of the policy issue (Sabatier and Jenkins-Smith, 1988, p. 155).

This entails that technical and scientific information has a crucial ‘enlightenment function’ that should be considered in the ACF analysis of policy change. Although the framework does not suggest that this is the only credible form of knowledge, it is usually the most influential and is a major source of subsequent learning and belief changes (Jenkins-Smith et al., 2014). In that regard, research institutions and individual researchers are among the most central players in policy processes (Sabatier and Weible, 2007, p. 192).

Therefore, according to the ACF, the ultimate causal mechanism through which learning leads to policy change is analytical debate. The observable outcome of policy-learning – as well as other external and internal events – is a belief change, which may drive the policy change. However, what Sabatier and Hunter (1989) also emphasized is that these belief systems are subject to both change *and* learning. This makes policy-oriented learning both the driver and the result of policy and belief change. The complexity of this concept, but also the prominent role it takes in the ACF demand a more nuanced discussion of the concept for the purposes of this thesis.

## 2.7 Policy Learning

### 2.7.1 Defining Policy Learning

Policy-oriented learning occurs when policy actors consider alternative beliefs associated with achieving policy change (Sabatier and Jenkins-Smith, 1993). These alternatives might refer to new problem definitions, solutions, or strategies for influencing policy decisions (Jenkins-Smith et al., 2014). Research regarding policy-oriented learning focuses on identification of learning among or across coalitions, policy brokers (policy actors operating between coalitions), or changes in beliefs over time. The concept of policy learning is extensively theorised, yet underapplied in public policy studies. I will briefly discuss how both the ACF, and other public policy literature view it to better unpack the concept. Policy-oriented learning is viewed as a complex, multi-tiered phenomenon which can affect either policy decision-making and processes, specific policy instruments choices, and/or the end goal of a policy change (Bennett and Howlett, 1992). In ACF theory specifically, Sabatier (1998, p.151) defines policy-oriented learning as “an ongoing process of search and adaptation motivated by the desire to realize core policy beliefs”.

Policy learning encompasses several distinct processes. First, there must be a *subject* (i.e. the agent) of learning, and the *object* of learning, that is – an output that learning is about (Bennett and Howlett, 1992). Some theories restrict learning to elite actors, such as politicians and officials, while others extend it to a wider society.

ACF assumes that policy-oriented learning is more likely to occur under certain conditions: 1) when there is a forum with enough prestige to assure the participation of professionals from different advocacy coalitions and which regulation follows professional standards; 2) the level of conflict between coalitions is intermediate; 3) the policy issue is manageable, because there is supportive theories and data; and 4) policy actors have moderate beliefs (Jenkins-Smith et al., 2014). The impact of learning on a subsequent policy change is another key process in ACF studies, yet it mostly remains a grey area in research (Bennett and Howlett, 1992). The following subsections investigate these processes in greater detail and distinguish typology applicable in to ACF studies.

### 2.7.2 Learning What?

Policy-oriented learning relates to both the process and the end result of policy development, as well as alterations in policy beliefs. Hecló (1978) argued that the policy process itself should be viewed more as a process of learning, rather than as a process of conflict resolution. In this view, what is learned in the end is the resulting policy. On the other hand, in Sabatier's view, policy-oriented learning involves facilitating a better understanding of competing belief systems, as well as identifying and responding to challenges to one's belief system (Sabatier, 1998, pp. 150-151).

In the ACF studies, therefore, learning is not as much about organizational changes as it is about ideas. As discussed in the previous sections, advocacy coalitions are formed around deep core beliefs (among other types of beliefs). These normative beliefs are relatively impermeable to change, meaning they are not usually altered through policy networks (Sabatier, 1998, p. 146). Instead, advocacy coalitions are engaged in transforming policy core and secondary beliefs, leading to the subsequent change in public policy. *What* is learned goes down to an understanding of an issue, how to better achieve policy goals, or what instruments to utilise in order to implement change.

### 2.7.3 Agent of Learning

Approaches to identify agents of policy learning tend to focus on either government (Etheredge, 1981), involving both institutional and individual levels, or social forces (Hecló, 1978). The latter views learning within governments as a response to societal demands, meaning that key actors are

not necessarily state officials, but rather the societal members who create the conditions to which state actors must respond (Hecló, 1978, pp. 284-285). The most influential political actors, on the other hand, are policy brokers with access to information, ideas and capable of influencing policy change (Bennett and Howlett, 1992). However, Sabatier (1998) refined both approaches and argued that the agents of learning are in fact advocacy coalitions, consisting of and/or not limited to elite institutional and societal actors. ACF studies therefore reject the institutional nature of the policy subsystem membership, arguing that advocacy coalitions develop out of dissatisfaction with existing institutional arrangements (Sabatier, 1998, p. 138).

Moreover, the ACF approach acknowledges the key role of policy brokers in both receiving and facilitating learning. Competing coalitions are linked together by policy, whose “dominant concern is with keeping the level of political conflict within acceptable limits and with reaching some 'reasonable' solution to the problem” (Sabatier, 1998, p. 141). Under the ACF, the agents of learning are therefore policy networks, a conception which expands the set of key actors compared to other theoretical proposals.

#### 2.7.4 Policy Learning Typology in ACF

Three main types of policy learning can be defined: cognitive/technical, social/political and institutional (Howlett et al., 2017; Hall, 1993; Koppenjan and Klijn, 2004). The first category, *cognitive or technical learning* is instrumental learning concerned about the very nature of a policy issue, the assumptions on the causal relationships involved and the pros and cons of measures aimed to address the issue (Howlett et al., 2017; Koppenjan and Klijn, 2004). *Social or political learning* implies that coalition actors also learn about how to operate within a political network setting, and use strategies aimed at collaboration, and/or negotiation (Howlett et al., 2017). Finally, *institutional learning* is about the development of shared and lasting arrangements, norms, and values that in turn should lead to productive negotiations and stronger collaboration (Howlett et al., 2017; Ostrom, 1990).

Whether any, or which type of learning occurs in policy development varies depending on the behaviour of actors within specific policy subsystems. Some of the factors that affect policy learning development include the following: the venues in which it takes place (formal vs. informal), the level of learning (i.e. individual, coalitions, or subsystems) and the tier of learning (deep core, policy core, or secondary) (Bennett and Howlett, 1992; Hall, 1993; Sabatier and Jenkins-Smith, 1993). However, policy-oriented learning may be problematic to achieve as coalitions tend to fall victim to the ‘devil shift’, in which each attacks the premises and understandings of the other. The ACF contends that if

the level of conflict is low, and political negotiations are mediated by a professional forum, then learning can take place (Jenkins-Smith and Sabatier, 1993). The ACF considers instrumental links, or policy brokers, imperative to provide a function as learning facilitators between diverse groups or coalitions.

This study focuses strongly on cognitive/technical learning due to the nature of the policy issue – shale oil and gas extraction. As a natural-based resource exploitation industry, it is bound to rely on scientific evidence to operate, and technical learning heavily depends on the production and use of scientific and/or technical information to occur. In turn, this research relies on three indicators of policy-oriented learning.

First, the instances of the direct participation of scientists and/or research organisations in debates, as identified in the media analysis. Second, specific references made by coalition members and policy makers to scientific studies or claims mentioned, which indicate the occurrence of an analytical debate, and heightened attention to technical information. And third, the analysis will identify whether there are clear instances of the scientific research informing policy beliefs, contributing to changes in policy beliefs, and influencing policy change. By clear instances I mean any direct references to or mentions of the scientific research in arguments and statements in the media. Technical/scientific information, according to the ACF, should be considered in any analysis of policy change through learning, which is another reason why I placed so much importance on it.

## 2.8 Strengths and Limitations

The ACF developed in the early 1980s by Paul Sabatier and Hank Jenkins-Smith in response to the perceived limitations of public policy research of the time, which included the lack of causal explanations provided by the policy cycle approach and the need to expand the understanding of policy development beyond governmental institutions and actors (Jenkins-Smith et al., 2014).

The ACF provides a model for longitudinal analysis of complex policy development processes. It does so by incorporating multiple policy elements, actors, conditioning factors, and causal mechanisms of policy change into its framework of analysis. This theoretical approach offers a clear-cut criterion for identifying competing coalitions, their belief systems and instances of major and minor policy change that result from coalition politics (Sabatier and Jenkins-Smith, 1999; Weible and Jenkins-Smith, 2016).

Henry et al. (2014) identified three core advantages of the ACF as a public policy theory. First, the framework provides a solid theoretical basis and “operational clarity” in defining its key concepts



(Henry et al., 2014, p. 301). Secondly, it provides a lens to understanding policy not as a single event or at a single point in time, but as a continuous and longitudinal development process. Therefore, it managed to sidestep limitations of viewing policy as a “linear set of stages with a definitive beginning and ending point” that is common in other public policy theories (Henry et al., 2014, p. 301).

Finally, the ACF is somewhat flexible and open to new development in theoretical expectations and in using different methods in data collection and analysis (Henry et al., 2014). Chapter 3 will discuss a range of methods and research approaches commonly used in the ACF in detail. All in all, the ACF provides a solid theoretical basis for studying longitudinal policy development, as well as scope for methodological experimentation and advancement.

The identification of advocacy coalitions based on their shared the three-tiered belief systems and the analysis of policy change have been subjected to numerous tests and received broad empirical support. Weible and Jenkins-Smith (2016, p. 26) noted that the strength of the theoretical framework “comes from its ability to map political landscapes on contentious policy issues and describe and explain coalitions, learning, and policy change”, and that its robustness “lies in its flexibility, which is applicable across government systems and topics, as well as its basic structure that enables generalizable lesson learning”. The ACF was initially designed to study complex environmental and energy policymaking in the US, which makes it well-suited to study policy issues in multi-faceted governance systems, such as shale policy in the UK and Scotland.

However, despite its long trajectory, the ACF is far from providing all the answers. There are several challenges and limitations of applying the framework that should be discussed.

One major limitation of the ACF is the identification of “secondary components” of the model in association with primary pathways to (or drivers of) policy change (Pierce et al., 2020, p. 79). Among these pathways, external events are some of the most frequently identified components, but even they are identified in only about 25% of the cases where these events are associated with policy change (Pierce et al., 2020; Weible et al., 2009). The other drivers have similar issues. Policy learning as a driver of policy change was identified in 33% and 15% of cases respectively (Pierce et al., 2020; Weible et al., 2009). For negotiated agreement, only 29% of ACF applications identified a hurting stalemate or a policy broker (Pierce et al., 2020; Weible et al., 2009). Scholars argue that these secondary components are not being identified frequently enough. This lack of pathways to policy change being explicitly identified in studies is a challenge to their utility, as well as comparability of ACF applications (Pierce et al., 2020). To address this limitation, this study takes on

recommendations suggested by Pierce et al. (2020) and explicitly identifies whether these causal mechanisms are present or absent in the Scottish UOG policy subsystem.

However, identifying drivers for policy change proved to be a challenge in itself. First, the causal mechanisms to identify policy learning and negotiated agreement, as well as their effect on policy change are not clearly distinguished by the ACF. There is also no guidance provided by the framework for empirical observations of the mechanisms through which either policy learning or negotiated agreement lead to policy change.

Thus, based on the nine core elements to achieve negotiated agreement and observable outcomes of policy learning (belief and/or strategy change) as suggested by the ACF, this thesis offers practical indicators and criterion for identifying instances of both negotiated agreement (discussed in Section 2.6.4) and policy learning (Section 2.7.4). These indicators are loosely based on analytic parameters proposed by Donadelli (2016).

Secondly, the ACF does not account for cases where the lines between relatively stable parameters and dynamic events, as well as internal and external events, are blurred. The framework views legal and constitutional structures as relatively stable parameters conditioning policy subsystems.

However, Scotland has experienced not one, but two significant constitutional changes in the span of a decade, after the Scotland Act 2012 and Scotland Act 2016 delegated more powers to the Scottish Parliament. This thesis views constitutional and legal changes as relatively dynamic factors affecting the Scottish UOG policy subsystem, but also as internal-external drivers of policy change. While changes in fundamental legal structures are external to the subsystem, certain provisions in the Scotland Act 2016 directly affected the Scottish UOG subsystem.

Although the ACF does not view legal and constitutional structures as dynamic, Weible et al. (2009) noted interplay between multiple pathways to policy change in ACF studies. This demonstrates a continued flexibility of the ACF to explain policy changes that are linked with multiple and diverse interrelated processes (Pierce et al., 2020). This thesis relies on the framework's flexibility for case-specificity to study dynamic constitutional changes.

Last but not least, another limitation of the ACF is related to boundaries and permeability of policy subsystems. About half of all ACF applications since 2007 were at the national level (Pierce et al., 2017), which raises questions about policy actors, institutions and events that may be excluded from the majority of ACF studies (Pierce et al., 2020). Sabatier (1993) argued that "to examine policy change only at the national level will, in most instances, be seriously misleading" (p. 17). This study explicitly distinguishes the scope of the Scottish subsystem which is nested in the UK. This helps to

clarify devolved and shared responsibilities in the national UK subsystem, as well as examine the role of Scotland-based actors. This is one of the key contributions that this thesis offers – both conceptually and empirically.

## 2.9 “Fracking” in the Advocacy Coalition Framework

### 2.9.1 Practical Applications

So far, I mostly discussed the ACF as a theory, but did not demonstrate its practical applications in a real-life context. Political actors and subsystem events do play a vital role in shaping environmental policy regimes and regulations worldwide, and the ACF has been meaningfully applied in various natural resource and hydraulic fracturing policy studies to demonstrate just how these processes work. In theory, this framework helps identifying competing coalitions, their belief systems and drivers of policy change, plus showcases various stable and dynamic factors affecting policy subsystems. I have identified and used five broad components in this study: (i) policy subsystems, (ii) advocacy coalitions, (iii) belief systems, (iv) drivers of policy change, and (v) relatively stable subsystem parameters. The question now is, what do these components mean in practice, and how do they translate to real-life cases?

I am especially interested in research focusing on UOG policy. Numerous studies on UOG subsystems have been conducted across the world. Although the Scottish politics of UOG extraction is the sole focus of our research, Scotland, of course, does not exist in a vacuum - the previous chapter has already demonstrated that. The Scottish case possesses many unique features, but it is not *the first* ACF case study looking at hydraulic fracturing, and it is not disconnected from global energy policy issues. By nature, even local energy policy is always part of the global environment, which means that there will be other countries and regions that share similar policy challenges. Indeed, current transition in the energy sector towards higher shares of renewable energy sources and more efficient energy consumption received strong political attention in many countries. Proponents of shale oil and gas industry view these energy sources as an inherent part of this energy transition (see Bomberg, 2014; Cotton et al., 2014), but the prospects of this “shale boom” also generated controversies and debates around the world, resulting from the insufficient scientific evidence of its health, social and environmental safety (Bomberg, 2014).

The ACF comes down as a useful method to analyse the complexity of hydraulic fracturing debates and policy development. While no ACF research on UOG policy development has yet been conducted in Scotland, several equivalent studies had been produced in the UK (Ingold et al., 2015; Cairney et al., 2016; Cairney et al., 2015) and other countries, such as the US, Canada, France,

Germany and other European states (Chailleux and Moyson, 2016; Heikkila and Weible, 2016; Ingold and Fischer, 2016; Montpetit et al., 2016; Nohrstedt and Oloffson, 2016; Tosun and Lang, 2016). Since energy transition and shale energy debates are global, rather than just local issues, it is important to explore how the theoretical perspective of the ACF is applied in similar to Scotland policy subsystems.

The key factors affecting environmental policy decision-making and cooperation of diverse interests over it are the formation advocacy coalitions, joint policy-oriented learning, scientific consensus, and focusing events (Smith, 2009). First of all, before any advocacy coalitions can form and policy-oriented learning can happen, a policy issue needs to arise. Focusing events are that external phenomena that take policy issues onto the formal agenda and expose existing problems or regulatory shortcomings (Birkland, 1998). Formal agenda for hydraulic fracturing developed in response to declining conventional oil and gas production in the US (Food & Water Watch, 2015), and now in European countries. Following the gas supply threats by Russia, one of the dominant natural gas suppliers to the EU, demand for alternative energy sources started to grow and exert influence on hydraulic fracturing debates in the region (Stegen, 2011).

However, in case of hydraulic fracturing, the nature of the resource exploitation has created more conflict than cooperation in the public view. Environmental and health risks associated with UOG exploitation, such as water contamination, earthquakes, and insufficient environmental regulations, generated strong opposition and calls for a permanent ban amongst many environmental and civic groups (Friends of the Earth, 2013; Food & Water Watch, 2015; WWF, 2015). For instance, seismic activities associated with hydraulic fracturing operations in Preese Hall in the UK by Cuadrilla Resources were accompanied by negative perceptions of hydraulic fracturing as “potentially dangerous and damaging” (O’Hara et al., 2015, p. 6). O’Hara et al. (2015, p. 6) measured negative public attitudes in the aftermath of Presse Hall tremors and found that the majority of respondents associated hydraulic fracturing with seismic activity up until the year of 2013, but since then that number declined. In the UK, even though there remains support for UOG at the national level, shale resources are still viewed as being the least acceptable energy source in the UK’s 2025 energy mix from a range of renewable, fossil, and nuclear fuels (O’Hara et al., 2015, pp. 3-4). These trends suggest that the divisiveness over the environmental implications of fracking is a very salient issue for the public.

These risk factors, coupled with the lack of scientific consensus over the extent of these impacts have in turn paved the way for the formation of opposing advocacy groups both in North America

and Europe. I will discuss the scientific evidence surrounding the shale reserves and potential industrial development in Scotland in Chapter 4.

### 2.9.2 Coalitions and Beliefs

As it was previously established, policy core beliefs are a vital element in studying policy processes. These can include policy preferences, perceptions of the problem severity or the need for action, causal perceptions, and value priorities (Sabatier and Jenkins-Smith, 1999). ACF predicts that actors use these core beliefs to interpret information and phenomena. It also hypothesises that stakeholders predominantly coordinate and seek/exchange information with actors of similar policy core beliefs, which is supported by a variety of ACF studies (Weible, 2005; Weible et al., 2016; Cairney et al., 2016; Cairney et al., 2015). As shown in the study by Weible (2005) on the US Marine Protection Act supported, actors with moderate (or predominantly secondary) beliefs are the most likely to coordinate with other actors or groups of divergent beliefs. In the realm of hydraulic fracturing, many of the studies also confirmed the above hypotheses (see Ingold et al., 2016). However, it should be noted that in consensus democracies such as Switzerland, the need for political compromise have been found to increase chances for more intense cross-coalition coordination and moderate policy outcomes (Ingold and Fischer, 2016). All in all, ACF studies demonstrate that policy actors tend to gravitate towards those with similar beliefs, and the less “extreme” their views are on the spectrum, the more likely they are to coordinate with opponents.

Furthermore, based on multiple studies on hydraulic fracking debates (see Cairney et al., 2016; Cairney et al., 2015; Tosun and Lang, 2016; Chailleux and Moyson, 2016), anti-fracking coalitions tend to demonstrate stronger and more unified beliefs, compared to the proponents of hydraulic fracturing. They typically perceived hydraulic fracturing as a major risk to health and the environment due to the insufficient or unequipped regulations over natural resources. They relied strongly on the precautionary principle as a strategy to cope with scientific uncertainties in the risk assessment and management (COMEST, 2005). The precautionary principle has four central components: taking preventive action in the face of uncertainty; shifting the burden of proof to the proponents of a proposed activity, or development; exploring a wide range of alternatives; and increasing public participation in decision making over the issue (Kriebel et al., 2001). It is widely used as a guideline in environmental decision-making in many major institutions, such as the European Parliament, and it is a deep core belief that unifies environmental groups.

On the other hand, the supporters of UOG exploitation point to industry’s potential to boost economies and generate “clean” energy (Cairney et al., 2016; Cairney et al., 2015; Heikkila and

Weible, 2016). The key thing to note here is that in many cases they were not explicitly advocating for hydraulic fracturing but were rather pushing against banning the technology altogether (Ingold et al., 2016). They supported shale exploration and that a better understanding of industry's full potential can be achieved by bringing in definitive scientific research (Ingold et al., 2016). They also often had disagreements within their own coalition members over the extent and stringency of environmental regulations that should apply to the industry (Ingold et al., 2016). This shows that, compared to shale supporters, anti-shale groups had a greater degree of cooperation as the result of more homogenous belief system amongst coalition members.

These belief patterns are not uncommon for broader policy subsystems. Studies by Jenkins-Smith et al. (1991), as well as Wilson (1973) and Moe (1981) hypothesized that *purposive groups*, such as environmental NGOs tend to be more constrained in their expression of beliefs and policy positions than *material groups*, for example companies and professional organisations. The former study (Jenkins-Smith, 1991) has empirically supported this hypothesis and demonstrated that material group agents have greater flexibility for strategic alterations of their policy belief expression, usually on less central issues (e.g. secondary beliefs). They also tended to be rather focused on their bottom-line positions (Jenkins-Smith, 1991). Purposive agents, on the other hand, were constrained over a wider range of issues and conformed their expression to a more structured belief system, as hypothesized by Sabatier (1987). These hypotheses in turn provide a feasible explanation for the reliance of anti-shale (namely environmental) actors on deep core and policy core beliefs, like the precautionary principle (taking preventative action to protect the environment, public health, etc.) and the subsequent hardball over the shale question. The difference between purposive and material groups is an important factor to consider when analysing coalition membership and belief systems.

### 2.9.3 Organisational Affiliation

Coalition members' attitudes about a specific issue are affected by organisational types and ties they belong to. Several studies (see Weible and Heikkila, 2014; Weible and Moore, 2010) showed that disputes over environmental issues in particular are primarily motivated by values (deep core and policy core beliefs) and group affiliations rather than actors' direct expertise. Shale energy as a policy issue is no exception to this.

Shale politics pitch environmental or pro-environmental actors against economic interests (Ingold et al., 2016; Weible and Heikkila, 2014). A study by Weible and Heikkila (2014) showed that on one side

of the spectre – oil and gas interest groups, public perception together with political contexts would likely be perceived as the main problem associated with shale gas. On the other hand, environmentalists and local groups are more likely to have pro-egalitarian and pro-strong governance beliefs and tend to focus on direct environmental and health risks (Weible and Heikkla, 2014). Several studies (see Weible and Heikkla, 2014; Ingold et al., 2016) also confirmed that government officials and academics tend to hold more ambivalent views and not be strongly align with one side of the conflict. It is not news, given that governmental actors also often act as policy brokers and mediators, while scientists are expected to provide an unbiased analysis of the issue. It is important to keep in mind, however, that all types of actor groups mentioned here - NGOs, industry, governmental actors, scientists, and research organisations – do have their own belief systems and are part of policy subsystems and advocacy coalitions. What can also be concluded from this context is that in most cases, local and environmental organisations tend to form anti-shale coalitions, while business interests, that is those actors that profit from the development, are in favour (Ingold et al., 2016).

It should be noted, however, that representatives from other industries, unrelated to hydraulic fracturing may show different attitudes and be opposed to UOG exploitation. This is especially common for those industries and sectors having a significant economic weight in a country or region. For example, French regions with more developed tourist and agricultural sectors showed more resistance to the idea of shale exploration than others (Chailleux and Moyson, 2016). Similar trend has been observed in Switzerland, where fishery and tourist organisations participated in anti-shale coalitions (Ingold and Fischer, 2016). Scotland is no exception. In the Proposed Prohibition of Fracking (Scotland) Bill (2016, p. 26), it was highlighted that there could be “potentially adverse effects on existing jobs in agriculture, tourism, food and drink, and others impacted by real and perceived damage to ‘brand Scotland’”. It is thus important to take into account broader stakeholder groups when studying UOG advocacy coalitions, even if they are not active subsystem actors, or belong to overlapping subsystems.

#### 2.9.4 Basic Attributes: Biophysical

So far, I have discussed how advocacy coalitions are formed and maintained – through common belief systems and organisational affiliation. But there are other factors that affect advocacy and policy subsystems in general when it comes to UOG. As previously discussed, Sabatier (1998) identified several types of relatively stable parameters that affect advocacy coalitions and the policy

process. Those include basic attributes of a policy issue or a resource, such as any relevant biophysical characteristics and the distribution of natural resources, which concerns the state of industrial development, but also the economic significance and viability of those resources. What do they look like for shale oil and gas, and what do other ACF studies say about them?

Biophysical characteristics of the shale resource and geographical zones affect technical feasibility, economic viability and socio-economic risks and benefits in each area (Ingold et al., 2016). These factors, in turn, shape political mobilisation and conflict within and across advocacy coalitions. For instance, questions of shale resource availability and how easily technically recoverable resources can be translated into production continues to create “serious investor uncertainty” (Stevens, 2012). This can have a direct impact on the type of coalition membership and levels of activity by affecting the number and type of economic actors in the pro-shale networks (Bomberg, 2017).

For example, the US and Canada are some of the leading countries with technically recoverable shale reserves and a mature UOG industry in both states (EIA, 2013). Significance of the shale reserves also contributed to the continuous saliency of the issue in those European countries that possess some of the largest shale reserves on a continent, like France and Germany. Unlike the US and Canada, however, they did not give industry a green light in the end (Ingold et al., 2016). On the other hand, the idea of hydraulic fracturing in Sweden was rejected in part due to the insignificant amount of shale deposits and unfavourable geological conditions for drilling (Ingold et al., 2016). All these examples point to the direct link between biophysical characteristics and policy outcomes, or at least policy saliency.

#### 2.9.5 Basic Attributes: Resource Economics

Scotland possesses the largest conventional oil and gas reserves in the EU, accounting for almost 60% of the total oil production and a third of hydrocarbon production in the region (Scottish Government, 2016). Yet the country’s shale reserves are modest compared to England and many other European states. The British Geological Survey (2014), or BGS, estimated total shale gas reserves in Scotland, Midland Valley at 80.3 tcf (trillion cubic feet of gas). That compares to 1,300 tcf in the Northern England and 4.4 billion barrels in the South (BBC, 2014). Cuadrilla has estimated resources in its licence area at Balcombe alone at around 56 years’ worth of current UK consumption (Friends of the Earth, 2013). However, these figures are relatively low on the European scale. For instance, some of the shale-richest countries, Poland and France, account for 146 tcf and 221 tcf technically recoverable reserves (EIA, 2015). It should be noted that recovery rates for shale gas are significantly lower than for conventional gas, averaging at around 15-30% of original gas in place



(OGIP) compared to approximately 80% in conventional reservoirs (House of Commons, 2017). I will present a more detailed discussion about the prospects for the onshore oil and gas industry in Scotland in Chapter 4, but what this data shows is that the amount of *recoverable* shale resources is an important factor to consider when examining Scotland's shale politics and debates.

Therefore, the resource possession alone is not enough to create a strong willingness to back up fracking, as the economic significance and viability of the resource play a huge role in shaping narrative arguments for or against. Hydraulic fracturing coalitions tend to emerge within and thus overlap with existing oil and gas policy subsystems. They would mostly become part of separate subsystems in countries with already developed hydrocarbon industries, such as the US or Canada (Weible et al., 2016). Countries or regions with established and developed petrochemical sectors often demonstrated stronger pro-shale movements, especially if they held a significant economic weight. The US, for instance, is the third and the first largest producer of oil and gas respectively (EIA, 2013). Hydraulic fracturing was first developed in the US and now accounts for 40% of total US natural gas production (Jones et al., 2014). Canada ranks 5<sup>th</sup> in oil and gas production, most of which now comes from the unconventional sources (EIA, 2013). In contrast, Germany, where the anti-fracking coalition was prominent, only produces 5% of the total EU oil and gas and accounts for less than 10% of total oil and gas reserves (Tosun and Lang, 2016). Another country to oppose hydraulic fracturing, Sweden, had a very limited market for gas in energy production system and thus little economic prospect for shale industry development (Nohrstedt and Olofsson, 2016). Therefore, countries or regions with developed petrochemical industries are expected to have strong pro-shale lobbies.

All in all, the economics of shale gas extraction is largely dependent on how much gas can be recovered compared to the estimates of the reserve size (WWF, 2015). WWF (2015) specifies that the total recovery rate is a function of the technology used, well design, fracture creation and geology, all of which can vary significantly between the states and/or regions. Again, this shows that the economic significance, affected by the biophysical characteristics of the resource, are important parameters shaping advocacy coalitions and whole policy subsystems.

### 2.9.6 Political Structures and Regulatory Regimes

Besides basic attributes of a policy issue and the distribution of resources, *legal structures* are another key parameter that shapes policy subsystems (Sabatier, 1998). Coalition structures and their ability to generate policy change are affected by the institutional context within which policy processes operate (Fischer, 2014). In other words, they are linked to the opportunity structures

institutional settings provide (Fischer, 2014). This context is country-specific and the extent to which coalitions can produce a policy change in an opportunity structure is always reliant on specific institutional requirements and required degree of consensus.

The level of government centralisation and the degree of consensus needed in decision-making can have a direct effect on what and how advocacy coalitions will be able to form and act. For instance, consensual democratic systems require a high degree of consensus and compromise to pass a policy (Fischer, 2014). This is partly due the availability of veto points that allow minority coalition to exert influence or act as an obstacle to a policy change (Lijphar, 1999; Tsebelis, 1995). On the other hand, some studies (see Weible et al., 2016) emphasized a higher degree of power that authority level governments have over the policy issue of hydraulic fracking. This, in turn, affects the level at which policy subsystems can operate. In federal systems, for example, authority is hierarchically divided. This provides a tiered policy subsystem foundation and advocacy groups can thus operate at multiple venues (Ingold et al., 2016).

This observation can be linked to the concept of political opportunity structures (POS). This term is used to highlight the importance of the broader political system for the extent, form, and success of social movements (Kubler, 2001). In their studies on the development of civic movements, Kriesi et al. (1995, pp. 27–33) defined four criteria for a comparative measurement of the level of openness of a political opportunity structure as determinants for success of these movements.

First, the *degree of territorial centralization* of a state is vital. For instance, state decentralization (e.g. federalism or devolution) implies a multi-level state actors and bureaucracy system, hence, wider venues of access (Kriesi et al., 1995). Another crucial factor is the *degree of a state's functional separation* of power between the legislature, the executive and the judiciary (Kriesi et al., 1995). Again, higher degree of separation provides greater possibilities for venue shopping and influencing decision-making. Third, a prominent *level of party system fragmentation*, common in proportional electoral systems is thought to increase capacity of policy proponents or opponents to exert their influence on the decision-making process (Kriesi et al., 1995). Finally, *formal access to venues* such as referendums and popular initiatives is also an indicator of the extent to which direct democratic procedures are institutionalized (Kriesi et al., 1995). In a nutshell, coalitions adopt and adapt their strategies in accordance with existing characteristics of given institutional settings and political opportunity structures they provide (Kubler, 2001).

The example of shale politics in Germany showcases just that. Tosun and Lang (2016) concluded in their study that federalism and party competition in multi-level German polity played a leading role in UOG policy development. Cooperative federalist system in Germany is based on the political

authority sharing between the federal government and the governments of the Land (i.e. federal state), who share the legislative powers. Party politics itself is also connected with legislative decision-making in the federal sphere, as well as party competition, especially in times of election (Tosun and Lang, 2016). German parties tend to adjust their policy preferences in accordance with preferences of the electorate in each Land, which can be quite different between the state and federal levels (Tosun and Lang, 2016). As follows, change in federal government composition following the German general elections in 2013 had radically shifted coalition structure and entrenched beliefs on hydraulic fracking. Pro-shale coalition, while having a large political congruence on the issue before the elections, ended up being less diverse, less complex and less coordinated after the elections (Tosun and Lang, 2016). The Federal Government started off by viewing the new industry as an opportunity to enhance country's energy independence and improve legal framework in the area (Tosun and Lang, 2016). After the general elections, a moratorium on UOG operations was introduced following the strong opposition from various Lands (Tosun and Lang, 2016).

On the other hand, majoritarian political system in the UK allows for fewer veto powers over the centralised decision-making. It is often assumed that policy change is largely driven from the top and should be quicker and more substantive in the UK, since political power is concentrated in the centre (Cairney et al., 2015; Cairney et al., 2016). Yet many studies showed that the UK Central Government is home to many 'policy communities' composed of civil servants and groups that are reinforced by devolved responsibilities with governments in Scotland, Wales, and Northern Ireland (Cairney et al., 2015; Cairney et al., 2016). The UK therefore does not impose policies on local government by default. Scotland has already been able to introduce an indefinite moratorium on fracking in 2017.

Another important institutional rule to consider is the allocation of mineral rights. This is one of the most important of the institutional rules that creates a base for hydraulic fracturing subsystems (Ingold et al., 2016). Different mineral right regimes and rules directly influence the level of involvement of corporate interests in fracking debates, as well as the extent to which individuals or communities can potentially benefit from the emerging sector. In most cases, minerals are an exclusive property of the state rather than individuals (Alramahi, 2013). Concessions to explore shale gas are typically awarded by governments, either national or provincial. This depends on a political system.

In the UK, under the Petroleum Act 1998, s. 3(1), licences to explore, bore for and get petroleum within Great Britain, its territorial sea and UK Continental Shelf are granted by the Crown, represented by the Department of Energy and Climate Change, or DECC (Alramahi, 2013). The Crown

is also able to decide on the form, mode or technology employed for petroleum exploration and production (Alramahi, 2013). That changed with the Scotland Act 2016 that devolved shale gas licensing to the Scottish Parliament (Delebarre et al., 2017). For more details, please see Chapter 4.

In addition, although people might welcome potential economic benefits regionally, they are less likely to benefit from shale projects individually under existing mineral rights arrangements. These aspects can in turn strengthen position of anti-shale coalitions (Ingold et al., 2016). In such instances, certain measures or policies can be adopted to ensure direct benefits for localities and communities where drilling projects are to be done. For example, the UK has implemented the Infrastructure Bill in February 2015, where it specified that a secondary legislation can potentially be introduced to obligate companies to compensate local communities through royalty payments (Norton Rose Fulbright, 2015). This would be one of the requirements for companies to get access the above rights (Norton Rose Fulbright, 2015).

In contrast, the USA has a unique system of mineral right allocation. Mineral rights are privately owned either by the public or private entities. To access mineral rights, oil and gas companies thus must lease them from the right holders. As studies by Ingold et al. (2016) and Weible and Heikkila (2016) concluded, private interests in the USA had more incentive to ensure that they can gain access and actively develop mineral resources as the result of this system. Oil and gas industry was seeking active participation in advocacy coalitions (Ingold et al, 2016; Weible and Heikkila, 2016). This system also opened opportunities for individual landowners and communities to financially benefit from shale operations. The minimum amount of royalty is not fixated at the Federal level and varies by states. In North Carolina, for instance, any shale-related lease must provide a landowner a minimum royalty payment of 12.5% of the proceeds of the sale of oil or gas produced from the landowner's share of gas in the pool (Elkan and Smith, 2012). Overall, these examples demonstrate that different mineral right regimes and socio-economic factors result in different opportunities for community benefits and coalition structures, all of which should be considered in the ACF research.

## 2.10 Chapter Summary

All in all, this chapter provided an in-depth yet practical introduction to the ACF. The goal was to provide a comprehensive theoretical background to the analytical framework and to demonstrate its practical applications in relevance to hydraulic fracturing policy. In this chapter, I have covered all the core elements of the ACF, including policy subsystems, advocacy coalitions and subsystem actors, belief systems, and drivers of policy change, and showed how they apply in real-life contexts. This approach was helpful to gain a solid understanding of the theory, and to link existing ACF

applications to the Scottish case study. Not only is the subsequent analysis of the study results is rooted in the core principles of the ACF, but it is also greatly informed by ACF studies that I discussed in this chapter.

The first part of Chapter 2 discussed the ACF as a public policy theory. To summarise, the primary unit of analysis in the ACF are policy subsystems that consist of opposing advocacy coalitions, which, in turn, are comprised from various elite actors and stakeholders that seek to influence policy decisions. They can be policy advocates, policy brokers (usually governmental officials and public institutions), and scientists, but all viewed as coalition actors by the ACF. Advocacy coalitions are formed around shared beliefs, represented in a three-tier system of deep core, policy core and secondary beliefs concerning the policy issue. Yet their behaviour, beliefs and resources are constrained, or, on the contrary, conditioned by broader socio-economic and political structures, as well as basic attributes of the policy, such as biophysical characteristics of the resource. Advocacy coalitions aim to achieve desired policy outcomes based on their beliefs, and there are four main drivers of policy change: external and internal events, negotiated agreement, and policy-oriented learning. Given the nature of the UOG policy issue – which highly depends on the technical data and the scientific consensus (or lack thereof) around it – I paid special attention to policy-oriented learning, as its primary concern is with the influence of scientific and technical information on policies and beliefs.

The second part of the chapter discussed the ACF as a practical tool to study UOG policy development and some of its core concepts into the context of real-life applications worldwide. In shale politics, subsystems usually consisted of two or more advocacy coalitions. Anti-exploration coalition members demonstrated stronger and more unified beliefs as they mostly consisted of purposive group types, compared to shale proponents that consisted mostly of energy companies, i.e. material groups. The former group usually perceived the industry as a major threat to the environment and strongly believed in the precautionary principle, while the latter viewed shale oil and gas as a huge economic benefit and a “clean” energy reserve. Apart from beliefs, basic attributes of the UOG industry and regulatory regimes were also important factors affecting subsystem dynamics in many studies. In particular, the amount of recoverable resource and its economic viability were found to be impactful on the willingness to embrace hydraulic fracturing, while the openness and the degree of centralisation of political systems affected power dynamics between coalitions. All these factors identified in the literature review are very important to consider in the case study analysis.

In addition, this chapter has advanced two major concepts that will help us to get a deeper understanding of the Scottish UOG subsystem: *nascency* and *nestedness*. One of the key assumptions of the ACF discussed in this chapter is that this model of analysis requires a time perspective of ten years or more, because usually the long-term perspective is vital for policy learning to occur. The Scottish UOG subsystem though is a *nascent* policy subsystem, which means that it emerged less than a decade ago. The year of 2021, when this thesis was written, hit the ten-year mark of the UOG subsystem in Scotland - this is when it hit 'maturity'. But the scope of this study is only eight years (2011 to 2019), meaning that the analysis focuses on the subsystem in its nascency. Although it has been established that the emergence of advocacy coalitions, beliefs and coordination can also be studied in nascent policy subsystems based on the ACF, they are anticipated to have fragmented beliefs and weaker cooperation patterns, compared to mature subsystems.

However, the Scottish UOG subsystem is also a *nested* subsystem. Being part of the UK, Scotland inevitably overlaps with the national subsystem in the area of shale politics. Although the issue of hydraulic fracturing is still in its nascency, Scotland has, in essence, "inherited" it from the UK, where it was in development for much longer. This means that any significant processes, regulatory changes, external events, or scientific knowledge accumulated in the overlapping UK subsystem over time were all important factors that contributed to the formation of the Scottish UOG advocacy coalitions and debates. This gives it a more solid foundation for belief consolidation and for policy learning to occur.

It should also be noted that, with nested subsystems, it is expected that diverging beliefs between the dominant coalition at the nested level and the larger subsystem are likely to result in high levels of conflict between them. The very existence of the Puzzle – the reluctance of the Scottish Government to embrace fracking despite Westminster's "all out for shale" approach - indicates that belief systems between the Scottish subnational and UK national hydraulic fracturing subsystems differ at a very fundamental level. This, of course, is going to be discussed in detail later in the analysis.

Before moving on to examining the case study and the data gathered, the next chapter will explain the methodology used in this research. So far, I have only discussed the ACF as an overarching theory, but in Chapter 3, I am going to dive in the research design and specific methods, appropriate for the framework, that I used for data collection and analysis.

# CHAPTER 3

## Research Design and Methodology

### 3.1 Chapter Introduction

This thesis started off with a puzzle about Scotland's decision to impose an effective ban on UOG extraction in the face of Westminster's commitment to fracking, despite energy policy not being a fully devolved matter. The overarching question here is how and why did that happen?

To solve this puzzle, I asked myself another set of questions that I engrained in my study design. First of all – what happened? In order to explain *how* Scotland was able to impose a moratorium on fracking, it is important to understand how the policy process and fracking debates developed. Next, what makes the Scottish subsystem distinctive that would explain the existence of the puzzle in the first place? The bottom line is to find out how these distinct characteristics impacted on regulatory changes in onshore oil and gas policy in Scotland. To uncover *why* the Scottish Government did not embrace fracking, it was important to identify who the main actors in the Scottish UOG subsystem were, and what were their goals and beliefs. What narrative arguments did these actors, formed into advocacy coalitions, use to support their case, and which were the most prominent? And finally, it was important to ask what were the key sources of policy change in UOG in Scotland that led to this puzzling outcome? To solve any puzzle, one must piece together different interconnected elements. All these questions are intertwined with one another under the analytical approach of the ACF.

This is a single case study of the Scottish UOG policy subsystem that is also nested within the wider UK political system. The case study selected is of highly salient regulatory changes in Scotland's energy regulations concerning UOG extraction that occurred between 2011 and 2019. Because they involve high levels of complexity and scientific uncertainty due to the nature of the UOG industry, they present a good opportunity to explore the theoretical assumptions regarding the importance of the four sources of policy change in the ACF (Nohrstedt and Weible, 2010, p. 311). This is a particularly good case for exploring policy-oriented learning due to the many technical uncertainties and risks associated with the UOG industry.

The research design is based on qualitative content analysis of media sources, combining elements of quantitative data collection and qualitative analysis. This is done to retain the strengths of the quantitative approach, such as systematic and replicable data, but also to include textual and interpretive analysis to fill in the gaps on elements not picked up by coding. This enables the researcher to provide a more thorough and detailed investigation of the material. More specifically, I used a directed approach to content analysis, as it allows using existing theories to develop an appropriate coding scheme and extend it by revising and refining the scheme along the way. The goal of this form of analysis is to “validate or extend conceptually a theoretical framework or theory” (Hsieh and Shannon, 2005, p. 1281), which can be useful in the ACF research.

To fulfil this goal, I have initially adapted and redeveloped the codebook based on the study of Heikkila et al. (2018) on shale development politics in Argentina, US, and China. There are several reasons for this decision. First, this study had a very similar focus and methods to mine, exploring the issue of shale development in three different policy subsystems using media content analysis. By relying on established methods and procedures in other ACF studies, I thereby strengthened my own research design.

Secondly, Heikkila et al. (2018) advanced the ACF by introducing and utilising standardised approach for measuring coalition attributes, which made a comparative analysis of three countries possible and solidified this method as replicable for other subsystems too. I was able to replicate this same method for the Scottish subsystem by following the same systematic procedure, which validates this theory conceptually. The only difference is that I also added a qualitative, interpretative element to the study to get an even deeper understanding of the Scottish UOG subsystem. My case study does not rely on comparative analysis, though it does acknowledge the influence of the overlapping UK subsystem. By using the systematic and replicable method I also open the door for further comparative studies on the subject.

The final reason why I relied on the codebook design by Heikkila et al. (2018) was the established link between the University of Stirling and the University of Colorado Denver, where two of the study authors, Weible and Heikkila, are based. The CU Denver colleagues have provided me with their expertise and advice on my research on multiple occasions, which includes a codebook that they shared.

In sum, the methods of data collection and analysis used in this thesis were, firstly, directed content analysis of news articles using coding to identify advocacy coalitions, distinguish their beliefs and measure the frequency of narrative arguments in the debates; and secondly, interpretive analysis of relevant internal and external events and other drivers of policy change through manual reviewing



of the primary (news articles) and secondary (government-published documents) materials. Following the definitions of the ACF of causal mechanisms behind policy change, the analysis focused on political indicators (e.g. changes in power, political crises, major political events), changes in the governing coalition, vital technical information, visible negotiations, and changing beliefs. Interpretative analysis allows this thesis to tell a story of policy development, while media coding provides an empirical basis of the study.

However, several difficulties emerged in attempting to empirically identify the belief systems of advocacy coalitions according to the theoretical guidance of the ACF when trying to measure deep core beliefs and levels of non-trivial coordination among actors. The difficulties lay in assessing actors' normative beliefs through data that only contained limited statements of or about policy actors in the media. Although the analysis does distinguish deep core beliefs from the rest, it was primarily based on policy core and secondary beliefs that were easy to identify and quantify using content analysis. Using normative beliefs as a criterion would require a more in-depth analysis of the beliefs of each of the key actors using surveys and in-depth interviews for the investigation of their underlying values. Another obstacle was to adequately measure the degree of conflict and cooperation between them, as these were also limited to the statements presented by the media that did not necessarily reflect any behind-the-scenes processes. The analysis therefore relied on observation and interpretation to assess both the normative beliefs and the degree of conflict and cooperation within and between coalitions.

The goal of this chapter is to outline the research strategy and details the methods employed in the study. It is divided into two main sections. The first of these will introduce common methods in the ACF studies and identify the distinction between qualitative and quantitative research approaches, evaluating relevant issues regarding both. The predominance of descriptive, qualitative studies suggests that advocacy coalitions and their belief systems are being identified mostly through content analysis, documentary research and interviews. This chapter includes all three main methodological tools, as well as the case study approach. The main focus is on the qualitative content analysis and the case study as primary methodological approaches. This chapter discusses their advantages and limitations, as well as practical applications in the ACF. This is done to explain the logic behind the overall approach of the thesis and to give better understanding of the research process. The next section is dedicated to the specifics of the research design, data sourcing and analysis. Specific tools will be described and discussed in some detail, providing an indication of how and why they were included in the research. It also addresses methodological limitations and other research barriers, and strategies I used to address them. To sum up, this chapter connects research

methodology to concrete methods by showing how the research design for this study was developed based on the knowledge of methodological approaches.

## 3.2 Methods in ACF Studies

### 3.2.1 Overview of the Common Methods

The ACF has historically been applied in the US political context and primarily in the environmental and energy policy domains. The majority of ACF applications from 1987 to 2006 followed this tradition (Weible et al., 2009). Over time, it has transformed from a framework criticized in the 1990s and early 2000s for being US-centric and context-specific to one that is now being successfully applied worldwide and to a wider variety of policy processes. Environment and energy (43% of applications) are no longer most frequently researched policy domains and, though comparative analysis is not uncommon in ACF studies, most of them still tend to focus on a single continent geographically (Pierce et al., 2017). The most frequent geographic location studied also shifted from North America to Europe (Pierce et al., 2017). Since 2007, there has been a volatile increase in the number of ACF applications from the maximum of 10 studies pre-2006 (Weible et al., 2009) to a high of 27 in the year of 2014 alone (Pierce et al., 2017). This indicates the growing popularity of the ACF as a robust theory of the policy process, which, in turn, means a greater variety of methods is being tried to set it in motion.

As follows, the predominant research approach in the ACF studies is **the case study**. According to Ma et al. (2020), single case studies are used in 50% of the ACF applications. The predominance of the case study approach in the ACF lies in structure of the framework itself, with the policy subsystem being the primary unit of analysis (Ma et al., 2020). The advantage of case studies is that they give way to identifying complex causal mechanisms, such as those proposed by the ACF (e.g. external events, belief formation and policy learning), which are otherwise difficult to measure with quantitative methods (George and Bennett, 2004; Ma et al., 2020). Focusing on policy subsystems demands a deep analysis of specific policy issues and processes, thus making the case study approach a useful tool for the purpose.

The framework was also criticised in the past for being dependent on empirical and quantitative methods of analysis, but with time qualitative tools had become prevalent in ACF studies. As for the data sourcing and analysis approaches, the majority of ACF applications in English focus on qualitative analysis with information sources being interviews and documents. A study by Pierce et al. (2017) suggests that studies using qualitative analysis depend mostly on interviews (72%) and documents (63%), with only 25% of studies incorporating a form of quantitative analysis. On the

other hand, the studies employing quantitative methods tend to use surveys. For instance, Weible et al. (2009) found that among ACF applications 61% use documents, 40% use interviews, and 17% use surveys. Likewise, the three main sources of information in existing ACF studies on UOG policy also include a documentary, or content analysis, structured interviews and surveys of the policy actors within hydraulic fracturing systems (Cairney et al., 2016; Chailleux and Moyson, 2016; Heikkila and Weible, 2016; Ingold and Fischer, 2016; Montpetit et al., 2016; Nohrstedt and Oloffson, 2016; Tosun and Lang, 2016).

### 3.2.2 The Case study approach

The case study approach can be defined as “the detailed examination of an aspect of a historical episode to develop or test historical explanations that may be generalizable to other events” (George and Bennett, 2004, p. 5). It is a specific, detailed investigation of a single event, issue, group, area, or community (Stoecker, 1991, p. 88). Case studies allow for observations of any intervening variables affecting an event under investigation. Overall, this approach is valuable in that it provides the researcher with a detailed enough set of information to examine and explore theoretical nuances that otherwise may not be possible in wider-level studies (Molnar, 1967, pp. 1–3).

In a case study, social phenomena are studied in the real context, and also as part of a broader context of events or cases (Bukve, 2019, p. 115). It is thus important to define what exactly is the case in a case study, given that broader context. A case study needs to be oriented towards a specific type of research purpose (Bukve, 2019), which will determine its focus. The collection of data must be structured in such a way that the gathered information can be effectively used for the relevant theoretical interpretation or testing of the study (Bukve, 2019). The qualitative approach in particular is used to investigate the case using a variety of data sources to ensure that the issue it is explored through a variety of lenses (Baxter and Jack, 2010). This allows for multiple facets of the phenomenon (causal mechanisms and other intervening variables) to be identified.

One of the most common pitfalls associated with the case study approach is that research objectives and/or questions are often too broadly defined (Baxter and Jack, 2010). To prevent this problem from occurring, an important distinction must be understood between studies that focus on the case as a sole purpose, and those that view the case as embedded within a context (Yin, 1984, p.44). When studying the case, less importance is placed on the context and more on the case and within-case variables and events (Bukve, 2019). The latter approach, on the other hand, is more focused on the relationship between the case and the context, often from a process perspective (Bukve, 2019). This

research focuses on the UOG policy case study imbedded in the Scottish context – its political system, political environment, and relations with the UK government. This is the first step in a research design – to define a clear research objective, including the type of events to be explained and the level of a case study.

Next, it is important to consider the design of the case study itself. Several typologies exist to distinguish different kinds of case study designs. This research will use the typology proposed by Yin (2003), as it is one of the most known and commonly used approaches. Yin (2003) categorizes case studies as **exploratory**, **descriptive**, and **explanatory**. The first type refers to case studies that seek to define questions and hypotheses for further research, as it allows a researcher to evaluate events without clear, single set of outcomes (Yin, 2003). The descriptive approach is different in that it is used to thoroughly describe a particular phenomenon within its given context (Yin, 2003). Finally, explanatory case studies are used to explore causal links of the events and explain how these certain events happen (Yin, 2003). To sum up, the three types of case studies each has one primary question in focus: *how* a phenomenon takes place (exploratory), *what* phenomenon takes place (descriptive), and *why* a phenomenon takes place (explanatory).

The selection of a specific type of case study design should be guided by the overall study purpose. The purpose of this study is to identify the intervening variables that contribute to policy change in a specific domain, through the lens of the ACF, but not to put theoretical underpinnings of the framework to the test *per se*. Therefore, it incorporates elements of both descriptive and explanatory approaches, in that the main goals of this study were: a) to understand *how* the Scottish Government was able to move in a different direction from the UK Government by distinguishing the Scottish UOG subsystem elements and the events in the debate process; and b) to provide explanations as for *why* the policy outcome in onshore oil and gas was so different in Scotland. The limitations of this approach are mitigated by the nature of qualitative case studies, as their data collection involves sourcing information from multiple sources to ensure that a good range of variables can be observed.

### 3.2.3 Content Analysis

The purpose of content analysis is to capture the frequency with which words or concepts occur in texts, or across them (Carley, 1993). In public policy studies, this is done to provide a detailed view of political discourse, which can be defined as the interrelated texts, debates and practices associated with a policy issue (Burnham et al., 2008, p. 250). In a nutshell, to analyse content means to take a set of relevant concepts, a number of documents/texts and then code the number of times each

concept occurs in each of them. This method has been used to study a variety of topics, such as conceptual shifts in presidential addresses (Sullivan, 1973) and in our instance – to grasp the shifts and dynamics in the Scottish UOG policy subsystem.

Content analysis is a particularly useful method in the ACF studies as it provides longitudinal information on policy subsystems. This allows researchers to trace policy events, stances on policy issues and, of course, their evolution within advocacy coalitions over time – which is fundamental in ACF research. This thesis specifically uses media content analysis of the Scottish newspapers. It should be noted that in some ACF applications (Montpetit et al., 2016; Tosun and Lang, 2016), media statements are coded to indicate actors' policy beliefs related to hydraulic fracturing, which is also the approach used in this study. The media coding provides an empirical basis for defining advocacy coalition membership and documenting organisational affiliation and joint actions of the actors involved.

One of the most used forms of content analysis is the quantitative approach. Quantitative content analysis provides a systematic and replicable method for analysing media communications, focusing on the quantitative description of its content (Burnham et al., 2008). The communication sources, such as relevant newspapers and media agencies are selected based on a research topic. It is a reductionist technique, in that it takes content and divides them into smaller elements or variables through systematic coding and quantification of content (Huxley, 2020). On this basis a descriptive statistical analysis is performed by looking at frequencies (Mayring, 2014).

Relying solely on the quantitative method of content analysis, however, may involve certain limitations. Mayring (2014) discusses these limitations in great detail. First of all, it's important to consider the multiplicity of meanings in the language. For instance, the word "madly" in the colloquial meaning, means "very", or it can pertain to psychological disturbance (Mayring, 2014, p. 24). Then, there are possible nuances and connotations conferred on terms by the context, as well as contextual modifications of the counted terms (Mayring, 2014). For example, in the case of "no anxiety", "little anxiety" or "a lot of anxiety", this gradation may not be accounted for and instead "anxiety" as a term will be counted in each case (Mayring, 2014, p.24). Finally, there is also an issue with pro-forms, such as "of this/that" and others alike. The understanding of the text is not just an automatic quantification of terms and textual elements, which is why the hermeneutical approach to content analysis is valuable. Hermeneutics in this instance refers to a procedure for interpretations that allows the researcher to formulate preconceptions in advance, but then modify them in due course as the material is being studied (Mayring, 2014, p. 11). This is where the qualitative content analysis comes in useful.

The central idea of qualitative content analysis is to retain the strengths of the quantitative approach, while providing for and accommodating techniques a systematic, but qualitatively oriented textual analysis. For the purposes of this study, qualitative content analysis is defined as a “method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (Hsieh and Shannon, 2005, p. 1278). It starts from the same methodological basis of quantitative analysis but conceptualizes the process of assigning categories from the texts as a qualitative-interpretive act (Mayring, 2014). This implies that data analysis in the qualitative approach can also involve frequency counts, just as in quantitative content analysis. But despite these similarities, qualitative content analysis is a method in its own right.

Qualitative content analysis has many similarities with other qualitative research methods, such as the focus on meaning and interpretation of the material, and the importance of context in determining that meaning (Scherier, 2014; Willig, 2014). Whereas the focus of quantitative content analysis is to “manifest meaning” (Schreier, 2014, p. 5) from the text and/or test hypotheses, qualitative content analysis is more preoccupied with *explaining* the context-dependent meaning. It seeks to provide a detailed description of the material under study (Schreier, 2014), and the phenomenon under study (Downe-Wamboldt, 1992, p.314).

However, as discussed above, the method also incorporates elements from the quantitative approach, and in this respect, it differs from other qualitative textual analysis methods. For example, some studies (e.g. Vieira, 2019) use discourse analysis to identify coalitions and their belief systems. However, discourse analysis is mostly qualitative and interpretive method of content analysis that focuses on “exploration of the interplay between discourse, text, and context builds the focus of the discourse analysis” (Bondarouk and Ruel, 2004, p. 6). Discourse analysis may use quantitative techniques like content analysis, such as codification, but without strict quantification of the findings (Bondarouk and Ruel, 2004). Qualitative content analysis, on the other hand, still follows quantitative steps of analysis and presentation, thus incorporating the strengths of both quantitative (systematic procedure and replicability) and qualitative (interpretative elements) approaches. It is for this reason that the qualitative content analysis is a preferred approach in this study.

Category systems are therefore the central instrument in content analysis (Mayring, 2014). These are developed based on a research topic and hypothesis. In ACF studies focusing on UOG policy development, arguments are usually looked at in their supportive or opposing form, being coded as “positive”, “negative” or “neutral” (Montpetit et al. 2016; Tosun and Lang, 2016). The object of the

analysis here is to filter out particular aspects of the material according to pre-determined ordering criteria (Mayring, 2014).

Media content analysis also helps in identifying specific types of actors and their policy core beliefs. The study material is usually selected from a sample of appropriate newspapers, editorials and articles reporting the issue. For instance, the study by Montpetit et al., (2016) conducted a content analysis of a shale energy discourse in Canada. They used leading provincial newspapers, searching for keywords such as “fracking”, “hydraulic fracturing” and “shale gas” (Montpetit et al. 2016). A sample of newspapers and articles can also be analysed over a period of time (Burnham et al., 2008). The historical timeline of for policy development would usually include key events and processes, such as elections and introduced policies. This systematic approach contributes to the intersubjectivity and replicability of the procedure (Mayring, 2014).

This study specifically takes a directed approach to content analysis. The goal of this form of analysis is to “validate or extend conceptually a theoretical framework or theory” (Hsieh and Shannon, 2005, p. 1281), which can be useful in the ACF research. Theories provide preconceptions about the key concepts or variables and their relationships, thus helping to determine the initial coding categories and system (Hsieh and Shannon, 2005; Potter and Levine-Donnerstein, 1999). Any findings that could not be categorized with the initial coding scheme would be given a new code and the coding system be refined (Hsieh and Shannon, 2005). Subsequent sections will discuss the method and research design for this study in greater detail.

#### 3.2.4 Interviews and Surveys

Content analysis in ACF studies can be further validated with survey, and vice versa - surveying methods can be supplemented with a systematic content analysis covering the issue of hydraulic fracturing. Structured surveys are used to gather a solid quantifiable data on advocacy coalitions composition and characteristics. They are administered either online or sent via post to relevant policy actors involved in hydraulic fracturing to identify and explore advocacy coalitions – their policy beliefs, strategies and degree of conflict and cooperation. Self-administered questionnaires are a primary tool for quantitative policy studies, as they help avoiding problems associated with interviewer bias (Burnham et al., 2008). Close-ended questions are typically used, having an advantage of being easy to code and analyse (Burnham et al., 2008).

In line with Knoke et al. (1996), it is assumed that formal organizations rather than individuals stand at the forefront of a policy issue and form advocacy coalitions. Respondents are asked to indicate

with which organisation, identified as part of an advocacy coalition, they agree or disagree about specific policy regulations and outcomes for shale oil and gas development. The network of agreement and disagreement between different actors and organisations is represented by numeric values. To identify their policy core and secondary beliefs related to UOG development, participants are asked to rate their preferences in terms of specific policy outcomes, perceptions of the seriousness of problems associated with shale operations and general attitude towards this development. The survey data is then used to identify advocacy coalitions.

Furthermore, interviews are also commonly used in ACF studies to shape the survey design and supplement quantitative analysis with more qualitative data. Respondents are typically selected from a purposive sample of policy actors from different organisational affiliations. It is a form of sampling that allows the researcher to purposively select participants for a sample. This gives an advantage of identifying those participants who are likely to provide data that are detailed and relevant to the research question. Interview questions are structured in a way that allows researchers to explore coalition actors' views and perceptions of the potential costs and benefits of hydraulic fracturing, their activities related to development and perceptions of current UOG regulations. Both methods were attempted for this research, but the decision had to be made to focus on the media content analysis in the end. This will be addressed further in Section 17.5.

## 2.11 3.3 Research Methods

### 3.3.1 Research Design

The research design of this study follows **seven** basic steps: i) developing a concrete research question; ii) linking the research question to theory; iii) developing research design (e.g. explorative, descriptive, explanatory); iv) defining the sample material and sampling strategy; v) choosing methods of data collection and analysis, pilot testing and inter-coding to ensure data validity vi) collection and processing of the data; and vii) data analysis and presentation of results in respect to the research question.

#### **Step 1: Concrete research questions**

As described in the introductory chapter, this study seeks to answer four main questions:

1. What makes the Scottish UOG subsystem distinctive? More specifically, this question sets to explore the nature of political system versus the nature of the policy issue in the Scottish context.



2. Who were the main actors in the Scottish UOG subsystem, and what were their goals and beliefs?
3. What arguments did advocacy coalitions use to support their case, and which narratives were the most prominent?
4. What were the key drivers of the changes in UOG policy in Scotland?

In this instance, UOG policy is the case study embedded in the Scottish context, but also in part tied with the UK national context due to the nature of the political system (discussed in Chapter 4).

### **Step 2: Linking research question to theory**

Advocacy Coalition Framework (ACF) provides a theoretical basis for this study, seeking to explain how policy positions are constructed and what drives policy change. In particular, the framework examines policy subsystems, consisting of advocacy coalitions and their beliefs, as well as the key sources of policy change: external events, internal events, policy learning and negotiated agreement (Weible and Nohrstedt, 2013).

### **Step 3: Developing Research Design**

This study uses elements from both descriptive and explanatory designs. Descriptive design follows a deductively formulated category system (coding) and registers category frequencies. The explanatory element comes with the longitudinal analysis of these category systems (advocacy coalitions, their beliefs and drivers of policy change).

### **Step 4: Defining the sample material and the sampling strategy**

The sample, as the empirical basis of the research project, consists of documents, primarily articles from selected major Scottish newspapers from the years of 2011 to 2019. The materials were selected based on the relevancy to the case study. The content of selected newspapers was searched in *Nexis UK* database and manually reviewed with the key words and concepts.

### **Step 5: Choosing methods of data collection and analysis**

To fulfil the purpose of this study, a directed approach to content analysis was utilised. This method was guided by a structured process of category codification. Using existing theory, in this case the ACF the first step was to identify key concepts or variables as initial coding categories. Those included the interpretive communities, i.e. advocacy coalitions, categorised on the basis of their attitudes towards UOG development (positive, negative, or moderate), but also narrative argument groups based on the typology derived from the literature review of previous ACF applications (see Chapter 5). Next, operational definitions for each category were determined using the same theory.

## **Step 6: Data Collection and Processing**

Directed content analysis of articles published in Scottish quality newspapers was conducted by categorising all the relevant actors into advocacy coalitions based on their beliefs. Coalitions were identified through the coding of the main arguments related to contentious points in the debates and through actors' statements in relation to these points. The different arguments and statements were, in turn, organised according to six discourse frames, or narrative categories identified in the Scottish debates. See Subsection 3.3.2 for more detail on data collection. Data that could not be coded initially was reviewed to determine whether they represented a new coding category.

## **Step 7: Data Analysis and Presentation**

The steps followed for the data analysis are summarised below, and then explained in detail in Subsection 3.3.3:

1. Country-level (Scotland) and subsystem historical process-tracing for the identification of internal and external events relevant to UOG policy development.
2. Overview of the most salient subsystem-wide events and debates through manual reviewing and interpretation of the content in the primary (news articles) and secondary documentation (Scottish Government publications).
3. Identification of advocacy coalitions and of the actors within each coalition through content analysis (codification of actors' arguments and measuring attitudes). The data is presented using descriptive statistics and charts.
4. Identification and measuring of frequencies of the main narrative arguments used in relation to UOG development and policies through systematic coding and frame analysis. The data is presented using descriptive statistics and charts.
5. Identification and assessment of external events, policy-oriented learning and negotiated agreement through the observation of specific criteria in debates (Chapter 2, Section 2.6 provide descriptions of those) identified in primary and secondary documentation.

### 3.3.2 Data Sourcing and Processing Methods

In the first stages of the study, Scottish quality press was reviewed to identify key policy actors involved in hydraulic fracturing policy development. Directed content analysis of articles published in quality newspapers was conducted by categorising all the relevant actors into "pro-exploration", "anti-fracking" or "moderate" advocacy coalitions based on their stance and grouping their statements on fracking into different narrative categories. The time frame chosen ranges from years

2011 to 2019, comprehensive enough to allow the analysis of the evolution of the policy, and to capture the influence of internal and external events.

Five key Scottish newspapers were selected for the study: *The Scotsman*, *The Herald*, *Sunday Herald*, *The Press and Journal*, and *Daily Record*. Similar to existing ACF studies (Tosun and Lang, 2016; Montpetit et al., 2016), the content of these newspapers was searched in *Nexis UK* database and manually reviewed with the key words and terms “fracking”, “hydraulic fracturing”, “shale gas” and “shale oil”. This study uses the timespan of eight years, more specifically the articles from 1 January 2011 until 31 December 2019. The reason for choosing these dates is that fracking did not come about as a policy issue in Scotland until the year of 2011. It should be mentioned that initially it was planned to choose a wider timespan of ten years, between the years of 2007 and 2017. This is a common practice in ACF studies, as a time perspective of at least a decade is usually needed to understand policy change. However, no articles relevant to the study has been identified before the year of 2011, hence this analysis is limited to a shorter lifespan. As for the year of 2017, it has marked a final decision to impose a ban on fracking by the Scottish Government, therefore providing a logical endpoint. The study was later supplemented by the data from 2018 and 2019 as more events had occurred. Table 2 below provides numbers of articles and statements coded over the study period.

Table 2: Total number of sample articles and statements

Timeframe	Articles	Statements
2011-13	130	309
2014-15	273	627
2016-17	366	936
2018-19	66	194
<b>Total</b>	835	2,066

Articles were selected on the following basis: i) **relevancy to Scotland**, i.e. articles must contain information, statements on hydraulic fracturing and/or mention actors specific to the Scottish context, rather than to UK as the whole; ii) **clarity of statements**, i.e. articles must contain explicit statements on hydraulic fracturing, information revealing actors’ stance on fracking, or present clear opinion on that matter in the case of op-eds; iii) **articles must be specific to hydraulic fracturing for shale oil and/or gas**, so articles vaguely mentioning fracking alongside other petroleum technologies, such as UCG, were not included. This is done to separate Scottish context from the rest

of the UK to meet the aims of this research, as a similar study has already been conducted nationwide by Cairney et al. (2016a). All the details on coding can be found in the codebook guide (Appendix I).

The first step in the coding process was to identify policy actors in the media, group them based on their organizational affiliation and into broader categories based on organizational type. The actor here is the primary unit of observation and is defined as any individual or organization named in the article. In total, eleven organizational types have been identified in the coding process:

*Table 3: Organisational types identified*

Scottish Government
UK Government
Local Government (Councils)
NGOs and Non-profit Groups
Energy Companies and Private Sector
Media
Political Parties
Research and Consultancy
Trade Unions
Public Bodies and Government Institutions
Other

Next, statements or actions made by the relevant actors were coded as either “pro-exploration”, “anti-fracking” or “moderate”, or if their stance is not clear from the paper, it remains “unspecified”. Their narrative arguments in favour or against fracking, as well as policy preferences are also accounted for in the coding and help determine their stance on this policy issue. Table 4 below presents key frames used for that purpose:

Table 4: Groups of arguments (on fracking) identified

Policy Risks	Legal/Regulatory Issues	Policy Benefits
Socio-economic risk	Constitutional/Democratic risk	Socio-economic benefits
Community risk	Constitutional/Democratic strength	Community benefits/safety
Environmental/Health risk	Regulatory stringency	Environmental/Health benefits/safety
Climate/Energy risk	-	Climate/Energy benefits

Finally, engagement between different actors and organisations was also observed in this study by identifying instances of agreement and disagreement between each other. It was only coded when there was a specific reference of one organization to another, to whom they directly agreed or disagreed. This was done to identify instances (or absences) of negotiated agreement between policy actors. The process of coding is shown in further details in the code book (Appendix I).

However, there are several main differences between how I approached coding and what Heikkila et al. (2017) did. Firstly, even though I coded instances of agreement and disagreement between policy actors, this was done for a different reason. While Heikkila et al. (2018) used this data to directly measure the level of active coalition engagement and created matrices of agreement and disagreement to compare different countries. In this case study, however, the aim was to find instances of agreement and disagreement to make a simple measure of frequency of both, which would indicate either high or low levels of negotiated agreement in the subsystem. But such direct instances are only one indicator for negotiated agreement, as this case study mostly relied on tracing events and qualitative interpretation to find evidence for it. Whereas the study by Heikkila et al. (2018) relied on quantitative methods overall, I opted for qualitative content analysis for reasons I have already discussed.

The same applies to identifying venues for negotiated agreements. The study by Heikkila et al. (2018) relied on the coding process to identify formal and informal venues, whereas I used qualitative analysis for that. The former used this data, and the rest, to create comparable agreement and disagreement networks. The goal of my study was not to facilitate a comparative analysis (though it is possible in future research with comparable data), nor was it to provide a numerical measure for subsystem attributes – but to provide an explanation and a reason for the final policy outcome in the Scottish UOG process, which is why I chose qualitative content analysis.

### 3.3.3 Data Validity

The data collected has been checked for quality criteria such as reliability and validity. I relied on three major criteria to ensure that my data was robust and accurate. These are: consistency, validity, and completeness. First, I ensured that the coded data was consistent by manually reviewing it on a regular basis and cleaning it when necessary. I assessed and investigated any statistical discrepancies in intermediate and final results. I have also evaluated the results against other (secondary) data sources, namely government consultation reports.

Secondly, it was checked for validity through inter-coder reliability methods. It is achieved when several content analysts, in this case the project supervisors work on the same material independently and their findings are comparable. We used percent agreement technique that relies on the proportion of agreement of coded units between judges and is best suited for nominal and ordinal data such as this. We have extracted a randomly generated sample of articles from the database – 28 in total, or 3% of all articles, to check. I should note that at the time when this test was conducted, the proportion of articles was 10%. The final percent agreement was 79%, which was a solid score to support data validity. This allowed to proceed with further data collection from a larger set with confidence.

Finally, I evaluated data completeness by revising preliminary data and intermediate results to check whether all required information to answer research questions was present in the dataset, but also whether the coding process captured all relevant details from the source material. I used pre-defined categories in my codebook design, but I introduced several new categories whilst collecting the data and evaluating it each step of the way to get accurate results. All in all, even though this study takes a qualitative approach to content analysis, the systematic coding procedure made it possible to ensure a high level of data validity and reliability.

### 3.3.4 Data Analysis Methods

This study is centred on the content-analytical method, which has the goal of extracting a certain information and meaning from the material. All concepts addressed in this study were categorised and extracted from the material either systematically through coding, or through observation and interpretation informed by the theoretical framework (ACF). The procedure is mostly deductive because the category system was established prior to coding. However, further observation and interpretation can and did lead to developing new categories following the same theoretical considerations.

This study starts with a qualitative description of how policy change unfolded. This is done to depict a chronological chain of events and specific causal mechanisms affecting policy change. The product of this process is a detailed policy timeline that identifies important subsystem events, and the debate overview that takes a form of a narrative battle, informed by the theoretical variables of the ACF (advocacy coalitions, belief systems, drivers of policy change etc.).

Next, I will move on to identification of elites and advocacy coalitions. This study relied primarily on the decisional approach to elite identification, but also used a combination of positional and reputational methods for better results (based on Hoffman-Lange, 2007). Starting out with an analysis of news articles, the decisional approach identified key actors by looking at the debate and decision-making process for important policy issues, in our instance hydraulic fracturing. It considered the most consequential actors as belonging to the “policy elite” (Hoffman-Lange, 2007). The criteria for that were their media presence, as measured by the number of statements, and participation in the policy issue. After manually reviewing each of the sampled news articles and studying government-published policy documents, I created a comprehensive yet concise policy timeline to showcase major events in UOG decision-making over. This approach helped to identify all “visible” policy actors [in the media], or the “base population” of the policy issue. From there, a list of elite actor groups was created.

Initially, I used combination of elite identification methods for the benefit of the ACF survey. They were supposed to strengthen the purposive sampling method. Although this survey did not work out (see Subsection 3.3.6) in the end, the study still benefited from this approach as it helped produce more reliable conclusions.

First, I studied the formal structure of authority using government-published documents and other secondary sources to supplement my data. Although media content analysis is useful for creating an initial sample of key actors, it was possible to identify other important figures using secondary documentation analysis in addition to verifying results of the content study. Next, as per reputational method, I asked experts in the field to name the most powerful organisations involved in the policy issue. In this specific study, they were asked to go over a drafted version of the Survey and comment on the initial sample. They could both name the most influential leaders from the list, or from outside of the existing sample. The validity of this method depended primarily on the choice of the experts and their knowledge, however, coupled with the other two tiers of elite identification, it gave this study a stronger foundation.

Next, I used frame analysis to interpret the data collected from content analysis. This is a common method in content analysis and document analysis (see, e.g., Linder 1995; Schmidt 2000, 2006;

Schon and Rein 1994). Frame analysis is an approach to analysing news discourse, which deals with how public policy issues are constructed and negotiated (Pan and Kosicki, 2010). Using this methodology, interpretive communities (Brummans et al., 2008), or in this case advocacy coalitions are identified and the language each uses to frame the policy issues are analysed. Analysis consists of identifying key frames surrounding hydraulic fracturing policy issues and the values underlying the respective frames. In this study, I used pre-defined frame categories on the issue of UOG development found in relevant studies (Chapter 4), but new categories (Constitutional Frame, Regulatory Stringency) were identified during the data collection.

Finally, I used descriptive measures to summarise and interpret the codified data, namely measures of frequency (percent) and graphs/charts. For nominal and ordinal data such as this, percentages are typically used to describe them. Graphs and charts complement this method by visualising those quantified values.

### 3.3.5 Methodological Limitations

Like any other research method, Media Content analysis has its strengths and weaknesses (Table 5). The key limitation is that, although media coding allows researchers to track policy development over time more effectively than a one-time survey, it does not fully capture the ways in which actors cooperate and compete with each other while sharing information.



Table 5: Strengths and limitations of the Media Content Analysis

Strengths	Limitations
Data readily available.	Limited by the availability of data.
Inexpensive form of data	Journalistic bias.
Saves time, if data collection and/or analysis are automatized (partly or fully).	Researcher bias – selective data sorting.
Data unbiased by data collection process.	Preparation before analysis (e.g. pre-determined coding).
Useful for hypothesis/problem formulation.	Time-consuming if manual selection and coding are done.
Useful for identification of key policy actors.	Tip of the iceberg – media reflects main events, but many may be outside of the frame.
Dynamics – can observe policy change and opinion shifts over time.	Media is not a “quality source” – it does not provide quality measure for public opinion.
It is applicable globally and is useful for comparative research.	Media does not give measure to information sharing and policy cooperation.

Moreover, news articles themselves cannot be classified as a “quality source”. Although they do reflect on the key policy events, on their own cannot give a valid measure of public opinion, nor do they always grasp the full scope of public and organisational participation in decision-making. They are also subject to journalistic bias, while media content analysis may be limited by a researcher bias while selecting and sorting data manually, and by using pre-determined coding system before the data collection. These issues are addressed by looking at Government-published secondary data sources, which are used for verification of information pulled from the media sources and final conclusions.

This study uses a directed approach to content analysis, which serves to supplement the ACF methods conceptually and help explore relationships among different policy actors. Directed content analysis requires the predetermined codes that are applied to identified statements and positions (Hsieh and Shannon, 2005). If the data that cannot be coded are identified, they are later analysed to determine if there should be a new category or a subcategory of an existing code distinguished (Hsieh and Shannon, 2005).

It is paramount to ensure data validity and how consistent is the information obtained from one source with information available from in other sources (Johnston, 2014). Apart from supporting the primary data obtained from the media, secondary documentation analysis of government-published

documents was performed to give more confidence to media content and discourse analysis. Government-published research is useful to either validate, disprove, or supplement results from the news coding. The main data source used for these purposes is analysis of responses to a consultation on UOG by the Scottish Government. A separate section will be dedicated to describing main conclusions from the "Talking "Fracking" consultation and to analyse how do they link up with the discourse interpretation.

### 3.3.6 Other Research Barriers

This study had attempted to use surveying methods to supplement the data obtained from media content analysis. The survey followed a similar model as in existing ACF studies (Cairney et al., 2016; Heikkila and Weible, 2016), designed to identify hydraulic fracturing advocacy coalitions. In this case study, the benefit of using this adapted survey was that that would put the Scottish UOG subsystem in the wider context and create comparable data with the UK and Switzerland. Even though that would be an advantage for the study and further solidify the findings, creating comparable data was not the end goal, and the research question was already answered by other means.

Purposive sampling was used to select respondents for the survey. It involved identification of respondents who meet the criteria of interest and are a valid representative of a group or organisation of interest (Halperin and Heath, 2012), which in this case was organisational affiliation of policy actors. A total of 40 respondents were selected based on the positional, decisional, and reputational methods for elite identification.

The questionnaire contained close-ended questions on respondents' policy process participation, venue shopping, their policy core and secondary beliefs, information exchange relations with other policy actors and their agreement or disagreement with key aspects of hydraulic fracturing policy proposals and measures. Respondents were asked to indicate their level of agreement with other organisations identified as key policy actors (listed in the questionnaire) on their policy beliefs regarding UOG development in Scotland using a network of agreement and disagreement between actors is then created. This way, clusters of actors with shared beliefs forming advocacy coalitions were to be distinguished.

However, despite the careful sampling, the survey was unsuccessful. Out of forty respondents, only five of them sent back answers. This is a mere 13% response rate, which is a low number to base analysis on. Attempts were made to follow up with selected respondents, but the response rate remained low. Some possible explanations might be the poor timing policy-wise and the lack of

interest from respondents. The survey was conducted in the end of 2018 and the beginning of 2019. By this time, the Scottish Government had already imposed an indefinite ban on “fracking”. This was perceived as a victory for anti-fracking coalition actors, who were less likely to respond compared to pro-exploration actors. The decision to impose moratorium in essence reduced the saliency of “fracking” as a policy issue in Scotland, hence the lack of interest to participate in the survey. In addition, it was not possible to get hold of and arrange interviews with selected respondents. Apart from the aforementioned reasons, the global Covid-19 pandemic made any follow up difficult.

As a mitigation strategy, it was decided to make qualitative content analysis the sole research focus instead. The initial plan was to incorporate all three methods, but by using the qualitative content analysis approach first, which involves both quantitative and qualitative methods, I ensured that there was enough data on all key elements of the research on its own. However, that also meant that I had to gather additional information from media and secondary sources to supplement my initial data collection results, as the goal was to cover a longer time span of the policy development than the first research stages did. I have thus collected additional data for 2018 and 2019 from the media to supplement my preliminary results, and to cover a wider time perspective of the policy development.

### 3.4 Chapter Summary

This chapter introduced and explained methods used in this study to answer research questions *and* set the ACF in motion. All in all, the research design relied on a combination of descriptive and explanatory approaches to investigate key events in the Scottish UOG debates and the policy process. It identified advocacy coalitions and their beliefs and explained why the Scottish Government imposed a moratorium on fracking. I followed seven basic steps in my research design.

First, I developed four concrete research questions: on the policy subsystem, on actors and beliefs, on narratives, and on policy change. The goal was to formulate questions that would help solving the overarching research puzzle. That is, concrete questions that need to be asked in order to explain the “controversial” decision of the Scottish Government to impose a moratorium on fracking. The four questions that I have designed aimed at covering key elements of the hydraulic fracturing policy development in Scotland that include relevant policy actors and stakeholders, their beliefs, and their strategies. And as a second step, I linked these research questions to ACF theory. I chose the ACF as an overarching model of analysis for this study because it provides practical tools and concepts to examine policy subsystems, as well as the key sources of policy change in-depth.

After that, based on these research questions and ACF theory, I developed a concrete research design. Given the nature of the questions and the core principles of the ACF, I decided to incorporate elements from both descriptive and explanatory designs in this study. The descriptive element is useful for formulating category systems and identifying category frequencies, which provides tools for distinguishing relevant policy actors and categorising their beliefs and arguments. The explanatory element, on the other hand, provides a longitudinal analysis of these elements, which is essential under ACF theory. Again, the key was to take into account both the research questions and the theoretical model, which I balanced with this mixed research design.

Next, I defined the sample material and the sampling strategy. In this study, articles from selected major Scottish newspapers provided the primary sample for data categorisation and analysis. I have selected materials based on their relevancy to the case study and by using *Nexis UK* database to filter relevant articles with key words and concepts. Although articles are the main data source for this study, I have also used secondary documentation (mostly government documents) to support the findings and supplement the analysis with more qualitative data.

After defining the sample material and sampling steps, I proceeded to choosing methods of data sourcing and started collecting the data. I used qualitative content analysis of the media, and more specifically a directed approach to content analysis for data collection and analysis. I identified and organised key variables as coding categories, which included actors in advocacy coalitions, their attitudes towards UOG development, and narrative argument groups – all of which were based on statements on hydraulic fracturing in the media. Some data categories were pre-defined in the codebook, but there was also a category identified during data collection and processing.

Finally, once the data was collected, I moved on to data analysis and presentation. I took five major steps in data analysis. These included: historical process-tracing for the identification of relevant internal and external policy events; overview of subsystem-wide events and debates and interpretation of the content; identification of advocacy coalitions and key actors; measuring of frequencies of narrative arguments; and, finally, the assessment of specific drivers of policy change.

The merits of qualitative content analysis lie in its combination of methods, incorporating both quantitative and qualitative elements. This combination of tools minimises methodological limitations and, on the contrary, enhances each other's strength. For the quantitative part of the study, I used codification of pre-defined categories of advocacy coalitions, defined by their attitudes towards UOG development. Thanks to the systematic procedure of codification, the data collected in the end was easily quantifiable and replicable for robust results and any further research needs. The qualitative, or interpretative part of the study, on the other hand, is what allows for a deep

discussion and description of the phenomenon under study – the UOG politics in Scotland.

Quantitative dataset is the “backbone” of this study that distinguishes key elements of the Scottish UOG policy subsystem, but qualitative data is the “meat” that transforms it into a comprehensive story.

# CHAPTER 4

## The Case Study Background

### 4.1 Chapter Introduction

Before I proceed to the study results, it is important to understand the full context of the case study. Moreover, it is equally important to define the boundaries of the case study to identify all relevant contextual information. So far, I have dedicated much of this thesis to explaining the analytical mechanisms behind the ACF and the research methods within this model. But the ACF, for all its intents and purposes, is a means to the end, rather the “end goal” itself. In other words, it is a tool to answer research questions. This research does contribute to ACF theory by demonstrating that it can be applied in devolved/regional subsystems, and by further developing the concept of “nestedness”, but the goal of using the ACF was to analyse this case study, not the other way around - choosing this specific case study to test the ACF. What prompted this research was the Scottish puzzle, whereby ACF theory was selected for the analysis based on its merits.

When developing research design for this study though, I was faced with the following question: what exactly is the ‘case’ in this study, i.e. what is its primary focus? Is it shale oil and gas politics in general, or is it Scottish politics? And the answer is that it is not feasible to separate the two. This is the case study of UOG politics, but it is heavily embedded in the context of the Scottish political climate and a multi-governance system that exists in the UK. Therefore, the central focus of this thesis is the relationship between onshore oil and gas policy in Scotland and the Scottish political scene.

With that in mind, it is important to provide comprehensive background information on and discussion of both the political system and the state of UOG industry in Scotland. The core questions are as follows. To what extent has devolution facilitated the rescaling of governance arrangements for energy policy for Scotland and what have been the consequences for how onshore oil and gas resources are governed? Also, what are the prospects of UOG development in the country? These questions are important to discuss because, from the ACF perspective, both biophysical and economic characteristics of resources and political structures affect policy subsystems. Since I will be discussing the political and legal structures, as well as the basic attributes of shale oil and gas in

Scotland, this chapter will also distinguish relatively stable parameters of the subsystem that are important elements of the ACF.

This chapter therefore has two aims: to set the context in which the UOG policy issue is being discussed and contested in Scotland; and to demonstrate how this information can help resolve the puzzle set out by this thesis. The first part of this chapter will explain the process of decision-making in Scotland and how distinctive the Scottish political behaviour is compared to the UK. It will also discuss how the multi-level energy governance system works with an emphasis on onshore oil and gas in order to explain the technicality of the UOG policy process in the country. The second section of the chapter will review the current state of the oil and gas industry in Scotland, linking them to the national energy sector. It will provide an overview of the potential scenarios for UOG development and a brief introduction to the regulatory framework in the onshore oil and gas sector. This context is very important to set the scene for further research and discussion.

## 4.2 The Background: The Scottish Political System and Devolution

### 4.2.1 The Devolution of Decision-making in Scotland

Scotland has two governments – national and devolved, each having powers and responsibilities over different domains. Devolution in the UK is not an event, but rather a process that has been developing since it was introduced to Scotland and Wales, and re-introduced to Northern Ireland, in 1999 (Pritchard, 2017). Prior to the devolution process, the UK Government operated decentralized administrative functions in the respective three countries, designated to their ministers (Cowell et al., 2016). The premise of devolution was therefore to transfer already decentralized competencies to subnational elected governments: the Northern Ireland Executive, Scottish Government and Welsh Government (Cowell et al., 2016). The Scottish Devolution specifically came about in 3 stages: through the initial Scotland Act 1998, and subsequent constitutional reforms in 2012 and 2016.

With the Scotland Act 1998, the Scottish Parliament and the Scottish Government were established. The parliament has 129 members and is elected through an additional member system of proportional representation, under which voters cast one vote for a specific candidate and one for a political party. The country follows a reserved powers model which means that the Scottish Parliament may legislate on any matter that is not reserved to the Westminster Parliament through Schedule 5 of the 1998 Act (Scotland Act 1998, s. 5). Such reservations include, among others, constitutional matters, foreign affairs, defence (Scotland Act, 1998). Energy policy is considered a reserved domain, however certain policy competences are fully or executively devolved to Scotland and other subjects (see Sections 3.3 and 3.4).

The Scottish devolution of policymaking to a subnational level has also led to a devolution of both lobbying functions and strategies of policy actors to local [Scottish] branches and the proliferation of new Scottish groups (Cairney, 2011, p. 77). Devolved policymaking arrangements and policy subsystems are particularly evident in Scotland, because the delegation of powers was most extensive (compared to Wales) and enduring (compared to Northern Ireland) for the Scottish Parliament (Keating et al., 2009). Given the strength of the Scottish devolution, interest groups in essence must lobby Scottish political institutions. This, in turn, means the “devolution” of policy subsystems, particularly in areas of political powers and responsibilities delegated to the Scottish Government. As the result, there has been a significant shift of interest group attention to the devolved policy agenda even though Scottish-specific groups and UK regional branches existed prior (Cairney et al., 2011).

Fast forward to the year of 2009, the Commission on Scottish Devolution (the Calman Commission) considered amendments to the Scotland Act 1998. The Commission’s goal was to “review the provisions of the Scotland Act 1998 in light of experience” (Commission on Scottish Devolution, 2010, p. 6). The main area under review were Scotland’s fiscal powers. Calman viewed the Scottish Devolution as a success story but recommended the introduction of a new rate of income tax for Scotland, to allow more borrowing powers to the Scottish ministers, to devolve powers over other forms of tax and to create new taxes (Pritchard, 2017). And with that, the second stage of devolution in Scotland came through the Scotland Act 2012 in line with the Calman recommendations for further fiscal devolution.

Two years later, in 2011, the Scottish National Party (the SNP) won the majority of seats in the Scottish Parliament and vowed to give the people a referendum on Scottish independence. Devolution allowed the SNP the best platform and venues in which to campaign on Scottish issues and the constitution (Lynch, 2011). September of 2014 marked the beginning of the independence campaign, which at the time was predicted to be ahead of the unionists in the polls (Pritchard, 2017). This led to the unionist UK parties to promise the Scottish electorate more extensive devolved powers (Pritchard, 2017). Following the “No” vote on 18 September, the Smith Commission was announced the next day tasked with reaching an agreement on further devolution to the Scottish Parliament.

This initiated the third stage of the Scottish devolution, finalised through the Scotland Act 2016. The Act can be viewed as an extension of the reforms of the previous Acts. Among others, these amendments included consolidation of the Scottish Parliament and the Scottish Government within the United Kingdom’s constitutional arrangements (Scotland Act 2016, s. 1), declaring that “the



Scottish Parliament and the Scottish Government are not to be abolished except on the basis of a decision of the people of Scotland voting in a referendum” (Scotland Act 2016, s. 1). The Sewel Convention also “recognised that the Parliament of the United Kingdom will not normally legislate with regard to devolved matters without the consent of the Scottish Parliament” (Scotland Act 2016, s. 2). The UK government's Scottish Secretary David Mundell subsequently called the Scottish Parliament “one of the most powerful devolved administrations in the world” (BBC, 2016).

However, these amendments show that the UK still retains the power to legislate for Scotland even in devolved areas, even if the UK would not *normally* do that. Westminster may also technically take back control over devolved powers, albeit subject to a political requirement to obtain the consent of the Scottish Parliament (Cairney et al., 2019). Cairney et al. (2019, p. 461) gave an example of how this power has been previously exercised in relation to energy, when the Scottish Parliament gave its consent to renounce its executive devolved powers over the setting of renewable energy subsidies in favour of a UK-wide approach, referring to the Energy Act 2013. Therefore - as Cairney et al. (2019) argue – the relationship between the UK and Scotland can be thought of as sharing rather than dividing responsibility, because no powers are *exclusively* devolved to Scotland.

This raises several important questions for our case study. First of all, the Scottish devolution process has led to the devolution of policy subsystems. Yes, the focus, strategies and lobbying functions of interest groups and other policy actors are directed primarily at the devolved policy agenda. But does that necessarily create a significantly different political behaviour amongst the Scottish actors and subsequently different policy outcomes from the UK? This is where I am reminded about the overarching question of this study: how can Scotland effectively ban “fracking” in the face of the UK-driven policies directed at developing the industry? Is this decision unusual for the country, or does it have deeper roots in the context of Scotland’s political environment and behaviour? The history of Scottish Devolution alone does not explain any of that. It does, however, remind us that neither devolution itself, nor specific policies are events. Instead, they are dynamic processes that both stem from and shape the unique political climate in Scotland. Therefore, to start solving the puzzle, it is important to look at the bigger picture and understand Scotland’s political environment and political behaviour. This topic is discussed further in Section 4.2.

Secondly, if the UK and Scotland are sharing rather than dividing responsibilities, then what does it mean for energy policy in practice? More specifically, what policy mechanisms was Scotland able to use to impose the effective ban on “fracking”, and what does that “effective ban” really mean under legislation from Scotland’s and UK’s perspectives? To better understand energy policy process, it is thus important to address the “grey areas” of reserved and devolved responsibilities between the

UK and Scotland and explain how energy is governed in practice. More specifically, it is important to comprehend the extent to which onshore oil and gas policy is devolved and/or reserved. These questions are discussed in greater detail in Subsections 4.2.3 and 4.2.4.

#### 4.2.2 Political Behaviour in Scotland

Scotland exists in three different polities simultaneously: it has thirty-two local authorities, the devolved Scottish polity (Scottish Parliament and Scottish Government) and a nested polity within the British (national) polity. Prior to Brexit Scotland was also part of the European polity (the EU), which is the time period that our research encompasses. This means that Scotland is a multi-level political player and seeks to engage with and influence policy at different levels – both devolved and reserved.

Devolution has accentuated the distinctiveness of a party system in Scotland compared to the UK. Historically, party competition in the UK has been characterised by a two-party system with each representing opposing ideological stances – Conservatives vs. Labour (Mitchell and Henderson, 2020). In the 80s, this system was challenged by the rise of smaller political parties, including the Liberal Democrats that eventually became a third major party, though that position has been taken by the SNP in the latest General election in 2019. Despite that, the UK majoritarian system for General election tends to favour the two major parties (Mitchell and Henderson, 2020). The Scottish Parliament has shown distinct party splits over time (see Table 6).

Party competition in Scotland focuses on a range of issues. The key parties on the Left (broadly speaking) of the political spectrum are the SNP, Scottish Labour, the Scottish Green Party and the LibDems, whilst Scottish Conservatives compete on the right. The SNP tends to be labelled as centre-left Conservatives are a major unionist and right of centre party (Cairney and McGarvey, 2013, p. 52). Scottish Labour, another unionist party, is labelled as ‘social democratic’ and has a bias towards state-oriented solutions to society’s problems, whilst the Scottish Liberal Democrats have a centrist ideological profile (Cairney and McGarvey, 2013, p. 54).

However, the “territorial issue” in the party competition is as significant as the spectral division. The SNP and the Scottish Greens support independence, while both the Scottish Conservatives and the Scottish Labour are in favour of devolution, and LibDems are committed to the idea of the federal UK. The territorial dimension of party competition in Scotland is so prominent that it arguably transcends the ideological dimension.

Table 6: UK and Scottish Governments since 1998. Adapted from Webb and Van Der Horst (2021)

TIMELINE	UK GOVERNMENT (FIRST PAST THE POST ELECTORAL SYSTEM)	SCOTTISH GOVERNMENT (ADDITIONAL MEMBER SYSTEM)
1998	Labour	Scotland Act 1998: supports 1999 creation of Scottish Parliament with devolved powers
1999		Labour-led coalitions (with Lib Dems)
2007	Conservative-led coalition (with Lib-Dems)	Scottish National Party (2007–2011 minority; 2011–2016 majority; 2016 - present minority)
2010		
2015 - PRESENT	Conservative	

What this means is that there is a third axis to the party-political compass beyond the traditional left-right, the other being *constitutional*. The constitutional axis has existed before and after devolution and ranged from status quo to Scottish independence, but what changed is the party shift from one end of the spectrum to another (Henderson et al., 2020). Prior to devolution, most Scottish parties supported change and further delegation of powers whilst Conservatives were in opposition, but now the SNP and the Scottish Greens are the only proponents of independence (Henderson et al., 2020). In addition, Scottish voters also tended to express different partisan preferences across electoral levels, leaning more towards the Labour party in Westminster elections (until the 2015 general election) but more likely to support the SNP in Scottish Parliament elections (Carman et al., 2014).

The 2015 and 2017 general elections both significantly altered Scotland’s electoral geography, and the 2019 general election enhanced the SNP leading position in Scotland. The SNP increased its share of Scotland’s votes from 19.9% in 2010 to exactly 50% in 2015, but just two years later, that vote share fell to 36.9% and the SNP suffered a significant loss of support (Johnston et al., 2017). The 2017 general election was called one year after the UK – but neither Scotland nor Northern Ireland – voted to leave the European Union, with Conservative Prime Minister seeking to obtain a substantial House of Commons majority in light of the Brexit negotiations (Johnston et al., 2017). Although the pro-union parties (Conservatives and Labour) gained seats at its expense in 2017, nevertheless the SNP retained a considerable number by small majorities.

The 2019 general election marked a return of the SNP who won 45% of the popular vote in Scotland (Simpkins, 2020). Much of the Scottish campaign in 2017 and 2019 focused on independence. The results of the European referendum of 2016 led to the SNP rebooting their independence campaign

by claiming that the circumstances of the 2014 independence referendum had changed, and that Scots should be given another opportunity to choose their constitutional future (Simpkins, 2020). Several polls consistently registered higher levels of support for independence during the 2019 campaign, putting the percentage of independence supporters at an average of 49% (Simpkins, 2019). The higher turnout to the 2019 general election, which increased from 66.4% to 68.1%, would also indicate the heightened perceived importance of the election compared to that of 2017 (Simpkins, 2020). This was an indicator that more voters may have been motivated by Brexit and constitutional issues in their voting preferences.

This shows that Scots base their votes on constitutional or territorial issues and on which party they perceive will best “stand up” for Scotland. It also shows that the independence dispute is of primary electoral importance regardless of the institutional body Scots are electing at the time (Henderson et al., 2020). Both Holyrood and Westminster see the ongoing independence debate as the central political issue in Scotland (Henderson et al., 2020). Therefore, if the constitutional discourse is present at all electoral levels and transcends ideologies, it can be expected to manifest itself in energy policy debates as well.

The constitutional factor, of course, is just one, albeit a very important aspect of divergence in political behaviour between England and Scotland, but are there other prominent examples of this? The answer is yes. For instance, the study by Webb and Van Der Horst (2021) examines diverging energy efficiency policy in Scotland and England and argues that these differences are rooted in contrasting political narratives. The UK Government has been traditionally relying on “advocacy of liberalised markets, competition and outsourcing as a means to improving public services”, while in Scotland a “distinctive narrative of ‘social market centrism’ has prevailed” (Webb and Van Der Horst, 2021, p. 4). The UK government pursued the politics of austerity in public finances in line with this neo-liberal narrative, which has been instrumental in scaling back energy efficiency and public funding in England, as well as reducing obligations on energy suppliers to invest in more energy efficient households (Webb and Van Der Horst, 2021).

In Scotland, on the other hand, energy efficiency policies remained in place and public investment to improve housing insulation and heating for low-income households was preserved (Webb and Van Der Horst, 2021). In a nutshell, the UK energy strategy is more oriented towards liberalised market, while Scotland prioritises social market. What this shows is that diverging policy strategies and political behaviours between the UK and Scottish Governments in the energy domain are not unheard of. And yet again this reminds us how important it is to view Scotland as a separate polity with its own policy subsystem when studying policy processes.

#### 4.2.3 Reserved and Devolved Responsibilities in Energy

Now, I have discussed how attitudes towards energy and specific policy mechanisms can vary between the UK and Scotland, despite the fact that energy is still regarded as a mostly reserved responsibility of the UK Government. But to what extent are the responsibilities reserved and/or divided? And what does it mean for onshore oil and gas policy?

The effects of devolution are summarized in Table 7, adapted from Cowell et al. (2018), which clearly depicts the asymmetric nature of the settlement between regions. Devolution did not change the fact that, formally, the UK Government retained overall responsibility for key energy policy agendas and market support (Cowell et al., 2018). The Department of Energy and Climate Change (DECC) is the main Westminster ministry with such responsibilities. All devolved governments gained control over economic development spending for energy projects, and powers over land use planning, although for Wales, those powers are more limited.

Energy policy is only *executively* devolved to Scotland. Executive devolution means the UK Government provides Scottish ministers with “powers and functions (including the power to make subordinate legislation) which would otherwise be exercised by UK ministers” (House of Commons Environmental Audit Committee, 2008, p. 175). In other words, Scotland is able to execute powers functions in a reserved area. Executive devolution gives Scottish Ministers “full control over major energy consents and planning, onshore and offshore, and operational control over aspects of market support systems” (Cowell et al., 2013, p. 4). However, the Scottish Government cannot make new laws in such areas as legislative competences remain with the UK Parliament (House of Commons Environmental Audit Committee, 2008, p. 175).

Table 7: Devolution of energy-related powers in the UK. Adapted from Cowell et al. (2018)

Instrument (and resources)	UK and England	Scotland	Wales	Northern Ireland
<b>Devolved institutions (constitutional legal resources)</b>	Limited decentralisation of roles to regional bodies	<b>Parliament and Government; primary legislative powers; tax-varying powers</b>	National Assembly and Government; secondary legislative powers	Assembly and Executive; primary legislative powers
<b>Energy Policy (constitutional-legal resources)</b>	Full competence	<b>Executively devolved</b>	Not formally devolved	Fully devolved
<b>Market support for renewable energy (financial resources)</b>	Full competence	<b>Executive devolution of some support schemes</b>	No powers	Fully devolved
<b>Planning and consents (onshore) (hierarchical resources)</b>	Full policy competence for England, partial for Wales; full competence over major projects (50MW plus)	<b>Fully devolved</b>	Partial powers over planning policy and consent for smaller schemes (below 50MW)	Fully devolved
<b>Planning and consents (offshore) (hierarchical resources)</b>	Full competence for English and Welsh Waters	<b>Fully devolved</b>	Power to determine applications up to 1MW	Fully devolved
<b>Economic development spending (financial resources)</b>	Full competence	<b>Fully devolved; can receive UK-wide programme funding</b>	Fully devolved; can receive UK-wide programme funding	Fully devolved; can receive UK-wide programme funding

Table 8, adapted from Cairney et al. (2019), maps out the respective roles of governments in greater detail. It depicts specific energy policy competences divided between different levels of government, including the EU, and shows the extent to which governments delegate responsibilities to agencies at those levels. It also accommodates indirect competences and non-energy policy responsibilities that have an impact on energy supply and demand.

Table 8: Distribution of Energy Decision-Making Competences. Adapted from Cairney et al. (2019)

Level	Direct Competences	Indirect Competences
<b>European Union</b>	<ul style="list-style-type: none"> <li>• Internal energy market (gas and electricity)</li> <li>• Security of energy supply</li> <li>• Promotion of renewable energy</li> <li>• Promotion of biofuels</li> <li>• Promotion of energy efficiency/energy efficiency standards</li> <li>• Energy networks</li> <li>• Trade in and safety of nuclear materials (Euratom)</li> </ul>	<ul style="list-style-type: none"> <li>• State aid regulation</li> <li>• Competition law</li> <li>• Free movement law</li> <li>• Greenhouse gas emissions trading</li> <li>• Other atmospheric emissions</li> <li>• Water quality</li> <li>• Environmental Impact Assessment</li> <li>• Offshore carbon storage</li> <li>• Trans-European networks</li> <li>• Innovation/R&amp;D funding</li> <li>• Structural funding &amp; strategic funding (e.g. in transport and energy infrastructure)</li> </ul>
<b>EU Agencies</b>	<ul style="list-style-type: none"> <li>• Cross-border market integration and network harmonisation (ACER)</li> </ul>	
<b>United Kingdom</b>	<ul style="list-style-type: none"> <li>• <b><u>Ownership of resources (coal, gas, oil, gas storage rights vested in the Crown)</u></b></li> <li>• Regulation of energy markets</li> <li>• Licensing of energy producers, suppliers and network operators</li> <li>• Security of energy supply</li> <li>• Energy taxation</li> <li>• Renewable energy subsidies/grants</li> <li>• Energy efficiency subsidies/grants</li> <li>• Nuclear energy Golden Shares</li> <li>• Nuclear licencing and nuclear safety</li> </ul>	<ul style="list-style-type: none"> <li>• Competition law</li> <li>• Financial services regulation</li> <li>• Intellectual property and commercial law</li> <li>• Climate change laws</li> <li>• Social security (winter fuel payments, energy debt payments)</li> <li>• Workplace health and safety</li> <li>• Emergency powers</li> <li>• Treaty-making powers</li> <li>• R&amp;D funding</li> </ul>
<b>UK Agencies</b>	<ul style="list-style-type: none"> <li>• Gas and electricity market regulation (Ofgem)</li> <li>• Coal mining licencing (Coal Authority)</li> <li>• <b><u>Oil and Gas Authority</u></b></li> <li>• Office for Nuclear Regulation</li> <li>• Nuclear Decommissioning Authority</li> </ul>	<ul style="list-style-type: none"> <li>• Competition law (Competition and Markets Authority)</li> <li>• Financial services regulation (Financial Conduct Authority)</li> <li>• Health and safety (Health and Safety Executive)</li> </ul>
<b>Devolved (Scotland)</b>	<ul style="list-style-type: none"> <li>• Promotion of renewable energy</li> <li>• Promotion of energy efficiency</li> <li>• Fuel poverty support systems</li> <li>• Electricity and gas installations consents</li> <li>• <b><u>Onshore oil and gas licencing</u></b></li> <li>• Nuclear waste storage</li> </ul>	<ul style="list-style-type: none"> <li>• Crown estate (seabed use/storage rights)</li> <li>• Marine licencing and planning</li> <li>• Property law (access to land/subsoil; nuisance; servitudes and wayleaves)</li> <li>• Environmental emissions &amp; water quality</li> <li>• Climate change law</li> <li>• Environmental Impact Assessment</li> <li>• Housing law/building regulations</li> <li>• Economic development</li> <li>• Social security law</li> <li>• Transport policies (including Air Passenger Duty from 2016)</li> </ul>
<b>Devolved Agencies</b>		<ul style="list-style-type: none"> <li>• <b><u>Environmental emissions and water quality (SEPA)</u></b></li> <li>• Seabed leasing (Crown Estate Scotland)</li> </ul>
<b>Local</b>		<ul style="list-style-type: none"> <li>• <b><u>Land-use planning</u></b></li> </ul>

The UK government (pre-Brexit) took on a role of balancing the power between the EU and devolved and local governments. The EU policy focused on core aspects of trade and competition and played a major role in the harmonisation of standards across all member-states. It also promoted key priorities, such as energy efficiency and renewable energy over fossil fuels. However, it is the UK that remains responsible for energy security overall, including the production and regulation of nuclear energy, the regulation of electricity supply, and access to the mineral resources (coal, oil, and gas) to produce energy as it retains ownership over them (Cairney et al., 2019). In that context, the role of the devolved administration and local governments may seem relatively limited to the delivery of EU regulations and recommendations and UK-driven policies, and a range of devolved policies with a more indirect impact on energy policy, supply, and demand (Cairney et al., 2019).

Given that Scotland, at the devolved level, is neither a standard-setter, nor does it have legislative competences in energy policy, then how was Holyrood able to impose an effective ban on “fracking” in the first place? The strictly technical answer to this puzzle is rooted in the planning and licencing regimes.

Before the Scottish referendum for independence in 2014, Scotland already had a substantial control over onshore oil and gas activities through planning controls and environmental regulation. Scottish Ministers had powers to set the framework for planning application for onshore oil and gas projects. Planning authority in Scotland, i.e. SEPA was then enabled to refuse planning permission for projects unacceptable in the specific locations proposed and to impose appropriate controls pollution prevention and environmental controls in respect of permitted projects (DECC, 2013, p. 6).

In the aftermath of the referendum and the Smith Commission Agreement, Scotland Act 2016 has been implemented, giving Scotland more control over energy policy. The only significant devolution of authority in the energy domain was in relation to onshore fracking (Little, 2016). The Scottish Parliament has been transferred a legislative competence for the licencing regime of onshore oil and gas exploration and extraction. Therefore, as well as authorising conventional onshore oil and natural gas planning operations, Scotland is now able to directly license onshore “fracking” to extract shale gas (Little, 2016). This was set out sections 47, 48 and 49 of the Scotland Act 2016. The licensing of offshore oil and gas extraction, however, remained reserved to the UK Government. Moreover, legislative competences over mineral access rights for onshore extraction of oil and gas were also transferred to Scotland. The only functions related to onshore oil and gas licensing in Scotland that have remained reserved to the UK are those on taxation type payments imposed on operators under petroleum licences.



All in all, when it comes to energy policy infrastructure, the responsibilities between Scotland and the UK overlap. The Scottish Government is responsible for overseeing planning consent for renewable energy development, new nuclear power stations, and onshore drilling applications, while the UK still remains in power over the electricity market, and commercial fracking licensing. It is also important to note that, even though Scotland was able to introduce a moratorium onshore UOG development under planning and licencing regimes, Holyrood would not be able to start a reverse process, i.e. to introduce “fracking” without the UK-driven policy. To gain a better understanding of the UOG policy process in Scotland, it is important to analyse how energy is governed in practice.

#### 4.2.4 Energy Governance in Practice

At the first glance, the division of responsibilities between the UK and Scotland seems relatively clear, but in reality, the formal allocation of legal and decision-making competences only tells a partial story about how energy governance system operates. In practice, there are a lot of overlaps and grey areas in decision-making powers and there are several reasons why they may operate differently from the strict legal division.

First of all, when it came to the EU’s decision-making competences in relation to energy and the environment, those were shared with Member States rather than exclusive competences (Cairney et al., 2019). Member States did retain the powers to act in these areas, but under the condition that EU legislators deemed it acceptable to do so (Cairney et al., 2019). However, the EU tended to act through the adoption of framework directives, rather than strict regulations, which set broad objectives or targets to be achieved, but leaving the Member States with considerable freedom to determine mechanisms how these objectives were to be met. The EU also needed to cater for divergent political opinions and differing energy needs and resources across Member States, which in some cases would lead to some retreat (Cairney et al., 2019). One such example was the shift back from legally-binding to indicative national renewable energy targets for Member States (Revised Renewable Energy Directive 2018/2001/EU, OJ L 328/82). This example demonstrates that, it is not only *policy* competences that matter in governance, but also *politics*.

Similarly, the relationship between the UK and Scotland may also be thought as sharing, rather than strictly dividing responsibilities. There are no powers that are *exclusively* delegated to devolved levels and the UK Parliament has the power to legislate for Scotland in devolved areas, as well as take back devolved powers, albeit under consent of the Scottish Parliament. However, full or executive devolution have given the Scottish Government considerable powers to influence even the

UK-driven policy. For instance, the Scottish Government is responsible for licencing onshore oil and gas production, which means that Scotland in essence must consent to the new operations on its territory. If the UK Parliament chose to override this de facto veto, this would come at a very significant political cost, and that is the risk most UK ministers would not be willing to take. Therefore, the devolution process has made Scotland a de facto veto player in many aspects of energy policy.

Moreover, the division of competences between national and EU levels exacerbates the internal divisions between Westminster and devolved levels. Even though certain competences may lie at the devolved level, they are still required to be exercised in accordance with EU law (Scotland Act 1998, s. 29). Since the UK Government had the formal competence to participate in EU decision-making, EU law acted as a centralising force, thus also reducing the policymaking autonomy of the devolved government (Cairney et al., 2019). One such example where the EU regulations are especially relevant is the environmental policy, for instance water quality, which was to be implemented by institutional bodies such as SEPA on behalf of the UK (Cairney et al., 2019). But on the other hand, as Cairney et al. (2019) argued, the EU energy policy framework, has allowed the Scottish Government to contribute disproportionately to UK's EU obligations in renewable energy and climate change targets, even though energy policy is a technically reserved area to the UK. These examples show that overlaps can occur even in areas that are otherwise legislatively reserved to the EU and/or to the UK.

These problems of unclear and variable responsibilities, direct and indirect competences are even more exposed when trying to identify how actors interact to produce policies (Colebatch, 2006). To do so, it is not enough to just look at the strict legal side of things, and so scholars draw on particular policy theories (such as the ACF) to identify key venues, such as 'policy subsystems', and specific set of key policy actors, such as 'advocacy coalitions', operating within them (Cairney et al., 2019). This is what this thesis intends to do in order to elucidate the puzzle of the UOG policy process in Scotland.

But before moving on to results of the study, it is important to further set out the context of this case. I have established how powers are devolved in the UK and what responsibilities the Scottish Government has over energy policy, as well as its motivations in that area. But in what context does it have all these powers and responsibilities over shale resources? It is one thing to talk about how onshore oil and gas is governed, but it is also important to understand the resource and the industry that are governed. The next section seeks to explain the oil and gas industry and its potential in Scotland to provide a better context for further discussions.

## 4.3 The Case: Unconventional Oil and Gas in Scotland

### 4.3.1 The Brief History of Oil and Gas Industry

Scotland's history of oil and gas has been one of considerable success and is worth 6.6% of the country's GDP (Scottish Government, 2020). The industry plays a vital role within both the UK and Scottish economies. The sector is a prominent source of energy supply and economic contribution to the country, a major employer, and one of the country's biggest industrial investors. The data cited comes from several years ago, but that was also the peak period of the UOG policy development in Scotland. The annual production of crude oil and natural gas liquids (NGL) in the UK reached 150 kb/d, which has been falling by around 5% annually since the year of 2000 (IEA, 2015). Out of this number, oil and gas fields in Scotland accounted for 96 per cent of the UK NGL production in 2015-2016 (Scottish Government, 2016). Natural gas production was estimated at 39.6 and 41 billion cubic metres in 2015 and 2016 respectively (Statista, 2016), to which Scotland contributed a total of 60 per cent (Scottish Government, 2016). In financial year 2015-16, the approximate sales value of oil and gas produced in the country was estimated at £16.1 billion (Scottish Government, 2016). Of this, £13.4 billion was accounted to be from the Scottish waters, or 83% of the UK total (Scottish Government, 2016). The more recent numbers are not drastically different. The oil and gas industry continues to remain a critical component of the Scottish economy, accounting for £25 billion in turnover and supporting 101,400 jobs in 2018-19 (Scottish Government, 2020). These numbers might seem very crude and overwhelming, but they show the scale and the economic weight that the oil and gas industry has in the country.

However, the industry is currently going through one of the most challenging periods of declining production. It is currently facing significant challenges of falling production levels and efficiency, growing operation costs and declining exploration activities. The sector has already experienced losses in employment, primarily in Aberdeen, that (together with the North-East Scotland region) accounted for 44% of all employment in the UK oil and gas sector (HM Government, 2016). Moreover, it was estimated that the sales value of oil and gas decreased by 23.5% following the sharp fall in oil prices in late 2014 (Scottish Government, 2016a). Considering the enormous proportions of the oil and gas production attributed to Scotland, this may represent a distinct kind of challenge for the country compared to the whole of the UK.

This can both represent an opportunity and an obstacle for potential hydraulic fracturing development in the country. While it might be costly in the face of growing operation costs, it can potentially diversify and strengthen the existing oil and gas sector. Potential costs of the sector in

the UK are currently predicted to be at least £20.5bn for hydraulic fracturing process (including equipment, personnel, and other costs), £8.2bn for drilling and completions, and £4.1bn for waste management, storage and transportation (Ernst & Young, 2014). Uncertainty over economic viability and incurring costs are in turn some of the factors that contributed to the formation of an anti-shale coalition in Scotland. In addition, Scotland's oil and gas industry is primarily offshore, whereas hydraulic fracking would require an onshore production development. This, in turn, further complicates the question of sector's economic viability in Scotland.

#### 4.3.2 Unconventional Oil and Gas Extractions Scenarios

A prospective development of UOG industry undergo at least four stages over different time periods, as described in Table 9 below. This Table and the data used in this section are adapted from the LUC (2018) report. The first stage involves the construction of a drilling pad – a base built to give space for the drilling rig, piping, storage equipment and other on-site facilities. Drilling pads usually come out at the size of 5000-8000 m<sup>2</sup>, which is an equivalent of a size of a football pitch. Drilling rigs, on the other hand, take up space of around 38m in height.

With that, the exploration for oil and gas reserves begins. Initial phases involve testing the rock structure and commercial viability of a site by obtaining core samples from the boreholes, testing hydraulic fracturing technique to analyse the flow properties, and undertaking seismic surveys to accommodate environmental and public health concerns. The on-site production is expected to go on for around 15 years, with no or few extra wells drilled after 2 years from the start of the full-on production stage.

The final, decommissioning stage would also take several years to complete, as production sites would be restored to their original condition. On-site activities at this stage involve well maintenance, removal of the surface infrastructure and aftercare monitoring.

Table 9: Onshore oil and gas operations, full process (LUC, 2018).

Stage	Description	Duration
<b>Exploration</b>	Initial testing of commercial viability of a site; analysing rock structure; assessing oil and gas reserves; testing flow properties with hydraulic fracturing tests	2-6 years
<b>Appraisal</b>	Further exploration of a site, constructing the infrastructure and conducting additional tests	2-6 years
<b>Production</b>	More wells to be drilled and hydraulically fractured throughout initial 2 years; then site activities are replaced by routine maintenance	Approximately 15 years
<b>Decommissioning</b>	Wells and surface infrastructure are removed and/or abandoned; aftercare monitoring regimes put in place	2-5 years

In 2016 and 2018, Scottish Government commissioned a series of independent research projects into UOG to examine the potential environmental, health and economic impacts of the novel industry. This section provides a brief summary of key findings in the impact areas of economy, environment, population, health and climate change.

#### 4.3.3 Economic Scenarios

KPMG (2016) analysed three major economic scenarios for UOG production in Scotland. These are based on the research project carried out in 2016, which studied economic impacts of prospective development. The study investigated aggregate economic scenarios for the Scottish economy and identifying key sectors and groups likely to be affected by each. The potential and extent of any community benefit payment schemes were also considered.

The three key scenarios (KPMG, 2016) are as follows:

- Central scenario – based on midpoint estimates of potential production;
- High scenario – in which significant, maximum scale development occurs for the next decade or more;
- Low scenario – in which development is initially slow and does not grow significantly, for example there is a low level of production.

For the ease of reference, only the central scenario is discussed in this study. It should be mentioned, however, that KPMG also considered a scenario in which development does not take place following some exploration activity. This would occur either due to the low UOG resource availability, or low economic viability (KPMG, 2016). In this scenario, the economic losses would outweigh the benefits and thus operators involved in exploration would be at a loss.

Under the central scenario, the total GVA, cumulative to 2062, was estimated at £1.1 billion under the central scenario (KPMG, 2016). These estimates include the CBM extraction activities, but it should be noted that the estimated GVA impacts for CBM are negative. The development of CBM would therefore be undesirable in an environment where the costs of extraction exceed revenues.

Estimates of the number of jobs generated in design, construction, maintenance and decommission of shale gas/oil pads varied across the studies. Ernst & Young (2014), or EY, and the Institute of Directors (2013), or IoD, suggested that jobs created in the UK by unconventional gas industry could be from 64,500 (EY) to 74,000 (IoD) from 2016 to 2032. At peak employment, the number of jobs was estimated at 1,400 under the central scenario.

Moreover, the UOG industry and its supply chain has the potential to generate more tax revenues through the direct extraction costs and sale of gas/oil as well as the indirect and induced effects from the supply chain. Four main sources of tax revenues are apparent: direct corporate taxes on UOG development; direct taxation on employees in impacted sectors; indirect taxation (VAT) on the goods and services purchased in the supply chain; and local government taxation receipts. In the Central Scenario, the total tax revenues up to the year of 2062 were estimated at £1,400 million (KPMG, 2016).

#### 4.3.4 Public Health and Community Factors

Peer-reviewed scientific publications on UOG hazards and impacts on human health were analysed by Health Protection Scotland (2016) to provide a broad overview of the existing scientific knowledge relating to the effects of UOG production on public health. The Health Impact Assessment (HIA) adopted a “generic”, rather than a local community level of analysis. Health Protection Scotland also would make predictions of the scale of potential impacts on any specific areas and communities in Scotland (Health Protection Scotland, 2016). This was done to provide a broader perspective of the effects that UOG production may incur on the population. The main conclusion of this HIA was that the existing evidence was “inadequate” to provide a basis for any valid predictions for the Scottish UOG production scenarios, but the study was able to draw conclusions about specific types of UOG-related health impacts.

First of all, there was “sufficient” evidence to suggest that hydraulic fracturing process, and to a greater extent the wastewater disposal was associated with increased seismicity of variable intensity. Yet there was insufficient evidence to link increased seismicity any actual physical health

risk. There was also “inadequate” evidence of UOG-related nuisances such as noise, light, and odours occurring at a level that would pose a risk to physical health of nearby residents and workers. Moreover, a very “limited” proof exists that UOG hazards could pose a risk to local residents, but the HIA points to the methodological weaknesses in the original studies. On the other hand, “sufficient” evidence exists to support the risk factor that respirable crystalline silica, a component of fluids used in hydraulic fracturing processes, could pose a risk to workers’ health. The HIA does suggest though that a number of airborne and waterborne environmental risks of releasing hazardous chemicals are likely to occur as a result of UOG operations.

The HIA identified significant research gaps in the health studies of the UOG production impacts on public health – which is both the obstacle and a finding. The study specifically highlighted that very little epidemiological research was even available on the topic, and a small range of material available was contradictory and inconsistent in findings. Therefore, the evidence base for the UOG exploration and production on public health cannot be deemed adequate due to the lack of consistent research.

#### 4.3.5 Environmental Impacts

The Strategic Environmental Assessment (SEA) undertaken by the Land Use Consultants (LUC) identified seven key areas in the environmental realm at risk to the UOG production impacts. These are summarised below in Table 10. According to the SEA results (LUC, 2018), the development of UOG industry in Scotland has the potential to have significant negative impacts on:

- Air quality
- Water quality
- Climatic factors
- Biodiversity (flora and fauna)
- Cultural and archaeological heritage
- Soil
- Population and human health

For the purposes of this study, this section will primarily discuss impacts of the UOG on the natural environment, the reason being the significance of the role they play in the “anti-fracking” narrative. This section will also omit further discussion of the UOG development impacts on public health, as these were summarised in the section above. This section instead focuses on five key impact areas: air quality, water quality, climate change (discussed in Section 4.3.6 separately), biodiversity and soil.

The climatic factor will be discussed in greater detail in a separate section due to the unique complexity of this issue.

Table 10: Projected impacts of UOG production in Scotland. Adapted from LUC (2018).

Environmental Impacts	Description	Timeframe
<b>Air Quality</b>	Direct gas emissions Exhaust emissions from construction activities and increased traffic	Throughout 20-30 years of an individual development
<b>Water Quality</b>	Groundwater and surface water pollution due to the (potential) release of contaminated water, hazardous materials, saltwater intrusion Can occur throughout <b>all</b> stages of development	Throughout 20 years of an individual development
<b>Climate Change</b>	Greenhouse gas and produced gas release to the atmosphere as the result of site development, gas processing and use of fuels.	Throughout at least 20 years of an individual development with permanent effects
<b>Biodiversity</b>	Loss and fragmentation of habitats, accidental spills of hazardous substances, impacts on wetland systems.	Throughout at least 20 years of an individual development
<b>Soil</b>	Ground contamination, surface leaks from flowback fluids associated with hydraulic fracturing from, or decommissioned wells.	Throughout 20-30 years of an individual development

The main air pollutants of concern in Scotland are nitrogen oxides, particulate matter, sulphur dioxide, non-methane volatile organic compounds, ground level ozone and ammonia. Fugitive emissions associated with UOG development contain these pollutants to a varied extent. The released substances from the hydraulic fracturing and UPG development process methane, nitrous oxide, volatile organic compounds, and sulphur compounds (LUC, 2018). Fugitive emissions generate direct air emissions arising from UOG production activities, mainly from on-site accidents, including leaks from pipe joints, well heads and compressors, overpressures of liquids in hydraulic fracturing system, or from routine wear and tear.

Moreover, unconventional hydrocarbon extraction both consume water resources and produce wastewater, thus incurring significant impacts on the water resources. Shale oil and gas operation require water for the hydraulic fracturing process, which is primarily sourced from surface water reserves in Scotland. The potential impacts of UOG development on water resources have the possibility occur during any of the development stages over a period of 20 years or more. The duration of these impacts on the water environment is also uncertain. These include the following:



- Direct water pollution arising during all stages of development;
- Water contamination caused by produced and flowback water during the production stage;
- Fluid leakage associated with poor well construction during the “active” stages;
- Aquifer cross-contamination due to poor borehole construction;
- Surface spills from storage tanks;
- Contamination during the construction and decommissioning stages;
- Shortage of water availability and supply for industrial needs.

With regards to the environmental effects on soil, LUC (2018) acknowledges that there is a lack of systematic Scottish soil data as stated in the State of Soil Report (Dobbie et al., 2011) This means there are currently significant research gaps in relation to the potential threats that UOG developments could impose to Scotland’s soils. However, the report recognises that the major environmental pressure affecting soils are changes in land use practices, leading to the increase in Greenhouse gas emissions.

Other key areas that could potentially be negatively impacted by the UOG industry include ground contamination caused by flowback fluids, leaks from surface installations, or saline intrusion; and soil sealing resulting from construction of the development infrastructure. The former can occur during the initial phases of development and during the actual production, while the latter poses the risk mainly during the decommissioning of wells. The scale of these effects is likely to be greatest under the KPMG (2016) high production scenario, as the highest amount of infrastructure is required for the development. The scale and duration of these impacts is uncertain, but it is suggested that their nature is temporary.

Finally, the loss or fragmentation of habitat is expected to occur with immediate effect during the “active” stages of UOG development, therefore taking place over a period of roughly two decades. The impacts on habitats are likely to occur both at the site of industrial pads, and along the route of pipeline construction and access roads. However, the land area under risk was not identified as “significant” within the wider context of industrial development in the Scottish Central Belt.

#### 4.3.6 Climate Change Pressure

Scotland’s GHG emissions from the industrial sector decreased by 47.6% between 1990 and 2016, marking a progress towards a low-carbon future (LUC, 2018). The waste sector also saw a significant reduction by 72.8% in emissions in the same time period. In the UOG sector, however, the

implications for the GHG emissions from the development of a new industry domestically are subject to uncertainties.

Shale gas is currently imported into Scotland, and the processing and consumption of this gas domestically is included within current GHG accounting. The Committee on Climate Change (2016) estimated that the overall emissions footprint of domestically produced shale gas, if tightly regulated, would likely to be of similar levels to that of imported gas. Strictly regulated domestic production may even lead to an emission saving when displacing natural gas imports and therefore provide greater control over the level of emissions associated with energy supply (The Committee on Climate Change, 2016).

Tight regulations would be essential to minimise a number of climatic effects of the prospective UOG development. First and foremost, direct release of produced gas throughout during the “active” development stages and venting (or leakage) of fugitive emissions are the main pressuring factors on the atmosphere. Moreover, indirect greenhouse gas emissions arise as a result of exploration and production activities, such as industrial development on high carbon soils, waste treatment and disposal, and the processing and use of UOG products. These effects are greatest during the production phase of the UOG development, which for an individual project is likely to occur over a period of approximately 15 to 20 years, having a long-lasting or permanent impact.

For UOG extraction in Scotland, the lifetime production per pad under the central KPMG (2016) scenario is 47.3 billion cubic feet (bcf), 94.7 bcf for the high scenario, and 31.6 bcf for the low scenario. Although it is recognised that the scale of emissions would be significantly higher under the high KPMG scenario, the effect of all three scenarios on national emissions accounting is concluded to be a **significant negative**.

#### 4.3.7 Current Regulatory Framework and Mitigation Options

In Scotland, there is a regulatory regime in place to control certain impacts of UOG developments on the public health and the wider environment. These regulatory controls would reduce – in some cases minimise, but not fully eliminate, such risks. This section provides a very brief overview of some of these legislative instruments in place, based on the LUC’s (2018) report.

The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations require the assessment of the impact of certain public and private projects on the environment through the planning system. For instance, this obliges consideration of impacts on water quality and quantity where UOG developments are of a size and scale to require an Environmental Impact Assessment

(EIA). In the UK, the Borehole Sites and Operations Regulations require to inform Health and Safety Executive (HSE) about the design, construction and operation of wells. In addition, well operators must provide HSE with regular reports of any activities on the well that pose risks of accidental releases of fluids. In such circumstances, they must appoint an independent examiner to undertake regular monitoring of well integrity.

The Control of Major Accident Hazards Regulations 2015 (COMAH) seek to prevent such incidents involving dangerous substances and limit their impact on the environment. If COMAH applies, the operator will be required to identify potential hazard scenarios and demonstrate safety and control measures are being taken to prevent them, as well as arrangements for mitigatory scenarios. The enforcement authority (HSE and SEPA) can prohibit operation where these measures are found to be insufficient.

As the result of existing regulatory framework, the environmental risks and impacts of ground contamination from flowback waters should be minimal, unless there is illegal fluid disposal. Current regulations incorporate best practices in order to mitigate accidental spills and leakages. These include using non-hazardous chemicals wherever possible, storing them away from surface waters and important aquifers, ensuring site security with impermeable liners and other precautionary tools against leaks. There is also a regulation to mitigate the risk of surface spills of fracturing fluids, and therefore the risk of soil contamination from these was judged to be minimal. However, given the proximity of potential UOG industrial sites to the local population means increased sensitivity of the vulnerable groups to these limited effects and potentially stronger consequences.

With regards to air quality in Scotland, SEPA sets limits for certain pollutants emitted from industrial sites. Through the Pollution and Prevention and Control (PPC) (Scotland), SEPA currently regulates over 500 major industrial sites posing air pollution risks. However, a study by the Committee on Climate Change critiqued the current legislation in Scotland that is applied for greenhouse gases from UOG developments specifically. The study concluded that current framework lacks clarity over the roles and responsibilities of the various actors and that there are gaps in relation to the release of fugitive methane emissions.

Finally, a number of measures were recommended by HIA (2016) for improving the effectiveness of the planning and regulatory systems, as well as mitigation options against potential UOG-related hazards. These include:

- Developing clear guidance for regulators in relation to the application of existing legislation to the UOG sector;

- Establishing appropriate setback distances for UOG operations, to minimise potential negative effects on local communities;
- Increased transparency with regards to the data availability on chemicals used in UOG operations;
- Creation of new regulatory instruments to manage UOG-related public health risks.

All in all, even with all mitigation options considered, there are still major research gaps and a lack of scientific certainty on the scale of UOG development that would have taken place in Scotland in the scenario if hydraulic fracturing was allowed. Firstly, shale oil and gas extraction at the levels described under the KPMG (2016) scenarios are predicted to result in negative environmental effects, even if some of the data was inconclusive (LUC, 2018). These include predicted effects on air, water, climate, biodiversity, population, human health, and others. Secondly, the extent to which mitigation measures could be successfully implemented is also subject to considerable uncertainty, according to the LUC (2018) report. And finally, the effects of prospective industry on oil and gas prices and wider patterns of production and use were not conclusive (LUC, 2018). This includes uncertainty about the amount of oil and gas that it would be economically viable to extract (LUC, 2018). The amount of recoverable resource and its economic viability, although vary in estimates, were called “modest” compared to England in the BGS (2014) report. BGS estimated total shale gas reserves in Scotland, Midland Valley at 80.3 tcf, comparing that compares to 1,300 tcf in the Northern England and 4.4 billion barrels in the South (BBC, 2014). Subject to this much scientific uncertainty, it would be near impossible for fracking to be accepted by policy actors, or whole advocacy coalitions, that base their belief systems on the precautionary principle.

#### 4.4 Chapter Summary

This chapter provided a thorough background for the Scottish case study of UOG. What is more, through this discussion it is now possible to define first key elements that shape the shale policy subsystem in Scotland: relatively stable parameters in the form the basic attributes and characteristics of the resource, and basic constitutional structure.

First of all, key aspects of energy policy are executively devolved to Scotland, meaning that Scottish ministers are able to execute certain powers and functions in a technically reserved area. Scotland may not be a standard setter or a primary legislator, but it still has considerable veto powers in the area of onshore oil and gas. In essence, Holyrood is able to “veto” onshore oil and gas projects by refusing planning applications, or by not issuing licences for them in the first place. The only power that remained reserved to the UK in onshore oil and gas is taxation under petroleum licences.

As discussed in Chapter 2, the level of government centralisation and the degree of consensus needed for decision-making are vital for a policy change to occur. In the Scottish case, high degree of separation in territorial and legislative domains opens up possibilities for venue shopping and actor participation at a subnational subsystem level. This is what explains the prominence of Scotland-based actors in the UOG policy subsystem, because interest groups are, in essence, obliged to lobby Scottish political institutions under the devolved arrangements. Next the level of party system fragmentation is also high under the proportional electoral system in Scotland. But, given that the SNP has been in office since 2007 and now holds the vast majority of seats, it has a crucial advantage in the subsystem to influence decision-making. Advocacy coalitions adapt their behaviour to institutional and legal characteristics, and it is thus expected that, in the Scottish UOG subsystem, policy advocates will divert most attention to lobbying the Scottish Government, rather than the UK Government, due to the prominence of Scottish laws and institutions.

Secondly, the Scottish onshore oil and gas policy only exists in a broader context of economic and technical feasibility of the resources, its biophysical characteristics, and potential costs to the environment and public health. In other words – external subsystem factors. I have previously discussed that, even though countries with developed petrochemical industry often have strong pro-shale lobbies, that alone is not enough to convince either legislators or the public to embrace fracking. The volumes of shale reserves are also important, but even that is insufficient if the amount of *technically recoverable* resource is not economically viable. Although Scotland does have an established petrochemical sector and is currently experiencing decline in production, these factors compete with considerable scientific uncertainties on the potential impacts of hydraulic fracturing on the environment and public health.

Current estimates of the Scottish shale reserves are modest compared to those in England, but even this evidence is inconclusive. Therefore, the economic narrative is expected to be prominent in this analysis for both amongst pro-shale groups who would appeal to the needs of the petrochemical sector, and anti-shale groups who would use research gaps and modest estimates of economic viability in shale exploitation to their advantage, as well as uncertainties over environmental and public health impacts. But more than that, the notion of scientific uncertainty is predicted to permeate all narrative arguments used by fracking opponents or sceptics and become a prominent part of the debates.

All in all, the Scottish Government had multiple veto powers over onshore oil and gas policy under planning and licencing regimes, but few incentives to drop them. First of all, KPMG (2016) projected that, in the scenario of low UOG resource availability, or low economic viability of the resource,

economic losses would outweigh any potential benefits of hydraulic fracturing. Given the “modest” amount of recoverable resource in Scotland compared to England (BGS, 2014), and uncertainties about the amount of oil and gas that would be economically viable to extract (LUC, 2018), the Scottish Government had little economic incentive to encourage hydraulic fracturing. And secondly, there are still significant scientific gaps in relation to hydraulic fracturing impacts. Some of the data that predicted effects on air, water, climate, biodiversity, population, human health, and human health was either inconclusive, or predicted mostly negative environmental effects should development go ahead (LUC, 2018). This uncertainty over hydraulic fracturing impacts and economic predictions left the Scottish Government with fewer political incentives to embrace the industry.

# CHAPTER 5

## Results and Discussion

### 5.1 Chapter Introduction

Drawing on the previous discussion, Scotland remains part of the UK political system but possesses devolved responsibilities that allow the nation to exert considerable political autonomy in areas such as onshore oil and gas. This autonomy is particularly significant when the UK government is in favour of, and the Scottish government opposes, policy change to encourage commercial hydraulic fracturing. Although not able to control all aspects of commercial drilling for onshore oil and gas, Holyrood currently acts as a veto player, which creates a distinct policy dynamic in Scotland. This policy dynamic, however, is difficult to capture with a static research design, such as a one-off survey. Instead, media and documentary analysis were used to capture key policy developments in the most active period of debate and policy action between 2011-2019.

To start with, this Chapter lays out the key events and highlights of hydraulic fracturing debates in Scotland to date in Section 5.2, including relevant policy developments and publications. After that it moves on to the in-depth analysis of the subsystem. Next, Section 5.3 proceeds with identifying advocacy coalitions involved in shaping this debate and subsequent decision-making, and Section 5.4 discusses their beliefs and main narrative arguments they used in debates. To solidify findings from the media analysis and cast light on the final policy outcome, Section 5.5 provides a detailed discussion of the Scottish Government's analysis of responses to a public consultation on UOG. And finally, Section 5.6 examines the sources of key policy changes in UOG based on the data analysis and previous discussions.

What the media content and documentary analysis show is that the Scottish UOG subsystem possesses several distinctive characteristics. These include: the prominence of Scotland-based policy actors and the central role of the Scottish Government in the subsystem as a policy broker, advocate and a veto player, the presence of three advocacy coalitions (unlike the UK-wide subsystem with only two coalitions) and the use of distinct narrative arguments. In addition, the analysis found low levels of negotiated agreement between advocacy coalitions, but high influence of technical learning on policy change. Those regulatory changes, namely the 2015 and 2017 moratoria on fracking were pushed by external subsystem events that significantly altered powers and resources available to policy actors in the moderate coalition, while others were impactful for both the Scottish and UK-wide subsystems. The Scottish UOG subsystem, although nested in the UK-wide subsystem, followed

a distinct policy process with analytical debates focusing on Scottish issues, which separates it both geographically and analytically.

## 5.2 Fracking Debates

### 5.2.1 The Debate Process

This section will provide an overview of the process of fracking debates and policy implementation in Scotland over the past decade. The goal is to trace the origins of argumentative clashes that shaped the debates surrounding the prospects of UOG development in Scotland, and a subsequent moratorium. Another important goal is to identify key events, trends and narrative arguments that are relevant to the subsequent ACF analysis. As this part will demonstrate, although the Scottish UOG subsystem flows from policy developments in the UK, it evolved into a distinct policy subsystem with its own set of local actors, beliefs, events and, overall, with its own dynamics.

Hydraulic fracturing first appeared on the British horizon in 2007-2008, before this policy issue has formally reached Scotland. In the 13<sup>th</sup> onshore licensing round (November 2007 to February 2008), onshore Petroleum Exploration and Development Licences (PEDLs) were awarded by DECC for the exploration of unconventional hydrocarbons, including shale oil and gas, for the first time. Five locations in England were earmarked for shale gas exploration at the time, Cuadrilla being granted two of them. In 2010 and 2011, there has been a session organised by Energy and Climate Change Committee to consult stakeholders and gather written evidence for the prospects of shale gas. The outcome of this was the Fifth Report on Shale Gas in the House of Commons (DECC, 2011).

In the meanwhile, Cuadrilla Resources Ltd began drilling at Preese Hall, Lancashire in 2010 and received a license and a planning permission for exploration in Balcombe the next year. However, in April and May of 2011, a couple of tremors were observed in Preese Hall, which led to investigations to establish a link between hydraulic fracturing operations and seismic activity. Hydraulic fracturing operations were officially suspended after the tremors and, by the April of 2012, an expert report on seismic mitigation resulting from shale gas fracturing was produced for DECC (Green et al., 2012). Despite this suspension, another written evidence session for the impact of shale oil and gas on energy markets took place in July 2012. That same year, Gas Generation Strategy was published by DECC, restating the economic potential for shale gas in a policy statement. In December 2012, the UK Government lifted a temporary ban on hydraulic fracturing and companies resumed their operations nationwide.



The first significant event in Scotland itself happened in the year of 2011, when SEPA granted Greenpark Energy a licence for shale gas exploration (Table 11). Greenpark Energy, owned by Dart Energy, was drilling for coal bed methane (CBM) at a test site in Dumfries and Galloway to develop a CBM site at Airth (Friends of the Earth Scotland, 2012). Although Dart Energy had ruled out using fracking, i.e. hydraulic fracturing process used to extract shale gas in their operations (Daily Record and Sunday Mail, 2013), these events had put UOG exploration on the Scottish political radar for the first time.

The detailed timeline of the key policy events concerning onshore oil and gas are listed in Table 11. Overall, the Scottish fracking debates can be broken down into four parts, each representing a significant period in the development of the policy issue and policy subsystem:

- 1. The Formative Stage of the Policy Subsystem (2011-13):** In the aftermath of the 2011 tremors in Preese Hall and with the newly introduced tax regime for shale gas in 2013, the first calls to ban “fracking” in Scotland were made by the opposition, mainly NGOs. This period shows the emergence of a policy subsystem that will remain active (and reactive to external and internal events) throughout the policy development process.
- 2. The Limbo Phase of the “Evidence-Based Approach” to Fracking (2014-15):** The UK Government has declared their “all out for shale” vision, and with that onshore oil and gas becomes an issue of high salience in Scotland. Competing coalitions seek to influence the Scottish Government, however they are not yet stable. In 2014, the majority of parties oppose the first official proposal by the Scottish Greens to ban fracking, but in 2015, when the Scottish Government imposes a temporary moratorium, most of them call for more stringent measures. The Scottish Government itself and the SNP as a ruling party at this point form a third, moderate coalition around the narrative of the “evidence-based approach” to hydraulic fracturing.
- 3. The Pre-Moratorium Period of Legislative Conflicts and Stabilising Coalitions (2016-17):** During this period, most actors in the policy subsystem show more firm and stable beliefs and positions that they will retain in periods of conflicts; prior to this, internal divisions within several key political parties were apparent. The anti-fracking coalition becomes the dominant coalition during this time. The Scottish Government has conducted a public consultation on the issue of hydraulic fracturing, *Talking “Fracking”*, which demonstrated an overwhelming opposition to fracking both amongst local communities and policy actors. Finally, the Scottish Government and the SNP joined the anti-fracking coalition by announcing their preferred position of not supporting UOG development and imposing an indefinite moratorium on fracking.

4. **The Post-Moratorium Period of the “No Support” Politics (2018-19):**

The final, “post-moratorium” stage started off with a legal challenge by Ineos and Reach Coal Seam Gas to the Scottish Government. They were concerned with the lawfulness of the moratorium. Although the legal challenge was lost, the Scottish Government had received a handful of criticism from both pro-exploration and anti-fracking coalitions for its “vague” policy formulation and delays in decision-making. Shale opponents continued pushing for a complete legal ban on hydraulic fracturing in place of the moratorium to secure the policy, but the Scottish Government opted out for the latter despite announcing its preferred position of “no-support” to fracking. The final decision still meant that no fracking could take place in Scotland in any foreseeable future.

Table 11: Policy Timeline for UOG Development in Scotland

DATE	EVENTS
<b>November 2007 – February 2008</b>	13th Onshore Licensing Round (UK Petroleum Exploration and Development License (PEDL)).
<b>November 2010 – March 2011</b>	Written evidence session and hearings for the forthcoming report on shale gas (organised by the Energy and Climate Change Committee of the House of Commons).
<b>April – May 2011</b>	Tremors in Preese Hall (Cuadrilla Resources Ltd). Drilling officially suspended while DECC is responsible for commissioning report to examine link to hydraulic fracturing and seismic activities.
<b>May – July 2011</b>	5th Report „Shale gas“ published by the Energy and Climate Change Committee of the House of Commons <i>and</i> Government response.
<b>November 2011</b>	SEPA granted licence to Greenpark energy for exploration (Scotland).
<b>June – December 2012</b>	Publication of report "Shale gas extraction in the UK: a review of hydraulic fracturing" by the Royal Society and Royal Academy of Engineering <i>and</i> Government Response.
<b>July 2012 – January 2013</b>	Written evidence session and hearings for the forthcoming report “The Impact of Shale Gas on Energy Markets” (organised by the Energy and Climate Change Committee of the House of Commons).
<b>December 2012</b>	Publication of the Gas Generation Strategy by the DECC.
<b>December 2012</b>	Temporary moratorium of hydraulic fracturing operations lifted in the UK.
<b>December 2012</b>	Establishment of the Office of Unconventional Gas and Development (OUGO).
<b>April – July 2013</b>	7th Report “The Impact of Shale Gas on Energy Markets” by the Energy and Climate Change Committee of the House of Commons <i>and</i> Government response.
<b>June 2013</b>	Announcement that the shale gas industry has committed to a package for communities that host shale gas development.
<b>July 2013</b>	Updating of the government policy “Providing regulation and licensing of energy industries and infrastructure” with a Supporting Detail on Shale Gas Development.
<b>July 2013</b>	Publication of “Planning Practice Guidance for Onshore Oil and Gas” by the Department for Communities and Local Government.
<b>July – September 2013</b>	Oral and written evidence session on the Economic Impact on UK Energy Policy of Shale Gas and Oil (organised by the Committee of Economic Affairs of the House of Lords).
<b>July – December 2013</b>	Proposal of UK Government of a new tax regime for shale gas <i>and</i> consultation.
<b>August 2013</b>	Technical Guidance "Onshore oil and gas exploratory operations" published by the Environment Agency
<b>September 2013</b>	Report "Potential greenhouse gas emissions associated with shale gas production and use" published by DECC.
<b>May 2014</b>	Scottish Parliament rejected proposed prohibition of fracking by Scottish Greens
<b>June 2014</b>	National Planning Framework 3 Scottish Planning Policy published
<b>July 2014</b>	Expert Scientific Panel Report on Unconventional Oil & Gas released
<b>July 2014 - Dec 2015</b>	14 <sup>th</sup> Onshore Licensing Round
<b>August - September 2014</b>	Department of Energy and Climate Change (DECC) filed a proposal to simplify underground access for oil and gas developers

<b>January 2015</b>	Moratorium on Fracking passed in Scotland
<b>February 2015</b>	<u>Fracking licences suspended</u> in Scotland (DECC)
<b>March 2016</b>	Scotland Act 2016 passed
<b>June 2016</b>	Amendments in favour of a full fracking ban supported by the Scottish Parliament (not legally binding)
<b>November 2016</b>	Following reports published: <ul style="list-style-type: none"> <li>• <u>Understanding and mitigating community level impacts from transportation</u>: Undertaken by Ricardo.</li> <li>• <u>Decommissioning, site restoration and aftercare – obligations and treatment of financial liabilities</u>: Undertaken by AECOM.</li> <li>• <u>Understanding and monitoring induced seismic activity</u>: Undertaken by the British Geological Survey.</li> <li>• <u>Climate change impacts</u>: Undertaken by the UK Committee on Climate Change.</li> <li>• <u>Economic impacts and scenario development</u>: Undertaken by KPMG.</li> </ul>
<b>November 2016</b>	Health Impact Assessment published by Health Protection Scotland
<b>November 2016 – April 2017</b>	Proposed Prohibition of Fracking etc. (Scotland) Bill lodged by Labour Party
<b>January – May 2017</b>	Public Consultation on unconventional gas open
<b>October 2017</b>	Announcement that the Scottish Government does not support UOG development and a moratorium on fracking will be extended.
<b>January 2018</b>	Ineos and Reach CSG launched judicial review against the “effective ban” on UOG exploration and development by the Scottish Government
<b>February 2018</b>	Scotland Act 2016 takes effect, meaning that powers over onshore oil and gas licensing are now devolved to Holyrood
<b>June 2018</b>	Ineos and Reach CSG lost the legal challenge in Court of Session
<b>June 2018</b>	Scottish Government grants 1 year extension to Ineos’s fracking license (PEDL 162)
<b>October 2018</b>	Strategic Environmental Assessment (SEA) is published by the Scottish Government, stating its “preferred policy position of no support for UOG”
<b>March 2019</b>	Scottish Government delays final decision on hydraulic fracturing, publishing an “addendum consultation” to the SEA consultation
<b>June 2019</b>	Scottish Government grants further 1 year extension to Ineos’s fracking license (PEDL 162)
<b>October 2019</b>	The Energy Minister makes a statement on final decision of “no support” on UOG extraction, extending the indefinite ban

### 5.2.2 The Formative Stage of the Policy Subsystem

The period between years of 2011 and 2013 marks the first stage of fracking policy debate in Scotland. During this phase, initial review of hydraulic fracturing potential in the UK was presented by the Royal Society and Royal Academy of Engineering (2012), while Oil and Gas stakeholders presented first economic evidence in favour of development. For instance, a study by Institute of Directors (2013) projected over 70,000 jobs generated by shale production. In 2013, a study by PricewaterhouseCoopers (2013), or PWC, also claimed that fracking could boost the UK's Gross Domestic Product (GDP) by around 2 to 3.3 percent by 2035, and that Scotland is in a prime position to benefit from development due to the country's expertise in the oil and gas sector.

Environmental groups like WWF and Friends of the Earth Scotland were quick to jump on the anti-fracking train with their criticism of industry's potential risks, referring to the US experience with hydraulic fracturing. Shale gas received a lot of negative press from the US documentary *Gasland* of 2010, which criticised its implications for human health and environmental safety. Climate change impacts became another strong theme in both the first shale debate phase, and in later stages. WWF Scotland, for instance, started a discussion on Scotland's overall climate strategy. Dr Richard Dixon claimed that it would not make sense "for a country with the world's best climate targets and supreme ambitions on renewable energy to be home to a proposal to produce a new fossil fuel even dirtier than coal" (The Herald, 2011). The first calls for a fracking ban in Scotland also occurred as early as in 2011 after tremors in Preese Hall. Friends of the Earth Scotland criticised hydraulic fracturing as "dangerous" and "disruptive" and proposed to halt the technology until the industry can offer further safeguards (Sunday Herald, 2011). It should be noted that at this point, these calls were for a moratorium and not yet for a permanent ban.

In 2013, UK Government Chancellor George Osborne revealed a new tax regime for shale gas in hopes of creating one of the most generous tax regimes for exploration in the world. It was announced that shale gas producers will pay just 30 per cent tax on their profits, therefore cutting tax break by 50% from what the oil and gas industry has traditionally paid (The Independent, 2013). This was met with immediate criticism from environmental groups and other shale industry opponents. Friends of the Earth Scotland (The Herald, 2013) claimed that it is an attempt to cover up the fact the real costs of the industry, as it requires massive tax breaks to kick off unlike lucrative fracking business in America.

Despite criticism, the Conservative UK Government showed a firm commitment to the novel technology early in the debate process. By the end of 2013, technical guidance "Onshore Oil and Gas Exploratory Operations" was also published by the Environment Agency. In Scotland, however, with

the SNP holding a majority in the Parliament, position on fracking was not unequivocal even at the early stages of policy development. While Scottish Conservatives called for the SNP Ministers to encourage the new industry, Scottish Government refrained from taking a firm stance on hydraulic fracturing and focused on “strengthening of planning policy in relation to unconventional gas” (The Scotsman, 2013) instead, which would be published later in 2014.

### 5.2.3 The Limbo Phase of the Evidence-based Approach

The year of 2014 started with the UK Government announcing funding to promote the use of hydraulic fracturing and urging opponents of shale to “get on board” with it (The Scotsman, 2014). However, the Scottish Government immediately occupied a rather moderate position on fracking as a policy broker. The official response implied that no proposals for shale exploration are given or to be given a green light “at this time” (The Scotsman, 2014). The Scottish Government also pushed forward a narrative of taking a “rigorous evidence-based approach” (The Scotsman, 2014) in development of this novel technology for the first time - the narrative that would become central to hydraulic fracturing policy debates.

On 7<sup>th</sup> of May 2014, a first official proposal to ban hydraulic fracturing technology was voiced by the Scottish Greens. However, this proposal was not passed in the Scottish Parliament, with the majority MSPs all rejecting it, including Labour and Conservative MSPs. In June, the National Planning Framework (NPF3) was published to strengthen planning regulations over hydraulic fracturing development (Daily Record and Sunday Mail, 2014). The new framework outlined buffer zones to be set up between development sites and communities, plus those sites would first need to go through local consultation to get approved. The Scottish Greens responded with a criticism that NPF3 is not stringent enough in offering protection to local communities from potential negative impacts of hydraulic fracturing (Daily Record and Sunday Mail, 2014).

Following a pledge to take an evidence-based approach to hydraulic fracturing, the Scottish Government established an Expert Scientific Panel on Unconventional Oil and Gas in July 2014 to examine potential exploration and development. By this time, environmental groups like Friends of the Earth and WWF had joined the Scottish Greens in their campaign to ban UOG exploration, regardless of industry’s potential merits to be investigated. The key narrative pushed by environmental groups at the time was that of Global Warming, and the need to reject further fossil fuel exploration altogether. In August 2014, Ineos acquired a 51 per cent share of the shale gas section of PEDL during the 14<sup>th</sup> Onshore Licensing Round (Aberdeen Press and Journal, 2014). The licence included the Grangemouth refining and petrochemical complex and further area of 329 km<sup>2</sup>

in the Midland Valley of Scotland (Aberdeen Press and Journal, 2014). The exploration did not go ahead due to substantial political changes in the UK and Scotland.

In September, the UK Department of Energy and Climate Change announced plans to grant firms rights of access to drill for UOG below residential areas, at depths of more than 300 metres (The Scotsman, 2014a). The Scottish Government made an objection to the UK government's "gung-ho" proposal. This move gave prominence to the constitutional and democratic debate over increased political powers in the energy sector, with the Scottish Government and major political parties, such as the SNP, being strong advocates for extended devolution.

This coincided with the Scottish Referendum for Independence, held on 18<sup>th</sup> of September 2014. The referendum question was, "Should Scotland be an independent country?", which voters answered with either "Yes" or "No". During the Independence debate, Scotland's political powers over energy matters were also brought on the table. The UK Government promised Scotland enhanced devolution in the case of a "No" vote, and in the aftermath of the Referendum set out plans for a "devolution revolution" (The Guardian, 2014a) across the country, which would later impact on Scotland's energy sector.

On 28 January 2015, following the result of the Referendum and enhanced devolution promises, the Scottish Government passed a moratorium on hydraulic fracturing. The policy was to prevent both hydraulic fracturing and coalbed methane extraction from taking place, with all fracking licences suspended from February 2015. Scottish Government saw this decision as an opportunity to start a national debate which is characterised by examining the evidence, that is to set out a period for evidence gathering and public consultation on this issue (The Scotsman, 2015)

The move was cautiously welcomed by shale opponents – environmentalists and political parties - while being criticised by its supporters. The Scottish Greens and Scottish Labour both agreed that the moratorium did not rule out fracking completely, and thus the pressure was still on. Scottish Labour had explicitly stated that this move does not "go nearly far enough" (quoted from The Scotsman, 2015), while environmental groups like WWF expressed hopes to ban it indefinitely in the future. On the other hand, criticism came from the Scottish Conservatives, who called the decision to impose a Moratorium a "backwards step for the manufacturing and energy industry" (The Scotsman, 2015). Scottish energy sector, represented by petroleum companies such as Ineos, stressed the industry's economic potential and warned that failure to embrace shale could result in a "collapse in manufacturing" (The Scotsman, 2015). All in all, it was clear to both sides that the policy was not yet set in stone.

#### 5.2.4 The Pre-Moratorium Period of Stabilising Coalitions

One of the key events in the next phase of the Scottish fracking debates and policy process was the enactment of the Scotland Act 2016. The 2016 Act amended the Scotland Act 1998 to provide the Scottish Parliament with legislative competences over the regulation of licences to search, bore for and to get petroleum within the Scottish onshore area (Scotland Act 2016, s. 47). Such licences include authority to obtain access to land, but also to exercise the licensing powers held by the UK Secretary of State under the Petroleum Act (1998). Therefore, as well as licencing conventional onshore oil and natural gas operations, Scottish Ministers were now able to authorise or refuse shale gas or coalbed methane extraction.

However, given that there was an on-going political controversy surrounding fracking, this policy issue presents both challenges and opportunities to Holyrood. On one hand, the 2016 Scotland Act gave Scottish Ministers exhaustive powers over licencing of any potential hydraulic fracturing operations. This meant enough power to prohibit this technology indefinitely, without a risk of this decision being overruled by Westminster. On the other hand, during this period the Scottish Government came under serious scrutiny from numerous political parties, NGOs, and business organisations, all of which criticised officials for not using their increased responsibilities to either lift the fracking moratorium or make it an indefinite ban.

In addition to that, the government's "evidence-based" approach was heavily scrutinised by both shale supporters and opponents. Both viewed this strategy as a missed opportunity, albeit for different reasons, and criticised the government for unnecessary delays for the sake of politics. For instance, Labour MSP, Claudia Beamish, accused the SNP ministers of "kicking [decision-making] into the long grass until well after the council elections" (The Scotsman, 2016). Scottish Conservatives, on the other hand, criticised the government for a "missed opportunity" to embrace fracking and recognise its socio-economic potential (The Scotsman, 2016). Despite criticism, the Scottish Government had continued with its approach.

As part of the public engagement process in policymaking, the Scottish Government undertook a public consultation, *Talking "Fracking": A Consultation on Unconventional Oil and Gas*, which ran from 31 January to 31 May 2017 (Scottish Government, 2017). The consultation paper presented a summary of key findings from the commissioned Strategic Environmental Impact Assessment and Business and Regulatory Impact Assessment studies. It also contained questions inviting views about the potential social, economic, and environmental impacts of UOG (Scottish Government, 2017).

The consultation demonstrated an almost unanimous opposition to fracking amongst local communities and various types of organisations actors. It received 60,535 responses, out of which



86% were standard campaign responses or petitions (Scottish Government, 2017). In all of these, the respondents explicitly called for a fracking ban in Scotland. In the meanwhile, the Scottish Labour party had lodged the Proposed Prohibition of Fracking etc. (Scotland) Bill in April 2017, which only strengthened the voice of opposition. The remaining 14% of responses were substantive responses, with the overwhelming majority also being unsupportive UOG (Scottish Government, 2017). The opposition was prevalent among community councils, political parties, community groups, NGOs and the third sector. Fewer than 5% of substantive responses, and this less than 1% overall, expressed their support or lack of concern about the industry (Scottish Government, 2017). Those responses mainly came from specific sectors, such as petrochemical industries and trade organisations.

Following the results of the public consultation, in October 2017, the Scottish Government declared its preferred policy position of not supporting the development of UOG industry in Scotland. It concluded that the research commissioned did not provide strong enough evidence to convince that communities' concerns can be addressed effectively. On that basis, the existing moratorium on fracking was announced to be extended indefinitely.

#### 5.2.5 The Post-Moratorium Period of Legislative Conflicts

The new year and the subsequent "post-moratorium" period started with a legal challenge to Scotland's fracking ban. This challenge came from Ineos and Reach Coal Seam Gas as the result of financial loss and "concerns about the legitimacy of the ban" (Daily Record and Sunday Mail, 2018). More specifically, they had put forward a petition for judicial review of the ban at the Court of Session, claiming that on the Scottish Government part there was a "failure to adhere to proper statutory process and a misuse of ministerial power" (The Scotsman, 2018). The advocate for Ineos and Reach CSG, Gerry Moynihan QC, had claimed that the SNP administration had exceeded its legal powers over hydraulic fracturing (The Herald, 2018). Ineos was also suing the Scottish Government for compensation.

In their initial response, the Scottish Government appealed to the evidence-based approach yet again, as well as the public consultation on fracking. To quote Paul Wheelhouse, then-Energy Minister: "The Scottish Government's position was endorsed by the Scottish Parliament in October and follows detailed assessment of the evidence and consultation with the public" (Daily Record and Sunday Mail, 2018). At first glance, the position of the Scottish Government seems clear. However, the issue gets more complicated from here.

To start with, the Court of Session has allowed Friends of the Earth Scotland to intervene in Ineos judicial review and make a formal submission in the “public interest” (Sunday Herald, 2018). What this means is that the group was able to argue in favour of the “fracking ban” and its lawfulness in court. The intervention challenged Ineos by claiming that not only was this policy lawful, but that it was arguably a *requirement* for the Scottish Government to impose a moratorium on fracking in order to meet the country’s legally binding climate change commitments by cutting greenhouse gas emissions from fossil fuels (Friends of the Earth Scotland, 2018).

The group had also appealed to the present scientific evidence against the development and the lack of a social licence to proceed with the resource exploration. To quote the Head of Campaigns, Mary Church: “We are confident that the process to ban fracking was robust and fair, and we hope that the courts will find against Ineos. A two-year process looked at mountains of scientific evidence that spoke of the risks of the UOG industry to our environment, climate, and people’s health. There is overwhelming support for the ban from communities on the frontline of this industry, people the length and breadth of Scotland, and almost all the parties at Holyrood.” (Friends of the Earth Scotland, 2018). This may be the first time the Court of Session has permitted a public-interest intervention on environmental grounds (Sunday Herald, 2018).

Despite this intervention defending the Moratorium and bringing up the country’s climate change commitments, the Scottish Government did not reiterate. Instead, it remained as “moderate” as possible in its statements. When the policy adopted in October of 2017, it was announced that fracking was “effectively banned” and that it was the “end of story” for Scotland (The Scotsman, 2018a). This narrative had drastically changed in court. Advocate for the Scottish Government, James Mure QC, made a claim that, in fact, there was no formal ban on fracking in place. He argued that what the Scottish Government had done was to “announce a *preferred* position on the issue”, but a final position has not yet been adopted (The Scotsman, 2018a). According to James Mure QC, a formal position which the government will adopt “has to undergo an environmental and strategic assessment” (The Scotsman, 2018a). Although the Scottish Government did not formally support onshore oil and gas exploration and expressed its “preferred position” of not supporting the industry, it did not announce it as a final position in court.

As the result, the Scottish Government received a strong backlash to these comments immediately after from both the shale supporters and the opposition. The operations director for Ineos said he had been “astonished” by a “staggering U-turn” the government had made on October’s position (The Herald, 2018a). He also questioned whether government’s statements “can even be taken at face value” after that (The Herald, 2018a). In turn, the Scottish Conservatives criticised the

government for the lack of clarity from ministers, pointing at the inconsistency between the past statements and the comments in court. To quote their energy spokesman Alexander Burnett (The Scotsman, 2018a): "If the Scottish Government in court thinks fracking is not banned, it should probably tell every SNP politician - from the First Minister down - who's been bragging to the contrary... This approach by the nationalists will convince absolutely no one and shows just how ill-thought through the ban on fracking is." The Scottish Labour representatives had expressed similar concerns about the inconsistency of the government's position on fracking and described it as a "spin before substance" (The Scotsman, 2018a). Both parties also called for an urgent explanation from the government.

In response, the SNP spokesman had refuted all the claims by stating that "there is no fracking in Scotland and there can be no fracking" (The Herald, 2018). The Court of Sessions also ruled that the claimants' position was based on a "series of fundamental misunderstandings of the Scottish Government's position" and refused the challenge (The Scotsman, 2018b). Energy Minister, Paul Wheelhouse, welcomed the court's decision and stated that the strategic environmental assessment (SEA) must be conducted and that "the practical effect of the current moratorium and the policymaking process which is underway to finalise our position is that no fracking can take place in Scotland at this time" (The Scotsman, 2018c). He also added that this decision [to undertake a SEA] was "set out to parliament... ahead of finalising that position and that approach has been endorsed by the overwhelming majority of the Scottish Parliament" (Scotsman, 2018c). The legal challenge was lost, and the anti-fracking groups reassured once again.

However, this did not end the "confusion" surrounding the Scottish Government and the SNP's position for the critics. After the court case, the Scottish Government formally extended the "fracking" licence for Ineos and Reach CSG in the Central Belt until next June. While extending the licence is not the same as giving a planning permission for exploration, meaning that the companies would not actually be able to proceed with the development, this action did generate a lot of criticism and concerns over the government's intentions. Liberal Democrat MSP, Alex Co-Hamilton went as far as calling the government's position "erratic and nonsensical" (The Herald, 2018b). Following the extension of a fracking licence, the Scottish Government in the face of the Energy Minister once again had to insist that this action "does not alter the current position", as local councils cannot and will not grant planning permission for operations (The Herald, 2018b).

Following these events, the anti-fracking groups called for a full legal ban of hydraulic fracturing instead of a moratorium. They argued that "only a legislative approach can ensure a robust, enforceable ban", otherwise there are concerns that the current policy could be overturned (The

Herald, 2018c). A legal opinion by Aidan O'Neill QC, who was commissioned by Friends of the Earth Scotland, later suggested that the Scottish Parliament had the legislative competence to pass a fracking ban. In doing so – they pointed out that, the possibility of successful legal challenges from interested parties against the policy would decrease (The Scotsman, 2019).

In the end, the Scottish Government went about the final policy decision differently. In October 2019, the Scottish Government announced the position of “no support” for fracking, following the results of the SEA and the previous evidence-gathering process (The Herald, 2019). As per Paul Wheelhouse’s statement, shale industry was deemed incompatible with “policies on climate change, energy transition and the decarbonisation of our economy” (The Herald, 2019). He also pointed out that the Scottish public was overwhelmingly opposed to the industry.

However, the Scottish Government did not outlaw fracking in the way the critics had hoped. The government extended the planning-based moratorium and confirmed that it would not grant permission for any onshore drilling projects going forward (The Herald, 2019). Mr Wheelhouse explained that the extended moratorium was already a “strong policy” position and thus no legislative ban was necessary at this time, but he did indicate that a legal ban may be preferable in the future (The Herald, 2019).

#### 5.2.6 General Trends

When looking at the process of fracking debates in Scotland, several trends become apparent:

1. Development of three competing belief systems, around which advocacy coalitions were formed (discussed in Sections 5.3 and 5.4);
2. The central role of the Scottish Government in the subsystem and the influence of the Scottish devolution on the policy process (discussed in Section 5.3);
3. Appeal to scientific and other evidence on the issue by members of all three coalitions (see Subsection 5.6.3);
4. High level of disagreement across all three belief camps (see Subsection 5.6.2);
5. The prominence of “anti-shale” narrative arguments in the media and in the policy subsystem.

All these factors are discussed in greater detail in subsequent sections, but I will initially consider the last point. The victory of the anti-shale sentiment is the closing line for the UOG policy debates in Scotland. Table 12 below provides a brief data summary of the coded statements on fracking, grouped by positions stated. It is clear from this data that the anti-fracking position was expressed

most frequently just in sheer numbers, accounting for 40% of all statements. Pro-exploration and moderate positions ended with only a small gap, accounting for 30% and 27% respectively. But sheer numbers do not tell the full story.

*Table 12: Statements on Fracking by Frequency of Occurrence*

<b>Position</b>	<b>Count (n)</b>	<b>Percent (%)</b>
Pro-Exploration	620	30
Anti-Fracking	812	40
Moderate/Mixed	565	27
Unspecified	69	3
<b>Total</b>	<b>2,066 statements</b>	

Based on the data, anti-fracking statements started to dominate the media ever since the third debate phase (2016-17). Figure 3 below shows how the opinion dynamics have changed over the years and the different debate stages. While the pro-exploration position had received the most coverage - over 40% of identified statements, during the formation of the policy subsystem development (2011-2013), by the third debate phase (2016-2017) it shrank to a mere 23 per cent. In stark contrast, anti-fracking statements have increased significantly since 2011, reaching over 50% in the third and fourth phases of debates. Finally, the moderate position had gained momentum in the media in the “Limbo” phase (2014-2015), accounting for the majority (37%) of all statements, but by the year of 2018 it was in the minority (15%). This trend can be attributed to two key factors: stabilising coalitions, whereby most partisan actors had gained the foothold in the anti-fracking coalition; and the Scottish Government’s shift to the “no-support” politics.

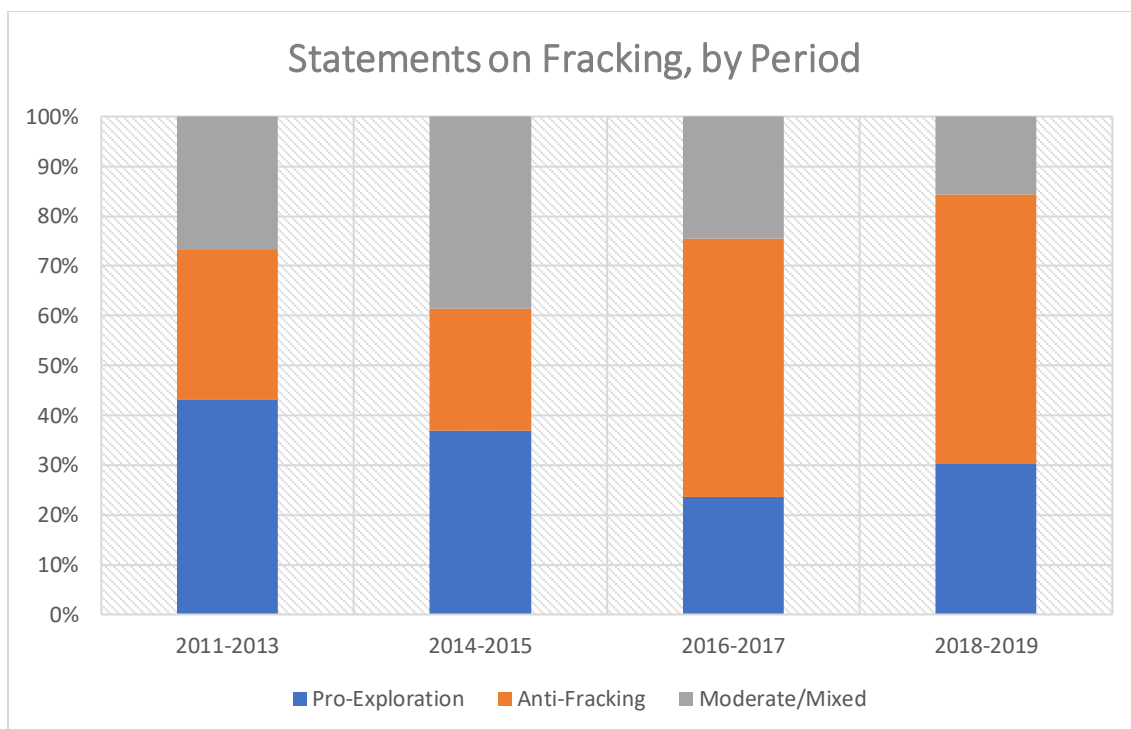


Figure 3: Statements on Fracking Over Years

It becomes clear from this data the anti-fracking narrative was prominent in the Scottish policy subsystem. It was the victor not only by sheer volumes, but in its results: the effective ban on fracking. But is it premature to declare anti-fracking coalition a winner? After all, despite winning the discursive contest, whether the anti-fracking coalition itself has won needs to be clarified. By taking a closer look at coalitions and their belief systems, the answer to the victory question will inevitably become more nuanced. In the ACF research, the result (policy change) is just as important as the policy process that had led to this outcome.

### 5.3 The Policy Subsystem

#### 5.3.1 Key Actors

Policy subsystems consist of advocacy coalitions, but every coalition, and therefore every policy subsystem by extension stand on the shoulders of policy actors. For this reason, identification of key actors in the subsystem becomes our starting point in the analysis. A fuller list of actors in each group and their place in coalitions are presented in the next subsection, but here I focus on identifying the most active and central stakeholder groups in the Scottish fracking debates. Table 13 below shows the frequency of statements within each group of actors expressing either supportive, opposing, or moderate/mixed stances during debates. Figure 4 presents the same data, but in

percentage bar graph, which visualises the range of responses by the three coalitions. From here it can be determined which groups were most vocal about their position in the media.

Table 13: Group statements on fracking

Group Category	Pro-Shale Statements		Anti-Shale Statements		Moderate/Mixed		Unspecified		Total (n)
	n	%	n	%	n	%	n	%	
<b>UK Government bodies</b>	69	80	3	17	15	0.17	-	-	<b>87</b>
<b>The Scottish Government</b>	3	1	70	20	281	77	7	2	<b>361</b>
<b>Public Bodies</b>	2	8	1	4	15	60	7	28	<b>25</b>
<b>Local Government</b>	1	7	11	73	2	13	1	7	<b>15</b>
<b>Political parties &amp; affiliated organisations</b>	124	18	395	56	153	22	27	4	<b>699</b>
<b>Energy Companies &amp; Private Sector</b>	309	87	4	1	38	11	6	1	<b>357</b>
<b>NGOs &amp; Non-profit organisations</b>	11	4	263	92	2	1	9	3	<b>285</b>
<b>Consultancy &amp; research</b>	62	49	40	32	18	14	6	5	<b>126</b>
<b>Trade Unions</b>	13	65	5	25	-	-	2	10	<b>20</b>
<b>Media</b>	22	36	12	20	24	39	3	5	<b>61</b>
<b>Others</b>	4	13	8	27	17	57	1	3	<b>30</b>

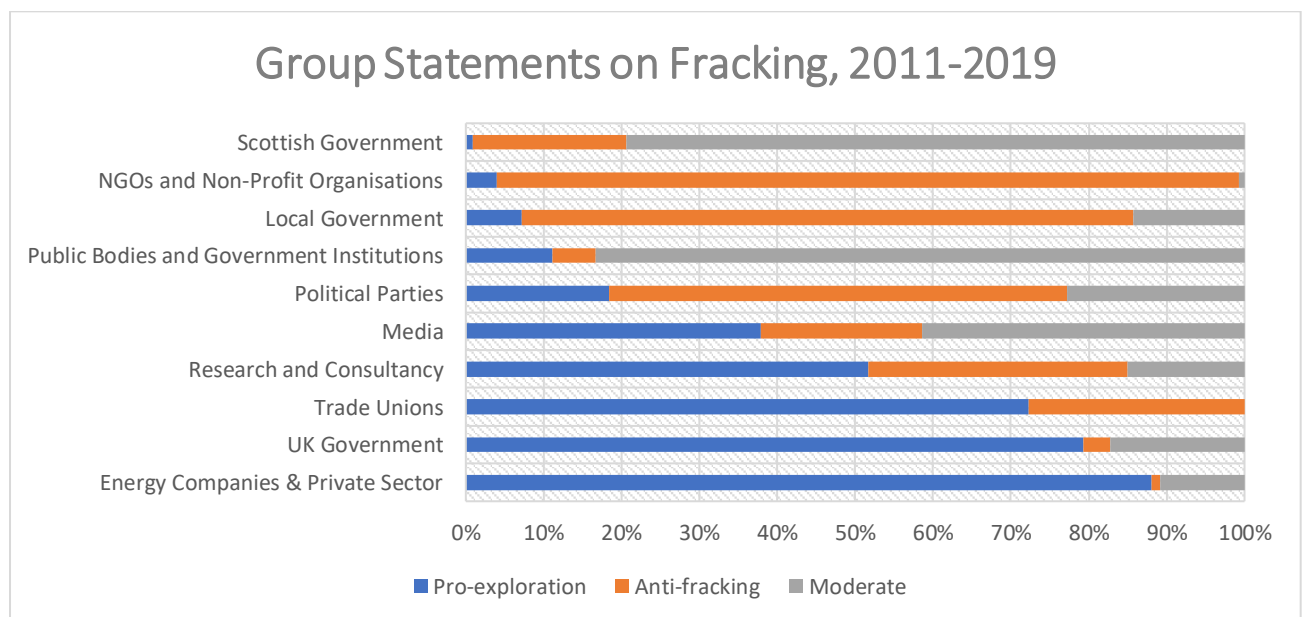


Figure 4: Group statements on fracking (%).  
N=1,968 (excludes unspecified statements and unclassified actors)

In this study, the level of influence of stakeholder groups is determined by two core indicators: media presence and participation in the policy decision-making. At first glance, the UOG policy issue outside of the Parliament seems like a battle between the private sector (mostly corporate energy actors) and (primarily environmental) NGOs, accounting for 17% and 14% of all statements respectively. Energy companies were the main advocates of the shale industry in Scotland, with 86% of positive statements per group and 50% of all pro-shale statements, whereas NGOs were first at the barricades against it, accounting for 95% opposing statements per group and 32% of all anti-fracking statements. This is a classic split between purposive and material groups. As a purposive group type, environmental NGOs are dedicated to advocating for robust environmental regulations and to preventing environmental risks. Energy companies, on the other hand, are a material group of agents, and they have a direct financial interest in the resource extraction as they would be the main beneficiaries. For these reasons, the private sector and environmental actors were so prominent in the Scottish fracking discourse outside of the Parliamentary debates.

Within the Parliament's walls, fracking was also a salient issue, as all major political parties were highly involved in the debate (34% of historic statements). Political parties were the most represented group of actors in the media, and most of them directly participated in decision-making in the Scottish Parliament. In the media, 56% of partisan statements were anti-shale, while the remaining 18% and 22% were pro-shale and moderate. Even though there is a clear majority here, political parties were not a homogenous group of actors, but this will be discussed separately in Subsection 5.3.3.

The UK Government, on the other hand, was clearly "all out for shale" with 80% of positive statements and 11% of all pro-shale statements. But for the reasons listed in Chapter 4, its influence on the Scottish subsystem was somewhat limited by the devolution process and the prominence of Scotland-based actors. The "limitations" refer to the ability and/or the willingness of the UK Government to overrule the decisions of Scottish ministers in onshore oil and gas. Next, the local Scottish councils, while mostly against fracking, had a very low media presence, or at least they were not extensively represented in the outlets selected for this study (15 statements overall). But the battle gets more complicated from here.

Certain groups were more difficult to classify both in terms of their influence and their overarching position. First of all, media actors as a stakeholder group analysed in the study is not to be equated to "the media" as a data source for this study. The media is a fundamental force in policy subsystems. It provides platform for political discourse and, in turn, can both shape and reflect public opinion. For example, by using opinion polls, the media can both have a reflective function and an active in shaping



public opinion as they also define the way the issue is being presented (Holtz-Bacha, 2012). The media presence can be considered an influence indicator but classifying it in a policy subsystem as a policy actor proved to be tricky.

In this case study, media as a codified group consists of a limited number of journalists and op-ed authors who chose to express their opinions on the issue. Even though most actors in this category expressed either pro-shale (36%) or moderate (39%) stances, it wouldn't be fair to conclude that media as an entity favours a moderate stance on fracking from this limited data. It is also not a measure of its influence on the policy issue, and that is not the research focus of this study. Therefore, there is an important distinction to be made between media actors identified in this study and "the media".

Similar things can be said about scientists and research organisations. As a group category, it is clear from the data that they favoured the pro-shale stance (49% of positive statements). However, this cannot be treated as proof of a scientific consensus on the issue, or that most scientific actors support fracking. If anything, the discussion in Chapter 4 hints at the opposite, pointing at many research gaps and scientific uncertainties. These findings go in line with Ingold et al. (2016) conclusions that scientific research on hydraulic fracturing in the UK was affected by the novelty of the issue. This explains the lack of scientific consensus on hydraulic fracturing. Not only was hydraulic fracturing a relatively new issue both in Scotland and the UK, but the Scottish UOG subsystem was also in its nascency - which is why scientific actors "suffered" from these uncertainties.

Yet, scientists are very important actors in policy subsystems, so it was still important to include them in the analysis while acknowledging these limitations. The number of actors whose opinions were picked up by media is very limited. Overall, this group category was not widely represented in the sample news sources, accounting for only 6% of all statements. In the end, more scientific actors were identified as part of the policy subsystem through positional and reputational approaches of elite identification. Furthermore, the media outlets selected for this study cannot be treated as a source of scientific knowledge; they are a source of news and opinions. Once again, there is a clear distinction here between "science" as a whole and individual scientists, research organisations and consultancies.

If anything, science (in relation to the Scottish UOG debates) in the media space existed as an ambivalent term, or even an 'empty signifier'. By that I mean that it was emptied of specific meaning, and thus it became 'everything' to represent numerous demands and beliefs, in line with MacKillop's (2018) definition of the term. Many actors were appealing to the "science" when expressing their opinions, but few specified what exactly they meant by that, as they did not always make references to any specific sources or studies.

At the same time, the importance of scientific actors in this policy process cannot be understated, because there is also clear evidence that their work helped to inform other coalition members' opinions and led to policy-oriented learning (more details in Subsection 5.6.3). After all, the Scottish Government was a proponent of the so-called "evidence-based approach" that relied on a series of research studies and consultations on the matter. Moreover, scientific actors used media as a platform to inform the public about their studies, raise awareness about the available technical and scientific information, and respond to other researchers. Overall, the role of science and scientific actors is more nuanced than it might seem from this data set.

Finally, these results show that the Scottish Government played a critical role both as a subsystem actor and a policy broker. This is discussed in a dedicated Subsection 5.3.3, but for now it is important to establish its place amongst other key actors in the subsystem. The Scottish Government was one of the central actors both in terms of its media presence (17% of historic statements) and its influence on the subsystem due to the nature of its position of formal authority. In this policy conflict, the Scottish Government appeared to be positioned between two opposing groups.

Indeed, at first glance the UOG policy issue might seem like a battle between energy companies and environmental NGOs as these two groups of actors were most interested in influencing the decision-making outcome the most. Because of its positions of power, it was expected that they would target the Scottish Government's to do just that. But also because of this position, coupled with its different stance on the issue, the Scottish Government was constantly being criticised by both parties for not delivering their desired outcomes. What all this shows is that a policy process is not just a conflict between supporters and opponents of a given issue, in this case hydraulic fracturing, but also a dynamic relationship between subsystem actors.

To conclude this subsection, I compiled a list of key actors in the Table 14 below. It does not include a full list actors identified in the study, but it features those with the most media presence and involvement in the subsystem. It also considers positional and reputational methods of elite identification relevant to the study. The next section will discuss subsystem actors as part of advocacy coalitions.

Table 14: Key Actors in the Policy Subsystem

Actor	Role	Examples
<b>The Scottish Government</b>	Policy broker, veto player, administrative actor	-
<b>Political Parties</b>	Policy Advocates	SNP, Scottish Labour, Scottish Greens, Scottish Conservatives, Scottish Liberal-Democrats
<b>Public Bodies &amp; Government Agencies</b>	Administrative, research	SEPA, Scottish National Heritage, Scottish Water, COSLA, Health and Safety Executive (HSE)
<b>Energy Companies &amp; the Private Sector</b>	Policy Advocates	Ineos, Reach Coal Seam Gas, Oil & Gas UK, Weir Group, IGas Energy, IoD, UKOOG, Energy Institute
<b>NGOs &amp; Non-profit Groups</b>	Policy Advocates	Friends of the Earth Scotland, WWF Scotland, Frack Off Scotland, SMAUG, Concerned Communities of Falkirk, Women’s Environment Network, Greenpeace
<b>Research &amp; Consultancy</b>	Research, policy advocates	Expert Scientific Panel, Scientific Alliance Scotland, The Royal Society of Edinburgh, BGS, KPMG, Oil and Gas People, Andrew Watterson, Paul Younger

### 5.3.2 Advocacy Coalitions

Three advocacy coalitions are distinguished in this study: *pro-exploration*, *anti-fracking* and *moderate*. Table 15 below gives examples of groups and actors involved in all three coalitions. In policy subsystems processing high conflict issues, it is common to find only two opposing coalitions, or at least in liberal democracies (Weible et al., 2011). This is true for most research on hydraulic fracturing policy debates (Chailleux and Moyson, 2016; Heikkila and Weible, 2016; Ingold and Fischer, 2016; Montpetit et al., 2016; Nohrstedt and Oloffson, 2016; Tosun and Lang, 2016). It also includes the UK case, with the exception of a very small number of actors focusing primarily on research (Cairney et al., 2016). The first marker of distinctiveness in Scotland is that it was not possible to group all actors in two opposing categories, largely because one key party – the SNP, in government since 2007 – promoted a predominantly moderate or mixed position until the end of the year of 2017. But how exactly are these coalitions different?

Table 15: Advocacy Coalitions in the Scottish UOG Subsystem

Category	Pro-exploration	Anti-fracking	Moderate
<b>UK Government bodies</b>	Cabinet, DECC, Energy and Climate Change Committee	Environmental Audit Committee	-
<b>The Scottish Government</b>	-	-	The Scottish Government, Scottish Parliament Energy Committee, Committee on Climate Change
<b>Public Bodies</b>	-	-	SEPA
<b>Local Government</b>	-	Glasgow Council, North Ayrshire Council	-
<b>Political parties &amp; affiliated organisations</b>	Conservative Party, UKIP	Green Party, Labour Party, Liberal Democrats, Solidarity, SNP Trade Union	Scottish National Party
<b>Energy Companies &amp; Private Sector</b>	Ineos, UK Onshore Oil & Gas, Reach Coal Seam Gas, Oil & Gas UK	Renewable Energy Association, Persimmon, Network Rail	-
<b>NGOs &amp; Non-profit organisations</b>	Reform Scotland, Global Warming Policy Foundation	Friends of the Earth, WWF, Frack off Scotland, Concerned Communities of Falkirk, SMAUG	-
<b>Consultancy &amp; research</b>	PWC, Oil and Gas People, Pinsent Masons	Andrew Watterson (Academia), John Underhill (Academia), Roy Thompson (Academia)	-
<b>Trade Unions</b>	GMB	Unite, Unison Scotland	-
<b>Media</b>	Scott Macnab, Peter Jones	Ilona Amos, Joyce Macmillan	Caroline Woolard, Brian Wilson
<b>Others*</b>	Not classified	Not classified	Not classified

\*This category includes individual actors that aren't part of the Scottish UOG policy subsystem, e.g. book authors, entrepreneurs, or legal advisors that remain neutral to the issue. They are not categorised as part of a coalition.

The first group can be broadly categorised as a **'pro-exploration'** coalition. Its members openly expressed their support for hydraulic fracturing, and/or emphasised economic, social, or other benefits that development would bring. Most supporters also favoured a well-regulated development of unconventional gas exploration to minimise health, safety and environmental risks. Key actors in this coalition included oil and gas companies and industry groups (87% of positive statements), such as Ineos and UK Onshore Oil and Gas, and the Scottish Conservatives that are now Scotland's second largest party.

Many of the **'anti-fracking'** coalition members (primarily NGOs and the Scottish Green Party in particular) advocated for an outright ban on the technology, while other groups sometimes stated more mixed beliefs. Actors in this coalition expressed concerns ranging from health and environmental

risks of fracking to the possibility of jeopardising country's climate change commitments by relying on fossil fuels. Many local NGOs and community groups, such as Concerned Communities of Falkirk, also believed that fracking operations could have a negative impact on local communities.

A third '**moderate**' coalition, holding *mixed* or *neutral* views, contained Scottish Government bodies, public bodies, and governmental agencies, together with the Scottish National Party. The Scottish Government has generally presented a "cautious" approach to fracking, advocating an "evidence-based" process. Only a very small number of statements by the Scottish Government implied support for hydraulic fracturing (mostly in 2012 and 2013) by emphasising potential energy benefits and the need to develop robust regulatory system for onshore oil and gas. The SNP's official stance on fracking mirrored that of the Scottish Government, although a within-party split was apparent when some members formed an anti-fracking group called SMAUG (discussed in Subsection 5.3.3). Even though the Scottish Government had imposed an indefinite moratorium on fracking in 2017, its position still differed significantly from the anti-fracking coalition, in that the SNP Ministers did not a) support a full legal ban as shale opponents demanded, and b) acknowledged the possibility of opinion shift in the future.

### 5.3.3 The Politics of Fracking

Fracking was, without doubt, a salient issue for many prominent political actors in Scotland. This issue has produced similar divisions within parliamentary walls as it did outside. Scottish Conservatives have been consistently and overwhelmingly supportive of fracking, while Scottish Greens were overwhelmingly in opposition from the start. Although Scottish Labour and Scottish Lib-Dems now oppose fracking, their statements have been less consistent over time. This shows that the formation of advocacy coalitions and the policy process itself are very dynamic events. The attitudes of political parties towards fracking are summarised in Figure 5 below.

Before 2015, Scottish Labour expressed a mixed and often accepting position on fracking. In 2014, the party's energy spokesperson Tom Greatrex MP stressed that fracking should only happen with "robust regulation, comprehensive monitoring and local consent" (The Scotsman, 2014b). Labour also briefly used the issue to gain electoral ground on the SNP (when the latter was clearly on the fence), such as by proposing that local communities should be given "the right to vote on and veto any fracking proposals" (Daily Record & Sunday Mail, 2015). After the appointment of Kezia Dugdale as the Leader of the Scottish Labour Party, it officially joined the fracking opposition. Anti-shale sentiment had become part of the party manifesto in the form of "no ifs, no buts, no fracking" (Daily Record & Sunday Mail, 2016). Party officials began their campaign for an outright ban rather than a moratorium. Overall,

less than 20% of all statements in the media made by the Scottish Labour Party officials were mixed or neutral and 80% were negative.

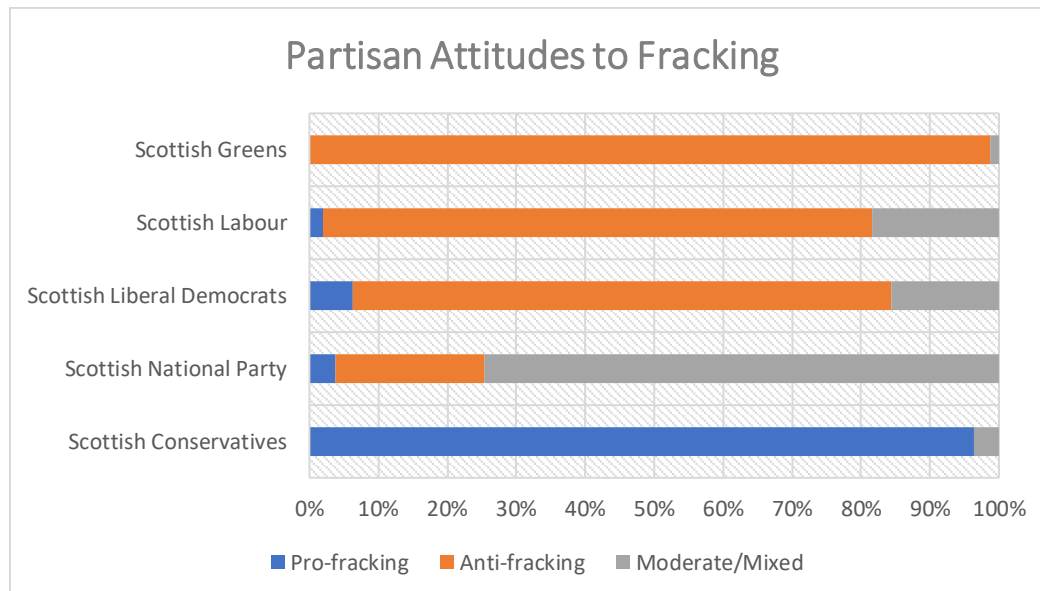


Figure 5: Statements on fracking by Scottish political parties, 2011-2019

Internal divisions were also apparent among Scottish Liberal Democrats. In 2016, pro-development supporters within Lib-Dems won a party conference vote. However, the party leadership overruled the vote and included an anti-fracking commitment in the party manifesto. They have since called for an outright ban. Overall, around 78% of statements made by Lib-Dem representatives on fracking were negative, with 6% positive and 16% mixed or moderate (Figure 5).

The SNP remained the most “moderate” party on fracking overall, with 85% of their statements being mixed or moderate. In response to the overwhelming support of fracking by Scottish Conservatives, the SNP pointed out that there are just “too many unanswered questions surrounding the technology” (Aberdeen Press and Journal, 2014a). The Scottish Government repeatedly stated that “unconventional oil and gas developments should only ever happen under a robust regulatory regime” (The Scotsman, 2014a).

These narratives are very different from those of the anti-fracking coalition actors, many of whom exclude the possibility of accepting the technology altogether. Instead, the Scottish Government has emphasised an “evidence-based, cautious and considered approach” (Aberdeen Press and Journal, 2014b) to fracking. The government stated that it would not give the go-ahead to the industry until environmental and socio-economic assessments and public consultations were conducted, and thus

did not declare a firm opposition nor support on it. The government's stance was mirrored by the SNP, being the ruling party in Parliament.

For most of this period, the role of the SNP and Scottish Government was difficult to classify. The government often appeared to be playing a role akin to policy broker, acting cautiously and postponing judgement while refereeing debates during a period of uncertainty about public opinion. Their position changed in 2017 when, to all intents and purposes, the SNP adopted a relatively anti-fracking position. This decision, however, does not contradict the "moderate" position adopted by the Scottish Government. According to their statements, unconventional gas exploration was only to be allowed if it is given a pass in public consultations and research studies, which didn't happen as the results of the public consultation came back overwhelmingly negative towards fracking.

As the time progressed, internal divisions over fracking became evident within the SNP. Although the official party statements on fracking mirrored those of the Scottish Government, by the year of 2015 internal disparities became clear. For instance, during the electoral campaign that very same year, the party used official badges with the term "Frack Off" alongside the party logo (The Herald, 2015). In addition, an anti-fracking lobby group called SNP Members Against Unconventional Gas, or SMAUG was formed amongst the party members. It existed as an internal pressure group trying to persuade the party leadership and the Scottish Government to impose an outright ban (The Herald, 2015a). This further emphasizes internal party divisions over the issue.

Furthermore, is clear from the data (Figure 6) that by the last debate phase, most statements by the Scottish Government on fracking were negative (65%). This is when the Scottish Government made the announcement of its "no-support" position. This, however, does not make it any less difficult to categorise it into a group. The significant number of statements (28%) in 2018-2019 were still in line with the government's "need for evidence" narrative. This shows that it is not always possible to divide actors as simply "supporters" or "opponents" of a given policy issue.

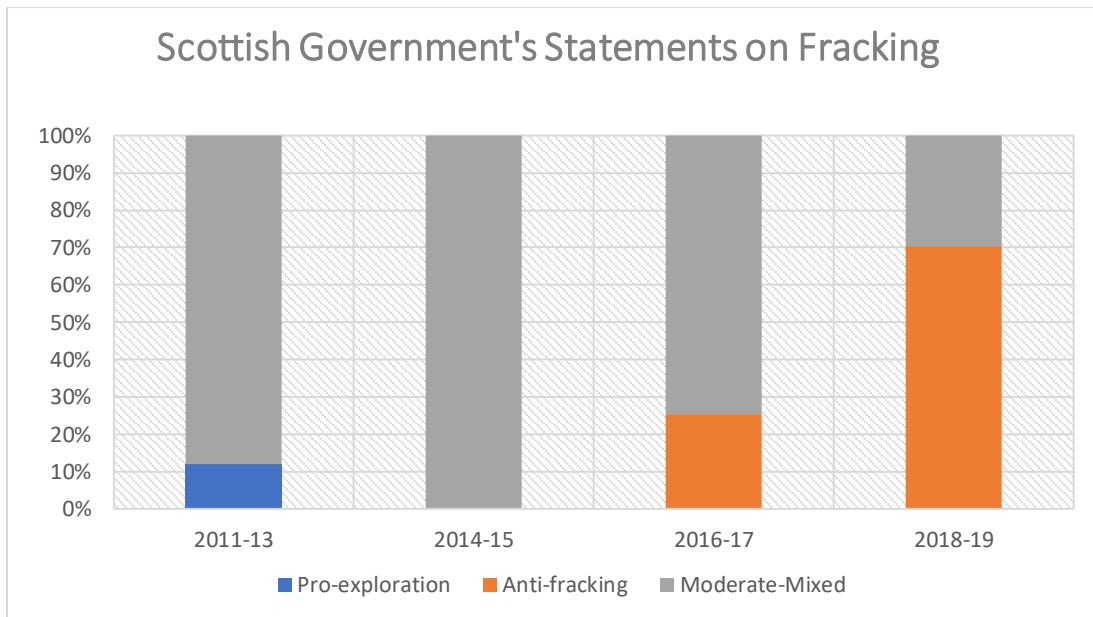


Figure 6: Scottish Government's statements on fracking over time

Even though the Scottish Government and the SNP had shifted their position in favour of the “no-support” politics, it was still hard to categorise them as anti-shale. Despite the government’s best efforts to explain their new position, many of the prominent anti-fracking actors did not “accept” it as part of the coalition. Coalition members found the government’s statements vague and inconsistent and had repeatedly expressed concerns regarding its approach. They claimed that it purposively used vague language and delayed the decision-making in order to achieve certain political goals. The critics did not stop even when the government announced its final decision. Even though it received some praise for not giving fracking the go-ahead, shale opponents were still dissatisfied with its approach. The end goal of the anti-fracking coalition has always been a complete legal ban on fracking, whereas the SNP Ministers were not willing or did not deem it necessary to go further than the moratorium. Thereby, the Scottish Government and, by extension, the SNP did not fit into the anti-fracking coalition for two main reasons: politics and policy.

#### 5.3.4 Distinct Subsystem Characteristics

The first distinctive element of the Scottish UOG subsystem comes from a third, moderate advocacy coalition which is best described in an overarching ‘need for evidence’ narrative. Policy actors belonging to this coalition could not be placed in either pro- or anti-shale camps due to their either mixed, or moderate views. The decision to draw out a third advocacy coalition instead of the “traditional” two opposing stands can be justified on theoretical grounds that the ACF incorporates



as a framework. The ACF hypothesizes that complex policy issues, in this case UOG development, will result in the emergence of two or more distinct advocacy coalitions formed and based upon shared belief systems (Sabatier and Weible, 2007). Belief systems provide the basis for the coalition existence, for them to be distinguished by their varied beliefs, and that involves all types of actors, including policy brokers.

The moderate coalition in Scotland was found to hold a distinct belief system from either pro-shale or anti-fracking groups, expressing a rather “agnostic” attitude to fracking. While the strongest pro-exploration actor – the UK government, was trying to go “all out for shale”, the Scottish Government was going “all doubt for shale”, displaying concerns over certainty and/or uncertainty of negative impacts of the nascent industry. And while anti-fracking actors were rejecting the mere possibility of giving the green light to development, moderate actors were not dismissive of it entirely, acknowledging potential socio-economic benefits of fracking and the country’s strong regulatory capacity to manage it.

The distinction here is clear: pro-exploration actors tended to promote UOG consistently, and the anti-fracking coalition denied its benefits and called for it to be banned to prevent potential damage. The moderate coalition, on the other hand, was sceptical about the industry’s safety but took potential economic benefits into consideration.

*"We should never close our minds to the potential opportunities of new technologies" (The Scotsman, 2015a).*

The second key difference between Scottish and the UK policy subsystems regards the role of government. Unlike the UK government, the Scottish Government has, until 2017, presented a moderate or cautious stance, and later announced its “no-support” position to fracking. Throughout this period, the government was led by the SNP which has no parent party in Westminster (unlike most other main parties). This distinctiveness is reinforced to some extent by the role of Scotland-specific actors such as local governments that were overwhelmingly opposed to hydraulic fracturing and local NGOs, accompanied by Scottish branches of international NGOs and business groups.

To sum up, the analysis of the Scottish UOG subsystem had identified two major characteristics that are distinct to Scotland: presence of the moderate coalition, formed around a separate system of beliefs; and the prominent role of the Scottish Government together with Scotland-based actors. These distinctions are reinforced by the narrative arguments and frames used by those actors, because they are mostly centred around Scotland and the Scottish politics.

## 5.4 Policy Beliefs

### 5.4.1 Belief System

From the ACF perspective, the existence of advocacy coalitions, but also the difference between coalitions is explained through the lens of belief systems. This section dives deeper into the analysis of UOG coalitions' beliefs in Scotland and narrative arguments used during the debate process. Table 16 provides a summary of the three-tiered belief system of each of them.

Table 16: Belief tiers of the Scottish UOG advocacy coalitions

Belief Tier	Advocacy Coalitions		
	Pro-exploration	Anti-fracking	Moderate
<b>Deep core</b>	<ul style="list-style-type: none"> <li>- Economic Conservatism</li> <li>- Proactionary principle</li> </ul>	<ul style="list-style-type: none"> <li>- Environmentalism and the precautionary principle</li> <li>- Social Welfare</li> </ul>	<ul style="list-style-type: none"> <li>- Knowledge (priority of) and the precautionary principle</li> <li>- Democratic pragmatism</li> <li>- Strengthening devolution</li> </ul>
<b>Policy Core</b>	<ul style="list-style-type: none"> <li>- Safe and clean technology</li> <li>- Robust regulations</li> <li>- Economic profit and energy independence</li> </ul>	<ul style="list-style-type: none"> <li>- Environmental and public health hazard</li> <li>- Danger to climate change commitments</li> <li>- Undemocratic</li> </ul>	<ul style="list-style-type: none"> <li>- Scientific uncertainty</li> <li>- Lack of social licence</li> <li>- Westminster-imposed politics</li> </ul>
<b>Secondary</b>	<ul style="list-style-type: none"> <li>- Fracking should be strictly regulated</li> <li>- Development allowed conditionally or unconditionally</li> </ul>	<ul style="list-style-type: none"> <li>- Fracking should be strictly regulated</li> <li>- Full legal ban preferable to moratorium</li> </ul>	<ul style="list-style-type: none"> <li>- Fracking should be strictly regulated</li> <li>- Temporary and/or Indefinite moratorium</li> </ul>

The deep core beliefs of *the pro-exploration coalition* are rooted in the economic conservatism and the proactionary principle. Broadly speaking, economic conservatism in this instance refers to support of the free-market development and a limited role of state in the economy. It was difficult to investigate the deep core level of values of advocacy coalitions with precision using only media content analysis, as those are overarching beliefs of actors that do not necessarily get picked up by articles focused on more narrow policy issues. Nevertheless, there were still statements that gave away hints of what deep core beliefs are. For pro-shale actors, they reflected a more economically conservative point of view. Here is one example of this:

*“The future of Scotland's last remaining refinery - the future of our vital oil and gas industry - should not be subject to political points scoring.”  
(Daily Record, 2015a)*

In turn, the proactionary principle refers to a calculated risk taking as essential to human progress (Fuller, 2012, p. 167). This contrasts with the precautionary principle that is focused on avoiding suspected risk and preventing potential damage, especially in contexts where scientific consensus does not yet exist. Indeed, most pro-shale actors viewed hydraulic fracturing as a revolutionary technology essential for the economic and energy progress, and thus worth taking a risk for.

*“The country can embrace this energy revolution, reinvigorate the manufacturing industry, and create jobs for generations to come” (Daily Record, 2015b).*

Policy core beliefs of the pro-exploration complement this worldview. These beliefs can be summarised by three main themes: a) hydraulic fracturing is a safe and clean technology; b) the safety of the shale industry can and should be ensured by robust environmental and health regulations; and c) this industry will be beneficial for economy and energy independence of the country. These arguments will be discussed in more detail in subsequent subsections.

*“We can frack safely. We already do it offshore. We can create jobs across Scotland, often in areas hardest hit by the decline of coal. We can cut our emissions, and it might just deliver independence. Not political independence, but perhaps something more important - energy independence.” (Daily Record and Sunday Mail, 2015a)*

When it came to policy preferences, the obvious choice for the pro-exploration coalition was to advocate for a full-scale exploration and development of the industry. Shale supporters wanted the government to give it a go-ahead. Table 17 summarises policy preference of each coalition, showing that 90% of pro-exploration statements (those where a preference was expressed) advocated for this legislation. The remaining statements also supported this position, but some reflected the idea that robust regulations are needed to ensure a safe development before any development can take place. These preferences correspond well with the other two tiers of their belief system.

Table 17: Policy preferences of advocacy coalitions

ADVOCACY COALITION	POLICY PREFERENCE							
	More robust regulations are needed for the industry		Development allowed/lift moratorium		Current regulatory system is robust enough		Moratorium/legal ban on fracking	
	n	%	n	%	n	%	n	%
<b>PRO-EXPLORATION</b>	7	7	89	90	3	3	0	0
<b>ANTI-FRACKING</b>	28	8	0	0	6	19	321	92
<b>MODERATE</b>	13	45	6	19	2	7	9	29

On the other hand, *the anti-fracking coalition* had completely opposing beliefs to pro-shale actors. At the deep core level of policy beliefs, this coalition was mostly preoccupied with environmentalism and social welfare. The former, environmentalism, can be defined as an ideology that aims at reducing the impact of humans on the natural environment. Because of that, it strongly advocates for the precautionary principle in environmental policy. The anti-fracking coalition shared this viewpoint, and it was very well reflected in the media.

*“We need to leave about 80 per cent of fossil fuels in the ground to have any chance of avoiding the worst of climate change” (The Herald, 2016).*

The second element is also very important. Social welfare means that disadvantaged groups, communities, and the society as a whole need to have a satisfactory level of welfare and be protected from economic insecurities and other risks. In the case of UOG development, anti-fracking actors expressed numerous concerns with regards to public health risks and unfair distribution of benefits that may come from the resource exploitation.

*“There may be talk of jobs and wealth, but these might never reach local people - and the human, health, environmental and economic costs of shale-reliant plants could be huge” (Sunday Herald, 2017).*

The anti-fracking coalition’s policy core beliefs were a direct reflection of its deep core values. Shale opponents were primarily concerned with its potential impact on communities, public health, and the environment. They used scientific gaps in their advantage to promote the idea that the game is not worth the risk and that a precautionary approach is preferable. Another important policy core belief was that the, in certain aspects, the UOG policy process was lacking democracy and transparency from the government. Even though pro-shale actors also criticised the government on similar grounds (for instance energy companies challenging the Scottish Government in court for

misuse of ministerial power), the difference here is that the opposing coalition also believed that allowing fracking at all would be undemocratic in retrospect due to the lack of a social licence.

*“If we are having a debate on fracking surely the right time in a democracy is in the election campaign, not a few months afterwards when a government hopes to be safely re-elected” (Aberdeen Press and Journal, 2016).*

When it came to secondary beliefs, the vast majority of shale opponents advocated for an outright ban on fracking. As can be seen from the Table 17, most of their statements expressing a policy preference (92%) were supporting either a moratorium or a legal ban. However, it should be mentioned that a moratorium was seen more as a transitory policy, or a first step to legally banning hydraulic fracturing. Unlike the moderate coalition, they were not satisfied with the final policy decision and openly criticised it later.

*“A moratorium pre-supposes there is more evidence we are searching for to find out whether fracking is dangerous - our position is it is absolutely clear that to be going after yet more fossil fuel reserves at this time ... is just deeply irresponsible” (The Herald, 2016).*

Overall, the anti-fracking coalition received every pro-shale narrative with scepticism and strong resistance. They introduced and expanded their own narratives, bringing in discussions on ethics and long-term environmental targets. Their beliefs found partial support within the moderate coalition, as it had similar concerns over the uncertainty over industry’s potential impact on public health and the environment but abstained from taking a firmly opposing stance.

At the deep core level of the belief system, *the moderate coalition*, consisting primarily of Scottish Government bodies and the ruling party, believed in three things: a) the priority of knowledge and precautionary principle; b) democratic pragmatism; and c) strengthening devolution. First, the priority of knowledge refers to the overarching “evidence-based approach” to policy-making that the Scottish Government had propagated. It prioritised a lengthy consultation process over taking any stances immediately. This approach also signified the belief in the precautionary principle, meaning that if a policy has a suspected risk of causing harm to the public or to the environment, then appropriate preventative actions should be supported before there is complete scientific evidence of a risk. The Scottish Government chose to be cautious in advance of any decision-making in the absence of scientific consensus, and in stark contrast to the UK approach.

Secondly, I refer to democratic pragmatism based on Dryzek’s (2012) definition. He defined it as an “interactive problem solving within the basic institutional structure of liberal capitalist democracy” (Dryzek, 2012, p. 98). The Scottish Government has taken an interactive approach to the UOG debates by conducting the *Talking “Fracking”* consultation back in 2016. The results of this

consultation are discussed in Section 5.5, but for now it is important to mention that the government had referenced the consultation results multiple times when explaining its decision to impose a moratorium on fracking.

*"We are taking a careful, considered and evidence-based approach to unconventional oil and gas, and the moratorium and the planned public consultation will allow all stakeholders and local communities to have their say"*  
(*The Scotsman, 2015b*).

Scottish devolution is another vital element of the deep core tier. The SNP and the Scottish Government firmly believed in delegating more powers to Scotland, which was the goal they partially achieved after the Independence Referendum in 2014. This had significantly impacted on Scotland's powers and responsibilities in onshore oil and gas policy.

All in all, just by looking at the moderate coalition's deep core beliefs it becomes clear that it is quite different from the other two. Even though it shared similar beliefs with the anti-fracking coalition, such as the precautionary principle, they arrived at these conclusions from different places. In addition, even though all three coalitions were questioning the democracy of the UOG policy process, they had entirely different reasons for that. While the pro-shale coalition was concerned with the Scottish Government's political strategies and viewed them as populist rather than "evidence-based", the anti-fracking coalition, despite also questioning its intentions, viewed the shale industry in itself as dangerous and undemocratic. On the other hand, concerns of the Scottish Government and the SNP were rooted in their deep core belief in strengthening devolution, and for them, the "unfairness" came from Westminster politics.

*"Whatever your view on the issue of unconventional oil and gas - and it is clear that there are both opportunities and concerns - there is only one way that the people of Scotland can determine the approach in Scotland - including beneath their homes and land. That is with the devolution of the necessary powers to Scotland and the current devolution process for the "extensive new powers"*  
(*The Scotsman, 2015c*).

At the policy core level, the issue of Westminster's shale politics is another important element in moderate coalition's belief system. It perceived Westminster's approach as a threat to the Scottish devolution. In August of 2014, the UK Department of Energy and Climate Change proposed to allow companies to drill for oil and gas below residential areas without negotiating access rights first. In the minds of the Scottish Government and the SNP, fracking became associated with the devolution question and Westminster's "all out for shale" politics.

*"The gung-ho approach of the UK government to the whole issue of unconventional oil and gas, often without any consultation with the Scottish Government at all, contrasts with our approach"*  
(Aberdeen Press and Journal, 2014c).

Other than that, the moderate coalition emphasized the lack of social acceptance of fracking and scientific uncertainty surrounding the technology. Regarding the former, shale resource exploration clearly lacked a social licence, which was evidenced by the results of the public consultation. The issue of scientific evidence, however, is more nuanced. As discussed in Chapter 4, the scientific research produced mixed results. It was concluded that UOG operations would have significant negative impacts on climate change, plus there were a lot of uncertainties when it came to public health and environmental impacts. However, several mitigation options were recommended to reduce these threats to a minimum. The Scottish Government still chose to focus on the risks and research gaps and not to support hydraulic fracturing, adhering to the precautionary principle.

*"Mass public consultation exercise will be undertaken to gauge Scottish public opinion on fracking and that a full public health assessment will be carried out to address safety amid concerns that the process can cause earthquakes and contaminate groundwater supplies. These are issues that must be researched further"* (The Scotsman, 2015d).

Finally, at the secondary level of beliefs, the moderate coalition, like all others, believed in robust environmental regulations. It also did not support legislating onshore oil and gas extraction. But, unlike the anti-fracking coalition, the moderate coalition preferred a moratorium on fracking over a legal ban. All in all, this coalition supported the notion that new research and technology may change the future of fracking.

*"The Scottish Government does not support the notion of a permanent ban as it is impossible to predict with any certainty what kind of clean energy technologies may be available in the decades to come, or future public attitudes"*  
(The Herald, 2018d).

I will now discuss narrative arguments that each coalition used during the debate process. This will allow us to examine the belief system in greater detail and identify whether there are more distinct characteristics to the Scottish subsystem.

#### 5.4.2 Narrative Arguments

Although similar arguments can be found in the UK and Scotland with reference to the potential risks or benefits (see Bomberg, 2017), most arguments have a Scottish reference point and there is a more prominent “moderate” position. These markers of distinctiveness are reflected in the mix of arguments on fracking summarised in Table 18 and Figure 7. Similar to the study on hydraulic fracturing discourse in the UK by Bomberg (2017), the pro-exploration coalition widely used a narrative frame of “Opportunity”. Coalition members believed that shale industry development would bring significant socio-economic benefits, energy security, help achieve climate targets and at the same time be safe for health and the environment. In turn, they “attacked” shale opponents with a narrative frame of “Missed Opportunity”, as they kept pushing for an outright ban on the technology. On the contrary, the anti-fracking coalition appealed to the “Disaster in the Making” narrative frame, reminding its opponents of the potential environmental and public health risks. The moderate coalition was using both pro- and anti-shale narrative arguments to state its case, but they all were wrapped in the “Need for Evidence” frame. These narrative arguments used to support them differ from those used in the UK subsystem because they specifically appeal to Scottish geographical and political contexts.

Table 18: Narrative arguments used by advocacy coalitions

<b>Narrative Argument Category</b>	<b>Count (n)</b>	<b>Precent (%)</b>
<b>Socio-Economic Risk</b>	80	6
<b>Socio-Economic Benefit</b>	299	22
<b>Environmental &amp; Public Health Risk</b>	195	15
<b>Environmental &amp; Public Health Safety</b>	108	8
<b>Climate &amp; Energy Security Risk</b>	169	13
<b>Climate &amp; Energy Security Benefit</b>	152	11
<b>Community Risk</b>	74	5
<b>Community Benefit</b>	50	4
<b>Constitutional/Democratic Risk</b>	170	13
<b>Constitutional/Democratic Strength</b>	40	3
<b>Total</b>	<b>1,337*</b>	

Note: Excludes statements with no argument (n=729)



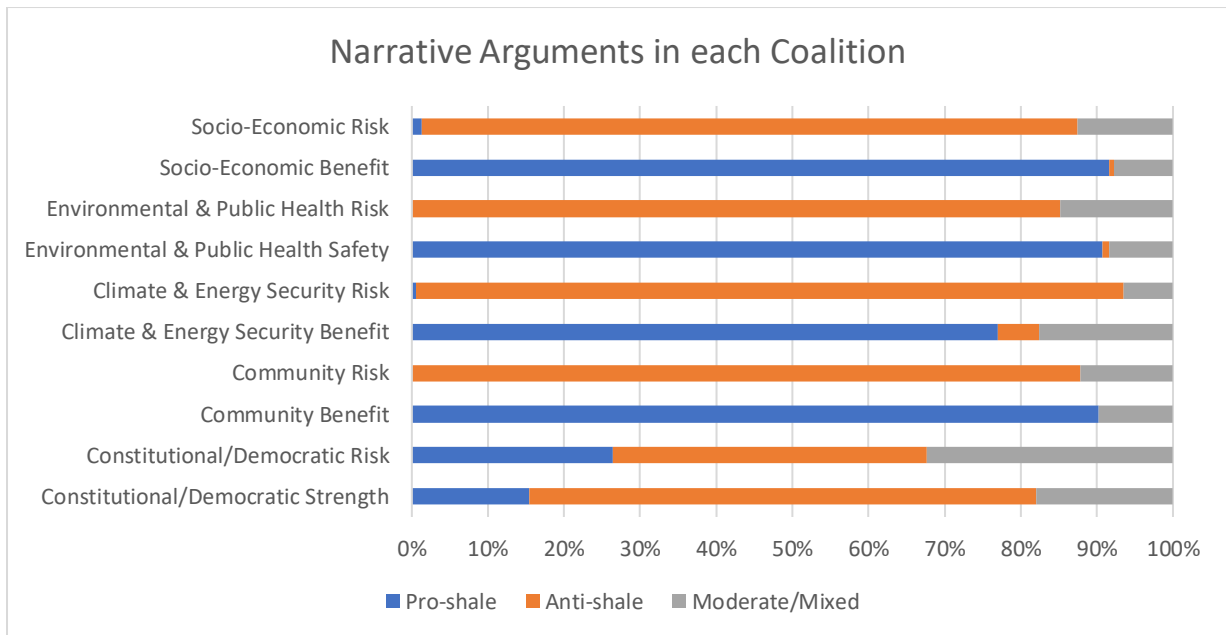


Figure 7: Categories of supportive and opposing narratives on fracking

Note: by frequency of occurrence (% of total amount of news statements), 2011-2019

Narrative arguments used by UOG advocacy coalitions in Scotland incorporate five broadly defined areas: socioeconomics, environmental and health factors, climate and energy security, community, and constitutional factors. The fifth narrative category, defined as the *constitutional and democratic frame*, is distinct to the Scottish subsystem. In Chapter 4, I have discussed the importance of the “territorial issue” in the Scottish political scene and party competition. The importance the territorial dimension, otherwise called the constitutional axis is so prominent that it transcends the ideological dimension of the traditional left-right politics. The *constitutional and democratic frame* is a direct reflection of that, hence the name. All these narrative arguments are discussed in greater detail in the following subsections.

### 5.4.3 Socioeconomics

The pro-exploration coalition primarily emphasises fracking’s contribution to *socio-economic* benefits or criticises opponents for their contribution to a ‘missed opportunity’. This frame has a Scottish element in relation to one key and highly salient issue: the vulnerability to closure of the Grangemouth Petrochemical Complex. Its owner, Ineos, expressed ambitions to “become the biggest player in the UK shale gas industry” (Daily Record & Sunday Mail, 2014a). By investing in shale energy development in Scotland, Grangemouth could propel Scotland “back into the premier league of energy” (The Scotsman, 2014c). In their view, the future of Grangemouth Refinery depends on the processing of

shale oil and gas (and it currently processes fuel imported from the US). This belief was backed by Scottish Conservatives, describing fracking as Scotland's best chance to achieve “economic independence” (Daily Record and Sunday Mail, 2015c). One of the reasons for that is the declining oil production in the North Sea, which generates the need for an alternative strategy to keep the economy growing.

On the other hand, shale opponents were concerned over resource availability and economic viability of extraction, both of which presented an uncertainty. Friends of the Earth, for instance, openly argued with Ineos over their statement regarding socio-economic benefits of fracking, claiming that it “just does not stand up to scrutiny” (The Scotsman, 2015e). More specifically, they have been questioning Ineos’s projections of Grangemouth’s gloomy future without the shale industry, trying to reassure the public that the Complex will survive without it. Doubts over the industry’s commercial viability in Scotland have been widely present in the media. Despite the “shale revolution” in the US, the geology in Scotland creates different conditions and challenges for the nascent sector. According to Friends of the Earth Scotland: “there isn't very much there and of that we may only get 1 per cent out” (The Scotsman, 2015e).

#### 5.4.4 Energy Security

*Energy security* is the second most used argument by shale supporters, again with reference to Scotland as a nation. The UK Government, Scottish Conservatives, energy companies and industries promoted UOG as the “North Sea all over again” (Aberdeen Press and Journal, 2013). This belief in “energy insecurity” is mirrored by the UK Oil and Gas Authority, which compared the North Sea industry to an “ageing patient’ that could face a ‘very grim’ future” (Aberdeen Press and Journal, 2015).

Further, the SNP MP Steward MacDonald voiced an “ethical” argument in favour of fracking: unconventional carbon reserves exploration could “fundamentally alter global security and energy balances” towards smaller scale and ethical producers (The Herald, 2015b). Scotland still needs fossil fuels as a baseload for energy mix, and it could benefit from developing an indigenous shale industry, instead of supporting “repressive” regimes, such as Qatar and Russia by supplying their energy (The Herald, 2015b).

On the other hand, anti-fracking actors depicted fracking as a threat to low-carbon energy transition and climate change. Environmental groups, in particular Friends of the Earth and WWF Scotland

often expressed concerns about a “dash for gas” (quoted in Aberdeen Press and Journal, 2012) at the cost of renewable energy.

Scotland is frequently being referred to as a “Saudi Arabia of Wind” in the media, on the basis that it is well placed for renewables. Therefore, to continue concentrating on fossil fuels and investing in the nascent shale industry is viewed by anti-fracking coalition members as a mistake. Dr Richard Dixon commented, in contrast with pro-shale actors’ promises of cleaner energy source, that “these claims that it will be clean, cheap and plentiful are all wrong” and that “the last thing we need is to go looking for more [fossil fuels]” (The Herald, 2013a).

#### 5.4.5 Community Factors

Shale proponents expressed confidence in Scotland’s regulatory capacity to govern fracking operations and eliminate potential risks they might pose, often countering public health concerns with an emphasis on *community benefits*. For example, in 2015, Ineos promised to give £2.5 billion to homeowners and communities in the adjacent area, or 6% of the revenues once it has established a shale gas business. Jim Ratcliffe went on to call it a “game changer” (The Herald, 2014). It also brings back the question of ethics, as he believed that “giving six per cent of revenues to those living above Britain's shale gas developments means the rewards will be fairly shared” (quoted in Herald, 2014).

On the other hand, *community risks* are strongly related to proposed development projects in highly populated areas in the Central Belt (which includes Glasgow and Edinburgh). These concerns are strongly linked to scepticism over socio-economic risks of fracking and public health issues. Proximity of proposed development projects to populated areas in the Central Belt fuelled protests from environmental and community groups, as well as homebuilding companies. A few local campaign groups emerged, including Loch Lomond Group, Concerned Communities of Falkirk, Canonbie and District Residents Association, and others, supported by larger environmental NGOs like Friends of the Earth Scotland.

These groups expressed a major distrust in energy developers, like Ineos and Dart energy. Referring to Ineos’s plans to do fracking test drilling, Bill Frew from Canonbie and District Residents Association made a statement that the firm, along with other oil and gas companies are “perfectly willing to exploit and trash our environment, and local communities” (Sunday Herald, 2015). Community campaigners were joined by some homebuilding companies, such as Cala and Persimmon, who have issued formal objections to proposed gas facilities in proximity to homes.

#### 5.4.6 Health and Environment

As in Bomberg's (2017) study, the Scottish anti-fracking coalition uses an overarching narrative of 'threat'. The most prominent belief amongst anti-shale actors is the belief that fracking poses a threat to the *environment and human health*. For example, for Friends of the Earth and WWF Scotland, fracking is "an environmental disaster in the making" (Sunday Herald, 2012). Shale opponents have used examples of incidents in the US to argue that fracking cannot possibly meet safety tests (Sunday Herald, 2016).

On the other hand, pro-exploration coalition's belief in *environmental and health safety* of fracking operations follows from Stephan's (2017) "social and environmental responsibility" narrative. It acts as a counter-narrative to opposition's calls to ban fracking on the grounds of environmental and public risks. Shale exploration proponents expressed confidence in Scotland's regulatory capacity to govern fracking operations and eliminate potential risks they might pose.

Ineos made promises of "safe, well-designed and managed shale gas drilling" (Daily Record and Sunday Mail, 2015d), while UKOOG defended safety of fracking operations against pro-environmental actors as "one of the most heavily regulated industries in the UK" (Daily Record and Sunday Mail, 2015d). Many environmentalists use the example of numerous accidents on fracking wells in the US, yet pro-shale actors in Scotland believe those issues are "down mainly to poor control" (Daily Record and Sunday Mail, 2015d).

#### 5.4.7 Constitutional and Democratic Frame

There was also a highly prominent *constitutional and democratic frame* which sometimes transcended all coalitions but was used to criticise a move to fracking with insufficient scrutiny. Although described as the 'bad governance' frame in Bomberg's (2015) study, it is not a visible frame in other ACF studies (Chailleux and Moyson, 2016; Heikkila and Weible, 2016; Ingold and Fischer, 2016; Montpetit et al., 2016; Nohrstedt and Oloffson, 2016; Tosun and Lang, 2016). In Bomberg's (2015) study, the 'bad governance' frame defines UOG development issue as a problem of democracy and accountability. This thesis expands on that frame. The analysis did record similar concerns in relation to the legitimacy of shale industry and faith in the democratic process, and identified visible constitutional "undertones" in them.

The *constitutional and democratic frame* manifested twofold: *i)* concerns with fairness of decision-making over shale exploration and the trustworthiness of institutions in Scotland; and *ii)*, concerns

with fairness of decision-making over shale exploration in Westminster in the context of Scotland's political powers over onshore oil and gas policy.

In total, 13% of narrative arguments reflected the idea that the policy process was not transparent and democratic enough. This makes *constitutional risk* the second most popular narrative argument used by advocacy coalitions after *climate change risk*. Statements highlighted insufficient political powers over energy policy in Scotland, as well as the lack of accountability and transparency in the political system. It was often invoked by coalition members when criticising energy companies, the UK Government, or even the Scottish Government of having vested interests in fracking and making decisions "behind closed doors".

For instance, the UK Government has been heavily criticised for its "gung-ho approach" to fracking (Aberdeen Press and Journal, 2014c), after it announced a large part of Britain's territory, including Scotland's central belt as exploration areas for onshore oil and gas exploration. Several Scottish politicians criticised this statement, pointing to the "complete failure to consult the Scottish Government" on the matter (The Herald, 2014). This frame has been widely used by the SNP in government: "whatever your view on the issue of UOG it is only right that these matters are devolved to the Scottish Parliament so that the decisions affecting the people of Scotland are made by the democratically elected Parliament of Scotland" (The Scotsman, 2015c).

## 5.5 Public Participation

### 5.5.1 Public Opinion and the Talking 'Fracking' Consultation

Although Media Content Analysis is useful for identifying key actors involved in the policy issue, the news articles are not a replacement for the public dialogue and consultations. It largely depends on researcher's interpretation to determine political climate based on these sources, but one key participant in hydraulic fracturing debates that is missing in this analysis is the public itself. The aim of this section is to fill the gap and provide a background for public participation, mainly focusing on the *Talking 'Fracking'* consultation.

Based on the existing data from public opinion polls, the Scottish public was overwhelmingly opposed to UOG exploration. A survey conducted by BMG for Herald, for instance, found that 54% of Scots supported a temporary moratorium on fracking, while only 19% opposed the policy (The Herald, 2016b). This survey also found that SNP and Labour voters tended to oppose fracking, while Conservatives backed it (The Herald, 2016). These results are consistent with the evidence presented in this analysis. Both Labour and Conservative parties in Scotland were vocal about their stances on

UOG, with Conservatives being avid supporters of shale exploration, and Labour standing in opposition. Although the SNP presented mixed or moderate statements in the media space, a within party split was apparent in the same year that the moratorium was announced. The party used badges with the term “Frack Off” alongside the official party logo as part of its electoral campaign in 2015 (The Herald, 2015a), and SMAUG was formed as an internal pressure group the very same year to persuade both the party leadership and the Scottish Government to impose an outright ban (The Herald, 2015). The BMG opinion poll thus reveals an additional pressure on the SNP and the SNP-led Government, to take an opposing stance to UOG exploration.

Moreover, the opinion poll by YouGov (2016) conducted in 2015 and 2016 demonstrated similar results, as shown in Table 19 below. Unlike the BMG poll, the YouGov poll did not focus on the moratorium. Instead, it asked respondents if Scotland should or should not start extracting shale gas. Based on the results, the overall majority was opposed to the idea, but that number declined from 59% in October 2015 to 49% as of August 2016. This corresponded to the increase in undecided responses, which number grew by 9% to a total of 27% as of August 2016. Support for shale extraction, however, remained stable over the study period, peaking at 24% as of August 2016. What both of these surveys confirm is that, in the year when the temporary moratorium was introduced and in the year prior to the indefinite moratorium on fracking was passed, the public exhibited mostly negative attitudes to fracking.

Table 19: YouGov Opinion Poll on Shale Gas Extraction in Scotland, 2015-16

	<b>AUGUST 2016</b>	<b>APRIL 2016</b>	<b>MARCH 2016</b>	<b>FEBRUARY 2016</b>	<b>OCTOBER 2015</b>
<b>SHOULD</b>	24%	21%	21%	22%	23%
<b>SHOULD NOT</b>	49%	55%	56%	55%	59%
<b>DON'T KNOW</b>	27%	24%	23%	23%	18%
<b>REFUSED</b>	0%	0%	0%	0%	0%

Adapted from: YouGov (2016)

In 2017, the Scottish Government organised a public consultation on UOG to foster the public engagement process in policymaking. This consultation contained ten open questions inviting views on a range of social, economic, and environmental issues, encompassing the general frames identified in this study. Substantive responses were submitted by 8,239 individuals and 186 organisations, which is exactly 14% of all consultation responses (Scottish Government, 2017). The largest fraction of organisational respondents were community councils and other community

groups (such as campaign groups), which comprised 33% of all the organisational respondents (Scottish Government, 2017). Others came from the third sector, or NGOs; private sector and industry bodies; public sector; a number of professional bodies, associations and trade unions; faith groups; and academic or research institutions.

Amongst organisations, the opposition to hydraulic fracturing was near unanimous. The exceptions included private sector actors, involving those in the food and drink sector, some public authorities, and a majority of academic and research institutions. These actors did not call for an outright ban on fracking but expressed strong reservations or serious concerns about the development. Only fewer than 5% of those responses (which accounts for just 1% of respondents overall) put forward supportive views on this issue (Scottish Government, 2017). They came from organisational respondents in specific sectors, mainly petrochemical industries, and related professional associations, business lobbies or trade organisations. Although BMG and YouGov polls revealed a bigger support to fracking in numbers, the opposition was still overwhelming. Therefore, it is safe to conclude that the anti-fracking stance dominated the Scottish UOG subsystem, as evidenced by the study results, opinion polls and the *Talking 'Fracking'* consultation.

The rest of this section will dissect the key findings from the consultation (based on substantive responses). Most narrative categories and arguments used by respondents correspond with those identified in this study, but these responses provide an in-depth view of how the public uses and interprets them. This analysis is useful to give study results more depth, reliability, and confidence.

### 5.5.2 Community Impacts

The predominant view among respondents was that UOG industry would have substantial negative impacts for communities in the long-term. The alternative responses repeatedly mentioned enhanced community prosperity as the result of increased investment in the area (Scottish Government, 2017). Most respondents, however, agreed that any benefits linked to the economic development would either be short-term, or completely outweighed by risks associated with health, community resilience, local amenity and quality of life in general (Scottish Government, 2017).

Members of the public, community councils, community groups and other third sector organisations were the primary groups to express concerns about health risks, which were central to their opposition to the prospective industry. These concerns were related to risks of drinking water contamination, exposure to air-borne toxins, dust and fumes released from the chemicals used during hydraulic fracturing operations (Scottish Government, 2017). Another important aspect was fear of

accidents at all development stages (construction, operation, waste disposal, and decommissioning) such as chemical spills, leaks etc. In addition, a consensus existed among respondents that the new development would lead to increased traffic that would create additional noise and light pollution in the local area. (Scottish Government, 2017).

Furthermore, respondents discussed a number of issues related to community resilience and cohesion, which are: *i)* character and nature of communities; *ii)* conflict; and *iii)*, trust and legitimacy (Scottish Government, 2017, p. 19). Hydraulic fracturing was believed to have a potential to disrupt the daily life of people and change the very way of life in affected communities.

First of all, there was a major concern over potential demographic change, that is how the population size and demography in adjacent areas would be affected by expected migration and fewer people moving to these areas. These changes could result in a breakup of social networks, a reduction in socio-economic diversity and, thus, reduced social capital within communities (Scottish Government, 2017). Respondents argued that the negative impacts of the industry would affect low-income people disproportionately, who tend to reside in more disadvantaged area (Scottish Government, 2017). However, there was a less vocal group of respondents affirming that the development could help support population retention in rural and disadvantaged areas (Scottish Government, 2017).

Secondly, participants were alarmed at the risk of increasing conflict and disagreement within communities between shale supporters and opponents in local communities, and “the winners and losers” of the development. One of the concerns was that the use of financial incentives for landowners would create divisions within communities. Respondents did acknowledge that UOG would also bring some benefits for the local economy in terms of job creation and local spending, but the dominant view was that these would be short-term, limited in scope and, again, would not be advantageous for everyone equally (Scottish Government, 2017). More specifically, respondents pointed out the “boom and bust” nature of the industry, posing potential difficulties in coping with the pressures of an incoming transient workforce and subsequent problems created by the loss of a local industry after the industry’s lifespan ends (Scottish Government, 2017).

Another key theme in the consultation responses was the lack of trust in and legitimacy of industrial operations, and onshore oil and gas policy in general. It was based on the belief that any attempts to introduce the shale industry into the communities without their explicit consent, or social licence, would break the trust between people and the government (Scottish Government, 2017). For this reason, a severe lack of trust in developers could be observed, as they were vocal advocates of hydraulic fracturing despite health and environmental concerns. To many respondents, this issue



represented a democratic deficit in policymaking (Scottish Government, 2017). These correspond with the constitutional and democratic frame observed in this study.

Furthermore, the consultation participants were provided with information about different types of schemes which could be established to both compensate and provide benefits to the affected communities in the event of an industry launch. For instance, the charter for community benefits, published by UK Onshore Oil and Gas was also discussed (Scottish Government, 2017, p. 20). This is in reference to the scheme whereby UOG operators pledge to giving communities one-off payments for each exploratory well site, together with ongoing payments of at least 1% of revenues during production. Most commonly, respondents were critical of such schemes.

The main reason why these initiatives received a great deal of criticism was due to their perceived inappropriateness, given the risks of the negative impacts of the industry. Many respondents viewed such schemes to be unnecessary, if shale industry development was, in fact, promising vast economic benefits (Scottish Government, 2017). Therefore, these schemes were perceived as almost a tacit acknowledgement of the industry's harmful effects.

Following from the previous points, community schemes could foster to divisions and inequality, as it would both create "winners and losers" (between those who benefit, and who does not), as well as major policy disagreements (Scottish Government, 2017). In this view, while it may be possible to provide compensation to local communities for the loss for relatively minor inconvenience, such as increased traffic and noise caused by UOG operations, energy companies cannot compensate for the health impacts, environmental damage, and disruption to the social capital (Scottish Government, 2017). An important issue to highlight is a trend among the public to view community benefit as a form of "bribery" or "sweeteners" (Scottish Government, 2017, p. 21). In other words, they were commonly seen as an attempt to win the local opposition and persuade residents to accept unpopular policy. On this note, it is important to expand more widely on the perception economic pros/cons of the shale industry as a whole.

### 5.5.3 Economic Impacts

Respondents agreed that the prospective development would result in at least a modest increase in jobs and would bring in economic benefits to the Scottish oil and gas and chemical manufacturing sectors (Scottish Government, 2017). From there, however, the responses were generally split between two groups: those, who believed that UOG potential for the economy was overstated or understated by the Scottish Government. The former group pointed out that any potential benefits

would be short-lived, and that other economic sectors – for instance, Renewable Energy, will bear negative consequences of financial loss, underfunding or reputational damage (Scottish Government, 2017). The alternative view, on the other hand was that the potential for positive impacts was enormous and the Scottish Government did not account for future price forecasts and job creation across the value chain in full (Scottish Government, 2017).

Job creation was traditionally the main argument for exploring shale resources. Those in favour highlighted that the Grangemouth complex would be the primary beneficiary of shale economic influx. They believed that the economic potential of the industry was understated and argued that the current evidence presented is inconsistent with forecasts by BGS (Scottish Government, 2017). Since the Scottish Government's report was published, shale oil and gas prices have risen, and thus future forecasts changed. This has impacted projected scenarios in the report, which may be more modest than they would be in today's economic context (Scottish Government, 2017). In addition, there was very little data in the report concerning benefits to supply chains. It was noted that job creation would occur not only within the petrochemical sectors, but also in smaller business sectors, supporting the industry (Scottish Government, 2017).

On the other hand, shale opponents were sceptical about grand economic and employment benefits and pointed out that any potential returns would be short-lived. Many of them believed that economic projections were overstated. Firstly, they argued that the report did not account for the fact that costs to other industrial sectors might be negatively impacted by UOG industry (Scottish Government, 2017). For instance, food and drink industry (whiskey production, agriculture, fishing), tourism and housing could suffer from negative consequences and reputational damage (Scottish Government, 2017, p. 25). It was often referred to as a threat to 'Brand Scotland' (Scottish Government, 2017, p. 25).

Moreover, there were concerns that the report did not give enough attention to health, environmental and social costs, as well as for public spending to develop and enforce robust regulatory regime to tackle these issues. In their view, these factors might outweigh any economic returns. The respondents have also pointed out that a lot of optimistic projections came about from the data on the US shale fields, which is not necessarily an adequate measure for Scotland given the drastic differences between the countries (Scottish Government, 2017). For instance, to reinforce the argument against the costly regulatory spending, it was emphasised that stricter regulatory regime in Scotland might result in higher industrial costs (and thus lesser benefit) than those in the US (Scottish Government, 2017). Scotland also has a very different demographic context, with a large population

residing in close proximity to potential development sites, as well as different biophysical characteristics, which should be taken into account.

In relation to job creation, though most respondents did identify it as one of the key benefits of the industry, shale opponents still found it questionable. They held the view that many of the jobs would be short-term, for instance jobs associated with construction and well pad development, while skilled job opportunities are relatively minor in numbers (Scottish Government, 2017, p. 27). Therefore, most local jobs arising from the development would likely be low-skill and temporary. Additional supply chain benefits, for example related to the technological manufacture, would be unlikely to play a big economic role in Scotland (Scottish Government, 2017, p. 27). The reason being that specialist equipment related to exploration and drilling would typically be purchased more cheaply from overseas suppliers (Scottish Government, 2017). Having a more accessible (i.e. cheaper to extract) onshore supply of oil and gas could cause further decline in the existing offshore industry.

Overall, the predominant view amongst respondents was that UOG was unlikely to provide impactful and stable local employment. Instead, they have repeatedly suggested that renewable energy and energy efficiency schemes have a better potential to provide greater benefit to the Scottish economy in terms of job creation and sustainable development (Scottish Government, 2017). Respondents who thought there was no role for UOG in Scotland's energy mix often set their comments within the context of Scotland's draft Energy Strategy and draft Climate Change Plan. The two main points made by this group were: *(i)* that the development of a new UOG industry in Scotland would jeopardise Scotland's efforts to meet its climate change commitments; and *(ii)*, that it was incompatible with the vision set out in the draft Energy Strategy.

#### 5.5.4 Climate Change and Energy Mix

There were two opposing camps on the climate change impacts of UOG: those who believed that it would have a negative impact, or that it would have a positive, or neutral/insignificant impact. However, there was a near unanimous agreement amongst respondents that Scotland should take climate change issues seriously, focus on reducing its greenhouse gas emissions, and make the transition to a low carbon economy. Therefore, the divisions amongst coalitions on the matter were not so much about reducing climate change is an important policy objective, or whether as a concept it stands up to scrutiny, but rather if shale industry represents an obstacle to achieve these set goals.

The predominant view was that industry development would lead to an increase of greenhouse gas emissions, and thus affect Scotland's ability to meetm nation's Climate Change targets to which it was

legally committed to. Many in this group described Climate Change as “the biggest issue of our time” (Scottish Government, 2017, p. 43) and emphasised the scientific consensus around it. In addition, respondents viewed Scotland almost as a role model, taking leadership for other countries in relation to Climate Change (Scottish Government, 2017). Investing in UOG, on the other hand, could potentially undermine this (again, loss of the ‘Brand Scotland’) and weaken Scotland’s commitment to reducing greenhouse gas emissions (Scottish Government, 2017).

By contrast, there were a range of alternative views that the new industry would have no impact, a negligible impact or a small positive impact on Scotland and the climate change, and hence on climate targets. Respondents who believed that often cited the following statement from the consultation paper: “an unconventional oil and gas sector in Scotland is likely to have a broadly neutral impact on global greenhouse emissions if it is tightly regulated” (Scottish Government, 2017, p. 45). This group of respondents has highlighted the scale of Scotland’s contribution to the Global Warming, which was not as significant in their view compared to other nations. Therefore, they didn’t regard Scotland’s approach in relation to meeting climate targets as significant at an international level.

Coming back to the regulatory aspect, respondents who supported potential development often mentioned switching away from the US shale gas supplies, where the environmental regulatory frameworks were perceived as weaker than in the UK. They emphasised the overall importance of using domestically produced gas rather than imported gas, bringing up a moral/ethical context. For instance, some respondents argued that “we should not expect other countries to do our dirty work for us or to take risks that we do not wish to take ourselves (Scottish Government, 2017, p. 46). And yet, the benefits of the US shale industry were also often brought up, namely the transitioning away from coal and oil to shale gas, which was good for reducing GHG emissions.

This group of respondents believed that UOG could be viewed as a valuable transition fuel while the country transitions to a low carbon economy, but the other group did not agree. The former group mainly consisted of actors from the oil and gas sector. However, there was no agreement and clarity with respect to how long this transition period should – or was likely to – last. The opposing camp, on the other hand, argued that even timewise that was not a feasible option, since fracking would not make a significant impact on meeting energy targets by the time more efficient and environmentally friendly technologies would be available and cheaper (Scottish Government, 2017). Moreover, the fact that the US had experienced a decrease in GHG emissions following the development of the shale gas industry was deemed irrelevant to Scotland, given the very different energy mix locally.

Irrespective of these inconsistencies, supportive responses still acknowledged that the long-term priority for Scotland was to reduce its reliance on fossil fuels. However, this group also emphasised a

strategic importance of having a reliable energy supply source and ensuring self-reliance during the energy transition period. They believed that UOG had a substantial role in guaranteeing Scotland energy security both short-term and medium-term (Scottish Government, 2017). They have also suggested that it was simply “unrealistic” to write off natural gas from Scotland’s energy mix for at least several decades due to a high demand for gas compared to electricity in peak wintertime (Scottish Government, 2017, p. 33).

In contrast, the opposing group highlighted the vastly different aspect of energy production and supply. Respondents in this group pointed to findings from the Scottish Government-commissioned economic impact assessment which indicated that shale oil and gas production would not fully begin until the year of 2026, with peak production not anticipated until around 2044 (Scottish Government, 2017). This is crucial due to Scotland’s targets to fully decarbonise country’s energy system by the year of 2050 – just six years after the peak production (Scottish Government, 2017).

Moreover, the report set out a few scenarios for UOG production and returns, and those were not met with optimism. Under the central scenario, the total production over industry’s lifetime was estimated to “a mere 5.5 years” worth of gas’ based on current gas consumption levels in Scotland (Scottish Government, 2017, p. 32). Again, respondents brought up the question of industry’s viability.

Moreover, respondents in this group also repeatedly voiced concerns about the possibility that any investment in a new UOG industry would divert investment from the development of low-carbon and renewable energy (Scottish Government, 2017). This could potentially create a risk of setting back Scotland’s renewable energy targets. However, the other group emphasised that this conviction that the government could only invest in either in renewables or in gas production was simply a “false dichotomy” (Scottish Government, 2017, p. 34). In view of shale supporters, Scotland should be able successfully maintain a diverse energy mix over time.

#### 5.5.5 Environmental impacts

At the time of the consultation, the Scottish Government did not commission EIA to specifically examine the potential environmental impacts of an UOG industry in Scotland yet. Therefore, a wide range of potential environmental impacts were not examined in the reports. Instead, they were more focused on the extent to which regulation was in place to control or mitigate key impact areas. The evidence on environmental impacts, however, was considered by the Independent Expert Scientific Panel. It must be noted that the lack of an EIA to support the consultation paper was highlighted by some respondents as a serious omission.

The vast majority of respondents agreed that there was a potential for significantly negative environmental impacts from the UOG development in Scotland. The predominant view among respondents was that the risks far outweighed any benefits that might accrue from the new industry. The key areas that were emphasised to be the most vulnerable to risks associated with the industrial development were drinking water, soil, air and climate change (Scottish Government, 2017). More specifically, respondents highlighted the potential accidental well, surface, and underground leaks of toxic fluids, including methane to be some of the primary concerns (Scottish Government, 2017). Contaminated water, seismic activity, earthquakes, and other impacts to geological structure of the earth were also discussed.

What is key is that many respondents did not trust current – or any future – regulatory framework to be able to monitor, control and mitigate these potential risks. They also questioned who would eventually bear the regulatory costs (referring to the taxpayer, and voiced concerns over the uncertainty of post-Brexit regulations (Scottish Government, 2017).

Moreover, a small number of respondents raised points in relation to decommissioning stages of the development. Again, there was a general scepticism amongst them that the current regulatory framework could be efficiently enforced or could ensure safe decommissioning. There were also concerns that drilling sites and adjacent areas would not return to the pre-development state and that environmental problems may continue growing in the future. Respondents pointed to the high cost of restoration, and many would not trust developers to take on the responsibility for the clean-up and cost bearing (Scottish Government, 2017). Rather, they thought, the financial liability could ultimately be borne by the taxpayer (Scottish Government, 2017).

There were two views offered by shale supporters. First, there were those who believed that the regulatory framework is robust, and that any potential negative environmental impacts can effectively be controlled and mitigated. They agreed that the regulatory framework, so long as companies adhered to it, would ensure decommissioning was undertaken safely (Scottish Government, 2017). Secondly, there were respondents who were sceptical about shale industry because of the insufficient evidence to support a full-scale development, by they were not opposed to unconventional oil and gas exploration in retrospect. They suggested that some exploratory drilling and limited pilots should be undertaken under the constant monitoring and assessment from the regulatory bodies (Scottish Government, 2017). This group believed that test development would help to address perceived gaps in the current evidence base on the environmental impacts and would navigate the future decision making on a policy issue (Scottish Government, 2017). It is

plausible to conclude that altogether, supportive respondents – be it strong or tentative supporters of the shale industry – sourced their confidence in the regulatory safety.

On the other hand, the source of opposing beliefs in many ways came from the distrust in developers and regulators, more specifically in their ability and interest to provide safe, just, and efficient solutions. Shale opponents referred to other international experiences with the industry. For instance, the opposing group often mentioned chemical spills and land and water pollution accidents in the US, or the image of “flammable tap water” from *Gasland* (Scottish Government, 2017, p. 39). This group of respondents tended to describe the consequences of shale industry as “catastrophic” or “devastating” (Scottish Government, 2017, p. 37), resorting to a very emotive language to push forward their cause.

In summary, the overwhelming majority of respondents to the Scottish Government consultation was opposed to shale development. Those respondents who were opposed to hydraulic fracturing in Scotland were primarily concerned with its potential negative impacts on communities, health, the environment, and climate. They were also sceptical about the current regulatory capacity to mitigate those impacts. With regards to the economic side of the debate, shale “sceptics” believed that any potential benefit was far outweighed by the risks.

On the contrary, shale “enthusiasts” highlighted benefits for the economy, communities, and climate targets - and to them, those outweighed any potential risks. They believed that any of such risks associated with UOG extraction were no greater than any other industrial risks. They have also argued that strengthening regulatory framework could mitigate any potential risks. But those were in the minority. The results of the *Talking “Fracking”* public consultation correspond with the results of this study, as both demonstrate the perseverance of anti-shale narrative arguments in the policy subsystem.

## 5.6 Drivers of Regulatory Change

### 5.6.1 External Events

The ACF theorises that external policy events, or exogenous shocks - namely changes in socioeconomic conditions, public opinion, the dominant coalition or overlapping subsystem, can drive policy change in several different ways. Those include redistribution of resources among coalitions, heightened saliency of the issue due to public and political attention, changes in beliefs and policy learning. Having examined the relevant external events in Scotland (and the UK) between 2011 and 2019, I would argue that the most influential external events were those impacting the

governing coalition, the overlapping (UK) subsystem and the public opinion in both. I am specifically referring to two major events: the *2011 Preese Hall Tremors* and the *2014 Proposal for Underground Access* by DECC. There were two other interlinked events that were as (if not more) impactful. I am referring to the constitutional changes that came after *the 2014 Scottish Independence Referendum* and the adoption of *the Scotland Act 2016*. The ACF would normally consider constitutional arrangements and legal structures as relatively stable parameters of the subsystems because they are not prone to drastic changes; in this case, however, they were also subject to major changes and are viewed as internal-external events.

In 2011, several fracking-induced earthquakes occurred in Lancashire. Overall, 58 tremors were linked to fluid injection during hydraulic fracturing at the Preese Hall well in 2011 (De Pater and Baisch, 2011). The largest one occurred on 1 April 2011 with a magnitude of 2.3 and was felt locally (British Geological Society, 2011). Cuadrilla, the company behind the exploration tests, admitted responsibility and suspended the drilling. This event resulted in a temporary fracking moratorium across the UK and a multitude of protests in England that have not faded to this day.

Even though the moratorium was lifted in 2012, the effects of these tremors were also felt in the Scottish UOG subsystem over the course of the fracking debates. It put fracking on the agenda of the media, politicians, and advocacy groups as a highly salient issue in Scotland (being part of the UK). It should be noted that all this happened right in the beginning of the first debate phase in Scotland, which means that the Preese Hall tremors set the tone for the whole discourse process, which, in a nutshell, was all about the question of risks and safety of fracking.

This event was especially significant for the anti-fracking coalition, because the very first call to ban fracking came directly as the result of this. The first group to call for a legal ban in Scotland were the Friends of the Earth, claiming that “the dangerous and disruptive extraction method of fossil fuels should be halted until further safeguards could be offered by the industry” (The Herald, 2011). Of course, there were other factors and events that shaped perceptions of unconventional oil and gas industry as a threat – the release of the movie *Gasland* (2010), or the Oklahoma earthquake in 2016 to name a few, but the Preese Hall tremors had the most direct impacts not only on the Scottish subsystem, the overlapping UK subsystem, and were the closest in geographical proximity.

All in all, the prospect of UOG development in Scotland had a very rough start as the result of the Preese Hall tremors, because in essence the whole policy process began from the temporary moratorium on fracking across the country. Not only did this start off the anti-fracking coalition’s campaign to ban fracking permanently, but also this meant that the burden of proof in a policy process now had to be on the pro-shale side, having to convince their opponents that fracking is



safe, which allowed anti-shale fracking to successfully exploit the “Disaster in the making” narrative from the beginning.

The second external event identified as relevant for the UOG policy process in Scotland was the DECC’s proposal for underground access for the extraction of gas, oil, or geothermal energy in 2014, which would apply to England, Wales, and Scotland in respect to petroleum. In a nutshell, the proposal was for the UK Government to legislate underground access to developers below 300 metres under private land without negotiating a right of access. Over 99% of all respondents to the public consultation opposed the proposal legislation, but despite that, the UK Government decided to carry on with the proposal and put it before the Parliament primary legislation for implementation (DECC, 2014). The official report by the DECC concluded that “the proposed policy remains the right approach to underground access” and that “no issues have been identified that would mean that our overall policy approach is not the best available solution” (DECC, 2014, p. 10). The UK Government stated that “all decisions on whether or not to grant planning and permitting consent for shale development in Scotland remain with local authorities” (BBC, 2014a), but regardless of that, Holyrood perceived it as a direct threat to Scotland’s autonomy.

The Scottish Government questioned the Westminster’s approach to hydraulic fracturing and stated that this proposal is “fundamentally an issue affecting land ownership rights” (Aberdeen Press and Journal, 2014c). As per Energy Minister’s statement, Scotland was choosing a different approach to UOG. Many anti-fracking actors were equally concerned with this development. For instance, the Green Party welcomed Energy Minister’s stance and made calls to block this proposal in Scotland (Aberdeen Press and Journal, 2014c). Now, it is clear that the DECC’s proposal created a heated reaction across the North border, but how exactly did it affect the subsystem dynamics and the subsequent policy change?

The significance of the DECC’s Proposal for Underground Access goes twofold: a) it had a direct effect on the moderate coalition’s policy core beliefs; and b) it impacted the Scottish Government’s decision to impose a temporary moratorium. The Constitutional Frame genuinely gained momentum after this event, as the first records of this type of argument appeared after the proposal was put through. Not only did the proposal solidify the moderate coalition’s views on hydraulic fracturing as a Westminster’s “pet policy”, but it also consolidated UOG as part of the independence debate in Scotland. In response to the proposal, the Energy Minister have directly said that “the issue should be taken at Holyrood rather than Westminster, and a Yes vote for independence in September's referendum would give Scotland the power to deal with the issue” (Aberdeen Press and Journal,

2014c). This also meant that, no matter the results of the Referendum, the UOG industry was now part of the devolution agenda.

In addition, the decision to introduce a temporary moratorium on fracking in January of 2015 can also be [partly] attributed to the DECC's proposal. Just as Dart Energy was expecting a decision on its application to start drilling bore holes at Letham Moss (Airth), the Scottish Government announced a temporary moratorium on both future and current planning applications. In his statement, the Energy Minister confirmed the government would: "undertake a full public consultation on unconventional oil and gas extraction; commission a full public health impact assessment; conduct further work into strengthen planning guidance; look at further tightening of environmental regulation" (Daily Record, 2015e). At the first glance, it might seem that these are two separate events, but the Energy Minister had directly linked them in his statement. Mr Ewing said: "We have put in place robust environmental regulation, tougher planning rules and successfully opposed the UK Government's plans to end Scottish householders' rights to object to drilling under their homes" (Daily Record, 2015e).

The SNP had backed a proposed moratorium on fracking in the UK, also in 2015, which was rejected by the majority of MPs in the House of Commons. The SNP energy spokesman at Westminster said that the party supported a moratorium "to ensure that no more licences for fracking are granted before full powers over licensing are transferred to the Scottish Parliament" (The Herald, 2015c). Based on this, it is fair to conclude that the DECC's proposal had been an impactful event on both policy core beliefs and policy development.

Finally, the Scottish Independence Referendum in 2014 was an event that had the biggest impact on the coalition dynamics, leading to significant constitutional changes that increased legislative powers and responsibilities of the Scottish Government (and thus, the moderate coalition). David Cameron, the UK Prime Minister at the time, had guaranteed Holyrood further powers if there was a "No" vote to independence (BBC, 2014a). Regardless of what the final vote would be, the Independence Referendum was going to transform the Scottish political environment in one way or another.

In the end, Scotland remained part of the United Kingdom, but that decision resulted in a devolution settlement - the Scotland Act 2016. This is an act that extended devolved powers to Scotland further, and energy sector was no exception. As previously discussed, UOG had become an integral part of the Independence question. It is worth mentioning again that, after the referendum, the only significant legal change in energy policy was in relation to onshore oil and gas licencing (Little, 2016). This, again, points to the heightened salience of the UOG question in the Scottish subsystem during the independence debates.

The adoption of Scotland Act in 2016 was arguably the most impactful event for the Scottish fracking subsystem. The Act transferred powers to Holyrood to legislate for the granting and regulation of onshore licences, determine the terms and conditions of licences, regulate the licensing process, including administration of existing onshore licences (Scotland Act 2016, s. 47 & 49). Holyrood was now fully in charge of the licencing regime for UOG, and the only reserved functions related to licensing were those on taxation type payments under them. One may say that Holyrood was at the centre of Scottish public life before already, hence there was a distinct UOG policy subsystem and significant powers over onshore oil and gas policy from the beginning. But, after the Scotland Act 2016 was adopted, the Scottish Government had gained even more substantial powers and resources to influence the policy process, and this is how the moderate coalition became dominant in the subsystem in terms of power and resources.

Finally, by its very nature, the Scotland Act 2016 can be viewed as both an external and internal event. The Act itself incorporates many policy areas that are external to the Scottish UOG subsystem. However, since it also deals with onshore oil and gas policy, it is also directly related to the policy sector under investigation – thus being proximate to the UOG policy process in Scotland. This overlap needs to be acknowledged and, for the purposes of this study, I decided to classify the adoption of the Scotland Act 2016 as both an external and an internal event.

#### 5.6.2 Negotiated agreement

As discussed in Chapter 2, the notion of “negotiated agreement” in the ACF refers to situations where competing coalitions came to a compromise with an observable change in policy beliefs and/or the status quo, which this case study found to be scarce. Absence of negotiated agreement, however, is as important as its presence since it indicates issue saliency and levels of conflict. I will argue in the subsection that the conflict level between advocacy coalition was high, whereas the level of negotiated agreement was low overall. Since three advocacy coalitions were identified in this study, consensus in this instance would mean an observable compromise between all of them (or however many were involved in specific negotiations). Not only was it never fully achieved, but on the contrary, the level of conflict between coalitions, though fluctuant, was heightened throughout the policy process.

First, it was evident from the UOG debates that there were several clear attempts to influence decisions and perceptions through both personal interactions and institutional means. Neither were successful in reaching a lasting compromise. One such case of direct talks did succeed in winning over a major pro-exploration actor, Ineos, to support the temporary moratorium, but that was short

lived. This is in reference to the meeting between the Scottish Government in the face of First Minister, and the CEO of Ineos, Jim Ratcliffe in April of 2015. The exact contents of this meeting are unknown, but the spokeswoman for the Scottish Government presented it as a regular “ministerial engagement” (The Herald, 2015d). As per Ratcliffe’s statement, “what [the Scottish Government] said to us is they’re not against fracking, but what they do need to do is get comfortable with whether they’re happy with the risks of fracking” (The Scotsman, 2015f). Even though Ineos had traditionally argued that hydraulic fracturing is safe and any delays in development were risky for the economy, it had [temporarily] altered its beliefs after the meeting in favour of the “evidence-based approach”. More specifically, the company now “understood the importance of consultation” (The Herald, 2015d). But it would be misleading to call this instance a successful case of a negotiated agreement.

The ministerial meeting with Ineos had led to an internal shock among both shale supporters and opponents, and especially for the anti-fracking coalition. They accused the Scottish Government and the SNP of misleading the public over its position on fracking. For example, former Labour MSP Lewis Macdonald questioned the future of the moratorium, saying that the government was “telling big companies that there’s nothing to worry about at the same time as telling protesters they’re on their side” (The Scotsman, 2015f). Scottish Tory energy spokesman expressed similar concerns, saying that “it’s utterly hypocritical of the SNP to appear to oppose fracking within local communities but bang the drum for it at senior level” (Daily Record and Sunday Mail, 2015f). This event was not the origin of the distrust in the policy process among the two opposing coalitions - as they had previously criticised the SNP for delaying consultations for the sake of elections, but this meeting had only exacerbated their distrust. Trust between policy actors is vital to enable productive discussion and is viewed as a main pathway to achieving negotiated agreement by the ACF, but in this instance the levels of trust were impacted negatively.

Secondly, institutional methods of negotiation were not any less competitive. For example, the Scottish Greens were the first to bring in the fracking debate into the Holyrood Parliament, calling for a ban in May of 2014, which was ultimately rejected by all other parties. In 2015, the Scottish Government introduced a moratorium on fracking, announced by the SNP Energy Minister. And yet just a year later, in June of 2016, the Labour Party tabled an amendment saying there “should” be a full ban [on fracking] as part of an environment debate (The Herald, 2016a). This motion was passed by 32 votes to 29, with the SNP abstaining (The Herald, 2016a). Even though that policy was not legally binding, it indicated a low consensus over the current policy. Not only did the vote ratio point at the high level of disagreement between different political parties, but the SNP’s decision to abstain from the vote also indicated the absence of a “hurting stalemate” in the face of that conflict.

Even after the indefinite moratorium on fracking was introduced in 2017, the agreement was still not reached. I would argue though that the level of trust between the anti-fracking coalition and the moderate coalition was somewhat elevated, unlike with the pro-shale coalition. Judicial power was involved once since the moratorium was introduced, which indicates a high level of disagreement between coalitions. This happened after the policy change had occurred. As previously discussed, some of the key pro-exploration actors - Ineos and Reach Coal Seam Gas - had challenged the Scottish Government in court for misuse of ministerial power and demanded compensation. On the other hand, Friends of the Earth Scotland intervened to argue in favour of the chosen policy. During the court process, they had officially stated that “the [policy] process to ban fracking was robust and fair” (Friends of the Earth, 2018). Thus, there was an acknowledgment and acceptance of the policy process [by anti-fracking actors] as lawful. On the other hand, the Scottish Government would continue to be criticised by both shale supporters and opponents for misleading statements on fracking, which just shows that no consensus had been reached in the end despite the victory of the anti-fracking narrative.

Finally, statements of agreement and disagreement (including personal public attacks) were recorded during the data collection, and the analysis showed that disputing statements were dominating the media. I should note though that I could not provide an accurate measurement of agreement and disagreement based on the media analysis alone, because newspapers do not always reflect on the direct communication between subsystem actors. Interviews and surveys would provide better tools to measure conflict, but I was still able to derive several important messages from the media analysis.

Out of all recorded statements that referenced specific actors, the vast majority (75%) were disagreements. This indicates two things: a) high levels of conflict in the policy subsystem; and b) the occurrence of devil shift, whereby opponents are vilified. These conclusions are confirmed by numerous statements where opponents verbally attacked each other in an exaggerated fashion. For example, the position of the Scottish Government’s position was labelled “erratic and nonsensical” by one Lib-Dem MSP (The Herald, 2018b), and a “damaging fiasco” by one Conservative MSP (The Herald, 2018). The occurrence of devil shift in the Scottish UOG subsystem was also confirmed in a similar study by Stephan (2020). It is assumed that in a situation of high negotiated agreement, personal public attacks would not occur, and statements of agreement would outnumber the rest, which was the opposite in this case study.

Of course, the data collected was limited by the boundaries of source material, i.e. the media. The media represents a platform where actors have spoken *about* each other, but not often *to* each

other, and it certainly does not show anyone the full picture. For those reasons, I did not attempt to measure the exact levels of agreement and disagreement, but there are enough indicators to suggest high conflict between coalitions. The prevalence of disputing statements, combined with the other evidence, suggests a low level of negotiated agreement in the subsystem.

What is also interesting is that the actor with whom others either agreed or disagreed the most was the Scottish Government. Of all disputing statements, 44% expressed disagreement with the Scottish Government, whereas 53% of agreeing statements were also addressed to the government. That was coming from both pro-exploration and anti-fracking coalitions. This may be simply because of the government's central and influential position in the subsystem as a policy advocate *and* a policy broker, and also a powerful veto player able to halt shale exploration regardless of Westminster's policies. Therefore, it is only expected that opposing coalitions would target the Scottish Government to impact the decision-making. But, perhaps for the same reasons, the Scottish Government did not reciprocate. The government rarely expressed any direct agreement or disagreement, but when it did, those disputing statements were mostly directed at the UK Government and not at Scotland-based actors.

Speaking from a theoretical standpoint, negotiated agreement could not be achieved in the Scottish UOG subsystem because most of criteria for compromise were not satisfied. First of all, it is argued that a "hurting statement", defined as a situation in which all parties find the continuation of the status quo unacceptable, was absent in the final stages of debate. There was a situation akin of the hurting statement during the evidence gathering and consultation processes, whereby a temporary moratorium on fracking was imposed. The future of UOG policy in Scotland was uncertain at that point, and thus all parties had a high incentive to advocate for a regulatory change: the pro-exploration coalition wanted that moratorium lifted, the anti-fracking coalition demanded a full legal ban, and the moderate coalition, represented by the ruling party and the government, was under pressure to announce a clear policy position. However, once the indefinite moratorium was backed by the majority of MSPs (91 to 28) in 2017, the stalemate dissolved.

This was a policy change supported by anti-fracking and moderate actors, but not a negotiated agreement between all parties, as no room for compromise was left for pro-exploration actors. After that, shale supporters sought legal action against the government, whilst shale opponents continued advocating for a full ban. But what changed was the incentive for negotiation. For the anti-fracking coalition, the status quo of the moratorium was preferable to reversing it entirely, since its ultimate goal – the absence of fracking in Scotland, was achieved. For the pro-shale coalition though,

reversing that decision was the only acceptable option. In the end, incentives for negotiations to take place are different for each coalition and thus the “hurting stalemate” is unlikely to reoccur.

Secondly, although all sides were represented in parliamentary debates and fracking was a salient issue for all major political parties in Scotland, the interdependency between these actors was actually quite low. The reason for that is due to the SNP MSPs occupying the vast majority of seats, and until 2016 that number was more than all other party seats combined. This guaranteed them a dominant position during negotiations and a central position in the subsystem. Holyrood as an entity held a veto power over Westminster’s decisions in the onshore oil and gas policy domain, but within the Parliament no formal veto powers were guaranteed on the issue.

Outside of the parliamentary walls, the Scottish Government did take leadership as a policy broker by undertaking two widescale consultations: one in 2016 - *Talking “Fracking”*, and the other one as part of the SEA in 2018. I would argue, however, that it is not a case of mediated negotiations. Public consultations are an excellent example of facilitated analytical discussions, as participants were asked to provide responses to existing (government-led) research on fracking, but they are not direct negotiations. There are several reasons for that. First, the Scottish Government did organise a series of roundtables for key stakeholder groups of the UOG policy, but those were aimed at presenting ideas about how to conduct a public consultation on fracking, and not the policy itself. Secondly, both consultations were done in a written form, meaning that respondents did not speak to each other directly. Instead, they mostly interacted with the Scottish Government. This means that, outside of the political arena, the only place where representatives of all three coalitions met was the court.

It can be concluded that few opportunities for mediated negotiations, coupled with low levels of trust between coalitions, were the main factors contributing to a low chance of negotiated agreement in the subsystem. However, these findings are not unusual for nascent subsystems. They are generally expected to have weaker coordination patterns across coalitions compared to mature subsystems. The Scottish UOG subsystem is still in its nascency, which means that cooperative and coordinating aspects of advocacy coalitions did not have enough time to extensively develop yet.

### 5.6.3 Policy-oriented Learning

Technical and scientific information, through analytical debates, drives policy-oriented learning within and across coalitions, and thus can greatly influence changes in policy and beliefs. There is ample evidence to suggest that scientists actively contributed to the UOG policy debates. Technical

information was mentioned by policy makers and other coalition members on multiple occasions. They openly commented on specific scientific outputs in the media, and there were also many identified instances of direct participation of scientists and research organisations in the Scottish UOG debates. In this section, I will focus on some of the most impactful occurrences of policy-oriented learning. The observable impact indicators of analytical debates include heightened saliency and attention to scientific and technical information, belief formation, changes in policy core beliefs and in policy. I will discuss key research outputs and one large-scale public consultation that distributed technical information that exerted the most significant influence on the analytical debates. These include:

- The Lloyds Bank Commercial Banking report, “Oil & Gas: Rising Fortunes 2”, 2013
- PwC report, “Shale oil: The next energy revolution”, 2013
- British Geological Survey (BGS) report, “The Carboniferous shales of the Midland Valley of Scotland: geology and resource estimation”, 2014
- Expert Scientific Panel on Unconventional Oil and Gas report, 2014
- A series of research projects commissioned by the Scottish Government, 2015
- Talking “Fracking”: a consultation on unconventional oil and gas in 2017, commissioned by the Scottish Government.

To start with, the year of 2013 was rich in the incoming technical information on UOG. The Scottish UOG subsystem was still in its early development and the first debate phase, whereas Westminster was not formally “all out for shale” yet. Fracking was still a relatively new phenomenon in both subsystems, and the demand for conclusive scientific evidence was increasing. Several important studies were produced that year, including the PwC report on shale oil as the “next energy revolution” (PwC, 2013) and the Lloyds Banking Group report on oil and gas in the UK, titled “*Oil & Gas: Rising Fortunes 2*” (Lloyds Banking Group, 2013). Both reports had received attention from Scottish actors in the media and stood out in terms of their impact on policy-oriented learning for similar reasons.

In a nutshell, Lloyds Banking Group and PwC were both criticised for making contradictory predictions about the shale industry potential. The Lloyds report was published shortly after the Institute for Fiscal studies forecasted a fall in oil and gas revenues by 17 percent in the following years (Scotsman, 2013a), but, in stark contrast, it predicted a significant growth in the sector across the UK and Scotland. The study concluded that more than 34,000 jobs would be created in the UK oil and gas sector over the next two years, and Scottish oil and gas firms would be the most likely to experience growth because they were more likely to embrace diversification, such as hydraulic



fracturing (Scotsman, 2013a). The Scottish Greens had immediately reacted to this by pointing at contradictory conclusions coming from these studies. A party spokesman said: “The conflicting predictions about the North Sea's volatile fossil fuel future highlight the need to focus on Scotland's undoubted clean energy potential” (Scotsman, 2013a).

The PwC report, while focusing on the global shale oil output, received similar criticisms. The study predicted that shale oil could push global oil prices down by up to 40%, which would boost the UK GDP by 5% (PwC, 2013). In turn, the Scottish oil industry could benefit from shale exploitation on its territory (PwC, 2013). But Friends of the Earth Scotland pointed at the uncertainty about recoverable reserves due to inconsistent estimates (The Herald, 2013b). Before these reports were released, UOG was mostly criticised for its potential environmental and public health risks, but this was the first time when its economic potential was put into question. All this demonstrates how coalition members use technical and scientific information to inform their beliefs and as narrative arguments.

As discussed in Chapter 2, policy-oriented learning is not just about organisational changes – it is about ideas. What is “learned” in the end by actors, advocacy coalitions, or even subsystems are knowledge about an issue and/or ways to achieve policy goals. But sometimes the first step to getting a deeper understanding of an issue is acknowledging that there is still a *lack* of proper understanding. These two reports are perfect illustrations of how scientific and technical information can stimulate analytical debate, inform coalitions’ beliefs, and be used as narrative arguments to state their position. These examples also demonstrate on what grounds the “Need for Evidence” narrative frame, mostly used by the moderate coalition later on, was formed.

The 2014 BGS report provides another example of how research generated analytical debates between advocacy coalitions. In a nutshell, the report concluded that shale reserves in Scotland were more “modest” than originally thought. Scotland's Midland Valley has shale gas resources of 80 tcf, which is lower than the north of England, but there are also about 6 billion barrels of shale oil, which is higher than England’s (BGS, 2014). This research was very significant for the Scottish UOG subsystem because it was a first full-scale study of Scotland’s shale reserves.

The BGS report had received a lot of attention and mixed reactions in the media. Andrew Aplin, Professor of Unconventional Petroleum at Durham University, said that the proportion of the recoverable reserve might be very low because of the regional geology, but the UK Onshore Oil Operators Group believed that those estimates were overly modest (The Herald, 2014a). The group added that they believed at least 10 per cent of the resource could be extracted, which would be enough to heat Scottish homes for 46 years (The Herald, 2014a). The WWF Scotland, similar to what Friends of the Earth Scotland were saying before, commented that these modest results are the sign

of the times, and that Scottish ministers should commit to leaving fossil fuels in the past (The Herald, 2014a). Once again, this example shows how coalition members engage in analytical debates and utilise specific technical information to present their case.

Shortly after the BGS study publication, the Scottish Government had released a report on UOG, prepared by the Independent Expert Scientific Panel, and it was the first study that directly impacted on regulatory changes. The goal of this study was to provide a strong evidence base relating to shale oil and gas, and a foundation for future policy in this area (Scottish Government, 2014). It discussed environmental and regulatory challenges associated with the potential deployment of hydraulic fracturing, and shale reserves in Scotland. The following points summarise some of the key conclusions of the Expert Scientific Panel (Scottish Government, 2014):

- There could be positive economic impacts from the UOG development, but the scale of the impact in Scotland may only become clear once development is underway.
- The impact of UOG extraction on the Scottish Government's commitment to reduce greenhouse gases is not definitive.
- The high population density of those parts of Scotland most likely to host significant UOG resources presents a challenge for any form of re-industrialisation.
- Public concerns around UOG development include concerns about water contamination, public health, seismicity, but also wider issues. Early consultation is vital to identify potential impacts on communities.

The Scottish Government welcomed the report as “an important contribution to the debate around the potential development of onshore unconventional hydrocarbons” and said that it would now set up a Working Group to consider the study findings (Daily Record, 2014b). The government also recognised that there are some major research gaps, for instance in the evidence relating to health impacts, which it called “anecdotal” (Daily Record, 2014b). The anti-fracking coalition was also quick to react to these new findings and used to them to refute pro-shale coalition’s predictions of a significant economic benefit. For example, Friends of the Earth Scotland stressed that the study analysis clearly showed that “even if all the environmental, health and regulatory issues could be overcome, there still would not be a US-style bonanza here, simply because the cost of extraction and the technical and geological challenges are too great” (The Scotsman, 2014d). All in all, this report was very influential in “feeding” belief systems of advocacy coalitions.

But not only did the Expert Scientific Panel study informed coalitions’ beliefs on fracking, it also *changed* them, which resulted in the first major policy development. Here’s what the Energy Minister, Paul Wheelhouse, declared in the ministerial statement:

*“In September 2013, the Scottish Government established an Independent Expert Scientific Panel on unconventional oil and gas; the Panel’s report, published in July 2014, highlighted a number of issues, which required further investigation prior to any policy decision being reached. Therefore, on 28 January 2015, the Scottish Government put in place a moratorium on unconventional oil and gas development in Scotland” (Scottish Government, 2019a).*

This was a clear instance of Scottish policy makers directly acknowledging the contribution of technical and scientific information to their policy decisions, which is a major indicator of policy-oriented learning. It should also be noted that, earlier in 2014, the SNP and other major parties voted against the shale gas moratorium proposed by the Scottish Greens. Therefore, the new vote in favour of a moratorium a year later indicates a major shift in beliefs amongst major subsystem actors, driven by policy-oriented learning.

The next regulatory development in onshore oil and gas – the indefinite moratorium of 2017 - followed the same route from research and consultation to policy change. The outputs I am referring to here are the Scottish Government reports (discussed in Chapter 4), published in 2016, and the *Talking “Fracking”* consultation on UOG (discussed in Section 5.5), published in 2017. Starting with reports, they were focused on the specific issues previously identified by the Expert Panel, covering public health, economy, seismicity, climate change and others. The KPMG (2016) study provided estimates for the UOG industry’s [potential] contribution to the Scottish economy, which could be 0.3% of the GDP in the High scenario. KPMG commented that this number is “not a large contribution to the Scottish economy” (KPMG, 2016). At the same time, the UKCCC (2016) study highlighted that “implications for greenhouse gas emissions of Scottish UOG exploitation are subject to considerable uncertainties”. The public health report, conducted by Health Protection Scotland, went further by directly suggesting “adopting a precautionary approach” based on the evidence reviewed on UOG hazards and potential health implications. The HPS report was particularly influential, as the Scottish Government made a direct reference to it in its ministerial statement on UOG:

*“Health Impact Assessment ... highlighted an insufficiency of epidemiological evidence on health impacts and that a precautionary approach to unconventional oil and gas is warranted” (Scottish Government, 2019).*

In turn, the 2017 public consultation invited views on the presented evidence of the potential impacts of UOG in Scotland, and on its future. In this instance, the Scottish Government took on a role of a policy broker to facilitate analytical debates on the issue. Most (86%) of the responses to this consultation overwhelmingly opposed to fracking. Consequently, the Scottish Government

attributed its decision to veto out hydraulic fracturing in Scotland to the results of the consultation.

The energy minister said the following in the ministerial statement:

*“In response to the publication of the consultation responses, I confirmed to this chamber that, having considered the suite of evidence, including expert reports and consultation responses, Scottish Ministers’ preferred policy was not to support unconventional oil and gas development in Scotland” (Scottish Government, 2019a).*

This example reveals not only a belief change in the moderate coalition, but also policy-oriented learning at the subsystem level. First, regulatory changes go in line with the government’s deep core beliefs in the precautionary principle and the priority of knowledge, but the shift occurred at the policy core level – going from “uncertainty” to “no support”. At the subsystem level though, the public consultation was an important platform for analytical debate among stakeholders, including the public, and the results demonstrated learning from existing scientific and technical information on the subject. From this and other cases, it becomes clear that the influence of scientific evidence on the Scottish UOG subsystem over time was considerable.

All in all, there is enough evidence to suggest that, alongside external events, policy-oriented learning was a key driver of policy change in the Scottish UOG subsystem. The “success” of cognitive/technical learning can be explained by two main factors. Based on ACF theory, the main pre-requisites for learning to occur are the following: a) for all coalitions to “have sufficient technical resources to be able to criticize the other’s causal model and data” (Sabatier, 1998, p.155), and b) for political negotiations to be mediated by a professional forum (Jenkins-Smith and Sabatier, 1993). Even though the level of disagreement in the Scottish UOG subsystem was high, the Scottish Government successfully acted as an instrumental link between coalitions by facilitating analytical debates between diverse groups of stakeholders and the public, which was vital for policy learning occur. But what’s as important is that all coalitions had equal access to scientific information, which was sufficient to set those debates in motion. The Scottish Government played a role of both a policy broker by distributing scientific information and providing a platform for debates, and a policy advocate that was subject to cognitive and technical learning and moved forward the policy change. I, therefore, conclude that the Scottish UOG subsystem provided a fruitful soil for policy-oriented learning to occur.

## 5.7 Solving the Puzzle

This analysis started out by identifying four key phases in the Scottish shale debates: i) the *Formative phase* (2011-2013); ii) the *Limbo phase* (2014-2015); iii) the *Pre-moratorium phase* (2016-2017); and iv) the *Post-moratorium period* (2018-2019).

From the debate analysis, several important phenomena were established. First, it was the central role of the Scottish Government and the devolution process in the UOG policy development that acted as a policy broker that distributed scientific information and organised consultations, but also as a policy advocate with a distinct system of beliefs. Secondly, a common use of scientific evidence on the issue by members of all coalitions, which signalled a presence of a technical policy learning. Third, high levels of disagreement between coalitions were apparent, which, in turn, were the first indicator of a low negotiated agreement and the subsystem. Finally, the prominence of anti-shale narrative arguments in the media were also apparent, and secondary data sources on public opinion and consultations supported the conclusion that shale industry lacked popular support in Scotland. These findings provided a good first look at the Scottish UOG policy subsystem.

Next, I focused on the analysis of the policy subsystem, coalition beliefs and narrative arguments. Not only did this analysis reinforce the initial findings, but the empirical results also revealed several other important conclusions. More specifically, there were three distinct characteristics to the Scottish UOG subsystem that discerned it from the UK nationwide subsystem.

First, it was the presence of the moderate advocacy coalition that held a distinct belief system from either pro-shale or anti-fracking groups. The Scottish Government, together with the ruling party, were its central actors. Secondly, it was the prominent role of the Scottish Government in the subsystem that was reinforced by the dominance of Scotland-based actors. The Scottish subsystem is decentralised, meaning that a low degree of territorial centralisation and high ministerial autonomy over decision-making are present. Scotland follows a combination of FPTP and PR electoral systems, and that PR element would usually imply that a high degree of consensus is needed for a policy change. Despite that, the SNP occupied over 50% of seats in the Scottish Parliament until 2016, and is still close to that number, making it the dominant voice in the Scottish Parliament. Also, unlike the UK Government, the Scottish Government upheld to the moderate stance on fracking. This further solidifies the role of the moderate coalition in the subsystem and the ability of the Scottish Government to “veto” the UK Government on issues like fracking.

Finally, it was the widespread use of the *Constitutional and Democratic frame* by actors from all three coalitions. While other frames and narrative arguments could be compared to those identified in other ACF studies (e.g. Cairney et al., 2016; Cairney et al., 2015; Heikkila and Weible, 2016), the

*Constitutional and Democratic frame* was unique to Scotland because of the constitutional factor and a narrative in reference to devolution and independence debates. The constitutional structure in Scotland was defined by the devolution process, meaning that Scotland has a reserved powers model of legislation. Although energy policy is largely reserved to the UK, many aspects are executively devolved, which is why Holyrood is able to execute powers functions in a reserved area. This explains the prominence of the *Constitutional and Democratic frame* that was largely focused on constitutional and independence issues. These findings advance, moreover, the understanding of a subsystem “nestedness” in the context of Scotland by explaining the central role of Scotland-based actors and a distinct belief system.

Moving forward, this study also identified and analysed drivers of regulatory change. The current evidence suggests low levels of negotiated agreement between advocacy coalitions, which is why the issue of UOG remained polarising even after the policy change (i.e. the indefinite moratorium) had occurred. Those regulatory changes were pushed by external subsystem events that impacted both the Scottish UOG subsystem and the UK nationwide subsystem. The Scotland Act 2016 in particular was influential, as it altered the constitutional structure in Scotland and delegated Holyrood powers over the onshore oil and gas licencing regime. Another important factor was the influx of technical and scientific information that informed actors’ beliefs and resulted in policy-learning. Table 20 below provides a summary of key events and documents.

Table 20: Drivers of UOG Policy Change in Scotland

Year	Event	Impact on Policy	Driver
2011	Preese Hall Tremors	<ul style="list-style-type: none"> <li>- UK-wide moratorium on fracking (until 2012)</li> <li>- Informing policy-core beliefs</li> <li>- First calls to ban fracking</li> </ul>	External Event
2014	<i>Proposal for Underground Access</i> by DECC	<ul style="list-style-type: none"> <li>- Informing policy-core beliefs</li> <li>- Fracking became part of the Scottish Independence campaign</li> <li>- Impacted the decision over a temporary moratorium on fracking</li> </ul>	External Event
2014	Publication of the <i>Expert Scientific Panel on Unconventional Oil and Gas</i> report	<ul style="list-style-type: none"> <li>- <u>Temporary moratorium on fracking</u> (2015)</li> </ul>	Policy Learning
2014	Scottish Referendum for Independence	<ul style="list-style-type: none"> <li>- Resulted in the adoption of the Scotland Act 2016</li> </ul>	External Event
2015	Publication of the Scottish Government commissioned reports on UOG	<ul style="list-style-type: none"> <li>- Impacted the decision over the indefinite moratorium on fracking</li> </ul>	Policy Learning
2016	Scotland Act 2016	<ul style="list-style-type: none"> <li>- Delegation of powers over licensing of onshore oil and gas operations to Holyrood</li> </ul>	External and Internal Event
2017	Publication of the <i>Talking "Fracking"</i> consultation results	<ul style="list-style-type: none"> <li>- Indefinite moratorium on fracking (2017)</li> </ul>	Policy Learning

So, how and why did the Scottish Government impose an effective ban on UOG extraction in the face of Westminster's "all out for shale" commitments? The short legal answer would be that the Scottish Government was able to do it through devolved powers over the planning and licencing regimes for onshore oil and gas. The short socio-political answer would be that shale industry lacked popular support in Scotland, and thus politicians were not willing to go against the public opinion. But that is not enough to fully answer the question. After all, the authority over policymaking cannot predict a specific outcome, and neither can the public opinion, as there are many examples of unpopular measures that were successfully passed. One such example is the decision of the UK Government to go forward with DECC's proposal for underground access despite the overwhelming opposition from the public. The ACF answer seeks to provide a much more nuanced perspective on this puzzle.

In short, the Scottish Government's decision to impose a moratorium on fracking can be explained by a combination of interrelated factors identified in the analysis. First, it is the central role and the position of power of the Scottish Government itself in the policy subsystem as a policy broker and a

policy advocate. Besides its authoritative role, what matters here is the system of beliefs that the Scottish Government, and by extension the moderate coalition, was informed and motivated by. Its belief system was rooted in the precautionary principle, the priority of scientific knowledge and democratic pragmatism, which made the Scottish Government cautious of the fact that hydraulic fracturing was lacking in scientific certainty and social acceptance. More than that, the Scottish Government and the SNP were concerned with the “all out for shale” agenda of the UK Government that they perceived as another threat to Scotland’s autonomy and democracy. Therefore, the central role of the moderate coalition is the first reason *how* the change was able to happen, and the nature of its belief system is the first reason *why*.

Moreover, the media analysis showed that the anti-fracking narrative was prominent in the debates – both by frequency of usage and in the policy outcome. Even though anti-shale actors sought to achieve a full legal ban on fracking rather than a moratorium, the end result still represented their ultimate goal: the absence of fracking in Scotland. Therefore, it can be concluded that the anti-fracking coalition was still successful in influencing the Scottish Government, as it acknowledged the industry’s potential risks. Environmental and public health risks, as well as concerns for climate change obligations outweighed any potential socio-economic benefits in the face of scientific uncertainty.

The Constitutional Frame was another influential type of narrative that transcended the conflict over shale oil and gas into the broader ideological dispute over the Scottish devolution and democracy. Because Holyrood opposed Westminster’s “all out for shale” approach that it thought was being forced on Scotland, it demanded more powers over onshore oil and gas policy that would eventually allow the Scottish Government to safeguard the moratorium. These narrative arguments are good indicators of actors’ belief systems, and therefore really show the reasoning behind the fracking moratorium.

The final policy outcome was heavily driven by the strengthening of the Scottish devolution, and a combination of external events and policy-oriented learning from technical information. I distinguished three major sources of policy change: overlapping external events in the UK subsystem, especially tremors in Preese Hall in 2011 and DECC’s proposal for unrestricted underground access of shale resources in 2014; constitutional changes in Scotland after the 2014 Independence Referendum with the adoption of the Scotland Act 2016; and policy-learning that occurred after a number of research studies on UOG and the results of the public consultation on fracking were published.



Their impact manifests threefold: events in the UK subsystem showed the Scottish Government reasons *why* fracking can be risky both physically (i.e. risky for the environment and the public), and politically; the constitutional changes delegated powers over onshore oil and gas licencing regime to Holyrood, which altered the rules of the “game” and coalition resources - it shows *how* the Scottish Government was able to impose a fracking moratorium; and finally, the results from research studies and the public consultation solidified the Scottish Government’s beliefs in that there were significant research gaps in this area and an evident lack of social licence for the shale industry, and this is *why* Scotland’s approach was so different from the UK.

# CHAPTER 6

## Conclusion

### 6.1 Chapter Introduction

In light of Westminster's "all out for shale" approach to hydraulic fracturing, Scotland's decision to outlaw onshore shale oil and gas exploitation was puzzling. That is, until the level of analysis shifts to the devolved subsystem, which in this thesis allows the researcher to dive deeper into the Scottish UOG policy process within its geographical and political boundaries. The goal of this study was to explain just that: *how* and *why* did Holyrood decide and was able to deliver this policy outcome. I have set out to thoroughly examine the policy process and understand the main drivers of regulatory change in onshore oil and gas policy in Scotland, and to establish the extent to which the country had an analytically separate policy process.

This concluding chapter intends to draw out the key outcomes of this thesis for wider theoretical debates and in relation to the specific political context of Scotland. Additionally, it discusses the limitations of the ACF, as well as the conclusions reached, and makes further research recommendations to address these gaps.

The Chapter starts by presenting the main results of the analysis of onshore oil and gas policy development in Scotland (Section 6.2). It highlights the evidence for the existence of a nested and analytically separate UOG policy subsystem in Scotland. It also discusses how subsystem nestedness enabled policy learning and regulatory changes to occur despite its nascency.

Next, this Chapter proceeds with discussing the findings by answering each of the research questions in detail (Section 6.3). It provides an overview of the Scottish UOG policy subsystem structure, its distinct characteristics, advocacy coalitions and types of actors that partake in them, belief systems and narrative arguments that shaped shale policy debates, and, finally, major drivers of policy change. Finally, Section 6.4 concludes, providing a detailed discussion of empirical and conceptual contributions of this study and identifies several avenues for further research (Section 6.4).

## 6.2 Key Findings

This thesis provided an extensive analysis of onshore oil and gas policy development in Scotland through the theoretical lenses of the ACF. It incorporated systematic quantitative and qualitative methods for data collection and analysis and, as the result, the key findings and contributions of this study can be categorised into two groups – empirical and conceptual.

First of all, this study empirically supports the existence of a nested and analytically separate UOG policy subsystem in Scotland. There were several core subsystem characteristics that supported this conclusion. First, it was the presence of the moderate advocacy coalition with a distinct belief system. The same was not discovered in the UK by other ACF studies (Ingold et al., 2015; Cairney et al., 2016; Cairney et al., 2015).

Secondly, there is strong evidence that points to the central role of the Scottish Government in the subsystem that was reinforced by the prominence of Scotland-based actors, including (but not exclusive to) political parties, local councils, and Scottish branches of prominent environmental NGOs. The Scottish UOG subsystem was conditioned by the devolved constitutional structure, whereby Holyrood held significant powers over the onshore oil and gas planning regime and was later delegated powers over the licencing regime as well. This structure also means that lobbying functions were now “devolved” to a regional level, which explains the prominence of Scotland-based actors.

This study found the widespread use of the *constitutional and democratic frame* by actors from all three coalitions, which set the Scottish subsystem apart from the UK-wide subsystem. This finding fits into the *constitutional axis* of party-political compass (discussed in Chapter 4), which transcends the traditional left-right party competition and ideological dimension (Henderson et al., 2020). *Constitutional and democratic frame*, on the other hand, transcended all three advocacy coalitions beyond traditional pro-shale or anti-fracking narratives. It was used to criticise Westminster’s “gung-ho” approach to fracking in the context of Scotland’s political powers over onshore oil and gas policy, as well as the trustworthiness of local Scottish institutions. *Constitutional and democratic frame* (as identified in this study) provides a solid illustration of the territorial dimension of Scottish politics.

As for the drivers of regulatory change, this study found that a combination of external events and policy learning was the driving force behind the Scottish Government’s decision to introduce a temporary moratorium in 2015, and later an indefinite moratorium in 2017. The first event, Preese Hall tremors, immediately alerted the then-forming anti-fracking coalition in Scotland and resulted in

a temporary moratorium on fracking UK-wide. The DECC's proposal, on the other hand, had a direct impact on the Scottish Government's decision to introduce a temporary moratorium on fracking in Scotland. The events from overlapping subsystems were always expected to be significant for nested subsystems like Scotland.

But it was the 2014 Independence Referendum and the resulting Scotland Act 2016 that had fundamentally changed the institutional rules under which the UOG subsystem operated. Holyrood was granted more responsibilities over onshore oil and gas policy, which meant that the Scottish Government, and by extension the moderate coalition, obtained significantly more powers over the decision-making. This has led to important changes in the governing coalition in terms of its power and resources to govern onshore oil and gas.

This thesis also identified a significant limitation of the ACF as a conceptual framework, which defines constitutional and legal structures as *relatively stable parameters*. This thesis examined devolution and constitutional provisions as relatively dynamic factors and classified them as internal-external events conditioning the Scottish UOG subsystem and driving policy change. All in all, the distinct subsystem structure and belief systems, the prominence of Scotland-based actors, dynamic constitutional parameters and the use of unique narrative arguments all provided solid evidence for the development of an analytically separate UOG policy process in the country.

Furthermore, this thesis found that the Scottish Government played a role of both a policy broker by distributing scientific information and a policy actor that was subject to cognitive and technical learning from it. There were multiple acknowledgments by Scottish policy makers of a direct contribution of technical and scientific information to their policy decisions. This indicates policy-oriented learning from the Scottish Government, which resulted in the indefinite moratorium on fracking.

This study demonstrates that policy-oriented learning occurred despite the evidence of low levels of negotiated agreement between coalitions. The nascent subsystem was formed in Scotland to sufficiently enable policy learning and policy change to occur. This happened as the result of subsystem nestedness. Among other factors identified in this study, the Scottish UOG subsystem was conditioned by policy processes, external events and policy learning that occurred in the UK-wide subsystem. One of the more prominent examples of this are tremors in *Preese Hall* in 2011. After this event, the first calls for a fracking ban occurred in Scotland, as the Scottish UOG policy subsystem was in its inception. It also led to a UK-wide ban on fracking. Another important example is DECC's policy on unrestricted underground access of shale resources in 2014 that influenced the

Scottish Government to instigate a temporary moratorium on fracking. This demonstrates how nestedness solidifies policy subsystem development at different stages of its formation.

So far, I have discussed how the study results in general, but what is still left to do is to answer each of the four research questions I posed at the beginning of the thesis. Before I proceed with discussing this thesis' contributions to wider debates, I will be answering each of the research questions in detail.

### 6.3 Answering Research Questions

#### 6.2.1 Question One: on the Policy Subsystem

The first question that I posed in my research was: what makes the Scottish UOG subsystem distinctive? More specifically, what defining characteristics did the Scottish subsystem have and/or was conditioned by? This, of course, is a very broad question that would be impossible to answer in just one subsection, or show in just one graph; instead, I discussed this theme of distinctiveness all throughout the chapter. This question permeates every element of the analysis, and I believe that it is the key to both solving the "Scottish puzzle" and answering the remaining set of research questions.

First of all, it is clear from the analysis that Scotland, being nested within the wider UK national subsystem, had its own debate process on fracking, separated by geographical and political boundaries. While shale resource exploration has been on Westminster's radar for longer than a decade (since 2007), for Scotland it only became a concern in 2011, when a licence for exploration in Scotland was granted to Greenpark Energy. The debate process tells a comprehensive story of the coalition formation and development, and, of course, policy change, while the remainder of analysis provides in-depth examination of subsystem characteristics and sources of regulatory changes.

There were four major stages in the Scottish UOG debates: the *Formative phase* between 2011 and 2013, whereby the policy subsystem formed; the *Limbo phase* between 2014 and 2015, marked by the emergence of the moderate coalition and its "evidence-based" approach; the *Pre-moratorium period* between 2016 and 2017 with solidifying coalitions and intense analytical debates, all of which led to the indefinite moratorium on fracking; and finally, the *Post-moratorium period* between 2017 and 2019, whereby the Scottish Government announced its "no support" position to fracking and was challenged by energy companies in court regarding the final policy. Although there were some analytical and political overlaps with the UK national UOG subsystem due to close geographical

proximity and multiple levels of governance, the Scottish debate process did, to a large extent, occur within its regional boundaries – both geographically and politically.

Overall, I have identified three major markers of distinctiveness of the Scottish UOG subsystem in my analysis: the presence and the central position of the moderate coalition, consisting of governmental actors, the ruling party, and public bodies in the subsystem; the defining role of the Scottish Government as policy broker, advocate and veto player, and the prominence of other Scotland-based actors in the subsystem; and finally, distinct and Scotland-focused narrative arguments used to frame the issue of hydraulic fracturing, especially the *Constitutional and democratic frame*, which is part of the territorial dimension of Scottish politics.

The underlining reason for all these attributes is, of course, the Scottish devolution of policymaking, which I discussed in detail in Chapter 4. First, it transferred legislative and executive competencies (including energy policy) to the subnational elected government in Holyrood – hence the central role of the Scottish Government in the subsystem. But more than that, with the devolution of policymaking also came devolution of lobbying functions of policy actors to Scottish branches and the proliferation of new Scottish groups of influence, which is evident by a high level of participation of Scotland-based organisations and political parties in the UOG policy process and their preoccupation with regional (Scottish) issues. In that regard, the UOG policy development in Scotland is both conditioned by the devolution process and is a good case study of how devolution works in practice. With Scottish devolution strengthened and more powers over licencing of onshore oil and gas operations transferred to Holyrood, this is *how* Scotland can effectively ban fracking on its territory.

### 6.2.2 Question Two: on Actors and Beliefs

The second research question I posed in this thesis was: who were the main actors in the Scottish UOG subsystem, and what were their goals and beliefs? The answer to this question helps unpack the previous one further, because it dives deeper into the analysis of the Scottish UOG subsystem and its distinct characteristics. This question is important for the *why* part of the puzzle, because answering it not only explains the reasoning behind regulatory changes, but also shows *by whom* they were achieved.

Overall, I have identified three advocacy coalitions in the Scottish UOG subsystem: pro-exploration, anti-fracking, and moderate. Each of them had a distinct three-tiered system of beliefs. The pro-exploration coalition emphasised the vast economic potential of the shale industry and the

importance of energy independence for Scotland considering declining North Sea resources. It also believed that, under robust environmental and safety regulations, hydraulic fracturing would be a clean and safe technology to deploy in Scotland. The goal of pro-shale actors was, of course, an “all out for shale” scenario for Scotland. In a nutshell, the pro-exploration coalition was all about production, not precaution.

On the other hand, the anti-fracking coalition was motivated by the precautionary principle and concerns for the environment. It believed that fracking would be (and is) an environmental and public health hazard that would also undermine Scotland’s climate change commitments. Contrary to the pro-exploration coalition, the goal of the anti-fracking coalition was a full legal ban on onshore shale resource exploitation in Scotland. Most ACF studies on Western democracies usually identify only two opposing coalitions, but in this study, the third, moderate coalition was apparent.

At the first glance, the moderate coalition shared similar beliefs with the anti-fracking coalition, but they differed in their secondary beliefs and their overall focus. Although both were motivated by the precautionary principle in their approach to fracking and recognised its potential, their ways split from there. The moderate coalition acknowledged its potential merits, as well as the possibility that this technology might be safe in the future. In other words, the anti-shale coalition’s precautionary approach was rooted in fear of the definitive threat, while the moderate coalition’s precautionary approach was rooted in scientific uncertainty surrounding shale industry.

Furthermore, although both anti-fracking and moderate coalitions were concerned that the UOG policy development was not democratic and transparent enough, these concerns had different reasons. The moderate coalition believed that shale industry was being forced on Scotland by Westminster, and more specifically its “all out for shale” attitude. Because of that, it demanded more powers and responsibilities over energy policy for Holyrood. Anti-shale actors, on the other hand, believed that the industry would be undemocratic by its very nature due to the lack of popular support. The moderate coalition also acknowledged the absence of social licence to allow fracking, but it never stated that the industry itself is “undemocratic”.

There were several key stakeholder groups within these advocacy coalitions trying to influence onshore oil and gas policy in Scotland. Those were mostly purposive and material groups, and governmental and partisan actors. Outside of the parliament walls, the most active and influential groups in the subsystem were energy companies and professional associations, such as Ineos, Reach Coal Seam Gas, and UK Oil & Gas, as well as (primarily environmental) NGOs and non-profit groups, such as the Friends of the Earth Scotland, Concerned Communities of Falkirk and Frack Off Scotland. As expected, energy companies were major advocates for the shale industry, having a material

interest in resource exploitation. NGOs, on the other hand, mostly stood in opposition as purposive groups focusing on environmental advocacy. While many, although not all of the private sector actors were headquartered outside of Scotland (e.g. Reach Coal Seam Gas is based in Aberdeen, but Ineos has its headquarters in London), NGOs were either locally founded (e.g. Concerned Communities of Falkirk), or were operating through Scottish branches. These findings reinforce the message that the Scottish UOG subsystem was largely influenced by Scotland-based actors even outside of the parliament.

Within the parliament's walls, all major political parties were involved in the fracking debates. Shale oil and gas was as salient an issue in the Parliament as it was outside. From the very beginning, the Scottish Conservatives and the Scottish Greens were on opposite sides of the debate. While the former party was consistently supportive of fracking, the latter was overwhelmingly opposed to it from the start. The Scottish Labour and the Scottish LibDems, on the other hand, had more "mixed" positions and internal divisions during first phases of debate, but eventually joined the fracking opposition. Lastly, the ruling party – the SNP, for the most part occupied a "moderate" position on the issue and appealed to unresolved scientific uncertainties. However, internal divisions within the SNP were also apparent, which resulted in the formation of SMAUG, the anti-fracking pressure group that aimed to persuade party leadership to oppose shale oil and gas exploitation. All this shows that the UOG policy development in Scotland was a highly salient and dynamic process.

Finally, the Scottish Government was one of the central actors, if not *the central* actor in the Scottish UOG subsystem both in terms of its media presence and its level of influence. It played a vital role as a policy advocate, policy broker and a veto player. It promoted a cautious stance to fracking. It was focused on the "evidence-based" approach to onshore oil and gas by gathering scientific evidence on shale reserves in Scotland and industry's potential impacts and conducting large scale public consultations. It was disseminating scientific information and facilitating debates and policy learning within and between advocacy coalitions and, of course, the public. By doing this, the Scottish Government was fulfilling its role as a policy broker.

Because of its central role in the subsystem as a decision-maker and a policy broker, it was the primary target for other advocacy groups trying to influence policy outcome. The Scottish Government also represented a more "moderate" stance on fracking, which made it a primary target to criticism from all sides of the issue spectrum. This demonstrates that fracking in Scotland was more than just a struggle between supporters and opponents – it was a separate ecosystem of evolving coalitions, beliefs, and strategies.



Because of its central role in the subsystem, the Scottish Government's "no support" position was the decisive element on the scales against fracking. Its beliefs, however, did not shift from moderate, as the final decision was very much motivated by the lack of scientific certainty, lack of social licence, and the precautionary principle – all part of the deep core level of its belief system. Therefore, the central role of the moderate coalition, represented mainly by the Scottish Government and the SNP, and the nature of its belief system is the first reason *why* the change happened the way it did.

### 6.2.3 Question Three: on Narratives

The third research question asked what specific arguments advocacy coalitions used to support their case, and which narratives were the most prominent in the Scottish UOG subsystem? As I have already discussed, one of the defining characteristics of the Scottish subsystem were distinct and Scotland-focused arguments used to frame the issue of hydraulic fracturing. I have distinguished the *Constitutional and democratic frame* as a narrative argument that set Scotland apart from the UK-wide subsystem, but other narrative arguments too were primarily focused on local Scottish and community issues, rather than on the UK-wide agenda.

The narrative arguments on fracking used by advocacy coalitions fell into five categories: socioeconomics, environmental and public, climate and energy security, community, and constitutional. All these factors were viewed from risk and benefit/safety perspectives. For example, while the pro-exploration coalition argued that shale industry would bring immense economic benefits and job opportunities to Scotland, the anti-fracking coalition argued from the position of socio-economic risk due to contradictory predictions over the amount of recoverable resources. These narrative arguments were extensively used by advocacy coalitions and members of the public both in the media and in response to the *Talking "Fracking"* public consultation.

All these narrative arguments were mostly used in the Scottish context. For the socio-economic category, the main dispute was between pro-exploration coalition's promises of prosperity for Scotland and anti-fracking coalition's appeal to uncertainties over shale reserves in Scotland. Pro-shale actors claimed that fracking would benefit Scotland financially and create job opportunities, specifically in the Grangemouth refinery. The Grangemouth refinery was under threat of closure back in 2013 and became a big talking point for the pro-exploration coalition due to its significant contribution to country's GDP, that is until Scotland started importing shale gas from the US. Moreover, pro-shale actors used community argument to convince the public that local communities (in industrial areas) would receive 6% of revenues from shale exploitation.

On the contrary, the anti-fracking coalition emphasised modest predictions of extractable resources in Scotland by major studies. What it was certain about, however, was that shale industry would have negative impacts on climate change and would thus impede on meeting Scotland's climate change commitments. Once again, the focus here was specifically on Scotland's commitments, and not at the UK level. Pro-shale actors too argued on Scotland's behalf, stating that shale oil and gas could be clean "transition fuels" that would benefit country's energy transition and energy security. They also argued that Scotland has robust environmental regulations in place to ensure that the industry is safe for the environment and public health. Shale opponents once again appealed to the many risks associated with fracking, and while those are general and not location-specific, these actors often referred to specific regions in Scotland with high proximity and population density to prospective industrial locations.

However, as I have already established, the Scottish UOG debates was not just a dispute between shale supporters and opponents. The presence of the moderate coalition was one indicator of this, and the other was the *constitutional and democratic frame*. Unlike other narrative arguments, it has transcended the political issue of shale resource exploitation to the question of democracy and constitutional powers over onshore oil and gas policy. While other categories were mostly used by one of the three coalition, the constitutional risk argument was important for all three of them: 26% of times it was used in pro-shale arguments, 41% in anti-shale, and 32% in moderate. Although this distribution is not even, it does not have an overwhelming majority like the the others.

Why did Scotland impose a moratorium on fracking based on the study of narratives alone? First, because of the prominence of both anti-fracking and constitutional narrative arguments that opposed Westminster's "all out for shale" approach; and secondly, because environmental and public health risks, as well as concerns for climate change obligations outweighed the prospective economic and community benefits in the face of many research gaps over the impacts of shale resource exploitation in Scotland.

#### 6.2.4 Question Four: on Policy Change

Finally, what were the main drivers of changes in UOG policy in Scotland? The UOG policy process is dynamic by its nature and was conditioned by a combination of events, legal changes, and research developments. And, due to the nature of Scottish devolution and subsystem nestedness, some of these spilled over from the UK-wide UOG subsystem.

The decision to impose an indefinite moratorium was heavily driven by three major factors: overlapping external events in the UK subsystem, namely tremors in *Preese Hall* in 2011 and a perceived threat from DECC's policy on unrestricted underground access of shale resources in 2014; constitutional changes in Scotland after *the 2014 Independence Referendum* and the adoption of *the Scotland Act 2016*; and policy-oriented learning that occurred after a number of studies on UOG and the results of the public consultation on fracking were published by the Scottish Government. In Section 5.6, I have discussed several more important events and publications, but these seven drivers were, in my opinion, the most impactful in terms of direct changes in policy and legislation, whereas others shaped policy beliefs.

To start with, the 2011 Preese Hall Tremors put fracking on the agenda as a highly salient issue in Scotland, but in the UK it led to a national moratorium on fracking, albeit temporary. Even though the first ever fracking moratorium was introduced by Westminster in a top-down manner, rather than coming from Holyrood, it still was the first time that shale exploitation was effectively banned in Scotland. It also set the tone for the initial UOG debates because it provided fracking "sceptics" with a real-life example as for *why* hydraulic fracturing can be risky if allowed.

Next, the *Proposal for Underground Access* by DECC gave the Scottish Government another reason *why* fracking can be risky, only this time not for any physical threats, but rather political. The proposal was for the UK Government to legislate underground access to oil and gas developers below 300 metres under private land without negotiating a right of access. This is the moment when UOG became a prominent matter of the Scottish devolution. The Scottish Government perceived this proposal as a direct threat to its ministerial autonomy, which is why fracking became part of the independence agenda immediately after. In 2015, the Scottish Government introduced a temporary moratorium on fracking, which was influenced by this perceived threat from Westminster. This shows how much of an influence overlapping events from the UK-wide subsystem had on the Scottish UOG subsystem.

But these were not the only influential factors. The 2014 Independence Referendum has led to fundamental constitutional changes that in turn significantly impacted on legal powers of the Scottish Government over onshore oil and gas policy. The Scotland Act 2016, defined as an internal-external event, transferred powers to Holyrood to legislate for the granting and regulation of onshore licences, determine the terms and conditions of those licences, and regulate the actual licensing process. In essence, the Scottish Government now had significantly more legal resources and abilities to "ban" fracking. What is interesting here is that constitutional arrangements are normally viewed as stable parameters in ACF theory and are not expected to change drastically, but

that was not the case for the Scottish UOG subsystem. The adoption of the Scotland Act 2016 was arguably the most impactful factor for the UOG policy process in Scotland because it changed the rules of the “game” in major ways and that demonstrates *how* the Scottish Government was able to outlaw fracking in Scotland.

Last but not least, policy-oriented learning that resulted from exchange of the scientific information and analytical debates had a direct impact on the Scottish Government’s decision to introduce both moratoriums. While external and internal events influenced the course of the policy process, the Government commissioned reports and the *Talking “Fracking”* public consultation had sealed the deal when it came to the final decision over its “no support” position. In this context, the Scottish Government acted as both a policy broker and a policy advocate. It distributed scientific information to coalition actors and the public, provided a platform for debates, and at the same time was subject to cognitive and technical learning that induced policy change. Despite low levels of negotiated agreement and, in contrast, high levels of disagreement between advocacy coalitions, the impact of policy-oriented learning on the Scottish UOG subsystem was fundamental.

One of the main reasons might be – once again – the central role of the Scottish Government (and by extension the moderate coalition) in the subsystem that had most powers and resources over the decision-making process. Another reason is the prominence of the anti-fracking narrative that was solidified by research and consultation results and influenced the decision of the Scottish Government.

But in the event that the moderate coalition was unconvinced by those results and narratives, the policy process would likely go in another direction. One primary example of this is the UK’s policy approach. Coming back to the DECC’s proposal, the UK Government also commissioned a public consultation on the proposed legislation, whereby 99% of all responses came back negative. Despite that, the UK Government went forward with it. But in the case of the Scottish Government, the results from the public consultation and study reports solidified its beliefs in that there were significant research gaps on the impacts of shale industry and the apparent lack of social licence for such developments, and this explains why the policy outcome was drastically different from the UK.

## 6.4 Contributions and Further Research

To start with, this thesis challenged the assumption over the ability of nascent subsystems to achieve sufficient policy learning to enable policy change. Nascent subsystems within the ACF are viewed as policy subsystems that emerged less than ten years ago and thus have not attained the necessary longevity for policy learning to occur. This thesis examined the extent to which the UOG policy subsystem developed in Scotland to lead to policy change and whether policy learning influenced policy outputs.

As discussed in Section 6.2, the devolved political structure in Scotland and subsystem nestedness are important reasons why policy learning could occur in a nascent UOG subsystem. The Scottish UOG subsystem formed from policy processes and events that spilled over from the overlapping UK subsystem, which equipped advocacy coalitions with a range of technical and scientific information to work with and use it as a base for evidence gathering.

In turn, this thesis advances the concept of *nestedness* by examining the nested subsystem in Scotland and how it impacts policy change. It demonstrated that, as the result of subsystem nestedness, a combination of external events, legal changes and policy learning opportunities spilled over from the UK-wide policy subsystem, which all had a visible impact on shale policy discourse and policymaking. Further research of nested subsystems within and outside the UK is recommended to enhance the understanding of their characteristics how they affect policy development and analytical learning.

Secondly, this thesis sheds a light on conceptual limitations of the ACF that views constitutional and legal structures as relatively stable parameters. It demonstrated that in the devolved political system of Scotland, constitutional structure is a relatively dynamic, rather than a static parameter. It offers a unique case study of examining a policy development process that is shaped by fundamental constitutional and legal changes leading to significant redistribution of resources and changes in coalition dynamics over time. More ACF applications should examine policy subsystems shaped by constitutional changes or changes in legal structures to better understand their impact on policy development. It is recommended that the ACF revisits its conceptualisation of *relatively stable parameters* and *dynamic events* to accommodate such case studies.

Furthermore, this study acknowledged the limitations of the ACF in defining indicators for *negotiated agreement* and *policy learning*. Both concepts are defined as core drivers of policy change within the ACF. Despite that, they remain underapplied in public policy studies. The ACF as a framework offers extensive definitions and justifications for each concept, but it does not provide

clear indicators of identifying or measuring them in the analysis. This thesis offers several practical ways of identifying instances and their observable outcomes of *negotiated agreement* and *policy learning* based on their key descriptors and the availability of the research data collected; it also offers an extensive discussion of a policy learning typology. It is recommended that public policy scholars continue developing and testing indicators and pathways for identifying drivers of policy change.

Finally, this study contributes to empirical knowledge by investigating the policy development surrounding one of the most controversial issues – shale oil and gas regulatory change in Scotland, in the time period marked by a very significant historic event: the 2014 Scottish Independence Referendum. It encompasses eight years of onshore oil and gas policy development in Scotland, between 2011 and 2019, capturing not only the Independence Referendum itself and its outcomes, but also the independence debates (involving shale oil and gas). It is recommended that further research on onshore oil and gas policy development in Scotland incorporates a variety of research methods, such as survey or interviews, to better understand the ways in which actors and advocacy coalitions cooperate and compete with each other and share information.

To add to that, the role of scientists and research organisations could be investigated further. In this study, they appeared mostly in the role of technical information providers, but little is known about them as policy advocates, or brokers. Traditionally, this group of actors is viewed as having a designated role of information providers that participate in policy subsystems to provide their skills and technical resources but is otherwise indifferent to the policy debates (Melstner, 1976). There is enough evidence to suggest, however, that researchers were active in the Scottish UOG debates not only as information providers, but also as policy advocates and policy brokers.

For instance, Professor A. Watterson, of the Occupational and Environmental Health Research Group at the University of Stirling, took a very bold anti-fracking stance and communicated his opinion to the media on multiple occasions, including his responses to existing scientific publications on the issue. He also presented evidence against the industry at the Permanent People’s Tribunal in 2018, stating that “the arguments of the UK industry about the alleged safety of fracking do not stand up to scrutiny” (Sunday Herald, 2018a). This is a clear example of advocacy. There were also instances when research and consultancy groups took on a role of policy brokers. One such example was “*The Fracking Question*” conference organised by Pinsent Masons in 2013. This conference accommodated a variety of speakers, including government representatives from London and Edinburgh, industry figures and academic experts (The Herald, 2013a). However, the implications of

these actors and events on the UOG policy subsystem and policy-oriented learning could not be identified in the analysis.

In sum, this thesis suggests several avenues of future research:

- Clearly distinguishing the scope of policy subsystems in studies and enhancing the understanding of nested subsystems in particular. Further ACF applications should focus on multi-level subsystems more frequently and distinguish their type and scope to enhance subsystem conceptualisation. More research on nested subsystems is also recommended to better conceptualise their parameters and boundaries.
- Improving conceptualisation of *relatively stable parameters* and *dynamic events*. It is recommended that the ACF scholars revisit these concepts and examine more case studies that are shaped by changes in constitutional and legal structures to better understand their effect on coalition dynamics, distribution of resources and policy change.
- Further research on onshore oil and gas policy development in Scotland using diverse research methods. It is recommended that future ACF applications pay attention the role of scientists and research organisations in more detail, as well any other potential groups of actors that they might identify.

## 6.5 Concluding Thoughts

For now, the formalised politics of “no support” seems to be the final destination in the UOG policy process in Scotland. At the very least, it is the endpoint in this research. The government’s decision did not satisfy anti-fracking groups completely, as they continued to question why this policy fell short of a full legal ban. However, any changes in the opposite direction are highly unlikely in the near future, given the strong opposition to fracking amongst advocacy groups and the public. On top of that, Westminster had also abandoned the “all out for shale” enterprise, at least for now. In November 2019, the UK Government imposed a moratorium on all fracking operations in England and said it will end its support for the process (The Herald, 2019a). This decision came following the recurring seismic activity at the drilling sites and resulting public protests. The Government commented that this policy will continue to take effect “unless compelling new evidence is provided” (The Herald, 2019a). The current lack of support for UOG from the UK Government means that the Scottish moratorium is now even less likely to be legally challenged and is further solidified in the eyes of the public.

This marks the end of the key decision-making phases in UOG policy for the time being. But I would like to end this thesis on a philosophical note: the beauty of studying public policy is that there will always be more to discover, because policy *is* a process that develops dynamically. This process is ever evolving - and thus never ending.



# APPENDIX I

## Scotland Fracking Media Code Guidelines

3 July 2017

### Entering data into the code form:

1. **Coder Initials:** Enter your initials into code form.
2. **Article ID:** Create Article ID using the following format: Paper initial followed by number of an article. *Example: H-1 is Herald Article #1.*
3. **Article Title:** Enter article title as it appears in the article header.
4. **Article Source:** Enter article source (e.g. *Herald*), codes provided separately.
5. **Article Author:** Enter article author(s) as the name appears in article.
6. **Article Date:** Enter the date of the article (DD-MM-YYYY)
7. **Actor Name:** Type the actor's full name. If no name is specified, write "Not Provided."
8. **Actor Org Name:** Select the Actor Org name (each coded manually in "Specific Actor Org Index" sheet).
9. **Generic Actor Org Code:** Use the pull-down menu to select the org code. Make a note in column AD if you think a new code is needed for a particular instance. The generic actor org codes are populated from the shared Generic Actor Org Index sheet and are listed below.

1. Scottish Government
2. UK Government
3. Local Government
4. NGOs and Non-profit Groups
5. Energy Companies & Private Sector
6. Media
7. Political Parties
8. Research and Consultancy
9. Trade Unions
10. Public Bodies and Government Institutions
11. Other

10. **Fracking Stance, Columns L-O:** Enter a 1 or a 0 for each column corresponding to the position on fracking of the actor being coded. There are four position codes: “pro-fracking”, “anti-fracking”, “neutral/mixed fracking” and “not specified”. **Note: an actor’s position must be obvious in the article through either a quote or a description of the action of the actor. If a position is not obvious, code it as ‘not specified.’** See below for more details on criteria.

“Pro-fracking” (1=yes; 0=no) would be coded if the actor is quoted in the article as being supportive of fracking (or oil and gas development that uses fracking), or if the article describes the actor’s actions in a way that makes it clear that the actor is in support of fracking.

- For example, a “supportive” stance can come in the form of stating that fracking (or oil and gas development that uses fracking) is good or beneficial for the economy, jobs, energy security (or something else), or that the actor wants to see fracking developed or expanded, or it may be a quote that argues against someone who opposes fracking.
- Supportive “actions” can be identified if the article’s author talks about an actor engaging in drilling or fracking wells, investing in fracking businesses, collaborating with the oil and gas industry on researching fracking technologies, exploring a shale formation, taking actions that represent support (e.g. testifying in a public hearing that fracking is beneficial, safe, or “good” in some way), etc.
- Supportive actions or quotes can also be in relation to technology that is part of the overall oil and gas development process (not just fracking alone). *“Gas Company A was excited about the new water treatment technology being used at their wells” = pro-fracking;*
- Supportive stances could also be related to the regulatory framework. For example, if a government official is proposing policy related to encouraging fracking. However, coders will be careful not to infer a supportive position if no other information is provided about the stance of the actor or if the policy itself is mixed, for example if regulations are being adopted that would curb fracking.

“Anti-fracking” (1=yes; 0=no) would be coded if the actor is quoted in the article as being in opposition to fracking (or oil and gas development that uses fracking), or if

the article describes the actor's actions in a way that makes it clear that the actor is opposed.

- For example, an "opposing" quote could come in the form of stating that fracking is harmful to the environment, the public, the economy, climate change, etc., or that the actor wants to see fracking, or oil and gas development that uses fracking, banned, stopped, or suspended.
- Opposing "actions" would be identified if the article's author talks about an actor as trying to stop or limit fracking (e.g. by protesting at a public event, by testifying before Congress on problems related to fracking), or talks about the actor collaborating with other organizations that are taking these actions.

The "neutral/mixed" fracking receives an affirmative code (1=yes; 0=no) if the actor is reported with a mixed pro/anti position on fracking or if the actor is reported as being neutral on hydraulic fracturing.

- For example, if a policymaker is described or quoted as taking a position that "more evidence is needed about the costs and benefits before passing a law" then it is clear that the policymaker has a neutral position (rather than "no position").
- Alternatively, if someone is quoted in one part of the article as saying "I'm concerned about the risks of fracking" and then later quoted as saying "but the economic benefits to our state are high", then this person takes a mixed position.

The "not specified" code is coded affirmative (1= yes; 0=no) when the actor is not described as being pro, anti, or neutral/mixed on the issue.

- For example, this may be the case if the article talks about an actor in a story about hydraulic fracturing, but there is no clear indication that the position or action the actor takes is related to hydraulic fracturing or oil and gas development.

**11. Agreement/Disagreement, Columns P and Q:** Enter agreement or disagreement using Actor Org IDs generated previously. Leave blank if no observations of agree/disagree are present.

**Actor Disagree/ Actor Agree:** For each Actor Org ID, if there is a specific reference to another organization to whom they directly agree or disagree, code accordingly by listing the Actor Org ID of the Actor Disagree or Actor Agree. Most likely this will be in the same sentence and must be in the same article. Separate list of actors under Actor Disagree / Actor Agree by semi-colons.

- Agreement/disagreement is identified through the words or actions that are attributed to the actors in the article. For instance, Actor A might say: “We oppose the actions of Org A” (disagreement evidenced by words) or Actor A might be described as “protesting the actions of the Org A” (also disagreement). Look for clear indications through words and actions of agreement or disagreement. *Don’t infer agreement or disagreement if you do not see the actions or words described in the article* (even if you know that they are in agreement or disagreement from another article or another context).
- Keep a fairly broad interpretation of agreement/disagreement. If the actors are both within the fracking/shale gas context, code even if it’s not exactly about fracking
- *Do not assume reciprocity of agreement. If Org A agrees with Org B, that does not necessarily mean that Org B is in agreement with Org A.*
- *Ex. “Org A has entered into an agreement [agreed to collaborate, entered a partnership, etc] with Org B...” = Org A agrees with Org B AND Org B agrees with Org A*
- *“Org A supports [or agrees with] Org B” = Org A agrees with Org B NOT Org B agrees with Org A*

An actor might disagree and agree with another one in the same article. For instance, the article might describe a conflictive relationship in the past that all of a sudden turn cooperative. In that case, code all the information. In other words, enter the name of the actor with whom the main actor is disagreeing, and then re-enter the former in the column for agreement.

12. **Risks and Benefits, Columns R-AB:** Enter the codes for columns R-AB, see additional notes below for the criteria.

**Social Risk:** The actor states a position suggesting that he/she believes fracking to have social risks. For instance, statements about how fracking displaces communities, fragments social capital, disrupts traditional ways of life, perceived as a public nuisance, etc. are considered examples of social risk. Code with a value of 1 if such statements exist, 0 otherwise. Issues regarding dust and transportation are likely to be social risks.

**Economic Risk:** The actor states a position suggesting that he/she believes fracking to have economic risks. For instance, statements about how fracking disrupts regional economies, negatively affects tourism, favors concentration of income in favor of corporations, or sucks up public resources that could be used in other sectors (health, education, etc.) are considered examples of economic risk. Code with a value of 1 if such statements exist, 0 otherwise.

**Environmental/Health Risk:** The actor states a position suggesting that he/she believes fracking to have environmental risks. For instance, statements about how fracking can result in contamination of groundwater or surface water, lead to earthquakes, affect biodiversity/displace species, etc. are considered examples of environmental risk. Public health issues associated with fracking should be included in this column. Code with a value of 1 if such statements exist, 0 otherwise.

**Climate/Energy Risk:** The actor states a position suggesting that he/she believes fracking to have negative effects on climate targets and energy. For instance, statements about how fracking can jeopardise adhering to climate and energy emissions target, lead to reduced levels of renewable energy deployment, have a negative effect on energy security etc. Code with a value of 1 if such statements exist, 0 otherwise.

**Constitutional/Democratic Risk:** The actor states a position suggesting he/she believes that fracking should be regulated at the devolved level and/or expresses concern that this regulatory power is at risk to be taken away by the national government. Also refers to statements that policy process on fracking is not democratic/transparent for other reasons [than devolution]. Code with a value of 1 if such statements exist, 0 otherwise.

**Regulatory Stringency:** The actor states a position on stringency of current or developing regulations on fracking. Codes include the following:

0: actor makes no statement about the stringency of existing or proposed regulations, rules, or laws.

1: actor makes an explicit statement that current or future regulation are not stringent enough/too supportive of the industry.

2: actor makes an explicit statement or expresses a position that current or future regulation are too stringent/unsupportive of the industry.

3: actor makes an explicit statement that the current legislations are stringent/supportive enough of the industry.

**Social Benefit:** The actor states a position suggesting that he/she believes fracking to have social benefits. For instance, statements about how fracking brings royalties to communities, increases social capital etc. Code with a value of 1 if such statements exist, 0 otherwise.

**Economic Benefit:** The actor states a position suggesting that he/she believes fracking to have economic benefits. For instance, statements about how fracking favors jobs creation, opens new economic opportunities, injects money in local communities, improves the financial health of local and state level governments, etc. are considered examples of economic benefit. Code with a value of 1 if such statements exist, 0 otherwise.

**Environmental/Health Benefit:** The actor states a position suggesting that he/she believes fracking to have environmental benefits OR if the actor states that fracking is “safe” for the environment. Code with a value of 1 if such statements exist, 0 otherwise. We probably won’t have statements talking about benefits, but we will have statements minimizing environmental risks. See next variable.

**Climate/Energy Benefit:** The actor states a position suggesting that he/she believes fracking to have positive effect on adhering to climate targets and/or on energy security. Code with a value of 1 if such statements exist, 0 otherwise.

**Constitutional/Democratic Strength:** The actor states a position suggesting that he/she believes that the policy process on fracking is democratic/transparent enough, and/or that Scotland possesses sufficient powers over onshore oil and gas policy.

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