A thesis submitted to the Department of Environmental Sciences and Policy of Central European University in part fulfilment of the Degree of Master of Science

Should We Risk Fracking the Emerald Isle?

The Framing of Fracking Risks in Irish News Media

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MESPOM

This thesis is submitted in fulfillment of the Master of Science degree awarded as a result of successful completion of the Erasmus Mundus Masters course in Environmental Sciences, Policy and Management (MESPOM) jointly operated by the University of the Aegean (Greece), Central European University (Hungary), Lund University (Sweden) and the University of Manchester (United Kingdom).

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No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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ABSTRACT OF THESIS submitted by:
Ariel Sara DREHOBL
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According to the Irish media, hydraulic fracturing presents both energy and economic development solutions as well as risks to the environment and to the preservation of the Emerald Isle's touristic appeal. These risks and benefits appear in the discourse through varying frames, and the identification of these frames can help stakeholders to better address the most prominent fracking risks. Media, while proving to be a major source of risk information, provides a pathway for identifying general risk perception frames. In order to identify Irish fracking risk discourse, this thesis uses qualitative and quantitative analysis methodology, as well as the Social Amplification of Risk Framework and Framing Theory, to identify prominent fracking frames in the Irish media. I analysed a total of 320 newspaper articles for prominent frames and also conducted a document analysis and 19 interviews with individuals in the Irish media, government, and anti-fracking organisations. The major frames identified were the Risk to Local Life Frame, Economic Potential Frame, New Irish Protest Movement Frame, Risky Language Frame, and Local Environmental Issue Frame. These frames illustrate the importance of local environmental impacts, economic benefits, and anti-fracking organizations in the risk discourse. The thesis also concludes with suggestions of how stakeholders can interpret the frames and what issues should be focused in future stakeholder dialogues.

Keywords: activists, discourse analysis, energy, fracking, Framing Theory, hydraulic fracturing, Ireland, journalists, news media, qualitative media analysis, risk perception, Social Amplification of Risk Framework, stakeholders

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List of Abbreviations

DCENR	Department of Communications, Energy, and Natural Resources
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency (of Ireland)
EU	European Union
GHG	Greenhouse Gas
NIEA	Northern Ireland Environment Agency
NIMBY	Not In My Back Yard
NORM	Naturally Occurring Radioactive Material
NPWS	National Parks and Wildlife Service (of Ireland)
SARF	Social Amplification of Risk Framework
SEAI	Sustainable Energy Authority of Ireland
UK	United Kingdom
US	United States of America
USEIA	US Energy Information Administration
USEPA	United States Environmental Protection Agency

CHAPTER 1 – Introduction

As energy technologies continue to improve and develop, energy choices will likely become more complex and controversial. New technologies can allow for greater access to energy sources but can also create more complex and vibrant energy debates. Which energy technology is the most efficient? The safest? The cleanest? Scientists try to answer these questions as they discover new ways to produce cleaner and safer energy. But all new technologies, while providing benefits to society, also present risks. Fossil fuel sources, nuclear reactors, and even renewable energy technologies present a variety of risks that must be considered along with their potential benefits.

These risks can affect the quality of the air we breathe, the water we drink, the soil in which we grow our crops, and the overall health of society. While we must face some of these risks in order to sustain our livelihoods, societal risk perception will greatly determine which technological risks are publically accepted and which are rejected. Media representations of risk can prove influential in determining overall societal familiarity, opinion, and acceptance of environmental and energy risks. Many forces contribute to the creation of societal perceptions of risk, including media, political, and social discourses.

In this thesis, I aim to determine the key risk perception frames relating to hydraulic fracturing technologies in Ireland. Hydraulic fracturing – often referred to as 'fracking' – is currently an energy technology of national importance in Ireland, as the government recently commissioned a study to help determine if fracking should proceed on a national scale. This thesis examines fracking risk perception through a media analysis of 320 articles as well as a document analysis and 19 interviews. Through this study, five main frames are identified that emphasise key elements in the fracking risk discourse. Issues of local vs. national discourses, environmental dangers, economic benefits, and assumed risk terms all appeared prominently

in the discourse. These frames help determine the most important fracking issues in the Irish public perception, which can then be addressed in the future by stakeholders.

Risks and Energy

The acceptability of risk always amounts to a political issue as numerous factors influence how people perceive risks. According to Douglas and Wildavsky (1982), leaders in the risk perception discipline, the ways in which individuals perceive societal dangers influence the aversions of society as a whole. Similarly, Freudenburg (1993) found that people tend to accept risks that they are more able to control, such as cigarette smoking or the potential for car accidents while driving. Risks that are out of the control of the individual – such as energy production choices like nuclear power plants, renewable energy, and fossil fuel extraction methods – tend to cause more controversy and have less public acceptance. These are risks that individuals are forced to accept without choice, while tends to lead to higher levels of fear and anxiety; conversely, risks taken by choice are often perceived as less risky even when that is not the case.

While these risk decisions are not always rational – as, for example, more people die every year from the effects of smoking than from nuclear power plants – they do demonstrate why certain risks are framed as more important than others. People tend to have trouble weighing long-term and short-term risk trade-offs and have difficulty performing cost-benefit analyses against local concerns (Clarke 2012). For example, wind turbines tend to spark strong debate within local communities amongst those who dislike the effect they have on the local aesthetics. Turbines change the landscape and require transmission infrastructure that can cause controversy in its location and installation. In contrast, the long-term benefits of wind energy in terms of climate change reduction may not be properly assessed when compared with the more immediate local consequences of the turbine installation.

Within public discourse, energy sources are often discussed in terms of their risks. Nuclear power plants can have meltdowns, the use of fossil fuels can increase the rate of global warming, and the process of harnessing wind energy can disrupt bird migration patterns. Debates around energy sources tend to focus on each technology's risks and the risk of transitioning from one source to another. The ways in which energy sources are framed differs between countries depending on many factors, including risk, location, and cultural context. By understanding the way in which energy risks are framed, stakeholders can better address the political and social debates surrounding progression of energy technologies.

Case Study: Fracking in Ireland

In recent years, the process of fracking has become a controversial energy issue. Fracking involves the injection of high-pressurized water mixed with sand and chemicals into the ground in order to create small fractures in the rock. These fractures then allow underground shale gas to migrate towards gas wells for collection. The proponents of fracking emphasise the benefits of the process such as cheaper energy prices and job creation, while the opponents stress the risks to human health and the environment.

Fracking technologies are currently spreading throughout the world as countries consider utilising this energy extraction process. First developed in the United States, the US continues to be the global leader in fracking technology and capacity, though other countries are beginning to operate their own fracking wells. Many countries in Europe, including the United Kingdom and Ireland, are considering the potential for fracking technologies. The UK has experience in drilling technologies and is currently in the exploratory stages of fracking. If the UK begins fracking, especially in Northern Ireland, this could greatly impact Irish policy and public perception. The debate surrounding fracking in Ireland has grown more pronounced over the last few years and fracking discourse has become more prominently

represented within media sources. Recently, Irish media have reported on the risks and benefits associated with fracking technology with more frequency than in the past, which aids in increasing awareness of fracking discourse.

Presently, Ireland has the opportunity to join the new fracking phenomenon. Scientists have estimated that 266 billion cubic meters of shale gas exist in Ireland, and with the national consumption of natural gas at 5 billion cubic meters per year, these reserves are estimated to potentially power Ireland for up to 50 years (Hewitt 2012). Even with the identified shale gas potential, the Irish government has been reluctant to begin drilling. Irish Energy Minister Pat Rabbitte expressed "considerable genuine concern" surrounding the potential impacts of fracking (Swords 2013, 31). This uncertainty, as also seen in the academic discourse, has led to the nation suspending the issuance of new drilling licences until a scientific study can be carried out by the Irish Environmental Protection Agency, which should be completed by the end of 2016. As the UK government continues to advance fracking nationally, with consideration for fracking in Northern Ireland, the issue of fracking has become one of environmental and economic concern in Ireland.

The Irish government has recently shown a growing interest in fracking through their commissioning of research reports. In May 2012, through a study commissioned to David Healy of Aberdeen University, the Irish Environmental Protection Agency (EPA) presented a report entitled "Fracking: Current Knowledge and Potential Environmental Impacts." The report provided a preliminary overview of Irish fracking potential through a basic assessment of the potential for fracking in Ireland The report also prompted doubt and controversy concerning its ability to accurately represent the potential consequences of fracking in Ireland. At the end of 2012, the Department of Communications, Energy, and Natural Resources (DCENR), the Environmental Protection Agency (EPA), and the Northern Ireland Environment Agency (NIEA) commissioned a joint report to identify baseline levels, impacts

and mitigation measures, and to produce a regulatory framework for shale gas development in Ireland.

This thesis is the culmination of a qualitative and media content analysis of fracking risks in Ireland, using both the Social Amplification of Risk Framework and Framing Theory to guide the research. Ireland proves to be an interesting case study as its political stance on fracking is currently in development. The Irish DCENR, EPA, and NEIA fracking study will help determine if the technology's risks will be accepted or rejected. The government report, supported by analysis of public perception of fracking risk, will prove influential in determining the result of fracking proposals in Ireland.

1.1 Problem Statement

The central aim of this research is to identify public perception of fracking risks in Ireland. As a country with little history of fossil fuel extraction technologies, no analysis of Irish fracking risk perception has been examined within an academic setting. By studying fracking risks from a scientific perspective, a more comprehensive understanding of fracking risk discourse can be determined which can aid in future decision-making by stakeholders. The Irish government placed a two-year moratorium on fracking until an extensive government study could be completed, meaning that stakeholders will have at least two years to continue to develop fracking discourse and influence future policy. This political action also indicates the prominence of fracking currently in the Irish energy debate as no other energy technology has warranted a study of a similar nature. Stakeholders will be better equipped to respond to fracking discourse if they are aware of which fracking risks are viewed as the most prominent and important.

Energy sources and extraction methods, such as fracking, are often debated amongst political, social, and media stakeholders, and by understanding the ways in which these

sources' risks are framed, stakeholders can best respond to the articulations of these risks. The understanding of public support and opposition is critical to the planning process, and identifying risk frames can help researchers, advocates, and other interested parties to communicate potential risk impacts and mitigation measures to stakeholders (Boudet and Ortolano 2010; Clarke *et al*. 2012). Frames provide a method for interpreting and analysing discourse patterns through qualitative analysis methodology. By identifying, understanding, and effectively communicating risk frames associated with the development of shale gas technologies, policymakers can be best informed about the issue and can choose an appropriate policy approach. Policymakers often discuss risks with certain agendas in mind, either advancing or halting new energy technological developments, and frames can be important for understanding what factors shape these discussions.

In relation to shale gas extraction and hydraulic fracturing technologies, the discourse is still very much in development. Fracking first surged in the media in 2010 after the release of Josh Fox's successful documentary *Gasland*, which detailed the environmental impacts of fracking in the United States. Since then, studies have examined public perception of fracking in numerous areas. According to the European Commission (2014), the public perceives an insufficient level of precaution, transparency, and consultation in relation to shale gas activities. Studies in the United States have indicated that most people still feel that they do not know much about fracking (Fisk 2013). A Pew Research Center (2012) survey found that only 26% of Americans had heard 'a lot' about the issue and 37% claimed to have heard 'nothing at all.' Similarly, the study by Boudet *et al*. (2014) found that, in a nationally representative US sample, individuals had limited familiarity with the fracking process and its potential impacts. These studies indicate a slow increase in fracking awareness between 2012 and 2014, as both studies found awareness lacking.

Many scholars identified media as a primary source of information for people about environment and health risks (Hansen 1991; Driedger 2007; Griffin and Dunwoody 1997; Hester and Gibson 2010; Dunwoody and Peters 1992). In the Stedman *et al.* (2011) study comparing the views of individuals in Pennsylvania and New York on fracking, the respondents in both states claimed that they received information about shale gas from newspapers almost twice as often as any other information source including interpersonal communication. Although the media is not the only source of information people use in order to understand risks, it is an important and prominent pathway for risk presentation and communication to society.

While the communication of risks is complex and is presented through many forms of information sharing, media does strongly play into the framing of risks (Sjöberg 2000; Krimsky and Plough 1988; Hansen 1991). According to Entman (2007), the phrase that inaugurated the modern study of media discourse is: "the media may not be successful much of the time in telling people what to think, but is stunningly successful in telling people what to think about" (Cohen 1963, 13). In other words, the media does not define what society thinks, but it does influence which concepts are amplified and familiarised. By studying how the media frames fracking risks, the frames identified will reflect the overall image of how fracking is viewed on a societal level, providing stakeholders with information about what risks are most prominent and important in the discourse. By identifying which risks are most often discussed, policymakers or activists can adjust their discourse focus to either advance or mitigate the fears surrounding those risks in order to make fracking appear either more acceptable or more risky for Irish society.

Currently, no academic studies have analysed fracking in Ireland through media sources, and few studies have analysed fracking media in order to determine fracking frames. While the 2016 Irish governmental study on fracking is underway and the Irish anti-fracking

movement gains strength, an understanding of how fracking is framed in Ireland provides useful information to relevant stakeholders, such as government officials, industry representatives, policymakers, anti-fracking activists, news reporters, and local citizens. By identifying the risk frames in relation to fracking in Ireland, stakeholders will be better able to address fracking risks on both political and social levels and then advance their positions accordingly.

1.2 Research Questions

In order to address the thesis problem, as discussed above, this research aims to answer the following question and sub-questions:

Main Research Question: How are the risks of fracking portrayed by local and national media in Ireland?

Research Sub-Questions:

1. What risks are most prominent in Irish fracking discourse and what risks are excluded?
2. What patterns exist in relation to the discussion of risks within the discourse?
3. Do frames differ in relation to national and local media, and if so, how?

By identifying the most prominent fracking risks, stakeholders will be best able to address these risk issues in relation to the development of fracking discourse in Ireland. Patterns may also arise in relation to which risks are discussed together or which risks are left out of the discourse. By first conducting a literature review of fracking risks, I was better equipped to identify how the Irish fracking media discourse relates to the global fracking risk discourse. By analysing the relationship between national and local media discourse, I was able to draw conclusions in regards to how the discourse differs between these types of sources.

1.3 Thesis Objectives and Outline

This thesis will identify how fracking risks are articulated in Ireland through the utilisation of risk perception and framing methodologies to conduct a qualitative analysis of Irish media sources. This analysis identifies themes and patterns in relation to how fracking risks are perceived in order to help stakeholders address fracking risks and to provide a foundation for future research on Irish fracking risk perception.

Chapter 1 [Introduction] outlines the purpose of the thesis through the identification of a problem, questions, and objectives. This chapter highlights why the research is important and what the thesis aims to achieve. Chapter 2 [Analytical Frameworks] identifies the analytical frameworks that are used in the analysis, namely Social Amplification of Risk Framework and Framing Theory, and explains how these frameworks will guide and enhance the research. The importance of media in risk analysis research is explored in order to validate the use of media in risk perception research.

Chapter 3 [Research Methodology] describes the methodology used for the study, based on the analytical frameworks and study goals. The methodology includes descriptions of qualitative media analysis, interview methods, and document analysis strategies. Chapter 4 [Current State of Fracking] conducts a document analysis in order to identify the current state of fracking in Ireland. The chapter defines fracking and explains the development of the technology in Ireland and its potential for success. The two potential fracking companies and regions are described, and Irish fracking regulations and anti-fracking groups are detailed. This chapter places the Irish fracking situation into perspective so that the discourse can be better understood in the context of the current state of fracking in Ireland.

Chapter 5 [Document Analysis of Fracking Discourse] details a second literature review in which fracking risk discourse is explored within both the academic and media realms. This literature review aids in the formation of initial coding categories for the media

analysis by providing a basic conceptualisation of academic discourse on fracking risks and what issues tend to arise as important within academic and media sources.

Chapter 6 [Results] performs a qualitative analysis of Irish media, coding the articles in relation to risk discourse and risk frames through the influence of the previous literature reviews. The codes are partly pre-determined based on the literature review, but mostly arise based on patterns seen in the data. Another objective of this chapter is to analyse the interviews that were conducted with members of the Irish government, media, and anti-fracking organisations in order to determine aspects of the risk discourse that may be missing or enhanced within the media discourse. The interviews were transcribed and analysed to determine their main themes and points of connection and interest. Overall, the chapter presents the results of the media analysis by identifying the most common terms and themes in both the newspaper articles and the interviews.

Chapter 7 [Discussion] examines the coded media discourse as well as the interview discourse in order to answer the research questions as stated previously. The objective of this chapter is to determine the most prominent aspects of fracking risk discourse in the Irish media context and within the interviews conducted. Patterns of language and frames are identified in order to determine how risks relate in the discourse and comparisons are made between local and national fracking coverage.

Finally, Chapter 8 [Conclusion] then draws conclusions based on these identified patterns as to the nature of fracking risk discourse in relation to both Social Amplification of Risk Theory and Framing Theory. These conclusions will allow stakeholders – such as policymakers, businesspersons, anti-fracking activists, and journalists – to be better informed about the nature of fracking risk discourse which can prove beneficial in designing policies or campaigns in regards to fracking.

1.4 Scope and Limitations

This study examines Irish media sources in order to identify the most prominent fracking risks and how they are interrelated. Only print media sources are used in this study with a focus on both national and local media. The number of articles analysed were limited to a one-year time frame from 1 April 2013 to 1 April 2014. Only articles that referenced "fracking," "hydraulic fracturing," or "shale gas" were used in the analysis. In total, 320 articles were collected for analysis from three main national newspapers and three main local newspapers. All sampling procedures suffer from limitations due to an inability to capture the entire representation of the discourse studied. This one-year time frame of articles excludes the emergence of the discourse around 2010 and its development until 2013.

Another limitation of this study is that only one researcher analysed and coded the articles in relation to risk discourse. In this way, no quantitative accuracy tests can be performed to test for consistency in the coding. Advanced coding tools were used to improve the accuracy. I could also interview only a limited number of individuals for the research. Although nineteen individuals were interviewed for this research, a more diverse qualitative interview-based study should be conducted in the future to determine how individuals in Ireland speak about fracking issues from a number of perspectives. Instead, this research focuses on the media's portrayal of fracking risk discourse, but the views of the interviews do help to influence the direction of the research.

CHAPTER 2 – Analytical Frameworks

This chapter focuses on a literature review of the two analytical frameworks on which the research is based – Social Amplification of Risk Framework (SARF) and Framing Theory – and also examines media in relation to risk, framing, and in local/national contexts. These two frameworks combine to create a comprehensive and effective lens to analyse risk in the media, and the media acts as a way to study risk perception discourses.

2.1 Social Amplification of Risk Framework (SARF)

Social Amplification of Risk Framework (SARF) provides the foundation for understanding the representation of risks in communication sources and how these representations influence individual's perceptions of risk. This section first explores risk theory, then the Social Amplification of Risk Framework, and then the Framework's implications for use in media analysis.

2.1.1 The Modern Conceptualisation of Risk

Modern risk is defined in different ways. The most common definition involves risk being a product of the probability of an event occurring and the severity of its harm (Douglas 1986). Events that are more likely to occur with more severe outcomes will have higher risk. The 1972 preparatory committee for the United Nations Conference on Human Environments gave an alternative definition for risk, defining it as the expected frequency of undesirable effects arising from exposure to a pollutant (Douglas 1986). This definition more prominently highlighted environmental risks within risk discourse.

Many scholars attribute the rise of environmental awareness and concern to the risks of the twentieth century. The post-World War II period saw a rapid advancement in new nuclear technologies, which were found to have huge potential risks to the environment and human health. The development of nuclear technologies led to an increase in public awareness surrounding health and the environment. Nuclear fallout was one of the first modern poisons that entered the modern consciousness, with its prominence increasing as its risks became better known.

Some scholars attribute modern changes in risk perception to changes in societal structure. Ulrich Beck's 'Risk Society' describes a move from a class-based society to a risk-based society where risks are more evenly distributed amongst a nation's citizens (Hannigan 1995). Beck blames many environmental risks as failures of social institutions to properly regulate and control new technologies. Many disagree with Beck's 'Risk Society,' due to the fact that it recognizes an objectively certifiable and socially constructed concept of risk that can be managed in a near-perfect society, which does not exist (Hannigan 1995). But even so, his 'Risk Society' concept has become a guiding principle in modern risk discourse.

Fears over radioactive fallout from nuclear testing pioneered concerns over other poisons to the air and water, and these fears helped inspire the US environmental movement of the 1960s. Rachel Carson's 1962 book *Silent Spring* is often viewed by scholars as the source that sparked the environmental movement through its emphasis on nuclear fallout as a proxy for pesticide contamination (Gottlieb 1993; Lutts 1985). Carson's description of the detrimental effects of environmental pollutants can have on humans and wildlife alike led to an increase in environmental and health awareness and led many people, both in the US and globally, to think more about the risks imposed on them (Carson 1962).

According to Mary Douglas, one of the leaders in risk perception research, the nuclear community of the 1950s expected thanks and recognition for the increased productivity,

wealth, and health brought on by the new technology, but instead nuclear technologies became the "target of increasingly articulate, hostile, and public criticism" (Douglas 1986, 19). One interviewee for this research claimed that if nuclear technology had been introduced to the world as an energy source rather than a weapon, it might have experienced more positive public perception. But because its first appearance was as a deadly bomb, the risks associated with the technology continued to appear high. In this way, strong public opinions continued to arise in response to new energy technologies, such as renewable energy alternatives and new energy extraction methods.

Researchers first began examining the idea of risk perception in the 1960s as they noticed the growing societal fear surrounding nuclear energy development. This fear has been studied for the past 50 years, leading to numerous theories on how and why people perceive certain risks. According to prominent risk theorists Douglas and Wildavsky (1982): "What are Americans afraid of? Nothing much, really, except the food they eat, the water they drink, air they breathe, the land they live on, and the energy they use" (10). Societal fears are extensive and complex. Technological risks, such as nuclear energy, are perceived as dangerous because individuals believe them to be dangerous (Wildavsky and Dake 1990). People tend to worry about the risks that are most immediately affecting them and those that they can see and understand. Similarly to nuclear energy, fracking technologies present a risk that previously was not prominent in the risk discourse and one that is not easily understood. As a newly prominent energy technology, it is important for the public to be familiar with its risks in order to decide future fracking policy.

2.1.2 The Social Amplification of Risk Framework (SARF)

The Social Amplification of Risk Framework (SARF) utilises psychology, sociology, anthropology, and communications theory in order to analyse how risks interact with social

and cultural factors and are then perceived by the public. SARF is a conceptual framework that aims to explain how stigma is created through media transmission of information about hazards, public perceptions, and decision-making processes (Flynn *et al*. 1998). SARF views risks as interactive phenomena that involve biophysical, institutional, social, and cultural contexts and the social amplification of risks affects how they are perceived on both individual and collective scales (Hung and Wang 2011). Kasperson *et al.* (1988) first termed the Social Amplification of Risk methodology and used it to explain the effects that amplifications of risks can have on society, including mental perceptions of risks, economic impacts, social impacts, and changes in societal order. Media often acts as a source of social amplification of risks, both big and small (Renn and Benighaus 2014). According to Kasperon, the worldwide mass media spreads risks from one locality to the next, allowing risk perceptions to be constantly changed through access to information (Larock and Baxter 2013).

The amplification of risks occurs in two stages: first in the transfer of information about the risk, and second in the response mechanisms of society. Signals about risks are processed by both individuals and 'social amplification stations,' which include scientists, news media, cultural groups, and interpersonal networks who then spread risk information to others (Kasperson *et al.* 1988, 177). SARF emphasises that risks cannot be defined as a probability of harm because this definition neglects issues involving equity of future generations, space, or social groups. The social amplification process is a corrective mechanism by which society can better determine which risks should be highlighted within societal culture (Kasperson *et al.* 1988, 179).

According to SARF, communication systems may act as risk amplifiers in two ways: by intensifying or weakening the signals that individuals and social groups receive about risk and by filtering the myriad of signals of risks by their importance. Communication agents can

include news media, scientists, risk-management institutions, activist and social organisations, and public agencies (Kasperson *et al.* 1988). The media acts as a way to provide information on less known risks to the public. According to Kasperson *et al.* (1988), "when direct personal experience is lacking or minimal, individuals learn about risk from other persons or from the media." Once a risk event enters social communication, awareness and concern about the risk often increases which can lead to changes in societal behaviour (Flynn *et al*. 1998).

Understanding the construction of risks, as seen through the Social Amplification Framework, allows individuals to recognise what is currently viewed as important by a society. The construction of certain risks has not always been logical or accurate, especially in relation to energy risks. According to Hull (1977), all energy sources will have risks involved, but the source with the most benefits as compared to risks should be utilised. In the case of nuclear energy, the technology has been perceived historically as a high-risk energy source, even when nuclear energy may inherently be a safer energy technology than fossil fuel energy sources. Cohen (1985) argues that the low estimates of nuclear power plant accidents as compared to other energy source accidents locally should lead people to believe that we have too few nuclear power plants, as nuclear energy statistically appears safer. If the public perceives an energy source as dangerous due to reporting on rare, large-scale accidents, it may be difficult to change that belief.

The misdirected fear that individuals felt towards nuclear energy sparked risk perception research. This response to relatively unknown energy risks may relate to that of fracking technology, as fracking has only entered the public discourse over the last few years. Therefore, the way in which the media and other information sources present fracking will greatly influence public perception of its related risks. By identifying which risks the media

amplifies within fracking discourse, the frames in which fracking risks are presented to society can be determined.

2.1.3 Social Amplification of Risk in the Media

The amplification of risk through the media allows risks to be visualised and to gain substance. Cottle (1998) claims that the mass media is positioned so that it occupies a key position to communicate hazards and risks to society. He believes that "the media are identified as a key arena in which such social contests over definitions, knowledge, and risk consequences are played out" (8). The amplification of certain risks in the media may also lead to higher levels of perceived overall risk (Sjöberg 2000). According to the Social Amplification of Risk Theory:

> News media receive the bulk of scientific attention for its critical role in public opinion formation and community agenda setting; since media tend to accord disproportionate coverage to rare or dramatic risks, or risk events, it is not surprising that people's estimates of the principal causes of death are related to the amount of media coverage they receive (Kasperon 1988, 185).

In this way, the increasing coverage of fracking as an energy risk, as seen through reporting on fracking accidents or environmental incidents, may influence the way that many in society perceive fracking risks. The more familiarised a risk becomes, the more dangerous it may be perceived.

While news media amplify risk based on risk frames, media also act as a source of knowledge and awareness-spreading in relation to societal risks. According to Beck's 'Risk Society' thesis, more knowledge creates more risks, but risks also may arise from unawareness and a lack of knowledge (Beck 2000, 217). An assumption exists that social projects fail because the general public cannot understand the specialist information about risk, and if the public were better informed, risks would be more readily accepted (Stenekes *et al.* 2006). A study by Freudenberg (1993) analysed 110 community groups and found that 88% of respondents felt that they had difficulty obtaining information about risks and 45%

felt that the government blocked this learning process. According to a study by Wildavsky and Dake (1990), findings showed that individuals who rated their self-knowledge of technologies as high also tended to perceive greater average benefits associated with those technologies than those who felt they had less knowledge. By viewing news media as an amplifier of risk, the representation of fracking risks will be analysed in relation to how much information is provided about the risks and which risks are viewed as the most prominent. By identifying the amplified risks, frames for these risks can then also be recognised and analysed.

2.2 Framing Theory

Framing Theory explores how certain social phenomenon are constructed and presented within society, which occurs often through mass media sources. Framing Theory can be used to analyse media discourse in order to determine the way in which certain topics, themes, or risks are described, categorised, or characterised within media sources.

2.2.1 What is Framing?

Frames provide a method for interpreting and analysing discourse patterns. According to Erving Goffman (1974), one of the foremost scholars on the subject of framing: "Frames are cognitive structures that include elements of organisation and subjectivity. As such, they help guide representations and perceptions of reality." Goffman wrote *Frame Analysis,* which formed the foundation of Framing Theory. By organising communicative discourses into these cognitive structures, we are then able to create a more accurate understanding of reality, which takes into account the frames and biases that exist in the way we view the world. When media sources are framed, potential agenda-setting forces guide the representation and perception of reality. Framing implies agency in the construction of frames, as frames often

produce meaning for events and occurrences that help organise experience and guide action (Benford and Snow 2000). Frame amplification involves the strengthening of an already existing frame, as could be related to the social amplification of risks.

Frames can be developed intentionally or unintentionally, either through power structures with specific agenda-setting goals or through continual representation of events in a specific way. Olausson (2009) believes that "frames are often taken for granted, not subject to any kind of questioning, and are therefore invisible in everyday practice" (423). Although frames may become invisible due to their unnoticed presence in our perceptions, they still have a strong impact on the way that people perceive the world, and especially risk. The way in which politicians, protest groups, industry, and the media frame new technologies and energy sources greatly influences the way that people perceive the risks associated with them.

2.2.2 Framing and the Media

It is impossible to create media that does not possess a frame. Frames arise through the choice of what will be reported, how often it will be reported, and in what way it will be reported. Frames express the patterns of thought that journalists and audiences use to make sense of events and understand news stories (Griffin and Dunnwoody 1997). Frames allow journalists to make quick decisions about what information is worthy of being news, which allows them to emphasise some information and exclude others in ways that correspond to the chosen frame. Media framing scholar Robert Entman defined media framing as "the processes by which media select some aspects of a perceived reality and make them more salient in a communicating text in a way that can promote a certain definition, interpretation, moral evaluation, or treatment recommendation" (Blankenship 2011). Biases in media reporting, which can be as simple as choosing what will be reported and what excluded from media coverage, will affect the way that issues are framed and presented to society. Similarly,

media frames create the central organising concept of a new technology or risk by placing it within everyday reality as a common component of life (Scheufele 1999). This allows individuals to familiarise themselves with certain risks that fall within the frames used by reporters, and to gain awareness and familiarisation with certain 'report worthy' issues.

In order to successfully construct environmental risk frames, attention must be paid to the media and the way in which risk is constructed through its reporting. The environmental claims reported on in the media gain attention due to their uniqueness, relevance, stature, and familiarly (Hannigan 2006). According to Goffman (1974), there are five aspects that influence a journalists frame creation: societal norms and values, organisational pressures and constraints, external pressures from interest groups and policy makers, professional routines, and the ideological or political orientations of the journalists themselves. Even if journalists attempt to remain unbiased in their reporting, they will still succumb to these influences in some way, and will therefore rely on the frames that they create to guide them towards successful reporting.

2.2.3 How to Identify Frames

In order to study media frames, narratives and themes must be identified in relation to the subject. The researcher must identify the core frames, depictions, visual images, and roots found within the subject at hand (Palmeri 2001). According to Streeter (2009), stylistic clues of language choices, modes of reference, quotations used, as well as not used, all influence the construction of media frames. Once these patterns have been identified, then the underlying assumptions of the frame must be determined, such as: what the frame highlights as important or not important, what is assumed, what is reinforced, and whose voices are heard and whose silenced. The organisation of these concepts reveals the frames used in

relation to the subject. By identifying the most prominent frames, stakeholders can decide how to best approach certain risk issues in relation to new energy technologies.

2.3 The Significance of Media in Risk Amplification and Framing

The study of news media provides an opportunity for analysing societal frames in relation to risks. This section examines the importance of media in terms of information spreading and awareness-raising for risk perception, the importance of local and national media distinctions, and agenda setting in the media. It should be noted that, while media may mutually construct as well as reflect the views of the populace, media does not equate to overall societal views.

2.3.1 Media and Risk Perception

Media has often been used as a method for studying risk perception, as one of the purposes of media is to present risks to society. Although media provides an imperfect representation of risk on a societal level, it can be used as a substitute for other risk studies. According to Driedger (2007), media analysis is "an imperfect, but useful and low-cost, technique to understand how the general public may understand risk events when traditional risk perception surveys are not available or are not economically feasible" to perform (775). In this way, media can provide important cues for how risks are framed and presented within the public domain.

Some researchers do believe that risks, as reported in the media, reflect on the views of society. The impersonal impact hypothesis states that media reports on risk create an impact on societal rather than personal level views (Tyler and Cook 1984; Wåhlberg and Sjöberg 2000). Individuals may view some risks as dangerous but not likely to impact them personally. Instead of identifying what individuals think about certain risk issues based on a

representative survey, instead a broader assessment of risk can be determined through a media analysis. While some accuse the media of sensationalising and expanding on risks, others claim that the media can also be too unquestioning of the scientific claims that they report and can at times downplay certain dangers (Kitzinger 1999). In this way, media must be viewed as containing potential biases in relation to what information is included or excluded in articles as well as what language is used to describe topics and situations. In the analysis of fracking risks through the media, not only the discourse within the articles must be studied, but the discourse that is absent from the articles must also be identified. The interviews are used to help determine gaps in the media discourse of fracking risks and identify what risks are missing from this media discourse.

2.3.2 Media: Local vs. National

In addition to an overarching risk and frame analysis, I also conducted a comparative analysis of local and national media risk perceptions. National and local news coverage differ in the topics chosen and the frames used in reporting. Many scholars believe that local and national media should not be lumped together, but should instead be studied separately as they may provide different coverage and frames for similar issues (Hester and Gibson 2010; Palmgreen and Clarke 1977). According to a study by the Pew Research Center (1998), local newspapers tend to report more traditional and straight news accounts with less explanation of how and why things happen the way they do. National papers, in contrast, tend to be more interpretive and try to place news stories within a larger context. According to Long (1958), local newspapers have much influence "in determining what most people will be talking about, what most people will think the facts are, and what most people will regard as the problems to be dealt with" (260). In this way, local papers may provide much of the risk information that individuals are exposed to on a daily basis. In Mcleod *et al.*'s (1996) study,

local newspapers were determined to be a somewhat better predictor of community knowledge and participation than other forms of news coverage such as televised media.

In the case of fracking reporting in the local vs. national news, it could then be hypothesised that local news reporting will contain more stories that focus on local events in relation to fracking, such as protests, planning activities, and opinion pieces. In comparison, national reporting may focus on a more global fracking discourse in which fracking technology is discussed in terms of more abstract concepts like energy security and climate change. In this research, the differences between local and national media risk representations are explored along with other differences in risk discourse that emerge from the data.

2.3.3 Media and Agenda-Setting

Agenda-setting is the "ability [of the news media] to influence the salience of topics on the public agenda" (McCombs and Reynolds 2002). By choosing what will be reported and how it will be reported, journalists are influencing the policy agenda as to what issues will gain the most attention (McCombs and Shaw 1972; Mcleod *et al.* 1996; Driedger 2007). According to Entman (2007), agenda-setting can thus be viewed as the first function of framing: "defining problems worthy of public and government attention" (164). These agenda problems can focus on societal conditions, world events, or political candidates. Many researchers have found that agenda-setting effects are most likely to occur in relation to media coverage of issues in which the public does not have direct personal experience, and instead must rely on the media for their primary information (Demers *et al.* 1989; Lee 2004; Zucker 1978). In relation to hydraulic fracturing, many people still are unaware of the particulars of the technology and gain the majority of their information about the subject from the news media (Stedman *et al.* 2011). In this way, the discourse and frames that journalists

use when reporting on fracking in the media may influence the political or social agenda in relation to the advancement or halting of the technology.

CHAPTER 3 – Research Methodology

This chapter explains the methodology used for the media analysis, interviews, literature review, and also addresses research limitations. **Overall, I analysed 320 newspaper articles using the Atlas.ti Qualitative Data Analysis Research Software, reviewed over 170 journal, newspaper, and government articles for the document analysis, and conducted and transcribed 19 interviews with diverse stakeholders.** These elements all contributed to the final discussion and conclusions that identify the major frames used in Irish media to characterize fracking.

3.1 Media Analysis Methodology

In order to analyse Irish media in relation to fracking risk discourse, all newspapers as listed in the National Library of Ireland Newspaper Database were examined for relevant articles. These articles were then coded using the ATLAS.ti Qualitative Data Analysis and Research Software. The coding categories chosen were informed by the information obtained from the literature review as well as the interviews, but coding also proceeded based on the key terms found in the articles during the coding process.

The Social Amplification of Risk Framework (SARF) and Framing Theory also advised the research. SARF guided the research in its identification of the most prominent or amplified fracking risks in the media. By using SARF, the risks that are viewed as important by journalists, and potentially by society, could be identified and analysed in relation to other risk discourses. Framing Theory aided in the development of categories and codes used in the coding process.

3.1.1 Newspaper Articles Reviewed

In order to determine what articles would be used in the analysis, I first chose a scope and keywords for analysis. Only articles published between 1 April 2013 and 1 April 2014 would be used in the analysis. This time frame is justified because fracking discourse has been increasing over time, so by analysing the most recent media articles, a larger proportion of the discourse would be studied. The following three key terms were chosen in order to identify relevant articles: "fracking," "hydraulic fracturing," and "shale gas." I used all articles in the research that referenced any of these. This includes articles that only mention "fracking" or "shale gas" in passing and do not focus on fracking as the main theme of the article.

Next, I searched all Irish newspapers for articles that referenced any of the three key search terms over the selected time frame. The articles were identified using the Google search term: [site:newspaperwebsite "fracking" OR "hydraulic fracturing" OR "shale gas"]. I replaced 'Newspaperwebsite' with the specific website for each Irish newspaper. All 11 national newspapers and 128 local newspapers were searched for articles that referenced the research terms [see **Table 2** and **Table 3** in Appendix]. Of the 11 national newspapers, 7 had articles that contained the specified search terms. The three papers with the largest sample sizes (containing 84% of all fracking articles) – *The Irish Times, Irish Independent, and Irish Examiner* – were chosen as the sample sources for analysis.

Out of the 128 local newspapers, 9 contained articles with reference to the search terms, 63 contained no reference, and the remaining 56 were unsearchable or redundant. Fourteen of the local papers were subsidiaries of the *Irish Independent* and therefore contained redundant articles and were excluded from analysis. Of the 9 local papers with articles referencing fracking, I identified 44 articles and all were used in the analysis. The *Leitrim Observer* contained 75% of the 44 local newspaper articles. In order to supplement

this small sample size from the local news coverage as compared to national coverage, I chose two newspapers from Northern Ireland to enhance the analysis: the *Fermanagh Herald* and the *Impartial Reporter*. Both of these local newspapers cover news in Fermanagh County, Northern Ireland, which is the county that borders Leitrim County, Ireland. The addition of these two local newspapers aided in balancing the coverage between local and national news, with 188 articles from national papers and 132 articles from local papers, for a total of 320 articles for analysis [**see Table 1**].

Table 1. Newspapers and number of articles used in analysis

National Newspapers	**# Articles**
The Irish Times	80
Irish Independent	68
Irish Examiner	40
Total National	*188*
Local Newspapers	
Impartial Reporter	59
Leitrim Observer	33
Fermanagh Herald	29
Other	11
Total Local	*132*
Total Articles	**320**

I then copied the text of each article from the online news source and text documents were made for each article for analysis. The text documents referenced the article name, author, section of the newspaper, date, text, and a link to the online webpage in which the article was taken from. These 320 documents were then uploaded into the Atlas.ti Qualitative Analysis Software program and were then coded for terms relating to the framing of risks.

3.1.2 Coding Methodology

I used open coding methodology to code the 320 newspaper articles. Open coding allows for the text to be explored for general thoughts, ideas, and meanings (Strauss and Corbin 1998). Coding categories and subcategories were identified during the coding process based on the language patterns seen within the text. Specific ideas were coded in relation to the fracking risks identified during the literature review in Chapter 5. These concepts helped to direct the coding initially, but I also identified more codes based on risks termed from the interviews and patterns noticed during the coding process.

3.2 Interview Methodology

From March 2014 to May 2014, I conducted 19 interviews with individuals who have a relation to fracking, including 10 anti-fracking activists, 6 journalists, and 3 government employees. I travelled to Ireland and conducted interviews in Dublin, Sligo, and Leitrim with a variety of individuals. I conducted 4 interviews by phone and 2 interviews through email correspondence. I contacted both fracking companies in Ireland – Tamboran Resources and Energi Oil – but received no industry responses. More local newspapers were also contacted, but only the *Impartial Reporter* responded positively for an interview.

Of the 10 anti-fracking activists interviewed, 7 were associated with the Love Leitrim anti-fracking group, one with Fracking Free Ireland in Dublin, one with Good Energies Alliance, and one with Fracking Free Clare. Love Leitrim and Fracking Free Clare are anti-fracking groups in areas in which fracking has been proposed in Ireland. Fracking Free Ireland in Dublin focuses on awareness-raising in the country's capital, and Good Energies Alliance is a non-profit that aids in the promotion of sustainable energy practices in Ireland. Of the 6 journalists interviewed, 2 write for the *Irish Independent*, 1 for *The Irish Times*, 1 for the *Sunday Times*, 1 from the *Impartial Reporter*, and 1 is an independent journalist. The 3

government employees work in the Environmental Protection Agency (EPA), the Department of Communications, Energy, and Natural Resources (DCENR), and for the Sligo County Council. I asked four central interview questions to each interviewee:

1) How would you describe fracking (as a scientific or social issue)?
2) What are the major challenges and opportunities in relation to fracking?
3) How would you describe the nature of the fracking debate in Ireland?
4) How does fracking in Ireland relate to fracking globally?

These questions were adjusted based on the interviewee's knowledge in specific areas, with questions focusing on the representation of fracking in the media for journalists, the anti-fracking movements for activists, and government action in relation to fracking for government employees. The interviews allowed for the interviewees to give open-ended responses. I recorded all interviews with the consent of the interviewees and subsequently transcribed each one. I then analysed the transcriptions for themes in relation to risk perception and fracking frames. I then used the interview themes to guide the analysis of fracking media frames and discourse. Due to agreed upon permissions, all quotations used in this thesis are attributed generally and not to specific speakers, but all interview participants are cited in the references.

Through the identification of important frames and discourse in the interviews, I then compared the interview frames to the media frames in order to identify what aspects of fracking risk discourse are most prominent in both or missing from either. The interviews helped to enrich the understanding of the fracking situation in Ireland, public opinion, and the key risk terms in relation to people's beliefs and opinions.

3.3 Document Analysis Methodology

The document analysis chapters utilise academic texts of varying origins including academic journals, government publications, media, Irish anti-fracking websites, and various

other internet resources. I utilised over 170 articles for the literature review, sourced mainly from academic journals, government documents, and media. I also consulted documentaries and other forms of information. The information obtained from these sources was then synthesised into a comprehensive and well-sourced depiction of fracking's development in Ireland as well as the current risk discourse as seen in general academia and media.

3.4 Research Limitations

For the media analysis, the overall time frame had to be restricted in order to limit the total number of articles analysed. The research also excluded some newspapers from analysis, while in a more extensive analysis all Irish newspapers could be included. Only two national newspapers, containing 35 articles that mentioned fracking in total, were excluded from the analysis in order to limit the scope. All other Irish newspapers were included in the analysis. The literature review also aided me in limiting the coding categories and my interpretation of the language in the articles also contributed to the coding results.

It should be noted that the interviews do not characterize a representative sample of the Irish population, as the majority of interviewees were anti-fracking activists, and therefore the conclusions drawn from them are limited. Activists do tend to be well versed in risk discourse, and the information obtained from their interviews was important in guiding the discourse analysis. Overall, no inferences or conclusions can be drawn from the interviews in relation to overall societal perceptions of fracking risks. The literature review was also limited in the amount of sources that I could explore. Thousands of articles exist in relation to fracking, but only a small subset of relevant literature could be utilised from this quantity. I tried to use relevant and dominant articles in the literature review sections, but the research had to be limited in the scope of articles cited.

CHAPTER 4 – Case Study: Fracking in Ireland

In the coming decades, population growth, increased demand by individuals, new emerging economies, and the depletion of other energy sources may all increase the global demand for natural gas. Although conventional gas sources are still being harvested, new advancements in technology have allowed unconventional gas sources, such as shale gas, to become more viable energy options. Shale gas has the potential to meet 30% of the world's total primary energy supply by 2025 and from 35% to 50% by 2040 (Pearson *et al.* 2012; Peduzzi and Harding 2012). According to Inglesby *et al.* (2012), significant unconventional gas resources are estimated to exist in Abu Dhabi, Algeria, Argentina, Australia, Canada, China, Colombia, Germany, India, Indonesia, Mexico, Oman, Poland, Russia, Saudi Arabia, Ukraine, and the United Kingdom. The biggest potentials are in China, India, North Africa, Russia, and South America, but Europe has also become an area of focus in the shale gas arena as certain countries – such as Poland, the UK, and potentially Ireland – aim to replicate the seemingly successful US experience (McGowan 2014).

4.1 The Fracking Process

The hydraulic fracturing process uses a mixture of highly-pressurised water, sand, and chemicals to fracture rock and release natural gas from the earth [see **Figure 1**]. The process involves first drilling straight down into the earth, between 1.5 to 3 kilometres deep, and then drilling horizontally for 150 to 250 metres (BBC 2013; Santoro *et al.* 2011). The molecules of shale gas are trapped within tiny cracks in the rock that are then expanded by the drilling and highly pressurised liquid. The fracking fluid creates larger cracks, which allows the molecules of shale gas to be released and collected at the surface. Once the gas is collected,

the wastewater, also known as flowback, from the process must be treated either in nearby ponds or transported to a wastewater treatment plant.

One of the main advantages of hydraulic fracturing over other types of drilling is that horizontal wells can extend for kilometres within a single shale layer. This allows the process to have a smaller surface footprint, as it is mostly contained underground. Several wells can then be drilled from one well pad with access to shale gas in many directions through a variety of layers of shale (Schafft *et al.* 2013, Kargbo *et al.* 2010; Soeder and Kappel 2009).

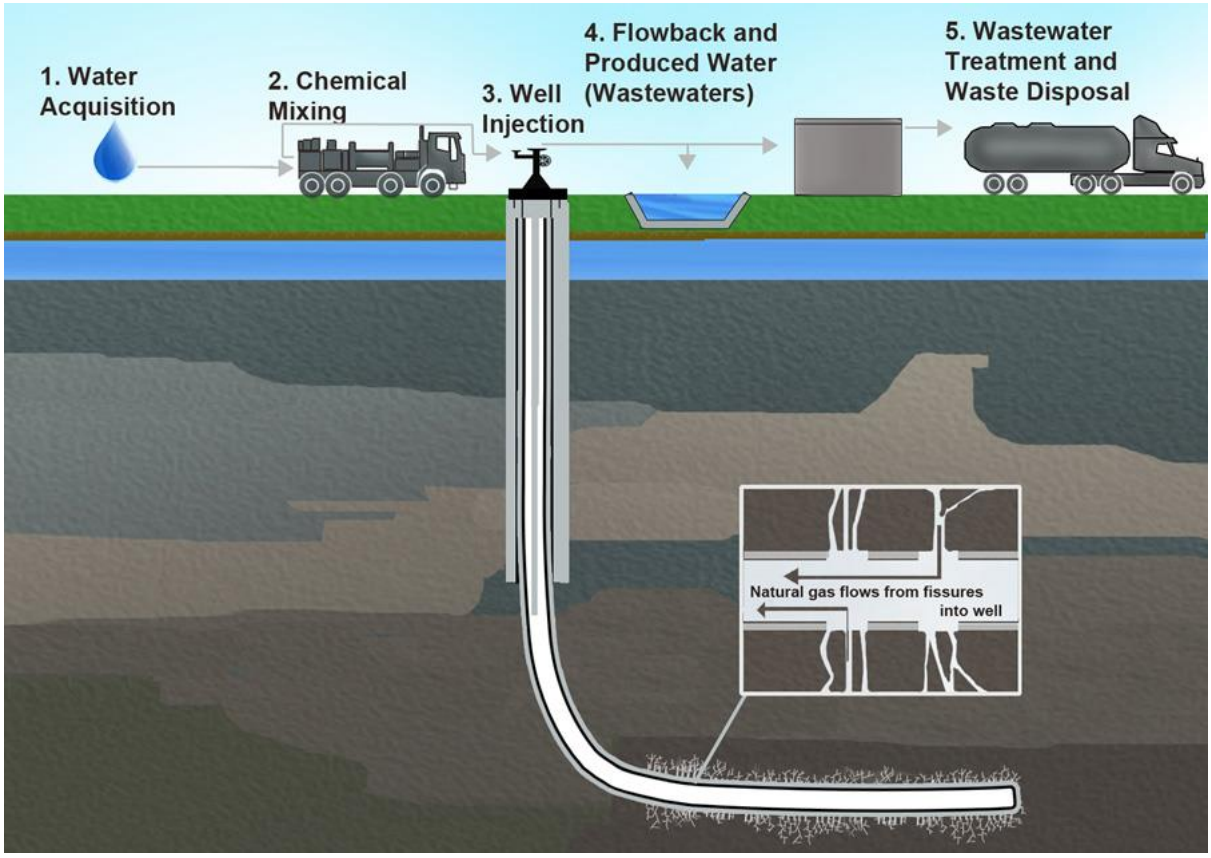

Figure 1. Diagram of hydraulic fracturing process
Source: Wikipedia Commons

Each fracking rig requires between 4 and 10 million gallons (15 to 38 million litres) of water mixed with sand and chemicals, many of which are hazardous and potentially toxic, to be injected into underground shale deposits in order to fracture the rock layers and release natural gas (Abdalla 2010; Finkle 2011; Ladd 2013). The fracking fluid is 99-99.5% by mass

water and sand and 0.5-1% chemical additives, and the wastewater can contain contaminants such as radioactive radon from the underground shale formations as well as chemicals used in the process such as oils, acids, alcohols, and other organic chemicals (Abdalla 2010). With these proportions, the use of 3 million gallons (11.4 million litres) of hydrofracturing fluids would create approximately 15,000 gallons (57,000 litres) of chemical wastewater that would then need to be treated in nearby waste ponds or a wastewater treatment facility (Soeder and Kappel 2009). Of the total wastewater produced in the process, between 30% and 70% returns to the surface as flowback and needs to be treated (Schafft *et al.* 2013).

In order to process the extracted gas, pipelines and compressor stations also must be built in proximity to the drilling site in order to transport the harvested gas to consumer markets (Schafft *et al.* 2013). Other infrastructure, such as roads, must also be built in order to allow large vehicles access to transport in water and fracking chemicals and transfer out wastewater and gas products. Waste ponds also need to be constructed next to fracking sites in order to contain the chemical flowback. Wastewater treatment plants could be used to treat flowback, but they must have the proper facilities and capacity to treat the chemicals used in the process. This need for new infrastructure can prove controversial in areas where fracking is proposed or taking place, as locals tend to dislike changes made to their local environment.

4.2 Fracking in Ireland

The history of fracking in Ireland is still in development. As Ireland currently has very little history of fracking or other energy extraction projects, there is little acceptance or support of the practice (Hernan 2012a). Of the 157 exploration wells drilled in Ireland since 1970, only 4 have been commercially viable and exploited (Dennehy *et al.* 2011). This contrasts the American and British experiences as both nations have much more familiarity with mineral extraction. For example, in the United States farmers have had oil companies

mining resources on their land for decades. The government of the United Kingdom currently supports fracking activities and Prime Minster David Cameron openly promotes fracking in the country. Ireland has a strong connection to the UK historically, physically, and through their energy markets. If the UK begins fracking in Northern Ireland, this decision could greatly affect Irish fracking policy.

4.2.1 The Potential for Fracking in Ireland

Currently 85% of Irish energy is imported and over 90% of this imported energy is in the form of fossil fuels (Whittaker 2014). Ireland receives 50% of its imported energy from the UK, and Ireland has a close connection to the UK energy market (Bord na Móna 2014). As of 2012, natural gas accounted for 61% of the fuel used in electricity generation and many predict that natural gas will become even more crucial to the Irish energy system (CER 2011; Clancy and Scheer 2012). The Sustainable Energy Authority of Ireland (SEAI) predicts that unconventional gas will make up 84% of the global gas demand over the next 250 years, and that it would be a 'high risk strategy' to assume that the Irish gas market will respond similarly to the US market in regards to shale gas development (Russell 2010; Clancy and Scheer 2012). This may be due to the fact that the Irish energy market is connected to the UK market, so any natural gas extracted in Ireland will not lower Irish energy prices, but will instead enter the British energy market.

Fracking activities in Ireland are often compared to the American situation in which fracking has recently been economically successful. Fracking in Ireland has both its advantages and disadvantages as compared to fracking in the US. Although the shale in Ireland is more complex and harder to predict and drill into than the flat and consistent shale in parts of the US, Irish shale can be drilled in multiple layers instead of just one layer as is the case in the US. Ireland has thick shale and sandstone, which allows drilling to occur on

multiple levels with the result of increased efficiency (Moorman and Mitchell 2012). In this way, fracking may be able to be done with fewer wells than in the US.

4.2.2 The Development of Fracking in Ireland

The first real discussion of fracking in Ireland occurred in 2011 after the first onshore petroleum licencing options were issued. On February 14, thirteen days after the dissolution of the 30th Dall and the collapse of the Fianna Fail/Green Party coalition, the newly appointed Minster for DCENR offered three companies licencing options to evaluate the potential for fracking in the North West Carboniferous Basin and parts of the Clare Basin (DCENR 2007; Mitchell 2014; Rabbitte 2013). In 2011, three companies obtained exploration licence options (DCENR 2011):

- Tamboran Resources, with licensing for over 986 square kilometres in the Northwest Carboniferous Basin, the counties of Leitrim in Ireland and Fermanagh in Northern Ireland
- Lough Allen Natural Gas Company, with over 467 square kilometres in the Northwest Carboniferous Basin
- Energi Oil, with over 495 square kilometres in the Clare Basin (in Clare County)

These licencing options were for assessment purposes only in order for companies to assess the potential for shale gas exploration based largely on desktop studies and previous data. The option also permitted shallow geological sampling, but exploration drilling was excluded (DCENR, NIEA, EPA 2013a; Rabbitte 2013). The options licence requires that the government seriously consider granting an exploration licence to the companies, and if a company has an exploration licence and discovers a viable source of petroleum, then they must be granted a lease for exploration (DCENR 2011).

In 2012, the Irish Environmental Protection Agency (EPA) commissioned a preliminary report on fracking from the University of Aberdeen to evaluate the potential for fracking in Ireland. The report highlighted limitations in the understanding of Irish geology

and seismic risks and stated that contamination of groundwater would be the most serious environmental concern (Healy 2012). The report concluded that: "Media, corporate, scientific, and other publically available material on shale gas development and fracking should be framed in a rational, coherent manner. Detailed peer-reviewed analyses of the successes and failures of fracking are the way forward" (Healy 2012, 22). The report was criticised in the press and by environmental groups for the strong connections that Aberdeen University has with the fossil fuel industry and because it was not peer-reviewed before publication and appeared to not utilise enough peer-reviewed literature (Hernan 2012a). But the report did use a variety of sources through a broad range of information areas. The report only provided a preliminary summary of the fracking potential of Ireland, and many felt that a more detailed study was needed before fracking could proceed.

In March 2013, the DCENR confirmed the receipt of two follow up exploration licence applications from two of the three companies: Energi Oil and Tamboran Resources. The Minister of DCENR announced that no decision would be made in regards to the use of hydraulic fracturing technology until the completion of a new research government-sponsored project (DCENR, NIEA, and EPA 2013b). Administered by the EPA, a multi-organisational study was designed in order to determine the best practice in respect to environmental protection for fracking in both Ireland and Northern Ireland (Rabbitte 2013). The project is sponsored by the EPA, the DCENR, and the NEIA and should be completed over two years with the final report completed by 2016.

A public consultation took place on the Draft Terms of Reference for the project from 11 January to 8 March 2013, which warranted 1,356 submissions, one of the largest amounts of submissions ever recorded for an Irish public consultation process (DCENR, NIEA, and EPA 2013b). The Terms of Reference outline the areas of focus for the study:

- Project A: Baseline Characterisation

    - A1 – Groundwater, Surface Water and Associated Ecosystems
    - A2 – Seismicity
    - A3 – Air Quality
- Project B: Unconventional Gas Exploration & Extraction (UGEE) Projects and Operations: Impacts and Mitigation Measures
- Project C: Regulatory Framework for Environmental Protection

The EPA, DCENR, and NIEA responded to the public comments noting that they would now include more aspects of human health, baseline air quality studies, change the phrasing of certain sections, emphasise the precautionary principle, and consider extending comment periods for future consultations (DCENR, NIEA, and EPA 2013b). The project will proceed with its research phase from 2014 to 2016 and should conclude with a report to guide decision-making at that time.

4.2.3 Irish Regulation for Fracking

There is currently no European-wide regulation that provides guidelines for hydraulic fracturing. Instead, regulations are developed and managed by individual countries. But even though there is no European legislation to mandate fracking requirements, many of the current EU directives do influence fracking practises. For example, the Water Framework, Groundwater Directive, and Mining Waste Directive cover regulation of water and spillage/leakage that can occur during fracking. The REACH (Registration, Evaluation, Authorisation and Restriction of CHemicals) Directive covers chemical usage, and Natura 2000 and Environmental Impact Assessment requirements cover impacts to the landscape and biodiversity. The Hydrocarbons Directive grants authorisations to explorations and productions of oil and gas, and the Environmental Liability Directive may require that operators be subject to liability for damages caused by fracking (McGowan 2014; Phillippe and Partners 2011). Ultimately, these directives do address many of the issues that may arise from fracking activities.

Many champion the Precautionary Principle as a main tenant of community policy in Europe and one that should have a stronger role to play in the fracking regulatory debate (Majone 2002; McGowan 2014; Postel 2013c). The Precautionary Principle claims that if an action or policy has a risk of causing harm to individuals or the environment, and there is no scientific agreement on its risk, then the burden of proof for its safety falls on those creating the policy. According to Majone (2002), "the precautionary principle has a legitimate but limited role to play in risk regulation" as it should be used when knowledge is too limited to reach a scientific consensus on a dangerous issue (18). This risk framework falls on more receptive ears in Europe as the precautionary principle is a main part of European legislative ideology. In Europe, the idea of risk is framed before fracking actions take place while in the US risks are discussed afterwards (Majone 2002). Because there are many unknowns about the fracking process, the precautionary principle should be a guiding tenant of European fracking regulation.

The European regulations as well as Irish environmental regulations apply in the case of fracking. Many scholars believe that Ireland's environmental regulation lacks the authority to effectively monitor fracking activities at this time (Costello 2014; Whittaker 2014). For example, none of the amendments to the Petroleum Minerals and Development Act 1960 envisioned fracking as fracking may have larger impacts on local landowners and the right of access to the private property of a landowner under authorisation of a petroleum lease may prove to be unconstitutional (Whittaker 2014). This Act imposes liability on the holder of the permit in case of damage to the land or water, but there are no provisions for the claims of neighbouring property owners and does not require compensation (Costello 2014). The EU Environmental Liability Directive uses the "polluter pays" principle to prevent damage to water and soil, but the directive does not discuss damage to persons or property. The operator

would therefore be liable for the cost of carrying out preventative or remedial measures only for 'pure ecological damage' but not for other damages (Costello 2014, 141).

According to Rabbitte (2013), if a company wanted to begin fracking in a region, they would need to: obtain consent from the Minister of DCENR, who would be advised by the EPA and the National Parks and Wildlife Service (NPWS); gain planning permission for the well pads from the Local Authority; and obtain planning consent in respects to the requirements of the Environmental Impact Directive. An Environmental Impact Assessment would take into account potential impacts on population, flora, fauna, soil, water, air, climatic factors, as well as archaeological heritage and would take place over the course of at least 2 months. Full licencing would also include: planning consent from Bord Pleanála, an Integrated Pollution Prevention Control Licence from the EPA, a Gas Act consent and safety case approval from the Commission for Energy Regulation, and a Petroleum Lease, a Plan of Development consent and a Gas Pipeline consent from the Minister of Energy. Overall, a variety of legal frameworks would be involved in the regulation of future Irish fracking activities.

Irish officials continue to champion proper regulation as a key tenet of future potential fracking operations. In a 2013 speech on fracking, the Minister for the Department of Communications, Energy and Natural Resources (DCENR), Pat Rabbitte stated: "Ultimately, our shared goal is to maximise the benefits to Ireland from our indigenous oil and gas resources. But we need to ensure that both exploration and production – conventional or unconventional, on land or at sea – are conducted safely and on an environmentally sound basis" (Rabbitte 2013). In this way, the DCENR claims it will provide proper and efficient regulation for any unconventional gas extraction in the future.

4.2.4 Fracking Regions: Clare and Leitrim

There are three main areas for shale gas development in Ireland: the Lough Allen Basin, the Northwest Carboniferous Basin, and the Clare Basin. To date, only the Northwest Carboniferous Basin and Clare Basin have licence options for development. The Northwest Carboniferous Basin is estimated to be 3 kilometres thick, consisting mostly of sandstones and shale. This basin was drilled in the 1960s, but low flow rates from the wells made them commercially unviable at the time and no subsequent exploration occurred (Bentham *et al.* 2008). The Clare Basin consists of mostly Carboniferous sediments and is shallower than the Northwest Carboniferous Basin. One interviewee claimed that the fact that the Minister for Enterprise, Trade and Investment Arlene Foster, who granted the licences to Tamboran, is from Fermanagh "has heightened the emotion and the debate around fracking."

The local authorities of Leitrim, Clare, and Rosscommon counties have implemented fracking bans into their development plans. The officials in these counties implemented the bans in order to reflect the sentiments of their counties, which were predominately anti-fracking. According to Convery and Scannell (2012), local bans should not take place because they are based on illegal precedents due to a ruling that overturned the local authority of Mayo's attempt to ban mining in the county in 1992. Furthermore, they believe that a fracking ban by the local authorities is a misuse of power, as the national, not local government, should determine this type of decision due to the fact that the national government is better informed on these types of issues.

4.2.5 Fracking Companies: Tamboran and Energi Oil

To date, Australian Tamboran Resources has released more information for its potential fracking plans than Canadian Energi Oil. Tamboran currently has permissions to explore fracking possibilities in both Ireland and Northern Ireland. According to Moorman

and Mitchell (2012), Tamboran plans to use 40,000 acres of land in Northern Ireland and 40,000 acres in Ireland [see **Figure 2**]. This area will contain 120 well-pads (60 on each side of the border) at 1 kilometre each in length. This will produce 24 wells per pad, spaced 200 meters apart for a total of 2,880 wells. These wells will drill in three layers within the shale in

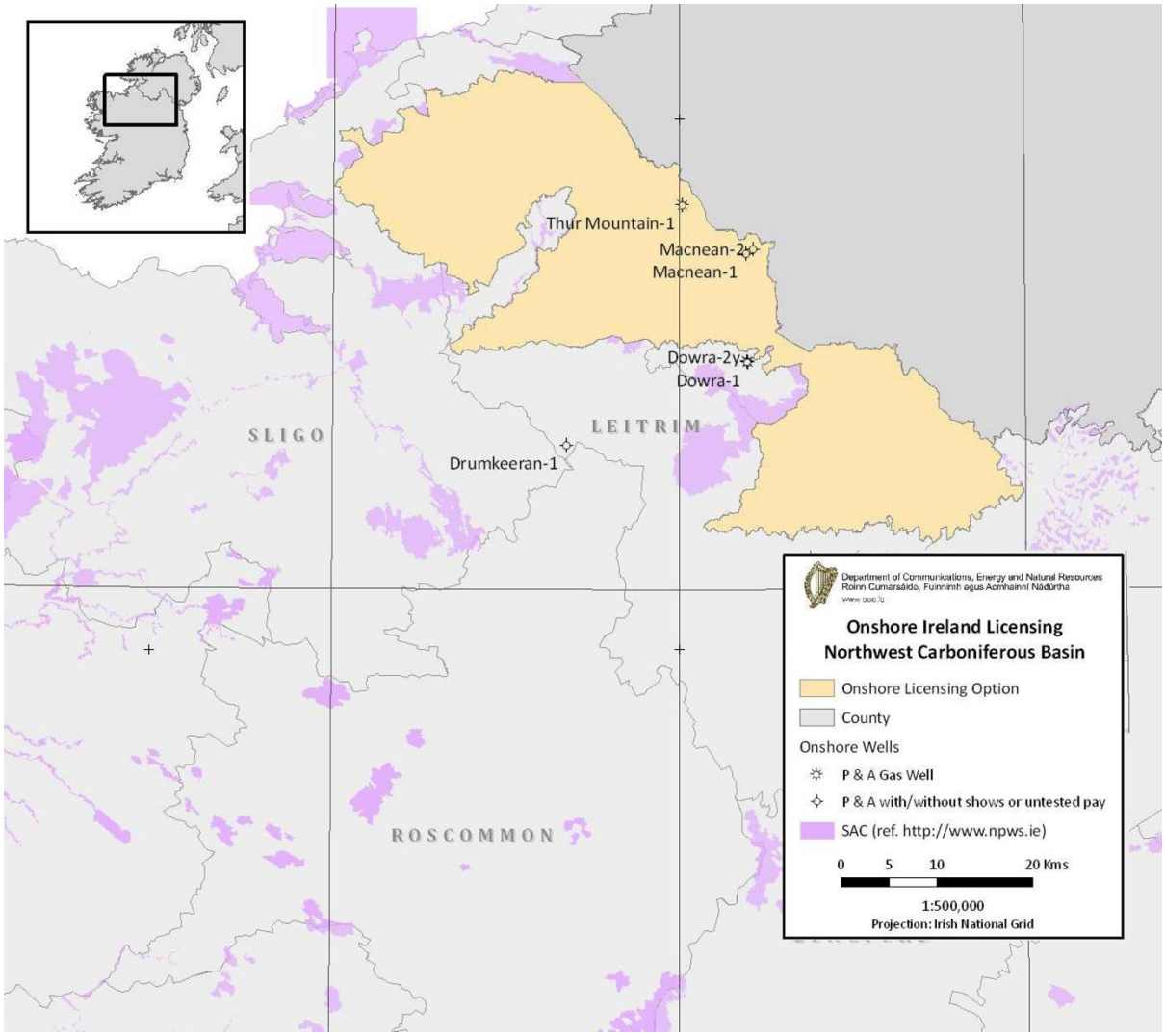

Figure 2. Proposed area for unconventional gas exploration by Tamboran Resources in the Northwest Carboniferous Basin
Source: The Department of Communications, Energy and Natural Resources

different directions. Tamboran Resources claims that it will avoid placing wells in areas that contain fault risks and that they will initially source their water from rainwater and then supplement this amount with groundwater (Moorman and Mitchell 2012). The company expects to recover 25% of the flowback water and will then treat the water in nearby ponds

that would be the size of Olympic swimming pools. Gas analysis shows that the gas extracted will need to be transferred to refining facilities, as it will not be able to be directly used.

Tamboran Resources also claims that it will "try to use no injected chemicals in [its] hydraulic fracturing operations in Ireland" (Tamboran 2014). At the test stage they plan to use only sand and water, as they are "confident that extra chemicals, even harmless biodegradable chemicals, will be unnecessary." To date, no company has performed

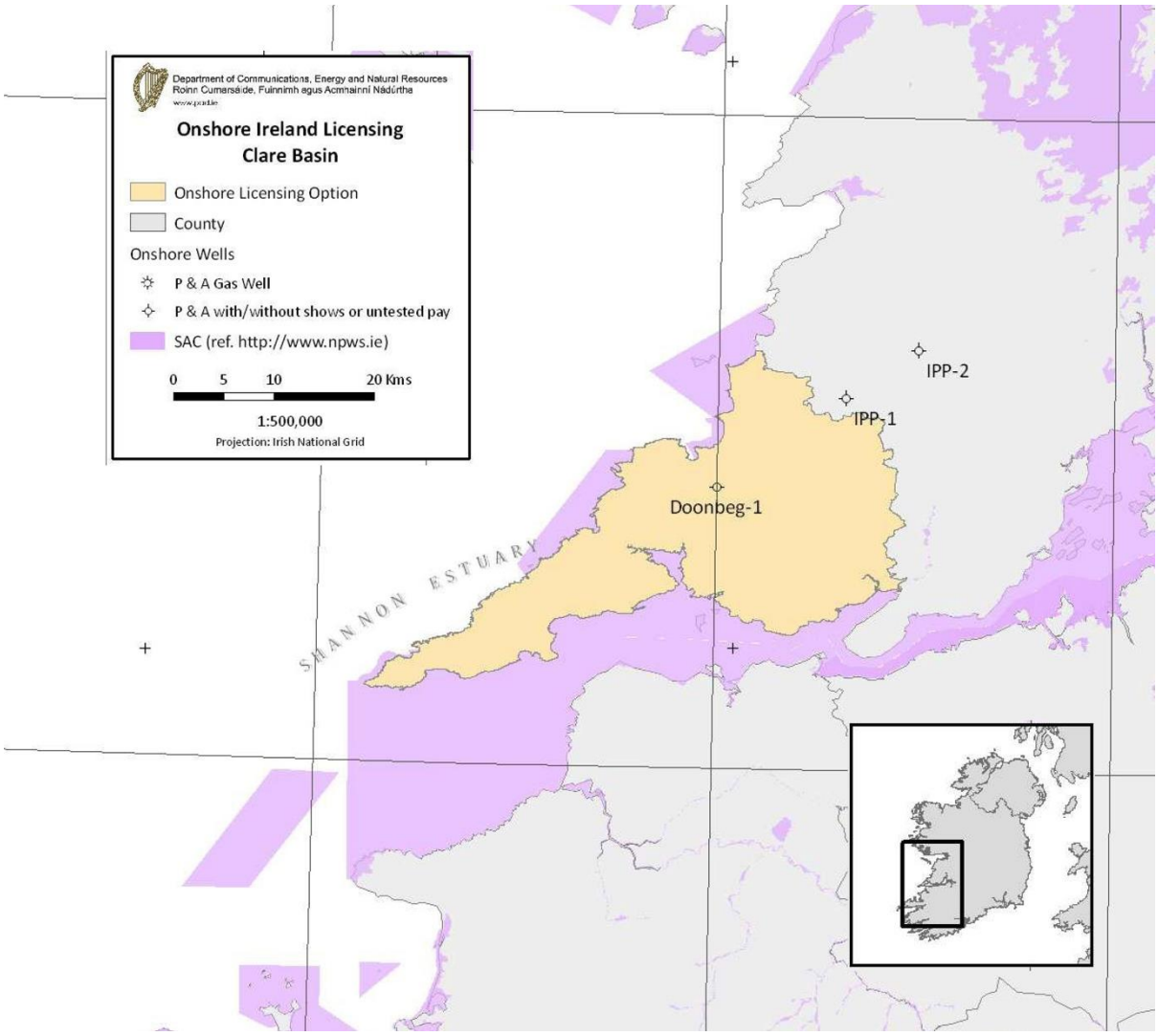

Figure 3. Proposed area for unconventional gas exploration by Energi Oil
Source: The Department of Communications, Energy, and Natural Resources

hydraulic fracturing without the use of chemicals in its fracking fluid. If Tamboran Resources does so, it will be the first company to perform this type of fracking operation. The company

also claims that the whole drilling and fracturing process can be performed in a few weeks after which the wells will produce "for up to several decades" (Tamboran 2014).

Energy Oil asserts that its interest in the Claire Basin is "100%," and that they are planning to quantify the gas potential, identify potential drilling targets, and identify optimal well design for the area (Energi Oil 2014). Depending on the results of their current program, they may apply for an exploration licence for the right to conduct drilling activities, but this is not yet confirmed. Energy Oil has not released quantifiable numbers as Tamboran Resources has done, leading one interviewed anti-fracking activist to believe that Tamboran is more committed to drilling in the Northwest Carboniferous Basin than Energi Oil is in the Clare Basin [see **Figure 3**].

4.3 Representation of Fracking in Culture and Media

In both the media and literature, fracking is often deemed a controversial and divisive issue. The general discourse focuses on a dichotomy between those in favour of the technology and those who oppose it. Sean McDermott, the Cathaoirleach (Chairperson) of the Leitrim County Council claimed that in relation to fracking there was "no middle ground, it's either right or it's wrong" (Crawford 2014). Many see fracking as a debate with only two sides and little room for compromise.

Numerous sources of media information have proven to be highly influential within fracking discourse. The Academy nominated 2010 documentary *Gasland*, written and directed by Josh Fox and funded by HBO, proved to be one of the main "rallying points for the anti-fracking movement" as the film "turned the obscure anti-fracking movement into a populist, celebrity and Occupy endorsed cause" (Wood 2012; Weigel 2013). The documentary explored the experiences of residents in Colorado, Wyoming, Utah, Texas and

other states in which fracking was taking place in order to expose the adverse affects that the process had on the local people (Jaspal and Nerlich 2013).

Even though the accuracy of claims in *Gasland* were challenged by the State of Colorado's Department of Natural Resources and by journalist Phelim McAleer's alterative documentary *FrackNation*, *Gasland* continues to be used as the spark to ignite protest movement in many local communities around the world. Irish journalist and documentary-maker Phelim McAleer independently funded *FrackNation*, a documentary reviewing the claims made in *Gasland*. McAleer focused on the benefits of fracking to the local farming communities in the US and the economy rather than the environmental risk that was the focus in *Gasland* (Bialosky 2014). *FrackNation* acts as a counterpoint to *Gasland*, providing the other popular narrative – that of economic benefit – to the fracking debate.

Other media related to fracking was also produced including four independent films in 2013, the Hollywood movie *Promised Land* starring Matt Damon in 2012, and a *New York Times* investigative series entitled "Drilling Down" (Ladd 2013). The *New York Times* series is championed as "one of the strongest pieces of investigative journalism from any news venue" in 2011 (Kennedy 2011). Alternatively, one of the interviewees claimed that the *Times* reporting was a misrepresentation of biased claims. Even though opponents criticised the claims as false, no corrections were printed during the entire run of the series and numerous forms of reference documentation were released along with the articles.

4.3.1 Anti-Fracking Protest Groups and Media in Ireland

According to many individuals interviewed, the emergence of the anti-fracking movement in Ireland is often attributed to local screenings of the *Gasland* documentary in the proposed regions of hydraulic fracturing. Filmmaker and Green Party activist Johnny Gogan began screening *Gasland* in Leitrim in early 2011 through his role as the curator of the

'Leitrim Mobile Cinema' (Infoshop News 2014). In the summer of 2011, a screening of *Gasland* in Drumshanbo allowed the first relatively large group of locals to become aware of shale gas fracking. As time passed, more localised campaign groups began to develop in Leitrim, Sligo, Donegal, Clare, and Dublin. In August 2011, a group of more than 600 organised locals protested Tamboran's initial meeting with the Leitrim County Council as an attempt to show the local opposition to the proposal (Infoshop News 2014). Over the next two years, protests continued which helped influence the local fracking bans passed by the county councils in Leitrim, Clare, and Rosscommon.

Figure 4. Love Leitrim anti-fracking signs
Source: Author

Currently eleven regional protest groups exist in Ireland: Fracking Free Ireland, Fracking Free Cork, Fracking Free Clare (No Fracking Clare), Anti Fracking Kerry, No Fracking Ireland, No Fracking Dublin, North West Network Against Fracking, Keep Ireland Fracking Free, Carrick-against-Fracking, Love Leitrim, and Good Energies Alliance Ireland. Five anti-fracking protest groups also exist in Northern Ireland, including: Fermanagh Fracking Awareness Network, Ban Fracking Feremanagh, Rathlin Basin Residents Say No To Fracking, and No Fracking Northern Ireland. As part of the research for this study, I interviewed individuals from Love Leitrim, Fracking Free Clare, No Fracking Dublin, and Good Energies Alliance to identify their views on the representation of fracking in Ireland.

Most anti-fracking groups focus on awareness-raising activities in order to increase public understanding of fracking and to promote local knowledge and action. Most local anti-

fracking groups began by showing screenings of *Gasland* in order to familiarise local citizens with the issues of fracking. After showing *Gasland,* Love Leitrim began to do activities to give back to the community in order to create a positive image within the community. During the Global Frack Down Day in 2012, Love Leitrim planted daffodil bulbs around the community and the group organised a 10k walk and cycling events. According to one member of Love Leitrim, the group does a "good job at raising awareness, being positive, proactive, and doing positive things to make people aware." One of the ways that Love Leitrim raises awareness is through numerous hand-made signs that are spread around the county promoting anti-fracking sentiments [see **Figure 4**]. Local fishermen also formed the Fishermen Are Resisting Tamboran (F.A.R.T.) protest group, which has performed numerous demonstrations against fracking in the Leitrim county area. Clare Fracking Concerned sent out leaflets to all the households in the county in order to raise awareness of fracking. One activist believes that this overwhelming awareness effort helped to lead to the countywide ban on fracking instituted in Clare in 2012.

Anti-fracking protest groups have also used forms of media and art representation to spread their message in Ireland. Dearbhla Glynn, who won the Grand Prize at the 2013 Irish Council for Civil Liberties Human Rights Film Awards for her documentary *The Value of Women in the Congo*, made a video that highlighted the ignorance that most people in Ireland have in relation to fracking (Irish Examiner 2014). Numerous Irish news websites reported on this video as an awareness-raising tool, and the video was also prompted through social media. The Tahany Academy of dancing entered the world Irish Dancing Championships in 2014 with their dance entitled "My Farm I Adore" which presents an allegory for farmers standing up to the threat of fracking on their land (Love Leitrim Release 2014; Belfast Telegraph 2014). Many local protest groups use creative methods to promote their cause, gain attention, and gain acceptance in local communities.

CHAPTER 5 – Document Analysis of Fracking Discourse

Fracking discourse is normally framed in the language of risks and benefits. These risks and benefits tend to be expressed in the areas of the environment, economics, and society. This chapter aims to address the common discourse used in fracking representation in the literature, including academic and media sources. By first identifying the most common fracking risk themes, I can define a better scope for coding terms in the media analysis. The risks identified in this chapter are coded in the media analysis, and comparisons can then be made between the general academic fracking risk discourse and the risk discourse that emerges from the Irish news media.

5.1 Risks Associated with Fracking

Fracking tends to be discussed using a risk frame with the impacts of the technology discussed in risk categories. These include environmental impacts, economic impacts and social impacts. These three categories appeared often within the academic discourse as arguments against the use of fracking technologies. This section explores the common ideas and terminology used in this risk discourse.

5.1.1 Adverse Environmental Impacts

The environmental impacts from fracking operations represent one of the biggest frames of academic fracking risk discourse. The major adverse environmental impacts, as determined through analysis of the fracking discourse in academic journals and media sources, were as follows: wastewater and water pollution, water use, air pollution, climate change and GHG emissions, increased fossil fuel reliance and decrease in renewables, noise pollution, earthquakes, radioactivity, and wildlife (Dyson 2014; Beebeejaun 2013;

Environment and Human Rights Advisory 2011; Hernan 2012b). These prominent environmental risks provide a foundation for identifying fracking risk discourse.

Wastewater and Water Pollution

From the analysis of literature, wastewater and water pollution were often referred to as the most significant environmental impacts and the ones that received the most attention and coverage (Droulin 2014). The fracking process produces large quantities of wastewater that must be properly treated and disposed of. After fracking occurs, 30-70% of the fracking fluid resurfaces to be treated, while the rest remains underground. Methane and fracking fluid can escape by migrating up the fractures in the earth and leak through the well-casings to contaminate groundwater (Lipcomb *et al.* 2012). This fracking wastewater may contain substances from the earth such as strontium, benzene, toluene, and Naturally Occurring Radioactive Materials (NORM) (Food and Water Watch 2012). According to a report by Earthworks, Clean Water Action, and the Centre for Biological Diversity, "oil and gas production result in billions of gallons of contaminated wastewater that is often disposed of in underground injection wells" (Shauk 2014). Many fear that fracking wastewater will contaminate their drinking water or agricultural water sources.

The threat of groundwater contamination due to mistreatment of wastewater through leaks, spills, and methane migration is one of the major risks referred to in the literature (Finkel 2011; Hatzenbuhler and Centner 2012; Jackson *et al.* 2013; Le Renard 2013; Myers 2012; Osborn *et al.* 2011; Rahm and Riha 2012; Rozell and Reaven 2012; Warner *et al.* 2012). In 2013 scientists tested Blacklick Creek, a water source in Pennsylvania located near fracking activities, and found radium levels that were 200 times higher than normal, attributed to the effects of fracking wastewater (Droulin 2014). Another study led by Duke University scientists found that drinking water wells located within one kilometre of shale

gas wells in north-eastern Pennsylvania were at high risk of methane contamination (Postel 2013b). As is argued in the documentary *Fracknation*, this study's lack of baseline data for pre-fracking methane levels in the wells calls its results into question (McAleer & McElhinney 2013). Similarly, a 2012 study in Alberta, Canada, found that 4.6% of the 316,000 fracking wells had leaks due to events during transport, mixing, or storage of flowback (Peduzzi and Harding 2012).

Water Use

Hydraulic fracturing processes also use large quantities of water. Problems can arise with the water quality from an overuse of a water system. As more water is removed from the system, the chemicals in the remaining water become more concentrated. This lower dilution rate in a water system with less water can harm an ecosystem if fracking fluid is subsequently released into the system (Abdalia 2010). According to a report from Ceres, a Boston-based non-profit organisation that focuses on environmental risk education, currently 47% of fracking wells in the US are being developed in highly water stressed-regions (Postel 2013a). For example, 92% of shale gas wells in Colorado are in "extremely high" water stress regions, and in Texas, 51% of wells are in "high or extremely high" water stress regions. As hydraulically fractured gas is predicted to double in coming years in the US, competition and conflicts over water resources will become increasingly important for companies, policymakers, and investors.

Air Pollution

The fracking process also has the potential to affect air quality due to methane releases during the fracking process and pollution emitted from the equipment used (Clarke *et al.* 2012; Olaguer 2012; Rahm 2011). The health effects from fracking are believed by some

to rival the effects of coal. The fracking process may release large amounts of methane from the earth. Current estimates of methane release may be greatly undervalued. A study found that wells in southwestern Pennsylvania released methane at rates 100 to 1000 times higher than the federal regulators had estimated (Banerjee 2014). The equipment used in the extraction process also creates air pollution. The industry uses mostly diesel-burning equipment that emits NO_x, SO_x, and particulate matter, contributing to air pollution and climate change (Inglesby *et al.* 2012). Companies are now trying to come up with equipment to mitigate the polluting effects with a focus on methane seepage (Sider 2014). Some studies also suggest that the air pollution from fracking may be directly impacting human health. In a disputed study conducted by the Center for Disease Control, breast cancer rates dropped in nearly every county in Texas, increasing only in counties with the most fracking activities (Kennedy 2011). Scientific studies continue to explore the extent to which fracking activities impact air pollution levels and the subsequent consequences of these impacts.

Climate Change and GHG Emissions

Arguments exist for both positive and negative effects of shale gas on climate change potential. Some uphold shale gas as an energy source that creates less pollution than other fossil fuels sources when burned, while others claim that when the fracking process is also considered in the total emissions from shale gas, the gas may be more pollutive than other fossil fuel sources (Howarth *et al.* 2011; Hou *et al.* 2012; Weber and Clavin 2012; Kennedy 2011). The vast releases of methane during the fracking process may counterbalance the CO_2 reduction benefits projected through the use of shale gas (Howarth *et al.* 2011; Wigley 2011; Stevens 2012). Methane is a 25 times stronger GHG on a 100-year time scale than CO_2, and therefore produces a greater impact on climate change potentials (Inglesby *et al.* 2012). A report from the European Commission found that emissions from shale gas production sites

were 1-8% higher than for conventional pipeline generation in Europe (Forster and Perks 2012). But some argue that the GHG emissions from shale gas production in Europe could still be less than the GHG emissions from shale or other fossil fuel extraction in regulatory regimes outside of Europe. This indicates that European-produced shale could be a less pollutive source. Others argue that to combat climate change, there must be a global transition from fossil fuels to renewable and other alternative fuel sources.

By continuing to harvest and combust shale gas sources, many countries may find it difficult to meet their climate change targets. A report by the Tyndall Centre found that by burning only 20% of the gas that Cuadrilla Resources – a fracking firm investing in the United Kingdom – claims it has found in the UK would account for 14.5% of the UK's total carbon emissions budget to 2050, not including methane emissions from the process (Broderick *et al.* 2011). Similarly, if Ireland began harvesting shale gas and utilising it more heavily in its energy-mix, the country could have difficulty meeting its current emission targets. Ireland has adopted the Harvest 2020 strategy, which has committed Ireland to doubling it beef and dairy exports by 2020. Currently farming already generates 29% of the GHG emissions of the country, so increases in livestock production coupled with fracking activities may make it more difficult for Ireland to meet its EU climate targets (Hernan 2012b).

Increased Fossil Fuel Reliance/Decrease in Renewables

The academic discourse also compares shale gas to renewable energy sources and emphasises how an increase in shale gas production may lead to a decrease in renewables and an increased reliance on fossil fuels in the energy-mix (BBC 2013; Inglesby *et al.* 2012; Stevens 2012). According to Inglesby *et al.* (2012), shale gas development may slow down renewables and create a "lock in" to natural gas through fracking infrastructure investment

and the development of buildings and other infrastructure that rely on natural gas rather than other energy sources. Research from the US shows that investing $1 million in renewable energy infrastructure creates two to three times as many jobs as the same investment in natural gas (Pollin *et al.* 2009). In the UK, the renewable sector could support up to 400,000 jobs by 2020 if it receives the proper investment (Renewable Energy Association 2012). Fracking may be viewed as either "a bridge to renewable energy or a bridge to nowhere" because, while it may provide a fuel source to use during a transition to renewable technologies, it still requires a reliance on fossil fuel sources when a clean transition to renewables may be more desirable (Boudet *et al.* 2014, 65). In this way, fracking could take focus away from investment in renewable energy technologies and the renewable energy jobs and instead promote a fossil fuel lock-in.

Currently in both Ireland and Northern Ireland, wind projects have been proposed with the installed capacity of over 6 GW by 2020, but issues of limited interconnection, energy storage, and public acceptance have made the implementation of these projects difficult (Hewitt 2012). Wind energy featured predominantly in the interviews as well, representing another form of energy with controversial public acceptance due to the physical appearance of wind turbines, the pylons needed to transport the wind energy, and the fact that the energy would be directed back into the UK energy market. Recently, a proposed project to install 2,300 wind turbines in the Irish midlands to supply 5 GW of energy back to the UK was set back due to disagreements in the proposal (Smyth 2014). As seen in the interviews, many Irish citizens dislike the idea of wind energy and Ireland has a growing protest movement against wind technology.

Noise Pollution

Noise pollution from fracking sites can also cause problems for nearby residents, livestock, and wildlife (Ladd 2013; Rahm 2011; Woodyard 2014). At some sites the fracking equipment is run for 24-hours a day and can disrupt the sleep patterns of those living nearby. Many locals have spoken against fracking due to the effect that noise can have on their daily lives and health. Ironically, Rex Tillerson, the Chairman and CEO of Exxon Mobil, put forth a lawsuit against a fracking site proposed for his neighbourhood. He claimed that the project would "create a noise nuisance and traffic hazards" (Woodyard 2014). This act of NIMBYism (Not In My Back Yard), the concept that individuals are more against activities happening near their places of residence, illustrates how fracking discourse is advanced through lawsuits and in media reporting, as many newspapers and websites covered this lawsuit.

Earthquakes

Scholars often discuss earthquakes occurring as a result of fracking as a prominent risk in media and literature (Peduzzi and Harding 2012; Haaretz 2014; Ahmed 2014). All earthquakes to date that are associated with fracking activities have been low magnitude and have not risked damage to local infrastructure or threatened lives, but earthquakes could cause problems with the well-casings and with fracking infrastructure. In Ohio, there were 11 earthquakes within a few days, which caused all fracking operations to shut down due to the industry's "abundance of caution" (Fountain 2014). Few instances of earthquakes related to fracking have occurred in British Columbia, England, and Oklahoma. In March 2011, two small earthquakes – magnitudes 1.5 and 2.2 – hit the Blackpool region of the UK after fracking activities took place. These earthquakes exacerbated public awareness and public concerns about fracking that caused a suspension in June 2011 of all fracking activity (BBC

2014; Cuadrilla Resources 2011; Jaspal and Nerlich 2013). Although the suspension was overturned in 2012, this initial reaction to fracking as a response to seismic activity indicates the prominence of earthquakes in the fracking risk discourse and public consciousness.

Radioactivity

Concerns about radioactivity often appear within the fracking discourse as fracking activities have the potential to release Naturally Occurring Radioactive Materials (NORMs) from the earth. In North Dakota, an abandoned gas station was found full of radioactive filters used in the fracking process. The process produced 27 tons of dirty filters per day (Weissmann 2014). If not properly treated and disposed of, these NORMs can affect human and ecosystem health and potentially lead to increases in cancer and other illnesses. Risks occur in removing this material from the earth and then properly treating it once removed. Normal wastewater treatment plants are not equipped to treat radioactive materials, and therefore, the treatment of fracking flowback fluids can negatively impact the treatment process.

Wildlife

Fracking activities may also affect natural wildlife through salinisation of water sources, degradation of water quality, and habitat fragmentation (Gillen and Kiviat 2012; Smith *et al.* 2012; Weltman-Fahs and Taylor 2013; Ladd 2013). The construction of well-pads divides up habitats and reduces species range. Fracking operations often spread over wide areas of land with many fracking pads spaced quite a distance apart from one another. This type of operation will permanently damage habitats and can affect migratory patterns of species. Pollution of water sources may also threaten endangered species and other animals in the environment, especially sensitive species such as amphibians and reptiles. According to

Stephen Trottor, the director of the Wildlife Trust in the UK, the use of saline solution and chemicals could greatly threaten natural ecosystem health (Marshall 2014). In this way, fracking could pose a major threat to the survival of threatened and endangered species and to the wellbeing of natural ecosystems.

5.1.2 Adverse Economic Impacts

Academic fracking discourse also focuses on negative economic impacts associated with fracking, such as the overestimation of its profitability, the potential for a "Boom Bust" cycle, and a burden placed on taxpayers due to abandoned wells, damaged roads, and decreased real estate values (Kinnaman 2011; Weber and Clavin 2012). These adverse economic impacts are used to counter the positive economic impacts, which tend to be used as the main arguments in favour of fracking technology.

Overestimated Profitability

While the economic benefits of fracking are often used as the biggest discourse in favour of the activity, the idea that fracking is not quite as profitable as it has been illustrated to be also appears in the discourse. Many point to the overestimation of potential shale gas volumes as a sign that the industry's profitability has been inflated. The US Geological Survey slashed its estimate of the Marcellus Shale gas by 80% in 2011 and by 66% in 2012 due to improved data, which raised many doubts at the time about the projected revenues (Kennedy 2011). Similarly in Poland estimates were cut by 85% in 2012 based on the analysis of well data (Strzelecki 2012). The recovery rate of unconventional gas is also believed to be around 15-30% as compared to 80% for conventional gas, meaning that these large volume estimates will be smaller volumes once extracted (Pearson *et al.*2012).

The profitability of shale gas in the US may not transfer to the European market as easily as many predict. According to Williams *et al.* (2011), the overall production costs for shale gas extraction are likely to be higher in Europe than in the US due to the less promising geology, higher population densities, less land availability, lack of competitive onshore drilling, and more stringent environmental regulations. Europe also has a less integrated energy network with less pipeline connection than the US, and there is also no EU-wide regulatory framework for shale.

Many believe that shale gas is a profit bubble similar to that of the housing market, insinuating that it will continue to grow but will eventually burst (Ladd 2013; Rogers 2013). Deborah Rogers published an article about the potential of this "bubble burst," stating: "It is highly unlikely that market-savvy bankers did not recognise that by overproducing natural gas a glut would occur with a concomitant severe price decline" (Rogers 2013). She believes that the increasing profitability of shale gas will soon ebb. An analyst from PNC Wealth Management claimed that shale gas is "inherently unprofitable" but "money keeps pouring in" (Urbina 2011). These claims are countered by claims of economic prosperity due to shale gas investment, backed up by the current profitability of the shale gas market in the United States. The profitability of extensive shale gas development outside of the US has yet to be seen.

Economic Burden on Taxpayers

In some cases, the economic burden of fracking has fallen on the local citizens due to the fracking regulations in place. In 2009 in Pennsylvania, more than 8,600 wells were abandoned and taxpayer money had to be used to close 259 of them due to leakage of natural gas, oil, and fracking fluid into the groundwater, surface water, and air (Finkel 2011). The post-mineral extraction clean-up costs can be substantial in relation to cleaning up

contaminated streams and soil, wastewater spillage, and improper disposal of radioactive material and hazardous wastes (Finkel 2011). The costs of road damage may also fall on the taxpayer. The heavy sand and water trucks also tend to damage roads over time (Mertens 2014; Ladd 2013; Rahm 2011). A single use well needs between 360 and 1,100 truckloads of water and will vary depending on the size of the well (Peduzzi and Harding 2012). According to Kennedy (2011), the industry has acknowledged that it "absolutely cannot afford to pay localities the costs of road damage," so those costs are therefore transferred to the local taxpayers. The media also reports on the possibility of real estate values being influenced by shale well construction. Currently, not much is known about the effect of wells on property values, but it is believed that the value of existing real estate will decrease in relation to the construction of fracking wells nearby (Lipcomb *et al.* 2012). In this way, citizens will have to bear some of the costs of fracking in the form of lower property values and diverted or increased taxes to repair roads and ecosystems.

5.1.3 Adverse Social Impacts

Social impacts are framed as impacting human health, affecting aesthetics and the rural landscape, harming tourism, creating boomtowns, infringing on human rights, and negatively impacting communities. Many social issues such as the fast-paced economic and demographic transition caused by the arrival of the fracking industry, which can affect housing, crime, damage to infrastructure, traffic, municipal services, the character of the community, and the quality of life, all impact the social structure of communities (Brasier *et al.* 2011; Jacquet and Stedman 2011; Perry 2012; Schafft *et al.* 2013).

Health Impacts

Many scholars and journalists also frame fracking as a threat to human health. When fracking is discussed in the media, many writers focus on the fears and risks related to health impacts due to fracking activities. Journal articles published by the scientific community support many of the claims made in the media about human health impacts. In a study conducted by Colborn *et al.* (2011), of 353 chemicals known to be used during the fracking process in the United States, 25% of them could cause cancer, 40-50% could affect the nervous system, immune system, and cardiovascular systems, and more than 75% of them could affect skin, eyes, and the respiratory system. This study is often cited in the academic literature. Another 11 chemicals used in fracking are known endocrine disrupters and are linked to cancer, birth defects, and infertility (Postel 2013c). Between 2008 and 2012, over 161 incidents of drinking water contamination were reported from fracking as well as concerns over eye irritation, headaches, asthma, and cancer (Polus 2013). While one interviewee and many other journalists and bloggers dispute the scientific credibility of these claims, the discourse does place a large emphasis on the risks and fears of negative health impacts as a result of hydraulic fracturing.

Aesthetics and the Rural Landscape

The discourse, especially in Ireland, also focuses on the idea of the aesthetic beauty of the rural untouched landscape. In this way, many oppose fracking because it will change the landscape dynamic which can ultimately harm tourism and the local value of the land (Ladd 2013; Inglesby *et al.* 2012). Eight people in the interviews referenced Ireland's pristine beauty as something to be maintained and cherished, and they claimed that fracking would ruin this perception. This appreciation for the land can also be seen in relation to the proposed wind turbines in the Irish midlands, which failed to be implemented in part due to the

determined opposition from the local residents who viewed the turbines as a disruption and sore on the local landscape. Six interviewees claimed that the opposition to fracking mirrored the wind turbine debate, as they represent similar energy issues in relation to their lack of public involvement, potential impacts on the landscape and aesthetics, and the organisation of protest groups.

Tourism

Impacts on tourism are expressed in relation to the destruction of the pristine environment and natural ecosystem. Tourism is a substantial industry in Ireland, and much of the industry depends on environmental tourism and people traveling to see the "untouched" countryside (Costello 2014). Fracking could therefore pose a threat to this type of economic activity. In Clare and Leitrim, large-scale hiking trail projects have been proposed and are currently in development. In Leitrim, one activist spoke of the promotion by locals of a Greenway project that could attract 250,000 people a year and would help to vitalise cafes, bike rentals, bed and breakfasts, hotels, and shops in the area. Another activist spoke of a similar project underway in Clare County called the Wild Atlantic Way, which would consist of a western coastal route to promote tourism. Both projects could be threatened if fracking began in the area, and these potential jobs and local economic benefits could be lost.

Boomtowns

Fracking's association with the creation of boomtowns also arises in the media and literature. According to Schafft (2013), boomtowns are "places that experience rapid economic and population growth typically in association with mining or other types of resource extraction" (143). These areas then experience social stresses and tough transitions from boom to bust economies when the industry leaves. Both Clare and Leitrim Counties

have the potential to develop into boomtowns. Some welcome the possibility of boomtown development in the regions, as this type of development could bring economic prosperity and jobs to the regions that are already suffering due to current economy. Many locals argue that jobs created from fracking activities will be temporary. Related jobs, such as increases in cafes, stores, and pubs due to the influx of people from fracking activities, will then suffer failures when the industry is no longer there to support them. Many of the anti-fracking activists interviewed claim that many locals want to avoid this type of economic development, as they believe that investment in tourism could be more profitable and that environmental protection is more important than short-term economic gain. Journalist John Eligon, writing for the *New York Times*, also argues that boomtowns in the United States tend to bring an influx of men who can increase sexual violence against women and decrease women's sense of security (Eligon 2013). In this way, fracking development can change towns socially and economically in the short-term, with potential long-term negative consequences.

Human Rights

Discourse surrounding fracking in relation to human rights is not as prominent in the literature, but it does appear in a number of instances. Issues related to human rights and fracking include: the right to security of person and bodily integrity, the right of a family to protection, the right of motherhood and childhood to special care of protections, the right of children to the highest standard of health, and the right to prior free and informed consent (Environment and Human Rights Advisory 2011; de Rijke 2013). Fracking may threaten access to clean water and resources and may negatively impact human health, which can affect both mothers and children. Issues over access to information and participation of local citizens in the decision-making process also arise in relation to human rights issues.

Community Impact

According to Brasier *et al.* (2011), social impacts on communities may include: "Increased stress, changing patterns of interactions within communities, decreased community cohesion, and changing community character" due to the arrival of new people who seek employment with the shale gas industry (36). The quality of life of the individuals in the community may decrease as a result of an insufficient amount of services due to resource diversions for fracking activities and workers. Communities may also experience increased social strife between those in support and those in opposition of fracking activities. For example, one interviewee said that in Fermanagh, Northern Ireland, on 1 April 2014, a sign stating "Fracking is Good For You: April Fools!" was thrown into the river by an unknown fracking supporter [See **Figure 4**]. The interviewee spoke of the incident unfavourably and used it as an example of how community tensions were increasing in relation to fracking. In a study conducted by Theodori (2009), respondents from the Marcellus Shale region in the US stated that they believed that crime, respect for law and order, and disagreements amongst local residents were worsened due to the introduction of natural gas drilling.

5.2 Benefits Associated with Fracking

The discourse for the benefits of fracking focuses on a smaller number of frames, including the potential benefit of fracking for climate change, the economic benefits including job creation, energy security, and benefits for landowners, and the potential for positive social impacts through investment in local communities. This section explores these frames as counters to the previous risk frames.

5.2.1 Positive Environmental Impacts

In relation to positive environmental impacts, the discourse tends to focus on how shale gas can be viewed as a cleaner source of energy than other fossil fuel sources in terms of GHG emissions. When shale gas is burned, it produces half of the emissions of CO_2 as compared to coal and oil, and if methane leakages are avoided then shale gas could potentially be a solution to anthropocentric climate change (BBC 2013; Gold 2014). Kennedy (2011) believes that the transition to gas could also reduce US mercury emissions by 20% to 25% if combined with reasonable regulations. Many claim that shale gas is a "bridging fuel" that can help the world transition from the high GHG emitting fossil fuels to cleaner forms of energy (Cathles 2012). Although some argue that shale gas should not be seen as a climate change solution, the European Commission's Energy Roadmap for 2015 does identify natural gas as a critical fuel for the future transformation of the energy system, and that a short-term gas substitution could help to reduce GHG emissions until at least 2035 (Pearson *et al.* 2012). In Europe, and especially the UK, arguments are made that producing gas domestically will also help curb climate change as the shale gas extraction process is better monitored than in other parts of the world, meaning that it will be a less pollutive process overall (Jones *et al.* 2013). In this way, the discourse points towards the potential for shale gas to help curb GHG emissions and slow down climate change on a global scale.

5.2.2 Positive Economic Impacts

The frame of positive economic impacts acts as the largest pro-fracking frame and focuses on overall economic prosperity, job creation, and energy security (Inglesby *et al.* 2012; Whittaker 2014; Mertens 2014). These benefits are often used as a counter to the environmental risks of fracking, representing a cost-benefit analysis of fracking potential. The discourse often is presented as a comparison between economic potential and

environmental risk, with the positive economic potential arguments strongly supporting the promotion of fracking activities.

Overall Economic Prosperity

The most dominant pro-fracking frame focuses on the idea that fracking technology will lead to cheaper gas prices, lower energy bills, increased competitiveness, increased domestic energy production, boosted GDP, higher employment, and increased energy security (Inglesby *et al.* 2012). The predicted decrease in energy prices from shale gas development is attributed to the effects that shale gas has had on the US gas market. This influx of cheaper energy as well as jobs is predicted to increase overall economic prosperity. Some champion fracking as an energy solution as it can help facilitate a transition from coal-based electricity sources and at the same time boost domestic energy production and energy security (Clarke *et al.* 2013).

The media tend to attribute the emergence of the shale gas industry in the US to an increase energy independence, national security, global energy leadership, and even more international authority. The United States has recently experienced an energy boom in relation to its investment into fracking technology and extraction. In 2009, the US produced 5 million barrels of oil per day and now its producing 7.4 million, which is largely attributed to fracking (Ahmed 2014). In 2014, it is predicted that the US will produce 8.3 million barrels of oil a day, and that number is expected to continue to grow (Usborne 2014). The US has saved $700 billion per year in oil imports due to shale gas developments (Kennedy 2011). The success fracking has currently had in the US helps to bolster these claims that fracking provides the best energy source in terms of economic growth and energy security.

Job Creation

Much of the pro-fracking discourse is framed around the idea that fracking will create jobs in areas where unemployment is a major issue. In the US, predictions estimate that 600,000 jobs will be created from the fracking industry, and Tamboran in Ireland predicts that its project will create 600 full time jobs as well as energy supply in Ireland for up to 40 years (Mertens 2014; Pierce 2013). Although many argue that these jobs will be temporary and mostly for trained professionals and not the local population, a strong desire for employment in many small communities in areas with shale gas potential acts as an incentive for support of the industry. As seen in the interviews, emigration proves to be a major issue in rural Irish villages, as the young population tends to move to Dublin, the UK, the US, Canada, or Australia. Many young people do return to their hometowns years later with families, but many believe that having more jobs for their young adults will help to prevent this emigration and maintain more dynamic communities.

Energy Security

The desire for energy security in Europe is growing as the global political situation becomes more risky in relation to energy producing nations such as Russia. The US Energy Information Administration (USEIA) predicted in their 2012 report that Europe may have one tenth of the global shale gas resources, but the report has been criticised for its estimates (EIA 2012; McGowan 2014). Unconventional gas sources could account for almost half of the EU's total gas production and meet around 10% of the EU gas demand by 2035 (EC 2014). In a best-case scenario, shale gas could reduce import dependence to about 60% (Pearson *et al.* 2012). The EU-27 receives 34% of its gas imports from Russia and also a significant portion from Norway and Algeria (Le Renard 2013). Because of this, European countries desire an increase in domestic production in order to bolster energy security and decrease

foreign dependence, especially in regards to Russia. The energy crisis caused by Russia in the winter of 2008-2009 involving the Ukraine is still fresh in many people's minds, and the current 2014 conflict between Russia and the Ukraine reinforces the desire to decrease reliance on Russian energy imports (European Parliament 2011).

The promise of energy security features strongly in fracking discourse as almost all European countries currently rely on imported fuel sources, and this reliance causes risks for energy supply. In Europe, the uncertainty currently with Russia and the Ukraine creates fears concerning the continued gas supply. Because of this, many European countries are looking for alternative gas production methods, with a strong desire to produce gas domestically. According to the BBC (2013), the US and Canada currently have gas security for 100 years due to fracking. If fracking were shut down in the US now, energy imports would have to increase by 45% in order to meet demand, which would exacerbate political vulnerability and dependence (Miller 2013). According to Whittaker (2014), the "most significant potential economic benefit from an Irish perspective [on fracking] is security of energy supply." Because Ireland imports 85% of its energy, increasing energy security is a necessary and crucial aim. Within academic discourse, energy security appears prominently as a way to promote fracking.

5.2.3 Positive Social Impacts

The benefits of fracking are not often framed in terms of positive social impacts, but some examples of these do emerge in the literature. Although landowners in the EU tend to not own their own mineral rights and therefore benefit less than American landowners, arguments are still made in Europe for the benefits that farmers gain from fracking. Farmers that have fracking rigs placed on their land gain additional economic benefits and the oil companies tend to give money back to the community (Mertens 2014). Although critics say

that most of the profits go to the companies and little of money remains locally, the landowners can gain economic incentives for leasing their land.

Communities have the potential to gain percentages of the profits from a fracking venture, and this could be beneficial in improving community infrastructure and community wealth. In June 2013, the UK Treasury published a long-term strategy report on improving the infrastructure in the UK. This strategy indicated actions that the government should take in relation to shale gas development (Sanders and Almond 2014). These actions included new guidelines on permitting and planning for shale gas, tax incentives to encourage exploration, industry-led schemes of community benefits, £100,000 in community benefits at the exploration phase, and 1% of revenues from productions going to the host communities (Sanders and Almond 2014; Williams 2014). In January 2014, David Cameron announced that local authorities could keep 100% of the business rates collected from shale gas development, which was an increase from the previously determined 50% (Sanders and Almond 2014). These social benefits for the communities are used in the discourse to help curb community dissent and express the potential positive outcomes that can result from the investment in shale gas infrastructure. Ireland currently does not have any community benefits in place as no fracking legislation has been drafted, but due to the prominence of the UK's actions in relation to fracking in Irish media reporting, similar benefit schemes may be reflected in future Irish fracking policies.

CHAPTER 6 – Results

In this chapter I compile the results from the coding analysis of the 320 Irish newspaper articles (as identified in Chapter 3) as well as the major themes from the interviews. This chapter further identifies the most prominent frames found in the analysis, and then the following chapter discusses the implications of these results. The data from the article analysis is presented in graphs within the chapter and in tables in the Appendix.

6.1 Main Interview Discourses

From the interview data, I identified many themes and key terms and then used them in determining codes for the media analysis. I transcribed all interviews and then examined them in written form for key themes. The following are the most prominent themes as determined through analysis of the interview nineteen interview transcripts.

6.1.1 Key Buzzwords: Risks, Controversy, and Debate

Many of the interviewees referred to 'risks' associated with fracking, and used the word 'controversial' and 'debate' to describe fracking activities. Fracking risks were often described in ways that mirrored the risk perception framework. For example, a journalist claimed: "In the modern world there are always risks in everything that we do, and there are risks in un-policed fracking to be sure." In this way, many view fracking as a modern risk that must be policed in order to maintain a safe society. References to the 'controversy' surrounding fracking and the idea that fracking discourse is often 'debated' also appeared prominently in the interviews. The interviews also reflected ideas of scaremongering, NIMBYism, and the concept of fracking 'ideology,' but to a lesser extent. 'Fracking ideology' emphasises the belief that many have that fracking is inherently bad, and it is more

of an ideological issue than an environmental issue. Many of these terms were used to describe fracking without much subsequent explanation. These terms suggest that individuals tend to discuss fracking using specific risk related language, which may influence how people think about fracking and its overall safety. If fracking is constantly referred to as a debated, controversial energy risk, then individuals will associate fracking with these terms and will view fracking as a risky energy source.

6.1.2 Pristine Environment

The concept of Ireland consisting of a pristine natural environment was very prominently referenced throughout the interviews, with mention in nine of the interviews. The natural environment was often discussed alongside the tourism, agriculture, and fishing industries. Furthermore, the interviewees discussed the effect that fracking could have on these local industries as well as the aesthetic appearance of the Irish countryside. According to one interviewee: "We pride ourselves in the west of Ireland on having a pristine environment." Fracking could therefore threaten this 'pristine' image and the local pride of areas such as Leitrim and Fermanagh.

6.1.3 Corrib Gas Project

Twelve interviewees mentioned the Corrib Gas Project and it was often compared to fracking as a similar energy issue with similar local reactions and social consequences. The Project involved the development of offshore gas resources and resulted in considerable controversy and opposition from the locals in the county of Mayo who would be affected by the gas pipelines. The project began in 1993 and is still running today after years of protest and continued controversy. One journalist claimed that fracking cannot be understood without the context of the Corrib Project because the project "had informed everybody in

Ireland" about the nature of environmental protests and energy developments. Interviewees claimed that many of the same protesters who were involved with Corrib are now involved with the anti-fracking movement and many other similarities were identified between the two projects. Interviewees also pointed to the social conflicts that arose from the Corrib Project, such as divisions within the local community and social strife. For example, individuals would not enter certain shops and neighbours would stop speaking due to differing views on the issue. One individual interviewed claimed that these social divisions have been exaggerated in the media, but the majority interviewed believed that similar issues could occur in the proposed fracking areas. Due to the frequency that the Corrib Project was mentioned in interviews, it was also coded in the media analysis in order to determine its significance within the media fracking discourse.

6.1.4 Protest Culture

Discussions of protests and protesting culture arose often in the interviews, with a focus on Irish protester stereotypes and the inclusion of non-Irish protesters into the movements. Many interviewees used similar language to describe how protesters are viewed in Ireland including: "tree hugging hippie types," "crusty new-agers," having "long hair and long beards," and as people who would "sit in a corner and sing kumbaya." Many of these descriptions came from anti-fracking activists who claimed to not be this type of stereotypical protester. In this way, the protesters identify themselves more with the local aspect of fracking rather than the environmental aspect. Many anti-fracking activists had not worked on other environmental campaigns before, and therefore became involved with the movement due to the effect fracking could have on the local environment. The fracking protest movement is currently made up of local citizens from a variety of backgrounds, all of who

aim to protect their local communities from the potential consequences of this energy technology.

Some interviewees also discussed non-Irish protesters as 'professional protesters' who were negative entities in the Irish protest movement. These professional protesters come from countries like the United States and United Kingdom to protest environmental issues abroad. Many said that foreign protesters had taken over the Corrib Gas protests and some locals feared that these foreigners could involve themselves heavily in the future anti-fracking protest movement. Many locals feel the protester stereotype described previously applies to these foreign protesters but not the current local protesters. This negative 'hippie' stereotype could harm the image of the protesters as concerned local citizen, and therefore, some activists hope that the protest movement continues to remain local. Not all interviewees disliked foreign protesters or spoke about them at all, but those who did had strong opinions against their involvement due to their lack of understanding of local issues and different priorities.

6.1.5 Distrust of the Government

Five interviewees spoke explicitly about a current distrust of the Irish government, and how this distrust had led to scepticism of the 2012 EPA report and the current proposed fracking research project. One interviewee claimed that distrust of the government comes from elected officials pursuing different policies than the platforms and promises they ran on. Many are sceptical that the government will follow the recommendations to be made by the 2016 EPA, DCENR, and NIEA fracking report, and they instead believe that the government will choose to go forward with fracking no matter what the report claims. Others believe that distrust is unwarranted until the report comes out and the government acts upon it. But

overall, distrust of the current political system seems to be a recurring element in Irish society and in fracking discourse.

6.1.6 Energy Sources: Wind and Nuclear

Many interviewees also discussed the possibilities of wind energy and nuclear energy development in place of fracking. Although nuclear energy has been prohibited in Ireland by a previous government since the late 1990s, many believe it could offer a solution to the current energy and climate issues. Currently, controversy exists in Ireland over proposed wind projects, as many citizens oppose the installation of wind turbines in the Irish Midlands and the transmission cables that would be needed to transport the wind energy into the British energy market. Some also pointed to the importance of lifestyle changes and increases in energy efficiency as significant in the debate as well, though this idea was not as prominent in the interviews.

6.2 Media Discourse Analysis

During the coding of the newspaper articles, I identified four main categories with subsequent subcategories and terms associated with each. These categories represent different frames by which the media discusses fracking risks. The categories incorporate not only risks, but also stakeholder and key associated terms in order to determine a comprehensive assessment of the fracking news media discourse. The 4 categories, 11 subcategories, and 63 terms are listed below:

1) Fracking Risks and Benefits

i) Fracking Risks:

A) Adverse Environmental Impacts: 1) Agriculture, 2) Air Pollution, 3) Climate Change, 4) Earthquakes, 5) Fires, 6) Geology, 7) Noise, 8) Odour, 9) Radioactivity, 10) Soil

Pollution, 11) Traffic/Roads, 12) Waste Water, 13) Water Pollution, 14) Water Use, 15) Wildlife/Biodiversity

B) Adverse Economic Impacts: 1) No Economic Benefit

C) Adverse Social Impacts: 1) Aesthetics, 2) Future Generations/Children, 3) Human Health, 4) Social Impacts, 5) Tourism

ii) Fracking Benefits:

A) Positive Economic Impacts: 1) Energy Cost, 2) Energy Efficiency, 3) Energy Security, 4) General Economic Benefits, 5) Jobs, 6) Local Economic Incentives

2) Associated Stakeholders

A) Stakeholder Groups: 1) Anti-Fracking Movement, 2) Fishermen, 3) Foreign Protesters, 4) Political Candidates, 5) Industry/Business

B) Countries: 1) China, 2) Poland, 3) Russia, 4) Ukraine, 5) United Kingdom, 6) United States

3) Associated Discourses

A) Risk Discourse: 1) Controversial, 2) Danger/Threat, 3) Debate, 4) Fear, 5) Risk, 6) Safety, 7) Scare Tactics

B) Political Discourse: 1) Mineral Rights, 2) Policing, 3) Politics, 4) Precautionary Principle, 5) Regulation

4) Key Noted Terms

A) Awareness Raising and Knowledge: 1) Awareness/Education, 2) Lack of Knowledge, 3) Fracking Process Description

B) Energy Sources: 1) Nuclear Energy, 2) Renewable Energy, 3) Sustainable, 4) Wind Energy

C) Other Key Terms: 1) Corrib Gas Project (Mayo), 2) Environment, 3) Local, 4) New Technology, 5) Shale Gas Market, 6) Shale Gas Revolution

6.3 Frame Analysis Results

Each of the abovementioned terms was coded for its frequency within the articles. I then coded the terms using the search tools in the software to find specific terms as well as manually reading through each article to code for terms and themes. The terms were coded when specifically mentioned or when related terms were used. For example, the term 'energy security' was coded when references were made to energy security, security of supply, and energy independence. The results of the media analysis can be found in **Tables 4-13** in the Appendix. The frequency of appearance of certain terms can act as an indicator of the significance of the term within the Irish media fracking discourse, and therefore aids in the

determination of prominent risk perception frames. The following sections display the frequency of terms for each of the four categories. I analysed the terms based on their national and local frequency, with 188 articles analysed from national newspapers, 132 from local newspapers, and 320 articles in total. Representative quotations from each term are also listed at the end of the **Appendix** in order to provide an illustration of how each term tended to be used within the media discourse.

6.3.1 Fracking Risk and Benefit Discourse

This discourse was separated into fracking risks and benefits, with the risks consisting of adverse environmental impacts, economic impacts, and social impacts, and the benefits consisting of only positive economic impacts. Terms that could have fit into positive environmental and social impacts were covered within the risk section, such as 'climate

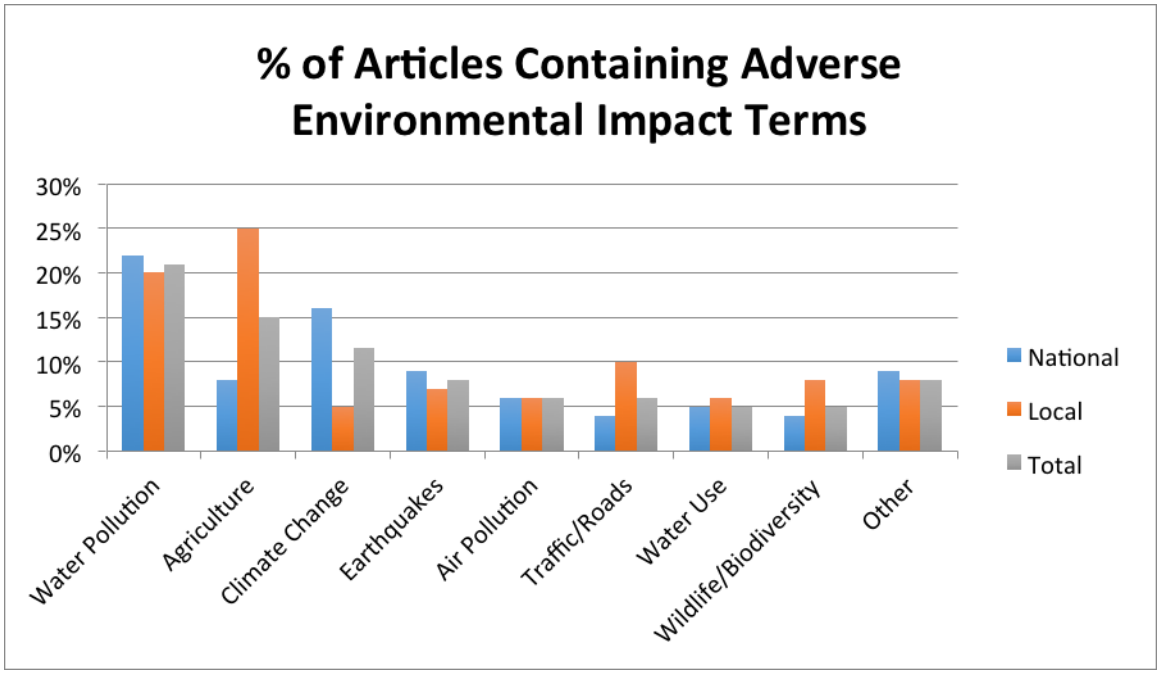

Figure 5. The Percentage of Articles Containing Adverse Environmental Impact Terms in both National and Local Newspapers and in Total

change' which could be seen as either positive or negative and 'local economic incentives' which was placed in the economic section rather than a social impact section. I did not conduct a qualitative analysis to determine the negative or positive slant of specific terms. For example, climate change was coded for every mention of climate change and does not denote if the article spoke about fracking negatively or positively affecting climate change.

The analysis shows that 'water pollution' was the most commonly referred to environmental risk (21% of total articles), with 'agriculture' (15%) and 'climate change' (11.5%) as the other most prominent risks. 'Water pollution,' the most common risk, would often be mentioned as part of a list of fracking risk terms and the articles tended to discuss 'water pollution' with the most focus and concern. 'Agriculture' and farming appeared as the second most common risk and was much more prominently mentioned locally (25%) than nationally (8%). Agricultural risks were often discussed alongside tourism, the anti-fracking movement, and the protection of agricultural jobs. 'Climate change' was mentioned much more prominently in national discourse than local discourse and tended to be listed alongside other environmental impacts.

The articles referenced the environmental certain environmental risks less often, such as 'earthquakes' (8%), 'air pollution' (6%), 'traffic/roads' (5%), 'water use' (5%), and 'wildlife/biodiversity' (5%). These risks were discussed occasionally and usually referenced in lists of risks. The other risks (8%) – 'fires,' 'geology,' 'noise,' 'odour,' 'radioactivity,' 'soil pollution,' and 'wastewater' – were each mentioned very rarely and therefore do not feature as prominent risks within the discourse. The environmental risks did not appear often in articles from the business section of the newspapers, where mostly only economic benefits were mentioned. When environmental risks were identified in the discourse, they tended to be mentioned but not explained in more detail. For example, air pollution would be mentioned as a possible effect of fracking, but the actual pollutants or effects of those

pollutants were not cited. In this way, the environmental risk discourse remains mostly general and often relates to buzzwords such as risks and dangers.

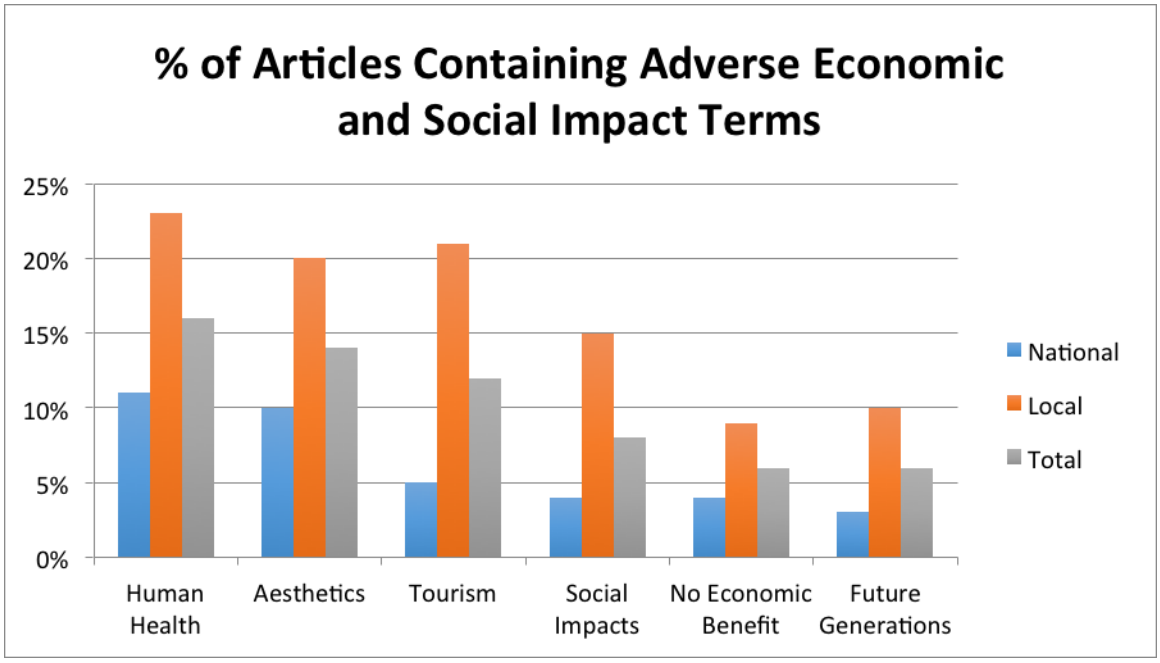

Figure 6. The Percentage of Articles Containing Adverse Economic and Social Impact Terms in both National and Local Newspapers and in Total

As for adverse economic and social impact terms, 'human health' (16%), 'aesthetics' (14%), and 'tourism' (12%) were the most commonly referenced terms, with 'social impacts' (8%), 'no economic benefit' (6%), and 'future generations' (6%) mentioned with less frequency. All adverse economic and social risks were mentioned more frequently in local rather than national news coverage. 'Aesthetic' codes focused on the idea that fracking could impact the beauty of the local landscape, and therefore these codes encompassed any mention of impacts to the aesthetics of the Irish countryside as a result of fracking. 'Aesthetic' codes tended to use terms such as "countryside," "beauty/beautiful," "gorgeous/wonderful," and "green/lush" in relation to fracking areas, and presented the loss of these areas as a risk to society and tourism.

'Human health' codes tended to be used in relation to other risks rather than on their own, and they often appeared in relation to 'local' and 'tourism' codes. 'Tourism' appeared significantly more locally than nationally as a risk issue. In the local papers, tourism was often referenced in relation to 'no economic benefit' as well as other environmental and social risks. The danger to the economy if fracking negatively affected tourism was often emphasised in local reporting. In national coverage, 'tourism' risks entered the discourse almost always through quotations made by locals or concerned citizens about why fracking should not occur, and the media rarely focused on tourism in the main body of the article.

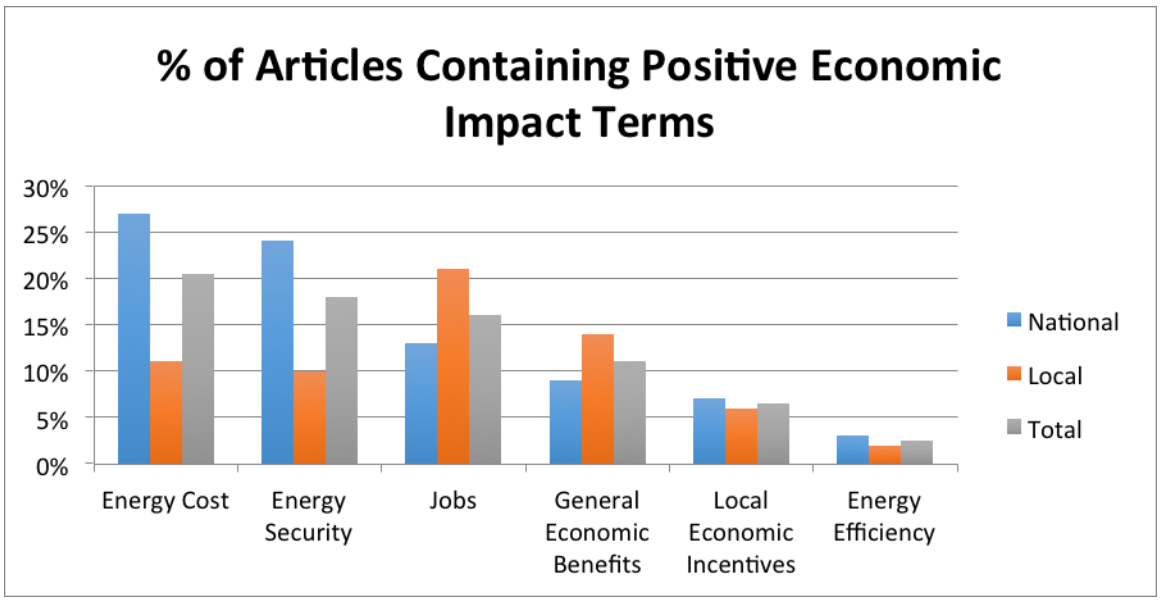

Figure 7. The Percentage of Articles Containing Positive Economic Impact Terms in both National and Local Newspapers and in Total

Within the positive economic impact terms, the three most commonly mentioned were 'energy cost' (20.5%), 'energy security' (18%), and 'jobs' (16%), followed to a lesser extent by 'general economic benefits' (11%), 'local economic incentives' (6.5%), and 'energy efficiency' (2.5%). 'Energy cost' and 'energy security' were mentioned more often in national reporting, often in relation to shale gas and energy markets. Discussion of 'energy cost' was often made in the context of discussions of the United States and the 'shale gas

revolution,' and was often used as a counter point to the environmental risks mentioned above. 'Energy security' references tended to relate international politics, such as energy flows that could be affected by conflicts in Russia and the Ukraine due to the current political situation. The discourse around 'jobs' was greater in local coverage, and was not always positive. While the news coverage discussed the potential for job creation from fracking, it also mentioned job loss that could occur in relation to negative impacts on tourism, agriculture, and fisheries.

6.3.2 Associated Stakeholders

I divided the stakeholder discourse into specific groups of stakeholders – anti-fracking protesters, industry, political candidates, fishermen, and foreign protesters – and into national groups – the United States, the United Kingdom, Russia, Ukraine, Poland, and China. By analysing the frequency of these terms, I can determine their prominence within the discourse as well as their relation to risk terms in the fracking discourse.

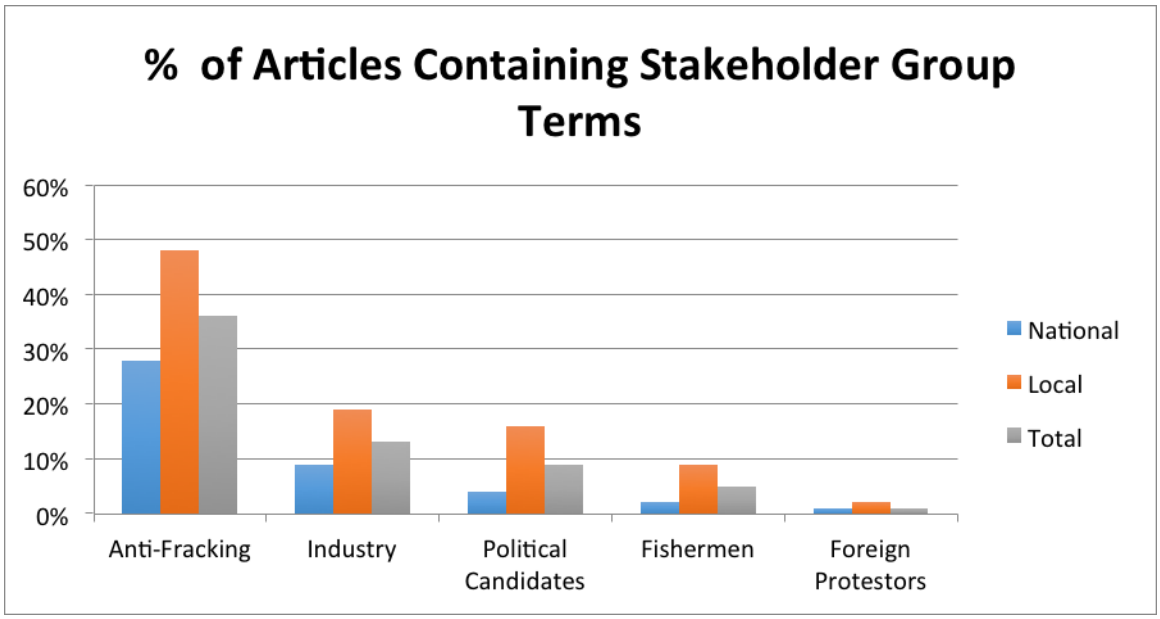

Figure 8. The Percentage of Articles Containing Stakeholder Group Terms in both National and Local Newspapers and in Total

'Anti-fracking' activists (36%) appeared almost three times more than the next most frequent stakeholder, 'industry' (13%). The other stakeholders – 'political candidates' (9%), 'fishermen' (5%), and 'foreign protesters' (1%) – appeared much less frequently. All stakeholders appeared more often in local coverage than national coverage. The 'anti-fracking' movement was coded in relation anti-fracking activists, groups, activities, and protests. Within local coverage, the 'anti-fracking' discourse focused on local Irish groups and protests and in national coverage anti-fracking activities focused more on the British anti-fracking protests against Cuadrilla and fracking in England. The fracking 'industry' was mentioned in relation to many topics, such as environmental risks, energy costs, and economic benefits, and acted as a general term to refer to fracking activities, though it was not used exceedingly often. 'Political candidates' used fracking as part of their platform for elections more often in local than in national media coverage. 'Fishermen' as stakeholders and often activists appeared more often locally than nationally. The term 'foreign protesters,' although prominent in the interview discourse, appeared rarely within the media discourse.

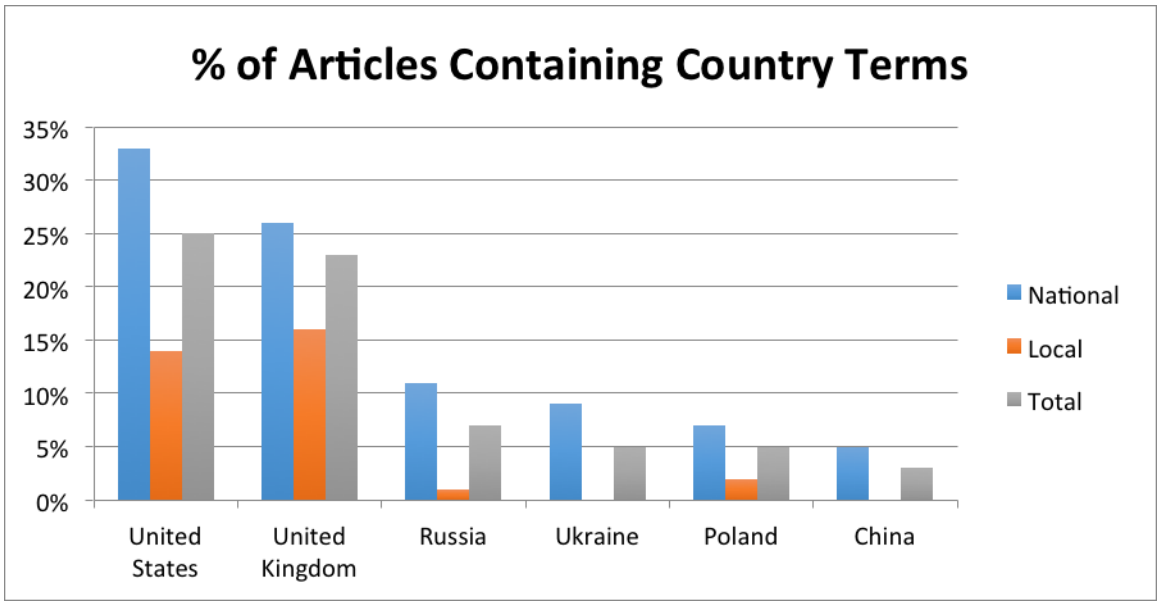

Figure 9. The Percentage of Articles Containing Country Terms in both National and Local Newspapers and in Total

The ‘United States’ (25%) and ‘United Kingdom’ (23%) were mentioned most often in relation to fracking, with ‘Russia’ (7%), ‘Ukraine’ (5%), ‘Poland’ (5%), and ‘China’ (3%) mentioned less frequently. Both the ‘United States’ and the ‘United Kingdom’ were mentioned in almost one-fourth of all articles, which illustrates the importance that fracking developments in these countries have on Irish fracking discourse. ‘Russia’ and the ‘Ukraine’ were most often mentioned in relation to energy security issues and the potential for shale gas in Europe. ‘Poland’ and ‘China’ were discussed in relation to their shale gas potentials and intentions to increase fracking activity.

The prominence of the United Kingdom and United States in fracking reporting can be attributed to the prominence of fracking in current American and British discourse. In many speeches, Prime Minster David Cameron has shown a propensity towards shale gas development as he believes that it will help to transform Britain like it did America by driving down energy prices, creating jobs, and producing new revenues for the local councils (Goldenberg 2013). Scholars attribute the success of fracking in the US to technological advances in locating and extracting shale gas deposits, a highly developed domestic gas industry, deregulated gas markets, and supportive federal regulation including exceptions from certain regulations (McGowan 2014). Many of these comparisons are made between the US successes and the situations in Ireland and the UK. Landowners in the United States also often own their mineral rights as well as land rights, which allow them to gain more compensation and benefits than landowners in Europe who do not own mineral rights. Scholars argue that it may be more challenging to develop unconventional gas resources in countries outside of North America due to differences in geology, lack of pipeline infrastructure, and differences in regulatory practices (Inglesby *et al.* 2012). These doubts of developing shale resources in Europe are rarely seen in the newspaper reporting, with reporting instead focusing on the success of fracking in the United States and elsewhere.

It should be noted that two newspapers, the *Fermanagh Herald* and the *Impartial Reporter* are British newspapers and could therefore have artificially increased the detected references to the UK in the reporting. For comparison, the *Leitrim Observer* referenced the UK in 9% of articles, while the *Fermanagh Herald* and *Impartial Reporter* referenced the UK in 17% and 19% of articles respectively. This disparity should be noted and should be taken into account in any conclusions made in regards to the significance of the UK in Irish fracking discourse.

6.3.3 Associated Discourses

The associated discourses explored terms used in both risk discourse and political discourse. The fracking risk discourse terms appeared more frequently than the political discourse terms overall, and both categories had terms that appeared in a significant portion of articles as compared to the overall discourse.

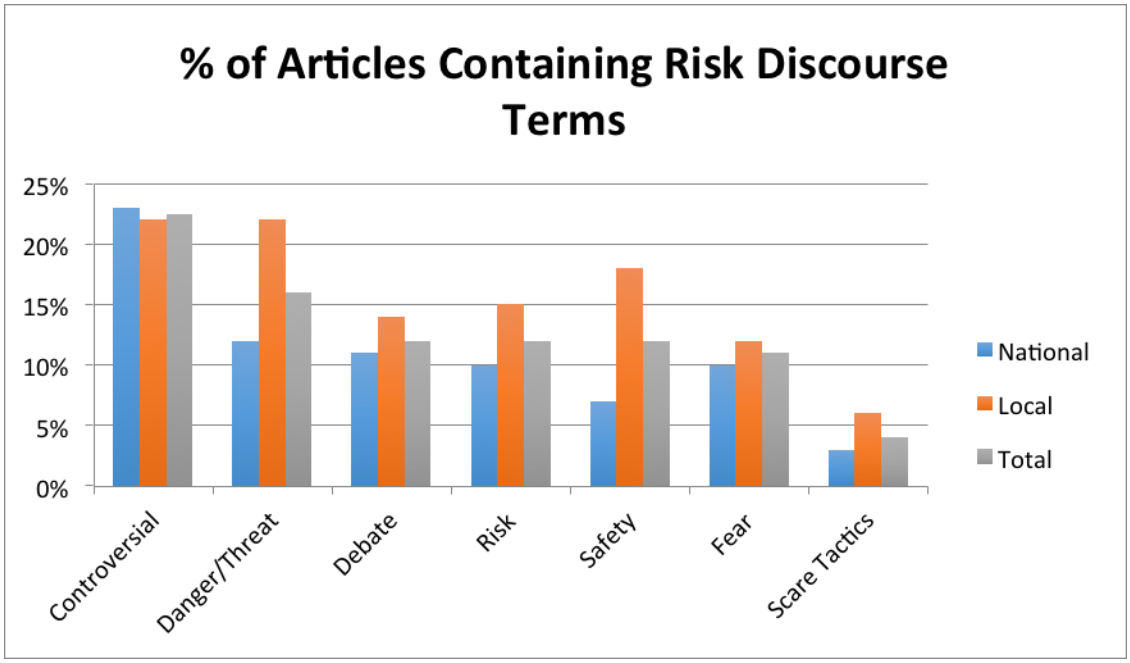

Figure 10. The Percentage of Articles Containing Risk Discourse Terms in both National and Local Newspapers and in Total

The most common terms in the risk discourse were 'controversial' (22.5%), 'danger/threat' (16%), 'debate' (12%), 'risk' (12%), and 'safety' (12%). Other terms were mentioned less such as 'fear' (11%) and 'scare tactics' (4%). 'Scare tactics' included terms such as scaremongering and scare stories. 'Scare tactics' were often described as used by the anti-fracking movement to scare people into being against fracking. The term 'controversial' was often used as a general modifier to describe the fracking process and fracking in general. Reasons why the process is considered 'controversial' were not always apparent. The term 'debate' was used similarly, but the 'fracking debate' was at times followed by examples of the two sides – risks and benefits – of fracking development. Other terms such as 'dangers,' 'threats,' 'risks,' and 'safety' were used in relation to risks and benefits and were also often used in relation to protests and local issues. These terms also appeared prominently in the interview data, but not as often in the scholarly documents.

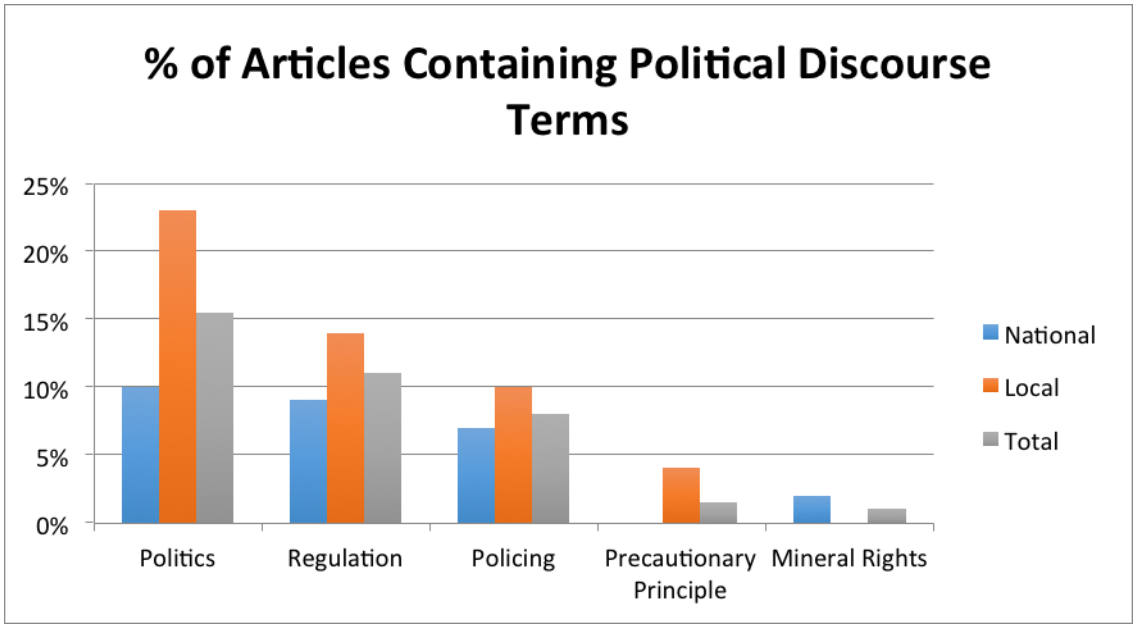

Figure 11. The Percentage of Articles Containing Political Discourse Terms in both National and Local Newspapers and in Total

The political discourse consisted mostly of references to 'politics' in general (15.5%), and was followed by 'regulation' (11%), 'policing' of protests (8%), and then brief mentions of the 'precautionary principle' (1.5%) and 'mineral rights '(1%). The 'precautionary principle' and 'mineral rights' were coded due to their mention in the literature review, but they did not appear prominently in the media. The 'politics' term focused on political action on behalf of fracking and was most closely related to environmental risks and the anti-fracking movement. Local fracking referendums, campaigns, elections, and voters also were associated with this term. 'Regulation' discourse identified both positives and negatives in relation to fracking regulation, terming fracking safe if properly regulated or a danger if there was insufficient regulation. 'Policing' activities were described in relation to physical protests, and the 'precautionary principle' was only mentioned occasionally in local media coverage but not at all in national coverage. Discussions of 'mineral rights' issues appeared very rarely in national coverage and therefore do not appear to currently be a prominent argument used in the debate to separate the US anti-fracking benefits from the proposed benefits in Ireland.

Scholarly discourse tended to focus on fracking regulation as a method of preventing environmental harm. According to the Royal Society and the Royal Academy of Engineering (2012), fracking's health, safety and environmental risks can be managed effectively as long as "operational best practices are implemented and enforced throughout the regulation process." In this way, many view regulation as a way to prevent the dangers and threats that fracking may pose, though the distrust of the government and subsequent regulatory practices may make it difficult for Irish citizens to accept fracking regulation as safe.

6.3.4 Key Noted Terms

The Key Noted Terms were determined based on the identification of other prominent areas that did not fit into the prior categories. These categories were awareness raising and education, energy sources, and a category of other key terms that appeared prominently within the discourse.

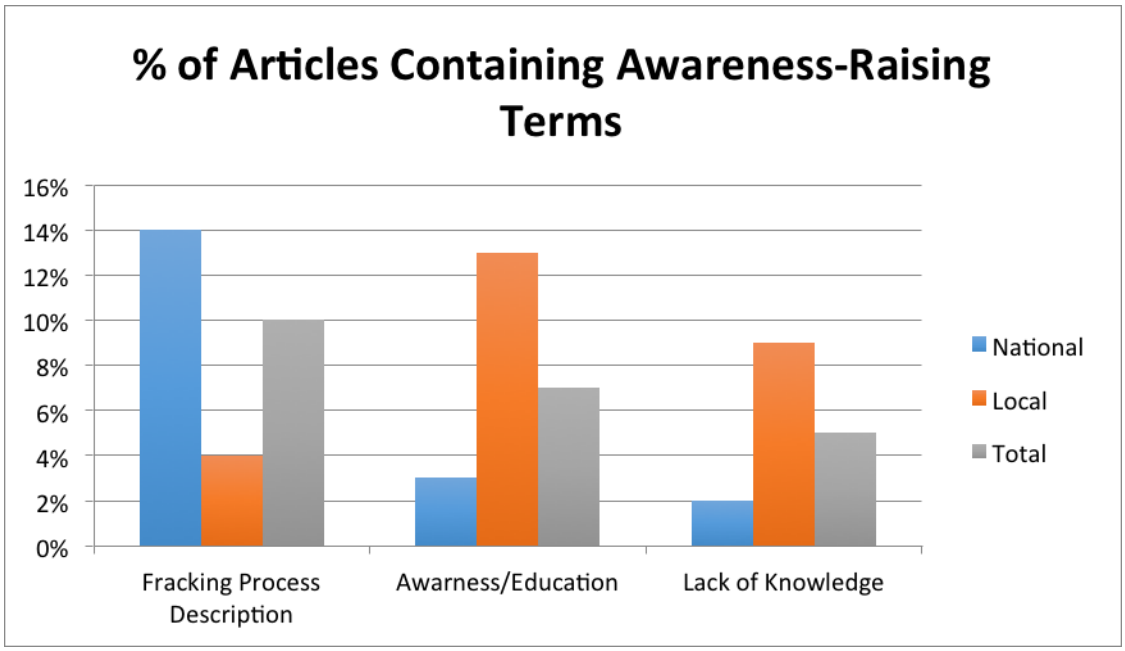

Figure 12. The Percentage of Articles Containing Awareness Raising Terms in both National and Local Newspapers and in Total

'Descriptions of the fracking process' (10%) appeared the most often, with 'awareness and education' (7%) and 'lack of knowledge' in relation to fracking (5%) as less frequent. Descriptions of the 'fracking process' included any description within the article of how fracking actually works. Most of these descriptions consisted of one to three sentences with a basic description of the drilling and chemical process that results in shale gas extraction. Based on the low percentage of articles that included this information, it could be assumed that reporters either believe readers already know how fracking works or that they do not need to know this knowledge in order to understand the fracking issues discussed

within the article. The 'awareness-raising' and 'lack of knowledge' of fracking discourses appeared more prominently in the local reporting than national, which may reflect on the local protest groups and their awareness-raising activities. Both 'awareness-raising' and 'lack of knowledge' codes were often referenced in relation to local and the anti-fracking movement.

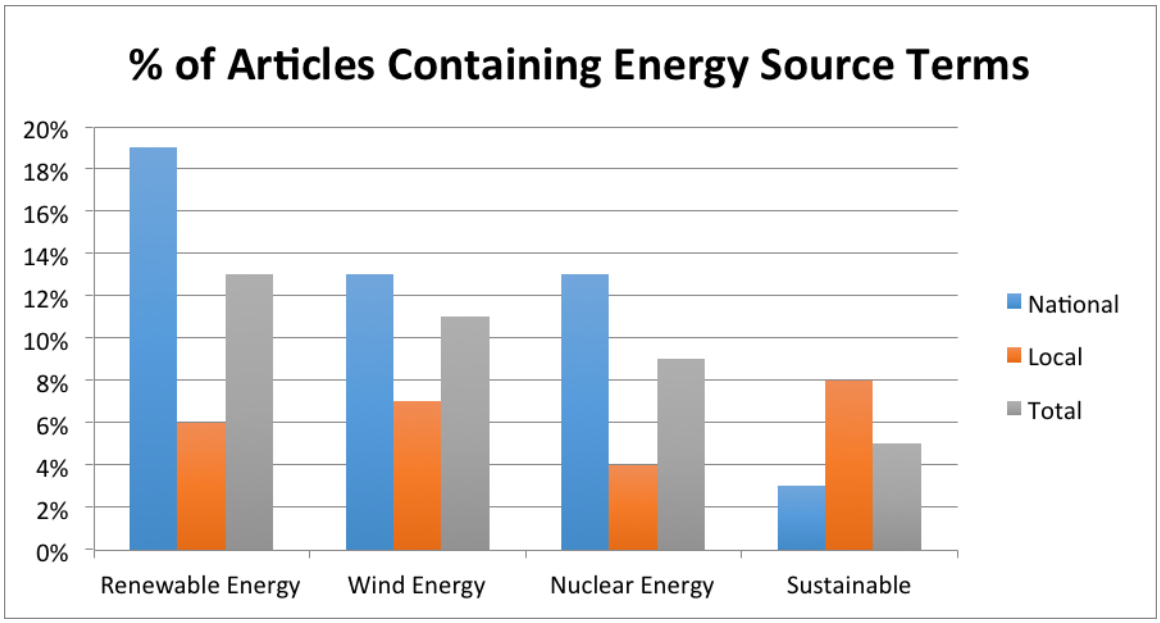

Figure 13. The Percentage of Articles Containing Energy Source Terms in both National and Local Newspapers and in Total

Energy source terms focused mainly on the concept of 'renewable energy' (13%), and then 'wind energy' (11%), 'nuclear energy' (9%), and 'sustainability' (5%). Discussion of 'renewable energy' sources was often used with references to climate change and energy security, and renewables were mostly referred to in quotations from interviews rather than in direct reporting. 'Renewable energy,' as well as 'wind' and 'nuclear,' were much more prominent in the national coverage than in the local coverage as issues that span more than a local scale. 'Nuclear' and 'wind energy' sources both present specific energy opportunities to lower GHG emissions and increase energy security. The idea of 'sustainability' was not

prominent within the fracking discourse, indicating that fracking is not seen as a sustainable practice, and arguments for sustainability are not often used to oppose fracking.

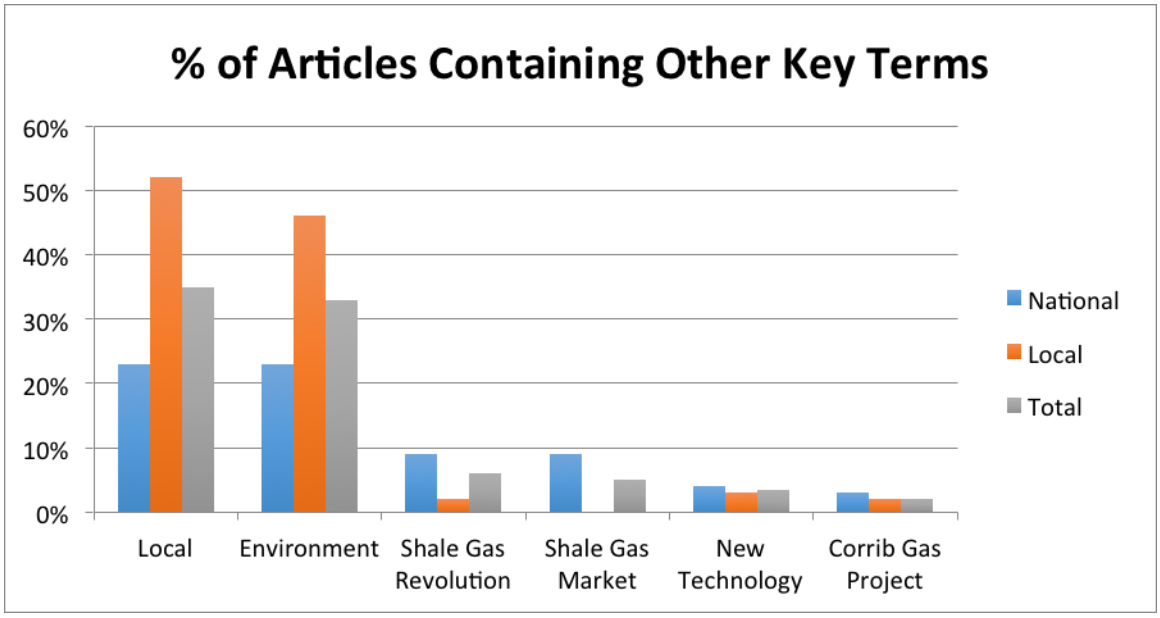

Figure 14. The Percentage of Articles Containing Other Key Terms in both National and Local Newspapers and in Total

The other key terms category contains two very prominent elements of in the fracking discourse: 'local' (35%) and 'environment' (33%). The other terms – 'shale gas revolution' (6%), 'shale gas market' (5%), 'new technology' (3.5%), and the Corrib Gas Project (2%) – were mentioned much less frequently. The term local was often coded with a variety of terms such as environmental risks and benefits as well as 'fears' and 'dangers.' As could be predicted, the term local also appeared more often in local than in national news coverage.

A general term referring to the 'environment' also appeared very often in the discourse, indicating that fracking is often viewed as an environmental issue rather than purely an economic or energy issue. The 'environment' was coded alongside many other fracking codes such as risks and benefits as well as risk discourse terms and 'regulation.' The concept of fracking being either a 'new or old technology' was also coded. This code focused on references to fracking either being an old technology, as it was first used in the 1940s, or a

new technology as it has not yet before been used in Ireland, though this code was not prominent within the discourse. The 'Corrib Gas Project' was coded due to its frequency in the interview data, but it also appeared rarely within the media discourse.

6.3.5 Analysis of Article Publication Dates

By analysing when articles referring to fracking were published, trends and important events can be identified in relation to fracking in Ireland and its media coverage [see **Figure 15**]. The spike in fracking reporting in June 2013 by the *Irish Times* corresponds to the 38th G8 summit that was held in Northern Ireland from 17-18 June 2013. Much of the coverage reflected protests that occurred in relation to the summit. The increase in articles by the *Irish Independent* in March 2014 can be attributed to the publication of a special two-day, four-

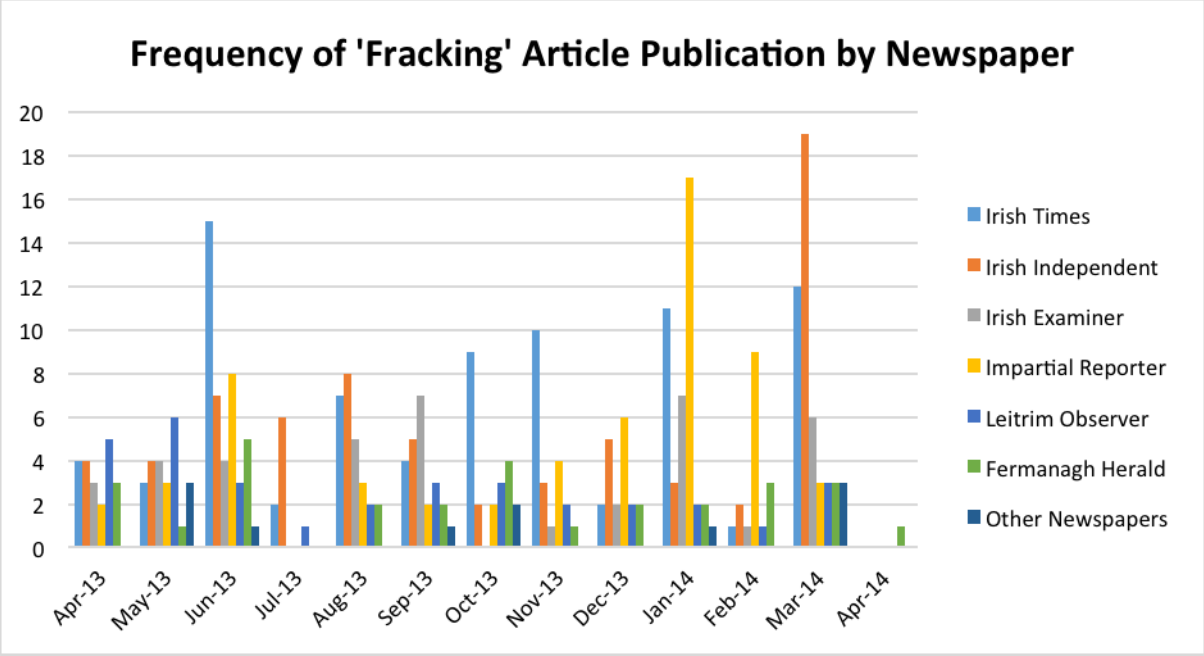

Figure 15. Frequency of Monthly Article Publication by Each Newspaper Studied

page spread on the fracking issue, as well as increasing coverage in relation to Russia and the Ukraine conflict. The large increase in reporting by the *Impartial Reporter* in January 2014

seems to be linked to political developments, such as potential moratoriums and electoral candidates discussing fracking as an issue. In the future, researchers can perform more detailed analysis of publication frequency of fracking articles in association with specific events in order to identify trends in fracking discourse.

6.3.6 Limitations in Media Analysis

It should be noted that a significant portion of the articles in the national newspapers with mention of 'fracking,' 'shale gas,' or 'hydraulic fracturing' were published in the Business section of the corresponding newspaper. These articles tended to focus on the term 'shale gas' and its economic benefits and not reference the actual fracking process. The local newspapers did not have section headers denoted for the articles, but for the national papers, the following percentages of articles were from the Business Section: 30% in the *Irish Examiner*, 29% in the *Irish Independent*, and 26% in the *Irish Times*. These articles tended to mention 'shale gas' in passing and did not focus on fracking risk discourse. In this way, the business articles had a large influence on reducing the overall frequency of many of the analysed terms and increasing the frequency of economic benefit terms. In future studies, a more precise subset of articles could be analysed that exclude articles that do not explicitly address fracking risk discourse. This could reduce the influence that this significant portion of business articles may have had on the research results.

Editorials also made up a significant portion of the articles studied: 19% in the *Impartial Reporter*, 15% in the *Irish Examiner*, 19% in the *Irish Independent*, and 12.5% in the *Irish Times*. The *Fermanagh Herald* and *Leitrim Observer* did not denote articles as editorials in their headers. Future studies could compare the risk discourse in editorials as compared to straight news articles in order to identify differences between risks in each type of discourse. In this study, editorial articles are treated the same as straight news articles in

the analysis. It should be noted that the vast majority of local news reporting makes no reference to fracking at all, and therefore most individuals will receive fracking information only from national reporting. In this way, the influence of fracking discourse from local news coverage in Ireland will only influence the Leitrim region where individuals can receive both local and national coverage in relation to fracking. The country overall will mainly have access only to the national fracking coverage.

CHAPTER 7 – Discussion

This chapter aims to answer the research questions by determining the most prominent fracking frames in the Irish media through the analysis of patterns and missing terms in the discourse. I conducted the frame analysis within the context of the knowledge obtained from the document analysis, and these relations and associations are included in the frame identification. The similarities and differences between fracking frames in the national and local media are also explored as well as research limitations.

7.1 Prominent Fracking Frames and Patterns

This section identifies the principle fracking frames through the exploration of the most prominent fracking terms and patterns from the analysis. As discussed in the Chapter 2 [Analytical Frameworks], media frames are determined through the study of language choices, quotations used, and what concepts are included and excluded from the discourse (Streeter 2009). Through the identification of the most common terms, I identified five prominent fracking risk perception frames: 1) Risk to Local Life Frame, 2) Economic Potential Frame, 3) New Irish Protest Movement Frame, 4) Risky Language Frame, and 5) Local Environmental Issue Frame. These frames are discussed through the identification of patterns and the use of quotations. All quotations from the analysed media are referenced in a separate section at the end of the References.

7.1.1 Risk to Local Life Frame

The Risk to Local Life Frame emphasises the threat fracking technologies could pose to local communities through impacts on agriculture, water systems, human health, aesthetics, and the tourism industry. Through this frame, fracking is described as a process

that could significantly affect communities and harm the native industries on which the locals currently rely. The potential of fracking chemicals to pollute local water systems threatens the fishing and agricultural industries as well as human health. Fracking infrastructure can negatively impact local aesthetics and tourism by eliminating the naturalness of the Irish countryside. As seen in the interviews, anti-fracking activists also commonly identified themselves as "normal" local people, not environmental activists. They emphasised their community identity as important in preventing the threat of fracking. The interviews also stressed the concept of a pristine Ireland that must be protected from dangers such as fracking.

References to agriculture were often associated with threats to the local economy through impacts on agriculture and tourism jobs. This argument acted as a strong local argument to counter frames such as the Economic Prosperity Frame. For example, an article in the *Irish Times* stated: "Food, agriculture and tourism support almost 500,000 jobs and even a marginal loss resulting from fracking will significantly exceed the jobs promised by fracking promoters" (Coombs 2013). In this way, the protection of local jobs acts as a counter-argument to the economic benefit of fracking discourse with an emphasis on protecting the already existing industries. The media often depicts fracking as a threat to agriculture and tourism, as can be seen in the *Impartial Reporter* in a claim made in an interview: "The environment, public health, farming and tourism industries, all may be at risk [due to fracking]" (Impartial Reporter 2014). In both the articles and the interviews, many locals spoke about fracking as something imposed on them that could severely change their individual lives. An *Irish Independent* article highlights this: "Farmers Michael Gallagher and Jim Dillon oppose any plans to introduce fracking in Leitrim, fearing it could spell the end of their livelihood" (Crawford 2014). Many interviewees also spoke of a distrust of the government and its decisions on matters relating to the environment. Locals spoke of fracking

as a threat to their local industries, focusing on tourism and agriculture, and tended to distrust reassurances that fracking could be done safely.

Water pollution was not always coded in relation to these other issues, but threats to the native landscape and industries in relation to water pollution did appear often in the interviews and occasionally in the coded articles. For example, one individual in the *Fermanagh Herald* stated that: "There have been concerns that 'gas extraction by the process of hydraulic fracturing may cause water pollution, seismic problems and visual issues and may impact on the agricultural and tourism industries" (Fermanagh Herald 2013a). Similarly, the *Leitrim Observer* addressed local concerns: "The fisherman are adamant that the risks caused by pollution and lowering of water levels caused by fracking as a industry would be detrimental to the spawning and survival of the species that they have been protecting, to their lifestyle they and their children now love, and to the tourism of the region" (Leitrim Observer 2013c). The risks tended to be perceived as directly affecting the local people, and the media often expressed these risks through the voices of the local people.

The media often discussed aesthetics and tourism together and did so more often in local reporting than national reporting. The discourse stressed the importance of the local landscape for the tourism industry in these areas, and the reporters often quoted individuals making this argument. An *Impartial Reporter* article highlighted a local's view that: "He feels "strongly" that "tourism in our beautiful county would be greatly affected with fracking in the area. Fermanagh tourism is priceless compared to what natural gas production would do for the local economy" (Monahan 2014). One interviewee claimed that the main groups opposed to fracking were from "the tourism industry, fishing industry, and people concerned about the landscape and environment." The media discourse overall tended not to emphasise tourism as strongly as the potential economic benefits from fracking industrialisation in the region. In the media discourse, discussions of tourism and agriculture tend to focus on

maintaining the levels that currently exist, but not improving or expanding upon these in order to increase profitability. Fracking instead has the potential to expand the economy, but based on the media discourse, tourism appears to only have the ability to maintain its current economic state.

Interest groups in support of fracking also recognise this frame and use it with the opposite emphasis by identifying local concerns and then downplaying or negating them. For example, an article in the *Irish Times* states: "In essence, the public health body says properly-regulated, properly-run fracking is safe and does not threaten groundwater supplies – a major concern for local groups who have become increasingly vocal" (Hennessy 2013a). This article identifies the individuals who utilise the Risk to Local Life Frame as increasingly vocal local groups who worry about the effect that fracking may have on their local environment. In this way, the discourse recognises this frame, but does not support or oppose it. An example of the Risk to Local Life Frame representing local opposition as the counterpoint to fracking's progression is seen in an article in the *Irish Times*:

> Despite mounting objections from locals where drilling is planned or under way, Mr Davey said: "I don't believe shale gas is the environmental threat some fear. Cleaner gas will be essential for keeping the lights on, as we replace dirty coal. Our [plan] for cutting carbon emissions assumes Britain will use a lot of gas in the future (Hennessy 2013b).

This article emphasises the need for more energy sources, and claims that the threatening image of fracking that the locals created is not credible. In this way, locals tend to use this frame to encourage others to oppose fracking as a way to preserve their local industries. Other interest groups who support fracking also use this frame to present the locals as fearful scaremongers who are hindering economic prosperity for the country as a whole. The locals also tend not to identify issues with less direct local effects, such as the effect of fracking on climate change, which may cause more future flooding in these localities. Overall, the Risk to Local Life Frame focuses on a local perception of maintaining local industries and the environment and therefore avoiding the industrialisation of the countryside.

7.1.2 Economic Potential Frame

The most common fracking benefit terms – energy costs, energy security, and jobs – come together to create the Economic Potential Frame. This frame focuses on the idea that fracking will reduce national energy costs, increase energy security, and provide numerous jobs into the faltering economy. This frame is prominent in the discourse and is often used as the dominant frame to support fracking developments. The discourse often uses the Economic Potential Frame as the counter to discussions of environmental risks. This comparison of environmental risk and economic benefit can be seen in the *Irish Independent* where it is stated that: "[Fracking] is either the solution to cutting our energy bills and creating employment, or an environmental nightmare" (Melia 2014). This economic benefit discourse tends to be used in a national context to counter concerns over environmental risks caused by fracking and is not used as often locally to counter discourses such as the Risk to Local Life Frame.

The belief that shale gas can reduce overall energy costs appears often in the discourse as well, with references to the US situation and how shale gas has successfully reduced prices in the domestic energy market. Because of the recent increase in domestic production of shale gas, US oil imports from OPEC countries fell more than 20% over the last four years and natural gas prices in the US have fallen by 75% in the last six years (Bremmer 2013). This combination of energy security and reduced energy cost proves appealing to other nations, and the US's fracking experience is often discussed in this light in the Irish media. An article in the *Irish Examiner* quotes an individual who argued that: "We have got to look at the example of the United States, where the absolutely spectacular reduction in energy (prices) has brought back whole industries" (Irish Examiner 2013b).

Language such as spectacular, incredible, and revolutionary are used in relation to the economic potential of shale gas, which helps to strengthen the discourse.

Although the fracking media discourse did not always discuss fracking as positively impacting jobs, the main emphasis on job creation does strengthen the Economic Potential Frame. When job potentials are discussed, usually comparisons are made to the situations in the US and UK. This can be seen in the *Irish Independent*: "They also claim that hundreds of jobs will be created, as well as tax revenue, and that environmental concerns can be managed" (Melia 2014). The frame emphasises the need for jobs in the Irish countryside and that these jobs may help to prevent emigration by providing employment for young Irish persons. The increase in jobs is often related to the Irish economy, energy costs, and energy security as well. This argument tends to ignore the Risk to Local Life Frame in that, according to the Frame, more jobs may be lost than gained and that fracking jobs are more short-term than agricultural or tourism jobs. The stakeholders against fracking tended to not use the negative impact on jobs as fervently to oppose fracking as proponents used job creation in its support.

Discussion of energy security often focused on the US and other energy sourcing countries such as Russia, the Ukraine and the UK. Because Ireland currently imports 85% of its energy, the nation remains vulnerable in its reliance on international imports. Due to the recent political tension between Russia and the Ukraine, many articles speculated about potential future difficulties in obtaining energy imports from Russia due to EU sanctions. Because the EU-27 receives 34% of its gas imports from Russia, this could be a major problem in the future. The discourse also focused on the UK and its issues with energy security, as Ireland receives 50% of its energy imports from the UK. These comparisons of Ireland to the UK and US helped to strengthen the economic argument as many want Ireland

to take advantage of the potential for economic and energy advancement that has already been experienced by other nations.

The Economic Potential Frame is often countered by the Risk to Local Life Frame through the argument that local industries can be more profitable if maintained and supported than the implementation of fracking. For example, the Irish Examiner quoted an individual claiming: "[Fracking] is not in our long term or medium term interest because if farming and tourism are damaged the economic impact alone will be a bigger loss of jobs than this few four to six hundred jobs they talk about" (O'Donoghue 2014). In this way, these two frames counter and support each other depending on the arguments they make. If fracking job creation is presented only in terms of jobs created and not potential local jobs lost, then the Economic Potential Frame will appear stronger. When information about potential job loss is included into the discourse, then the Economic Potential Frame may lose power.

7.1.3 New Irish Protest Movement Frame

The New Irish Protest Movement Frame recognises the plethora of media coverage given to anti-fracking protest events and indicates that fracking has become the new main protest movement in Ireland. In the interviews, many claimed that there were four current protest movements in Ireland: wind energy, pylon networks, the Corrib gas project, and fracking. Fracking appears to be the newest movement and is growing in attention and size. Comparatively, these other protest discourses tended to be less prominent within the media, with only dozens of mentions of Corrib over the past year per paper. In this way, fracking is growing into the new Irish environmental protest movement.

The anti-fracking discourse, as analysed in the media, tends to be associated with local people and events, and is often associated with negative risk discourses such as scaremongering, fear, and irrationality. This is seen in a *Fermanagh Herald*: "When it comes

to the controversy surrounding fracking, the MLA hit out at the protesters, accusing them of "scaremongering" in their "desperate" attempts to create "fear in the community" (Fermanagh Herald 2014a). But these negative images were not dominant in the anti-fracking frame. The majority of protester discourse focused on the views of the protesters and the actual activities they conducted. Both the local and national coverage of the anti-fracking movement focused on actual protest events and interviews with the protesters, but the national coverage focused much more on protests in the UK and the local coverage focused more on protests in Ireland.

Although discussions of foreign protesters were frequent within the interviews, the media discourse did not focus on this aspect of the protest movement. Only three articles made reference to these professional protesters, as made by an individual quoted in the *Fermanagh Herald*:

> What I don't respect is people who are using this for another reason and I do note that some of the people involved in the protests are first of all not from anywhere near Fermanagh – they are from America – they use scare stories to inform people instead of scientific fact and I think that's very wrong (Fermanagh Herald 2014a).

Although this language did appear in the media, it is not part of the dominant anti-fracking discourse. Instead, the media depicted anti-fracking activists similarly to how the activists depicted themselves – local farmers and fishermen, concerned parents and long-standing residents with a stake in protecting their community. Although there are fracking protest groups around the country and not just in Clare and Leitrim, the most reported anti-fracking activities came from these target counties.

Comparisons to the Corrib protests also do not appear often in the media discourse. Occasional comparisons with Corrib were made, such as comparisons of Corrib and fracking protesters as seen in the *Irish Examiner*: "Energy exploitation, has, in recent years, attracted all manner of protests, from the Shell To Sea campaign in Mayo, to anti-fracking groups in

Longford" (Clifford 2013). The Corrib gas project was also referenced in a *Leitrim Observer* article in relation to the effect it had on local communities: "The Corrib Gas Project has wreaked havoc and misery on the lives of communities in north Mayo. The interests of local people were bypassed in favour of big industry. This legislation aims to ensure that this never happens to a community again" (Leitrim Observer 2013b). But with only eight references in 320 articles, Corrib was not utilised as a main part of the discourse. Even though Corrib was a major topic in the interviews, the media did not strongly relate the Corrib energy project to fracking development. This may change in the future when fracking legislation progresses, but for now, the media does not seem to make direct comparison between Irish environmental protest movements.

The protest ideology also appears to be a major element to the anti-fracking frame. In one of the interviews, an individual claimed, "fracking is about ideology, not methodology." In this way, fracking discourse is not about the method of extraction but rather about the ideology behind the method, the industrialisation of the countryside and the effect on local life. The same interviewee asserted that even if fracking was proven to not harm the environment, people would still protest against it. Even though this is only one person's opinion, others also referenced a strong Irish protest mentality and protest cultures. In this way, the New Irish Protest Movement Frame connects with the Risk to Local Life frame in that both encompass strong ideological sentiments. The protest movement also frames its discourse around local risks, linking these two frames. Ultimately, the New Irish Protest Movement Frame places fracking into the public perception as a new issue to learn and care about, while also inciting strong emotions on both sides of the fracking debate.

7.1.4 Risky Language Frame

Based on the analysis of the media discourse, fracking appears to be discussed using risky language without the need for explanation. Terms such as 'controversial,' 'dangerous,' and 'threatening' are often used as well as the idea that fracking is a 'debated issue.' While sometimes these terms are justified with explanations of the two sides of the 'debate,' namely the environmental risks and economic benefits, often these descriptors are assumed. This Risky Language Frame illustrates how over the last few years fracking has become understood as a risky energy technology and can therefore be described as such without the need for justification. The descriptor 'controversial' appeared almost equally in local and national coverage on fracking, within more than one-fifth of all articles. Fracking was often described as a 'controversial drilling method' or 'controversial gas extraction process,' yet often no explanation of the controversy was given. Some articles would explain the controversy in simple terms of environmental risk and economic potential, but the controversy was rarely expanded on or explained in more detailed terms.

Similarly to the 'controversial' term, fracking was also described as a 'danger' or a 'threat' without much explanation for the use of these terms. Often this 'dangerous' and 'threatening' language was used alongside environmental risks or protest movements, which helped to strengthen the claims made by individuals against fracking. An article in the *Leitrim Observer* illustrates this: "It was a busy weekend as artists in the region took individual stands to raise the threat from fracking to local and international communities" (Leitrim Observer 2013a). By describing fracking as a threatening issue, it becomes a more pressing topic within national policy. In contrast, risk discourse sometimes was used in order to negate claims of danger and to help indicate the safety of fracking technology. An example of this is seen in the *Fermanagh Herald*: "In an exclusive interview with the Herald spokesman Marcus Pepperell outlined the benefits of fracking to the people of Fermanagh

and stated that it is not the threat it is being perceived as" (Fermanagh Herald 2014b). In this way, language of dangers and threats both builds up the environmental risks but also downplays risks as scaremongering or exaggerated claims.

While less prominent than the other terms, the media discourse often promoted the idea that fracking is a 'debate' with two sides. The term 'debate' was sometimes used as a descriptor and sometimes used with more explanation. An article in the *Irish Examiner* speaks of the fracking debate in terms of two sides: "The debate over the benefits for and against fracking comes as activists continue to pour into the Reclaim the Power camp, about a mile from Cuadrilla's exploratory oil drilling site" (Irish Examiner 2013a). In a *Fermanagh Herald* article, the UK Prime Minister David Cameron discusses the fracking debate as "something he was determined to win" (Fermanagh Herald 2013b). In this way, the media describes fracking as a discussion that can be won or lost, with strong opinions on both sides. The use of this type of language indicates to readers and citizens that this is an undecided issue. Even though an *Irish Times* article quoted an individual saying, "The sad truth is that debate is pointless – facilitating onshore gas extraction is already government policy," the majority of fracking risk language indicates that the debate has not yet been decided (Coombs 2013). The use of controversial, dangerous, and risky language terms aids in stirring up emotions in relation to fracking and making this seemingly undecided issue resonate more strongly within the Irish consciousness.

7.1.5 Local Environmental Issue Frame

The final frame is a more general one in which two of the most referenced terms combine to create the Local Environmental Issue Frame. The terms "local" and "environment" appeared frequently throughout the discourse, with each term mentioned almost twice as much in local reporting than in national reporting. In this way, local reporting

presented fracking as a local environmental issue rather than a national energy issue with these terms mentioned in almost 50% of all articles. Even in the national reporting, fracking appeared with local and environmental language almost 25% of the time, indicating national media often utilised this frame. Both local and environment terms were coded with a variety of other terms, ranging from environmental risks to anti-fracking movements. The environment term was not coded often in the business sections of the papers in which the shale gas market was discussed. Hence, fracking's impact on the environment is not a part of the Economic Potential Frame that has been used to describe the 'shale gas revolution' in the US and in other global markets.

Because of the local nature of the anti-fracking protest movements in Ireland and the UK, the idea of fracking as a local issue has emerged strongly within the discourse. In this way, fracking is framed as an issue that affects both local people and their environment and should be considered in relation to these subjects. By framing the issue thus, fracking's risks resonate stronger with local communities and concerned Irish citizens. Even if specific environmental terms are not identified – such as water pollution, earthquakes, air pollution, etc. – the idea that fracking is an environmental issue is clear denoted in the discourse. The current Irish media discourse presents fracking as a prominently local and environmental issue, one that can be protested and debated. This emphasises the academic discourses explored Chapter 5 as the environmental risks seem to be one of the most prominent elements of fracking discourse.

7.2 Missing Fracking Frames

This section addresses the frames that did not emerge within the media discourse. According to Streeter (2009), identifying the frames that are not prevalent in the discourse proves vital to understanding the frames that are used. The coded terms that appeared only

rarely within the discourse were the 'precautionary principle,' 'mineral rights,' 'energy efficiency,' and 'sustainability.' All of these terms appeared more prominently in the literature review and the interviews but are not used in the main fracking frames. The 'precautionary principle,' as previously mentioned, is a term that may not be as widely understood as others, and therefore other risk language may be used in its place in order to encourage cautious policy choices. The interviews revealed much discourse referencing the benefit Americans landowners receive from fracking over Europeans due to the difference in mineral rights laws. This argument is not prevalent in the news reporting on fracking in Ireland. Instead, articles discuss the economic advantages that many Americans receive from fracking investment in the form of jobs, money, and economic growth. The argument could be made that the economic prosperity seen in the US could differ in an Irish context due to this legal contract in mineral compensation, but this argument is not seen. The concepts of energy efficiency and sustainability tend to also be absent from these debates. Instead of focusing on how to obtain enough energy to meet the growing demand, more focus could be placed on sustainable practices and reducing demand.

As stated earlier, the New Irish Protester Frame did not include the concepts of foreign protesters or the Corrib gas project. Both of these issues received passionate commentary during the interviews, and the exclusion of them from the media discourse shows a shift away from these issues to a more local and active anti-protest movement. Arguments that appeal to the protection of future generations or children also did not feature prominently in the discourse, which often is used in environmental debates.

Climate change, although relatively prominent in national discourse, was rarely used as an argument in local discourse. This emphasises the argument mentioned in the introduction by Clarke (2012), that local people are not good at weighing long-term and short-term risk trade-offs against one another. Instead of using bigger picture arguments, such

as the potential for fracking impacting climate change and causing increased flooding in Ireland, only the short-term effects on aesthetics and jobs were addressed. Locals did do a good job at addressing the cost-benefits of the short-term fracking jobs over the long-term agricultural and tourism jobs, but the argument did not stretch much past these immediate concerns. Local impacts tend to garner more interest than the less tangible, long-term impacts of which individuals have less personal control. Thus, the exclusion of climate change makes sense on a local-scale as the argument may not have proved as relevant as other local concerns. Overall, climate change is not used as a strong argument against fracking, even though it was occasionally identified as such: "As a consequence, links to public health issues cannot be properly examined. Local objections are widely disregarded while the most important issue – the contribution to climate change – is dismissed by the industry as scientific fantasy" (Irish Times 2013). Similarly, the renewable energy markets and nuclear energy were excluded from the fracking frames. While discussion of these energy sources did factor into the debate, they were not as prominent as many other elements of the discourse. While fracking will remain an energy issue, these other forms of energy could be discussed in greater detail within the discourse.

Not all the key terms identified in Chapter 5 featured prominently in the Irish media discourse. Discussions of boomtowns, human rights, and the social benefits of fracking were missing from the discourse. Social benefits were mentioned occasionally in the media in relation to schemes in Britain for local communities to profit from fracking activities, but these benefits were never suggested or translated to the Irish situation. The argument that tourism could create longer-term jobs than fracking also did not feature strongly in the media discourse. While the activists interviewed frequently made this type of argument, the media quoted very few individuals making such statements and rarely stated the argument themselves. If built upon, the argument that building the tourism industry to create jobs in

place of fracking could gain more support and traction amongst reporters and citizens alike. The media also rarely reported on the economic burdens that Americans face in relation to fracking – such as paying for road and environmental damage after fracking activities have ceased. These financial disincentives are left out of the discourse in favour of the discourse of energy security and energy cost.

7.3 Comparison of Local vs. National Fracking Coverage

Even though the identified frames are based on a combination of reporting discourses, differences in local and national coverage should be addressed. The adverse social and economic risks proved to be much more prominent within local reporting as compared to national reporting, with each term appearing at least twice as often in the local coverage. Therefore, the Risk to Local Life Frame appeared more often in the local coverage and the Economic Potential Frame more often in national coverage. This suggests that locals are more concerned with the direct social impacts that fracking may have on their communities in relation to human health, aesthetics, tourism, and jobs. The national news coverage focused significantly more on the positive economic benefits of fracking through energy cost and energy security, as these terms were referenced more than twice as often in the national papers. Both the New Irish Protest Movement Frame and the Local Environmental Issue Frame appeared fairly equally in local and national news coverage.

National news reporting also incorporated more international stakeholders into the discourse while local reporting tended to emphasise local stakeholders such as anti-fracking groups, industry, and political candidates. The reporting of anti-fracking protests also focused on Irish protests in the local papers and focused more on British protests within the national papers. National reporting of the anti-fracking movement tended to use more negative risk discourse and depict protesters less favourably. Fracking became a political issue within local

protests – with candidates running as "anti-fracking candidates – but less so in national electoral discussions. Overall, the Risky Language Frame appeared less prominently in national coverage than in local coverage, indicating a propensity to use risk language locally.

To answer the hypothesis proposed in Chapter 2 [Methodology], the local news reporting did tend to focus on the elements of fracking that had more local importance, such as specific protest events, planning activities, and many local opinions were given in the reporting of the articles. The national reporting also did tend to focus on more global fracking discourse, with discussions of energy cost, energy security, and the overall energy market. As national news coverage tends to focus on more interpretive stories and place issues into a larger context, it is logical that the national news coverage tended to place fracking into a more global perspective (Pew Research Center 1998). If Long (1958)'s hypothesis that local news coverage tends to have more impact on societal thought is accepted, then the terms emphasised in the local news coverage should potentially be given more weight and interest than the national coverage as to how people will think about and react to fracking. But due to the fact that only one local Irish newspaper extensively covered fracking discourse, the influence of local news coverage on fracking risk frames in reality is more limited.

In this way, fracking could potentially be seen as more of a local issue that has the potential to affect communities and the Irish way of life. But this would only be true in the areas in which fracking was reported locally, which was only prominently in Leitrim and in Fermanagh, Northern Ireland. The other local newspapers did not report on this issue, and therefore, individuals would need to rely on the representation of fracking in the national newspapers in order to learn about the issue. In the end, fracking risks were covered more negatively in local news coverage and more positively in national coverage, as seen in the emphasis on the Risky Language and Risk to Local Life Frames in local coverage and Economic Potential Frame in national coverage.

7.4 Summary of Main Fracking Risk Perception Frames

Overall, the five fracking frames present a comprehensive picture of how the Irish media presents and amplifies fracking risks as the fracking discourse is most predominantly presented through these frames. The Social Amplification of Risk Framework emphasises that the media filters risks and presents them based on their importance (Kasperon *et al*. 1988). In this way, the Irish media has amplified certain aspects of the fracking discourse: its local and environmental impact, its economic potential, and its overall risk. The anti-fracking movement has become a prominent element in the discourse and the way in which protesters are viewed as the movement develops will greatly affect how people view the issue overall.

The frames presented here should be considered when developing discourse for future fracking protests, legislation, and debates. By understanding which issues are reinforced and which are pushed aside, stakeholders can be better equipped to address the fracking frames that are most familiar to the Irish population. Based on the analysis, it can be assumed that many accept that fracking is a controversial and risky technology, and also that many in Ireland are already somewhat familiar with its discourse. It should be noted that many of the journalists interviewed claimed that because Irish fracking legislation is still at an early stage, there currently is not a great deal of reporting on the subject. Many of the journalists interviewed hoped that their newspapers would cover fracking with more frequency and in more detail in future reporting.

Fracking still is very much debated within Irish media discourse, and its economic potential is often discussed in contrast with its local environmental and social impacts, especially regarding water resources and the local economy. Fracking tends to be spoken of using risk language, and this may make it more difficult to implement fracking legislation in the future in Ireland. Fracking discourse is still very much in development in Ireland, and the

current frames may change over time as the technology, its use, and increased research in risk analysis continue to mature on local, national, and global scales.

Ultimately, there is much more to discover in the area of Irish fracking risk discourse as this study addresses the media discourse and does not analyse political, scientific, or social discourses. The Irish media risk frame focused more on local environmental risks, while the scientific community more frequently discussed fracking's relation to climate change and renewable energy developments. The agenda-setting priorities of different stakeholder groups change the risks that are amplified within their representations. The local media's agenda focuses on representing issues that will directly impact the readers, such as the effects fracking may have on the environmental and local economy. This agenda tends to downplay or exclude the national economic effects of fracking, which may change how readers perceive fracking risks. The national news agenda, while also reporting on local risks, focuses more strongly on how Ireland interacts with the rest of the world, which amplifies the discourse surrounding other countries as well as economic benefits of fracking. By identifying this difference in fracking risk reporting, stakeholders can better understand the frames used, and they can then be better prepared to address the most prominent risks as perceived in Ireland.

CHAPTER 8 – Conclusion

In recent years, fracking has gained prominence in the Irish media as information and interest in this new energy technology has grown. The media acts as a major source of information about fracking, as reporters aim to present, either consciously or unconsciously, specific aspects of the fracking 'debate' that they, with their own individual worldviews, perceive as most significant to the on-going discourse. This discourse appears to focus mainly on the dichotomy of environmental risks and economic benefits, and much of the media reporting focuses on these two aspects. As Freudenburg (1993) claimed, individuals are much less likely to accept risks that are out of their control, and many in Ireland currently feel that they lack information and control in regards to national energy decisions. In this way, protest movements have arisen to voice these concerns, and an increasingly larger number of people have become vocal about their opinions on fracking risks. The media provides a major source of information about fracking risks and a platform for individuals to voice concerns and opinions, which together create a risk discourse that is accessible throughout the country. This thesis analysed 320 news media articles along with an extensive document analysis and 19 interviews in order to identify the most dominant fracking risk perception frames found within the media discourse.

Through the analysis, I identified five major frames in which fracking risks were amplified and presented to society: Risk to Local Life Frame, Economic Potential Frame, New Irish Protest Movement Frame, Risky Language Frame, and Local Environmental Issue Frame. The Risk to Local Life Frame emphasises the impact fracking may have on local communities, especially to agricultural and tourism industries, local health, aesthetics, and native employment. The Economic Potential frame counters the first in that it promotes the potential national benefits of fracking on lower energy costs, energy security, and the creation of jobs relating to the gas industry. The New Irish Protest Movement Frame identifies the

prominence that fracking currently has within protest culture, and the coverage that anti-fracking events receive within the media. The Risky Language Frame includes all the language terms that appear prominently in the discourse, such as 'controversial,' 'dangerous,' and 'threatening,' and the idea that fracking is something 'risky' that must continue to be 'debated.' This frame emphasises the idea that the implementation of fracking technologies is two-sided and does not have a straightforward, agreed-upon viewpoint. The final Local Environmental Issue Frame stresses the depiction of fracking as a local issue that affects not only energy production choices but also the environment.

Douglas and Wildavsky (1982) were correct in their assertion that local people are afraid of risks that directly affect their health and livelihood. People fear anything that creates risks to "the food they eat, the water they drink, air they breathe, land they live on, and the energy they use" (10). These risk perceptions appear strongly in the local consciousness, and local news coverage reported risks as such. But, on a national level, the discourse appears to be more focused on economic progress and the risk of being left behind as a 'shale gas revolution' bypasses Ireland. And although currently the local media emphasises the local environmental risks and the national media highlights the nation's global interests, perhaps these two levels of risk reporting could be better integrated in the future for a more balanced fracking risk representation. If media reporting discussed the local environmental risk frame alongside the national economic prosperity frame, it is possible that issues such as energy efficiency would become a larger part of the discourse and be perceived as something that can positively impact both of the aforementioned frames. Climate change and sustainability could also become more prominent elements in the discussion if local and national discourses were more uniform. Although local and national media have different agendas regarding the types of risks and issues they report, both types of media tend to limit their scope in ways that may not allow for a sufficient representation of risk.

Stakeholders can use this research to determine what parts of the fracking discourse are currently underrepresented, and can then focus on improving the arguments for these elements. For example, energy efficiency could be accentuated in the fracking discourse as a way to reduce the need for more energy sources, which could then reduce fossil fuel extraction accidents and promote safety and sustainability. Links could be made with other familiar energy conflicts such as the Corrib Gas Project. By incorporating these elements into the discourse, anti-fracking stakeholders could better connect people to the images of social strife and injustice that arose during similar energy projects. Stakeholders in favour of fracking could continue to emphasise the beneficial impact that fracking may have in transitioning the Irish energy mix towards less GHG emitting fuels as well as stress the growing threats to energy security based on the current state of global politics. Stakeholders who want to promote fracking can also continue to highlight the success of fracking technologies in other countries and compare these successes with Ireland's potential. By better understanding the national discourse, stakeholders can assess how best to develop and frame the risk discourse as the fracking debate continues to unfold.

It should be noted again that the media does not necessarily reflect the views of society. Certain aspects of the fracking discourse that appeared prominently in academic journals and interviews did not appear in the media frames. This indicates that the media cannot be depended upon for a complete representation of fracking risks. While the media does act as one of the main forms of information for many individuals about fracking, it cannot be used to represent overall societal views. Fracking risks are amplified within the media due to the agenda-setting influences of the journalists who choose which aspects of the discourse and whose voices to report and include in their articles. In this way, certain aspects of the discourse are amplified on a local level, such as risks to agriculture and tourism, but not on a national level. As Driedger (2007) stated, media analysis "is an imperfect technique"

to understand general public perception around risk issues, but it can provide a first step towards the identification of the current fracking risk perception.

Although this study was able to identify prominent frames within the fracking media, it must also be recognised that news media is not the only source of fracking discourse, as televised media, social media, political discourse, and activist dialogue all contribute to the ways in which fracking is framed in Ireland. This study analyses one aspect of this representation, and future studies should incorporate other elements of Irish fracking discourse into analysis and frame creation. Scaling down the study to just one area – such as focusing on the representation of anti-fracking groups or risk language terms within the media – could also provide a more detailed and rich analysis through the identification of voices, attitudes and language used in relation to fracking. More research could help determine who has a voice in the fracking discourse by exploring the types of individuals who are quoted within the media and what kind of ideologies they promote.

Over the next two years, stakeholders in Ireland will have ample time to build up their cases either for or against fracking in anticipation of the 2016 EPA, DCENR, and NIEA study results. The risk frames used to discuss fracking may prove instrumental to understanding the political outcome of fracking policy. During the interviews, one activist stated that "at the very first [anti-fracking] meeting, people said they were up for lying in front of the bulldozers, but I said that if it comes to lying in front of bulldozers we've lost and it's time to go home." Instead, the debate over fracking in Ireland must be won or lost through the discourse and political will of the stakeholders involved. Only once Irish citizens have been presented with the risks and benefits of fracking, will a decision be able to be made on the future of fracking in Ireland. Until then, the debate will be argued through the discourse, with the strongest frames influencing national perception and opinion and ultimately the future outcome of Irish hydraulic fracturing.

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Appendix

Table 2. All national Irish newspapers analysed for "Fracking, "hydraulic fracturing," and "shale gas" key terms

	National Daily Newspapers	# Articles
1	The Irish Times	80
2	Irish Independent	68
3	Irish Examiner	40
4	The Irish Sun	21
5	Irish Daily Mirror	14
6	The Herald	0
7	Irish Daily Star	0
8	Irish Daily Mail	0
	National Sunday/Other Newspapers	
9	Sunday World	1
10	The Sunday Business Post	1
11	The Evening Echo	0
Total National Papers Reference Fracking		**7**
Total National Papers No Reference to Fracking		**4**

Table 3. All Irish local newspapers analysed for "fracking," "hydraulic fracturing," and "shale gas" key terms and sorted by county.
Newspaper List source: The Audit Bureau of Circulations

County	Local Newspapers	# Articles
Carlow		
1	Carlow People	Irish Ind.*
2	Carlow Nationalist	0
Cavan		
3	The Anglo-Celt	2
Clare		
4	Clare Champion	0
5	The Clare People	0
6	The Clare County Express	N/A**
7	The Clare Courier	0
Cork		
8	The Avondhu	0
9	Ballincollig News	N/A**
10	Bishopstown News	N/A**
11	The Carrigdhoun	0

County	Local Newspapers	# Articles
12	Cork Independent	0
13	The Corkman	Irish Ind.*
14	The Cork News	0
15	The Douglas Post	0
16	East Cork Journal	0
17	Evening Echo	0
18	The Mallow Star	0
19	Midleton News	N/A**
20	Muskerry News	0
21	The North City News	N/A**
22	The Opinion	N/A**
23	The Southern Star	0
24	The Vale Star	0
25	West Cork People	0
26	Youghal News	N/A**
Donegal		
27	Derry People/Donegal News	0
28	The Donegal Democrat	0
29	The Donegal People's Press	N/A**
30	Donegal Post	N/A**
31	Donegal Times	N/A**
32	Finn Valley Post	N/A**
33	Finn Valley Voice	N/A**
34	Inishowen Independent	0
35	Inish Times	N/A**
36	Tirconaill Tribune	N/A**
Dublin		
37	Dublin Gazette Newspapers	0
38	The Northside People	0
39	The Southside People	0
40	Liffey Champion	N/A**
41	The Dublin Informer	0
42	The Echo	0
43	The Fingal Independent	Irish Ind.*
44	North County Leader	0
45	Metro Head	N/A**
46	LifeTimes	N/A**
47	City Wide News	N/A**
48	Newsgroup	N/A**
Galway		
49	The Galway Advertiser	0
50	Irish Emigrant	0
51	The Tuam Herald	0
52	The Connacht Tribune	0

County	Local Newspapers	# Articles
53	Connacht Sentinel	N/A**
54	Galway Independent	0
55	Galway First	N/A**
56	Galway Voice	N/A**
Kerry		
57	The Kerryman	Irish Ind.*
58	Kerry's Eye	0
59	Kenmare News	0
60	The Maine Valley Post	0
Kildare		
61	Kildare Nationalist	0
62	Liffey Champion	N/A**
63	Leinster Leader	0
64	Kildare Post	N/A**
Kilkenny		
65	The Kilkenny People	0
Laois		
66	The Leinster Express	0
67	The Laois Press	N/A**
68	The Laois Nationalist	0
Leitrim		
69	Leitrim Observer	33
Limerick		
70	Limerick Leader	1
71	Limerick Post	0
72	Limerick Chronicle	N/A**
73	Limerick Independent	Irish Ind.*
74	Weekly Observer	N/A**
75	Vale Star	N/A**
Longford		
76	Longford Leader	1
Louth		
77	The Dundalk Democrat	1
78	The Drogheda Independent	Irish Ind.*
79	The Argus	Irish Ind.*
80	The Drogheda Leader	N/A**
81	The Drogheda Weekender	N/A**
82	The Dundalk Leader	0
Mayo		
83	Connaught Telegraph	N/A**
84	The Mayo News	0
85	Western People	0
86	Mayo Advertiser	1
Meath		

County	Local Newspapers	# Articles
87	The Meath Chronicle	0
88	The Meath Topic	0
89	The Meath Echo	N/A**
Monaghan		
90	The Northern Standard	0
Offaly		
91	The Offaly Independent	1
92	The Offaly Express	0
93	Tullamore Tribune	0
94	The Midland Tribune	0
Roscommon		
95	Athlone Advertiser	1
96	Roscommon Herald	0
97	Roscommon People	0
Sligo		
98	The Sligo Champion	Irish Ind.*
99	The Sligo Weekender	0
100	The Northwest Express	N/A**
Tipperary		
101	The Nenagh Guardian	0
102	The Tipperary Star	0
103	The Nationalist	0
104	South Tipp Today	N/A**
105	Tipp Tatler	N/A**
Waterford		
106	The Munster Express	0
107	The Waterford News & Star	0
108	The Dungarvan Leader	N/A**
109	The Dungarvan Observer	N/A**
110	The Waterford Today	0
Westmeath		
111	The Westmeath Topic	0
112	The Athlone Topic	0
113	The Mullingar Adviser	0
114	The Westmeath Examiner	2
115	The Westmeath Independent	1
Wexford		
116	The Enniscorthy Echo	N/A**
117	The Enniscorthy Guardian	Irish Ind.*
118	The Gorey Echo	N/A**
119	The Gorey Guardian	Irish Ind.*
120	The New Ross Echo	N/A**
121	The New Ross Standard	Irish Ind.*
122	The Wexford Echo	0

County	Local Newspapers	# Articles
123	The Wexford People	Irish Ind.*
124	The County Wexford Free Press	N/A**
Wicklow		
125	The Bray People	Irish Ind.*
126	Wicklow People	Irish Ind.*
127	North Wicklow Times	0
128	South Wicklow Times	0
Total Local Papers Reference Fracking		**9**
Total Local Papers No Reference Fracking		**63**
Total Local Papers Not Accessible		**56**

*Irish Ind. = subsidiary of Irish Independent (same articles as found in Irish Independent search)
**N/A = not applicable (no online search possible of archives)

Table 4. Number of Article and Percentage of Total Coded for Adverse Environmental Impact Codes under the Category of Fracking Risks

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Agriculture	6 (7.5%)	6 (9%)	3 (7.5%)	15 (25%)	10 (30%)	6 (21%)	2 (18%)	**48 (15%)**
Air Pollution	3 (4%)	4 (6%)	4 (10%)	6 (10%)	2 (6%)	0	0	**19 (6%)**
Climate Change	13 (16%)	9 (13%)	8 (20%)	4 (7%)	0	3 (10%)	0	**37 (11.5%)**
Earthquakes	8 (10%)	5 (7%)	4 (10%)	1 (2%)	3 (9%)	3 (10%)	2 (18%)	**26 (8%)**
Fires	1 (1%)	0	1 (2.5%)	0	0	0	1 (9%)	**3 (1%)**
Geology	3 (4%)	0	0	0	0	0	0	**3 (1%)**
Noise	2 (2.5%)	1 (1.5%)	1 (2.5%)	2 (3%)	1 (3%)	0	0	**7 (2%)**
Odour	1 (1%)	0	0	0	0	0	0	**1 (0%)**
Radioactivity	0	0	0	4 (7%)	0	0	0	**4 (1%)**
Soil Pollution	0	1 (1.5%)	2 (5%)	0	2 (6%)	0	0	**5 (2%)**
Traffic/Roads	2 (2.5%)	3 (4%)	2 (5%)	11 (19%)	2 (6%)	0	0	**20 (6%)**
Waste Water	2 (2.5%)	0	1 (2.5%)	1 (2%)	0	0	0	**4 (1%)**
Water Pollution	18 (23%)	13 (19%)	10 (25%)	9 (15%)	8 (24%)	7 (24%)	2 (18%)	**67 (21%)**
Water Use	4 (5%)	3 (4%)	2 (5%)	6 (10%)	2 (6%)	0	0	**17 (5%)**
Wildlife/ Biodiversity	3 (4%)	0	2 (5%)	8 (13.5%)	1 (3%)	1 (3.5%)	0	**15 (5%)**

Table 5. Number of Articles Coded and Percentage of Total Coded for Adverse Economic and Social Impact Codes under the Category of Fracking Risks

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
No Economic Benefit	3 (4%)	2 (3%)	2 (5%)	8 (13.5%)	2 (6%)	1 (3.5%)	1 (9%)	**19 (6%)**
Aesthetics/Rural Landscape	8 (10%)	6 (9%)	5 (12.5%)	15 (25%)	3 (9%)	8 (28%)	0	**45 (14%)**
Future Generations/Children	2 (2.5%)	4 (6%)	0	9 (15%)	2 (6%)	1 (3.5%)	1 (9%)	**19 (6%)**
Human Health	13 (16%)	6 (9%)	2 (5%)	14 (24%)	9 (27%)	7 (24%)	1 (9%)	**52 (16%)**
Social Impacts	1 (1%)	4 (6%)	2 (5%)	11 (19%)	6 (18%)	3 (10%)	0	**27 (8%)**
Tourism	5 (6%)	3 (4%)	2 (5%)	14 (24%)	8 (24%)	5 (17%)	1 (9%)	**38 (12%)**

Table 6. Number of Articles Coded and Percentage of Total Coded for Positive Economic Impacts under the Category of Fracking Benefits

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
General Economic Benefits	8 (10%)	8 (12%)	1 (2.5%)	7 (12%)	3 (9%)	8 (28%)	0	**35 (11%)**
Energy Cost	23 (29%)	18 (26.5%)	10 (25%)	7 (12%)	3 (9%)	4 (14%)	1 (9%)	**66 (20.5%)**
Energy Efficiency	3 (4%)	1 (1.5%)	2 (5%)	2 (3%)	0	0	0	**8 (2.5%)**
Energy Security	15 (19%)	21 (31%)	9 (22.5%)	4 (7%)	4 (12%)	3 (10%)	2 (18%)	**58 (18%)**
Jobs	8 (10%)	12 (18%)	4 (10%)	16 (27%)	2 (6%)	10 (34%)	0	**52 (16%)**
Local Economic Incentives	5 (6%)	6 (9%)	2 (5%)	6 (10%)	1 (3%)	1 (3.5%)	0	**21 (6.5%)**

Table 7. Number of Articles Coded and Percentage of Total Coded for Stakeholder Groups under the Category of Associated Stakeholders

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Anti-Fracking Movement	16 (20%)	26 (38%)	11 (25%)	26 (44%)	16 (48%)	18 (62%)	3 (27%)	**116 (36%)**
Fishermen	2 (2.5%)	1 (1.5%)	0	8 (14%)	2 (6%)	2 (7%)	0	**15 (5%)**
Foreign Protesters	1 (1%)	0	0	0	1 (3%)	1 (3.5%)	0	**3 (1%)**
Political Candidates	4 (5%)	1 (1.5%)	2 (5%)	9 (15%)	4 (12%)	7 (24%)	1 (9%)	**28 (9%)**
Industry/Business	13 (16%)	3 (4.5%)	1 (2.5%)	9 (15%)	11 (33%)	5 (17%)	0	**42 (13%)**

Table 8. Number of Articles Coded and Percentage of Total Coded for Countries under the Category Associated Stakeholders

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
China	5 (6%)	1 (1.5%)	4 (10%)	0	0	0	0	**10 (3%)**
Poland	6 (7.5)	6 (9%)	2 (5%)	2 (3%)	0	0	0	**16 (5%)**
Russia	8 (10%)	7 (10%)	5 (12.5%)	0	0	1 (3.5%)	0	**21 (7%)**
Ukraine	7 (9%)	6 (9%)	3 (7.5%)	0	0	0	0	**16 (5%)**
United Kingdom	22 (27.5%)	20 (43%)	12 (30%)	11 (19%)	3 (9%)	5 (17%)	2 (18%)	**75 (23%)**
United States	34 (42.5%)	21 (31%)	7 (17.5%)	13 (22%)	5 (15%)	1 (3.5%)	0	**81 (25%)**

Table 9. Number of Articles Coded and Percentage of Total Coded for Risk Discourse under the Category Associated Discourses

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Controversial	9 (11%)	26 (38%)	8 (20%)	10 (17%)	5 (15%)	10 (35%)	4 (36%)	**72 (22.5%)**
Danger/Threat	12 (15%)	6 (9%)	5 (12.5%)	13 (22%)	6 (18%)	9 (31%)	1 (9%)	**52 (16%)**
Debate	9 (11%)	6 (9%)	6 (15%)	7 (12%)	5 (15%)	4 (14%)	2 (18%)	**39 (12%)**
Fear	6 (7.5%)	6 (9%)	7 (17.5%)	9 (15%)	2 (6%)	4 (14%)	1 (9%)	**35 (11%)**
Risk	8 (10%)	9 (13%)	2 (5%)	7 (12%)	5 (15%)	6 (21%)	2 (18%)	**39 (12%)**
Safety	5 (6%)	5 (7.5%)	4 (10%)	14 (24%)	3 (9%)	6 (21%)	1 (9%)	**38 (12%)**
Scare Tactics	2 (8.5%)	2 (3%)	1 (2.5%)	5 (8.5%)	0	3 (10%)	0	**13 (4%)**

Table 10. Number of Articles Coded and Percentage of Total Coded for Political Discourse under the Category Associated Discourses

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Mineral Rights	1 (1%)	1 (1.5%)	1 (2.5%)	0	0	0	0	**3 (1%)**
Policing	1 (1%)	8 (12%)	4 (10%)	7 (12%)	1 (3%)	5 (17%)	0	**26 (8%)**
Politics	14 (17.5%)	3 (4.5%)	2 (5%)	16 (27%)	8 (24%)	5 (17%)	2 (18%)	**50 (15.5%)**
Precautionary Principle	0	0	0	2 (3%)	1 (3%)	2 (7%)	0	**5 (1.5%)**
Regulation	7 (9%)	5 (7.5%)	5 (12.5%)	7 (12%)	4 (12%)	6 (21%)	1 (9%)	**35 (11%)**

Table 11. Number of Articles Coded and Percentage of Total Coded for Awareness Raising under the Category Key Noted Terms

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Awareness/ Education	3 (4%)	2 (3%)	1 (2.5%)	7 (12%)	3 (9%)	6 (21%)	1 (9%)	**23 (7%)**
Lack of Knowledge	2 (2.5%)	0	1 (2.5%)	6 (10%)	1 (3%)	4 (14%)	1 (9%)	**15 (5%)**
Fracking Process Description	17 (21%)	6 (9%)	3 (7.5%)	4 (7%)	1 (3%)	0	0	**31 (10%)**

Table 12. Number of Articles Coded and Percentage of Total Coded for Energy Sources under the Category Key Noted Terms

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Nuclear Energy	14 (17.5%)	7 (10%)	3 (7.5%)	2 (3%)	0	1 (3.5%)	2 (18%)	**29 (9%)**
Renewable Energy	17 (21%)	11 (16%)	7 (18%)	4 (7%)	2 (6%)	1 (3.5%)	1 (9%)	**43 (13%)**
Sustainable	2 (2.5%)	3 (4%)	1 (2.5%)	7 (12%)	2 (6%)	1 (3.5%)	1 (9%)	**17 (5%)**
Wind Energy	10 (13%)	10 (15%)	5 (13%)	6 (10%)	1 (3%)	0	2 (18%)	**34 (11%)**

Table 13. Number of Articles Coded and Percentage of Total Coded for Other Key Terms under the Category Key Noted Terms

	Irish Times (T=80)	Irish Independent (T=68)	Irish Examiner (T=40)	Impartial Reporter (T=59)	Leitrim Observer (T=33)	Fermanagh Herald (T=29)	Other Local (T=11)	Total (T=320)
Corrib Gas	0	4 (6%)	1 (2.5%)	1 (2%)	1 (3%)	0	0	**7 (2%)**
Environment	13 (16%)	21 (31%)	10 (25%)	27 (46%)	17 (51%)	13 (45%)	4 (36%)	**105 (33%)**
Local	25 (31%)	10 (15%)	8 (20%)	33 (56%)	10 (30%)	18 (62%)	8 (72%)	**112 (35%)**
New Technology	3 (4%)	2 (3%)	2 (5%)	3 (5%)	0	1 (3.5%)	0	**11 (3.5%)**
Shale Gas Market	0	11 (16%)	6 (15%)	0	0	0	0	**17 (5%)**
Shale Gas Revolution	10 (13%)	3 (4%)	3 (7.5%)	1 (2%)	1 (3%)	0	0	**18 (6%)**

Examples of Common Quotations per Coded Term

Adverse Environmental Impacts

- Agriculture/Farming
    - "We are standing up for communities concerned about the potential damage to the environment, to tourism and to the farming sector." (Leitrim Observer)
    - "The EPA said concerns related to "water resource depletion, water contamination, air and noise emissions, traffic, farming and tourism." (Leitrim Observer)
    - "Because of the risks to fish and farm animals, wildlife and water, fracking brings havoc to communities." (Impartial Reporter)
    - "The environment, public health, farming and tourism industries, all may be at risk." (Impartial Reporter)
    - "Our two main industries here are farming and tourism and neither can co exist with fracking." (Impartial Reporter)
    - "Farmers Michael Gallagher and Jim Dillon oppose any plans to introduce fracking in Leitrim, fearing it could spell the end of their livelihood." (Irish Independent)
    - "Food, agriculture and tourism support almost 500,000 jobs and even a marginal loss resulting from fracking will significantly exceed the jobs promised by fracking promoters." (Irish Times)
- Air Pollution
    - "In the meantime, the drilling frenzy continues with collateral damage in the form of air pollution, ground water depletion, road damages and potential aquifer ruination", she said." (Leitrim Observer)
    - "This of course will also release untold amounts of many other dangerous gasses into your air for you to breath." (Impartial Reporter)
    - "Opponents have said fracking, which involves blasting underground rocks with water, sand and chemicals, contaminates ground water, pollutes the air and mars the landscape." (Irish Examiner)
    - "The review will look at existing literature on fracking, while also carrying out some baseline studies of water and air levels." (Irish Independent)
- Climate Change/GHG Emissions
    - "There could also be environmental benefits: the European Union has also recognised that shale gas could be a possible bridging fuel as a substitute for more polluting fossil fuels, helping to contribute to its targets for reducing greenhouse gas emissions." (Fermanagh Herald)
    - "And it raised concerns that increasing gas and oil use would undermine efforts to tackle climate change."/ "We do know, however, that concentrating our resources on extracting fossil fuel from the ground instead of investing in renewable energy threatens to undermine our commitment to avoiding dangerous levels of climate change." (Irish Examiner)
    - "Local objections are widely disregarded while the most important issue – the contribution to climate change – is dismissed by the industry as scientific fantasy." (Irish Times)
- Earthquakes
    - "Critics say it can trigger small earthquakes, pollute the water supply and spoil pristine parts of the countryside." (Irish Independent)

    - "However, the prospect of drilling is deeply unpopular with many in local communities, who fear groundwater contamination, extra truck traffic and tremors." (Irish Times)
- Fires
    - "The idea was that anybody planning to frack for gas would need to do a study on the likely impacts — especially with reports of water being polluted, earthquakes and fires resulting." (Irish Examiner)
- Geology
    - "Moreover, the west Clare area is geologically unsuitable for this type of process and the whole Shannon estuary is threatened by this ruinous technology." (IT_75)
- Noise
    - "Opponents of fracking, in which water and chemicals are pumped into the ground at high pressure to fracture shale rock and release gas, fear it could harm water resources, cause small earthquakes and that development of the sites will cause noise and traffic." (Irish Examiner)
    - "Climate change, greenhouse gas emissions, the sustainable use of water, noise, odours or the visual impact of well-heads." (Irish Times)
- Odour
    - "Climate change, greenhouse gas emissions, the sustainable use of water, noise, odours or the visual impact of well-heads." (Irish Times)
- Radioactivity
    - "Just north of Belcoo large amounts of radon gas exists underground. It harmlessly seeps out into open air but if it permeates the foundations of a house it can increase the risk of lung cancer over the long term. The concern is that sinking wells and creating fissures underground will speed up the radon seepage (and other natural radioactivity) and increase concentrations, though more likely at the well pad itself." (Impartial Reporter)
- Soil Pollution
    - "Gandhi after offering his "hearty congratulations" said of the oil and gas industry, "They have no concern for future generations and the consequences of poisoning the earth with chemicals that will eventually make the soil worthless." (Leitrim Observer)
    - "Farmers living in intensively-drilled areas should be very concerned about potential exposures of their crops and herds to shale-gas contaminants in the water, air and soil," Prof Oswald told The Ecologist, a UK environmental magazine. "Farmers have a right to know what their families and their herds are being exposed to." (Irish Examiner)
- Traffic/Roads
    - "Asked if he would mind seeing lots of trucks drive past his home to-and-from frack sites, he replies: "When I look out my window I see windmills. They aren't particularly nice but I accept progression." He adds: "These folk – these anti-frackers and environmentalists – will have to accept [fracking] because it will come."" (Impartial Reporter)
    - "It's unbelievable the road traffic that comes with it," he says. "It's detrimental to quality of life but I'm sure business is better that it's ever been." (Irish Independent)
- Waste Water
    - "However, surface spills, of fracking fluids or waste water, may affect groundwater; and emissions to air also have the potential to impact on health,"

it said, though these could be safeguarded against by proper regulation." (Irish Times)

- Water Pollution
  - "The process of fracking, in which water and chemicals are pumped deep underground to break open the rocks, has led to fears it could cause earthquakes and contaminate drinking water." (Irish Times)
  - "Most evidence suggests that contamination of groundwater, if it occurs, is most likely to be caused by leakage through the vertical borehole. Contamination of groundwater from the underground fracking process itself… is unlikely." (Irish Times)
  - "The stories of water pollution are simply that: stories. There has been not one single case of proven pollution out of hundreds of thousands of shale wells in the US. The famous American lawyers would have picked up on that – but they haven't because they need proof." (Irish Independent)
- Water Use
  - "In the meantime, the drilling frenzy continues with collateral damage in the form of air pollution, ground water depletion, road damages and potential aquifer ruination", she said." (Leitrim Observer)
  - "For example, Ceres, a non-profit organisation, has combined Aqueduct's water-stress maps with hydraulic fracturing data (from Fracfocus.org) to find that nearly one-half of shale oil and gas wells in the US are located in areas with high water stress." (Irish Examiner)
- Wildlife (Biodiversity)
  - "McKinley is a rural farming community and has been hit hard by recession so when these two hit town offering big money for 'rights' to drill they are very well received by the local inhabitants – which surprises Sue and Steve slightly. All appears to be going very well for the pair until the locals start to hear there could be a downside to these people 'bearing gifts', and the whole issue of damage to the environment, to land, to animals and to water supplies rears its head." (Fermanagh Herald)
  - "Mr Bazley's presentation added: "It will not harm tourism, including fishing. It will not harm agriculture. It will almost certainly help both. It will not harm wildlife and with mitigation measures could build on existing, and create new, habitats to increase biodiversity."" (Impartial Reporter)

Adverse Economic Impacts

- Economic Harm/No Benefits
  - "There is too much uncertainty surrounding the number of local jobs that would be created. Tourism is too important to Fermanagh; we can't take that chance." (Impartial Reporter)
  - "It is not in our long term or medium term interest because if farming and tourism is damaged the economic impact alone will be a bigger loss of jobs than this few four to six hundred jobs they talk about." (Irish Examiner)

Adverse Social Impacts

- Aesthetics/Rural Landscape
  - "This is a gorgeous area and to think what could conceivably happen to it is ridiculous." (Fermanagh Herald)
  - "The fracking industry has never fracked before in a place so populated or so wet as Fermanagh. Or arguably so beautiful." (Impartial Reporter)

    - "People of Fermanagh, you and your beautiful county will essentially be used as one massive guinea pig and you were never even given a choice." (Impartial Reporter)
    - "We have a wonderful landscape and a wonderful county and we want it to remain so, people feel very strongly about maintaining that." (Irish Independent)
    - "The impact on the green and pleasant land will be far less than some fear it will be, with only a handful of drill sites going at once, rarely within sight of each other." (Irish Independent)
- Future Generations/Children
    - "One anti-fracking protester in England claimed yesterday: "It's going to leave lots of holes in the ground, and is that what we really want to leave our children?" (Irish Independent)
    - "Meg Rybycki was another who spoke out against fracking. "We will not negotiate" was the message as she did not want to leave a "toxic legacy" to her children." (Fermanagh Herald)
- Human Health
    - "'Fracking is safe for the environment and safe for our health' – That's the view of the European Resource Centre for fracking, Shale Gas Europe." (Fermanagh Herald)
    - "It is "extremely disturbing that no health study is mentioned despite the clear wishes of the people."" (Leitrim Observer)
    - "In brief, the proposal acknowledged that there is significant and growing public concern in respect to the social, public health, economic and environmental impacts that may be associated with unconventional oil/gas exploration and extraction (UGEE) in Leitrim and adjacent counties." (Leitrim Observer)
    - "Of great concern should be the health of us all, yet the company, Tamboran, has wrongly claimed there is no evidence of health risks to people." (Impartial Reporter)
    - "In essence, the public health body says properly-regulated, properly-run fracking is safe and does not threaten groundwater supplies – a major concern for local groups who have become increasingly vocal." (Irish Times)
- Social Impacts
    - "The division of rural communities is one of the worst effects of fracking." (Impartial Reporter)
    - "Residents are concerned about how this method of gas extraction called Hydraulic Fracturing will affect their lives and the countryside." (Fermanagh Herald)
- Tourism
    - "There are fears that the controversial shale gas extraction method could negatively effect the environment and tourism here. However, the company behind gas exploration here, Tamboran, feel that there will be economic gain for the area, including job creation, and that they will be working towards minimising social environment impacts." (Fermanagh Herald)
    - "The fisherman are adamant that the risks caused by pollution and lowering of water levels caused by fracking as a industry would be detrimental to the spawning and survival of the species that they have been protecting, to their lifestyle they and their children now love, and the tourism of the region." (Leitrim Observer)

    - "Fracking and tourism cannot co-exist." (Irish Examiner)

Positive Economic Impacts

- Economic Benefits
    - "However, the company behind gas exploration here, Tamboran, feel that there will be economic gain for the area, including job creation, and that they will be working towards minimising social environment impacts." (Fermanagh Herald)
    - "Some people fear shale gas exploration would increase traffic in Ireland. They're right: shopping centres will be full when money earned at home is spent at home." (Irish Independent)
    - "The process has been credited with bringing an energy boom to the United States, and President Obama is a supporter. However, opponents insist fracking is environmentally damaging and pollutes groundwater supplies." (Irish Times)
- Economic Incentives: Local
    - "Bear this in mind: any money they offer will not change the risks of polluting your water, damaging your health, wrecking your environment, increasing your energy costs or driving away your jobs." (Impartial Reporter)
    - "In a controversial move, the UK Government last week announced tax incentives for the extraction of shale gas (fracking) during its Budget 2013 measures." (Leitrim Observer)
    - "Landowners and local communities may get small payments to compensate them for surface disruption, but have no legal right to a share in the revenues from the oil and gas." (Irish Examiner)
    - "Local authorities in Britain will be given a multimillion pound cash incentive to approve planning permission for shale gas drilling, British prime minister David Cameron will say today." (Irish Times)
- Energy Cost
    - "The UK and Northern Ireland governments have recognised that shale gas could represent a huge economic opportunity and as demand for more affordable, cleaner energy continues to drive the need for more supply, shale gas may provide the potential means to meet this ever growing energy requirement in a commercially viable and environmentally responsible way." (Fermanagh Herald)
    - "Supporters say shale gas production in the UK could provide a cheap, secure source of energy, but opponents are worried about the possibility of earthquakes and water pollution caused by fracking." (Leitrim Observer)
    - "We have got to look at the example of the United States, where the absolutely spectacular reduction in energy (prices) has brought back whole industries which are now no longer competitive in China." (Irish Examiner)
    - "It's either the solution to cutting our energy bills and creating employment, or an environmental nightmare." (Irish Independent)
- Energy Efficiency
    - "The best way to create jobs, boost the economy and tackle rocketing fuel bills is to invest in energy efficiency and develop the UK's world-class renewable power potential." (Irish Independent)
- Energy Security
    - "The report says that increased domestic gas supplies would reduce Ireland's dependence on imported gas and ensure greater security of supply." (Leitrim Observer)

  - "Hydraulic fracturing for shale oil and gas is "in the national purpose" and right for Britain's energy security, the chairman of Cuadrilla said." (Irish Examiner)
  - "But Ireland still remains dependent on fuel imports. In 2012, we had the fourth-highest energy dependence in the EU, with 85pc of our energy imported. Price volatility and security of supply are major issues for the country." (Irish Independent)
- Jobs
  - "There are fears that the controversial shale gas extraction method could negatively effect the environment and tourism here. However, the company behind gas exploration here, Tamboran, feel that there will be economic gain for the area, including job creation, and that they will be working towards minimising social environment impacts. Spokesman for the group, Claire Falconer, indicated that the move would be challenged by local activists concerned that it represents the company getting feet on the ground." (Fermanagh Herald)
  - "The Assembly should "take more pro-active steps to aid job creation in the county as opposed to jumping on the 'magic bullet' solution of fracking, which will inevitably contaminate our environment, destroying the tourism and agricultural sectors," he believes." (Impartial Reporter)
  - "Terry McGovern Chairman of the Lough Melvin Anglers Association is worried about copious amounts of water being taken from Lough Melvin and then pumped back in. "What state is it going to be in?" He worries that the approximate 700-800 jobs in the local fishing industry could be jeopardised if fracking gets the go-ahead." (Impartial Reporter)
  - "It is not in our long term or medium term interest because if farming and tourism is damaged the economic impact alone will be a bigger loss of jobs than this few four to six hundred jobs they talk about." (Irish Examiner)
  - "They also claim that hundreds of jobs will be created, as well as tax revenue, and that environmental concerns can be managed. The US has seen gas prices plummet due to deployment of the technology." (Irish Independent)
  - "Food, agriculture and tourism support almost 500,000 jobs and even a marginal loss resulting from fracking will significantly exceed the jobs promised by fracking promoters." (Irish Times)

2. Associated Stakeholders

Stakeholder Groups

- Anti-Fracking Movement
  - "A local anti-fracking group has called a gathering of activists across the county and beyond to discuss plans of action." (Fermanagh Herald)
  - "In their inaugural anti-fracking protest, the non-political anglers group FART (Fishermen Are Resisting Tamboran), claimed the controversial fracking process could threaten local angling lakes and endanger fish species unique to Fermanagh." (Fermanagh Herald)
  - "When it comes to the controversy surrounding fracking, the MLA hit out at the protesters, accusing them of "scaremongering" in their "desperate" attempts to create "fear in the community." (Fermanagh Herald)

  - "Over 60 boats joined by a fleet of cars and vans sailed through the streets of Enniskillen on Saturday, March 1 in a powerful show of Fishermens antifracking solidarity." (Leitrim Observer)
  - "Anti-fracking represents how this county has been taken for granted by politicians. It also represents the complete mishandling of the economic catastrophe that's happening in the county." (Impartial Reporter)
  - "The British Government's adviser on fuel poverty has warned that protesters risk worsening the financial situation of millions of people struggling to pay their fuel bills." (Irish Examiner)
  - "A group from No Fracking Ireland protested outside an oil and gas summit in Dublin yesterday afternoon, saying the technology caused widespread damage to agriculture, the environment and human health." (Irish Independent)
  - "It seems they want us all to live in their yurts, teepees and wigwams in a sort of glorious save-the-planet pre-industrial squalor, regardless of our manifest objections." (Irish Times)
- Fish (Fishermen)
  - "In their inaugural anti-fracking protest, the non-political anglers group FART (Fishermen Are Resisting Tamboran), claimed the controversial fracking process could threaten local angling lakes and endanger fish species unique to Fermanagh." (Fermanagh Herald)
  - "The fisherman are adamant that the risks caused by pollution and lowering of water levels caused by fracking as a industry would be detrimental to the spawning and survival of the species that they have been protecting, to their lifestyle they and their children now love, and the tourism of the region." (Leitrim Observer)
- Foreign Protesters
  - "The group has organised multiple events including information nights for members of the public, whilst also working in partnership with other campaign groups to host foreign speakers including International Chair of Friends of the Earth NNimmo Bassey, Canadian scientist Jessica Ernst as well as survivors of the Bhopal disaster." (Leitrim Observer)
  - "Along with the relatively remote location and security detail, they said the refusal by Fermanagh District Council to arrange official camping facilities put off a lot of international campaigners." (Irish Times)
- Political Candidates/Elections
  - "Activist and former Sinn Fein councillor, Donal O'Cofaigh, is to stand for election in 2014 local shadow council elections, as an 'anti-fracking' candidate." (Fermanagh Herald)
  - "Speaking at an anti-fracking seminar in Sligo last week Sinn Féin MEP candidate for the Midlands North West, Matt Carthy, has pledged his support for the campaign to prevent fracking in Ireland." (Leitrim Observer)
- Industry/Business
  - "Last Saturday as part of Global Frackdown Day, a co-ordinated, international day of action against the fracking industry, campaigners and communities all over Ireland organised events calling on the government to ban fracking." (Leitrim Observer)

Countries

- China

    - "China may boast the world's largest potential reserves for shale gas but is likely to lose to Australia in the race to be second behind the US in bringing significant production on line." (Irish Examiner)
    - "…Even more shale gas in China will mean the world climate crisis can be solved by an eventual substitution of gas for coal in China." (Irish Independent)
- Poland
    - "The decision to offer new voluntary guidelines while maintaining current EU oil and gas laws is a victory for industry groups and governments such as those of Poland and Britain that are pioneering shale drilling in Europe." (Irish Examiner)
    - "The commission also unveiled a recommendation on shale gas yesterday but stopped short of introducing a legislative proposal that would impose regulations on individual countries. Britain and Poland are among the countries exploring shale gas options." (Irish Times)
- Russia
    - "Alternatives are deemed too expensive or too contentious to mark a significant change in the make-up of Europe's energy supply." (Irish Times)
- Ukraine
    - "The impact of geopolitics, such as what is happening in Ukraine, could be a topic and its impact on security of gas supplies to the EU, in addition to other topics such as nuclear, shale gas, the impact of austerity on investment in energy, and the cost of renewables." (Irish Examiner)
- United Kingdom
    - "Prime Minster David Cameron has this week urged the public to see fracking as a viable option for Britain – leaving a local campaign group up in arms. In a self-penned article in the 'Telegraph', the prime minister described the fracking debate as something he was, 'determined to win'. Fracking, the controversial shale gas extraction method, could come to Fermanagh as soon as 2014. He wrote: "If we don't back this technology, we will miss a massive opportunity to help families with their bills and make our country more competitive. Without it, we could lose ground in the tough global race." He compared Britain to the US." (Fermanagh Herald)
    - "People across the UK, including Northern Ireland, are rightly concerned about the threat fracking poses to their communities, local environment and the global climate. It's time to put the long term future of the planet first – and develop a clean energy future we can all afford." (Irish Examiner)
- United States
    - "While the US is reporting a 'shale gas boom', Minister Durkan is looking closer to home (e.g. Poland) because "our make-up is more European than American." (Impartial Reporter)
    - "Problems with fracking reported elsewhere, notably in the US, were blamed by PHE on "operational failure and a poor regulatory environment", which means that proper regulation is "essential" if risks are to be minimised in the UK." (Irish Times)

3. Associated Discourses

Risk Discourse

- Controversial

  - "Here are fears that the controversial shale gas extraction method could negatively effect the environment and tourism here." (Fermanagh Herald)
  - "And the countdown is on for fracking company Tamboran to decide whether it wants to drill and frack an exploration well and begin the controversial process of fracking in the areas surrounding Lough MacNean." (Impartial Reporter)
  - "No fracking will take place in Ireland until at least 2016, after a two-year study is carried out into the controversial gas extraction method." (Irish Examiner)
  - "Protesters have vowed to block any attempts to use a controversial technique known as fracking to drill for natural gas." (Irish Independent)
- Danger/Threat
  - "In an exclusive interview with the Herald spokesman Marcus Pepperell outlined the benefits of fracking to the people of Fermanagh and stated that it is not threat it is being perceived as." (Fermanagh Herald)
  - "It was a busy weekend as artists in the region took individual stands to raise the threat from fracking to local and international communities." (Leitrim Observer)
  - "Fracking is only the start – there could be contaminations, a range of threats arising from it which will need continued activity." (Impartial Reporter)
  - "In essence, the public health body says properly-regulated, properly-run fracking is safe and does not threaten groundwater supplies – a major concern for local groups who have become increasingly vocal." (Irish Times)
- Debate
  - "The debate in Ireland about shale gas will continue, but we are now starting to see serious consideration of the issues based on science and economics." (Leitrim Observer)
  - "After years of debate on the subject of fracking, Leitrim County Council has voted not to permit it within the county." (Leitrim Observer)
  - "The debate over the benefits for and against fracking comes as activists continue to pour into the Reclaim the Power camp, about a mile from Cuadrilla's exploratory oil drilling site." (Irish Examiner)
  - "The sad truth is that debate is pointless – facilitating onshore gas extraction is already government policy." (Irish Times)
  - "PRIME MINISTER David Cameron has this week urged the public to see fracking as a viable option for Britain – leaving a local campaign group up in arms. In a self-penned article in the 'Telegraph', the prime minister described the fracking debate as something he was, 'determined to win.'" (Fermanagh Herald)
- Fear
  - "The spokesman also criticised both the media and police for what he described as creating an element of 'fear'." (Fermanagh Herald)
  - "When it comes to the controversy surrounding fracking, the MLA hit out at the protesters, accusing them of "scaremongering" in their "desperate" attempts to create "fear in the community". She highlighted the potential positives of fracking in Fermanagh, and, if it is environmentally safe, the jobs and investment it could bring locally." (Fermanagh Herald)

    - Describing many fears surrounding fracking as "massively, massively exaggerated", Mr Paterson, who recently visited a test well in Poland, added: "We have been doing this for a long time, extracting oil from the earth. (Irish Examiner)
- Risks
    - "Fracking poses a very real risk to the success of our farming industry, which is vital in counties like Fermanagh and Leitrim." (Fermanagh Herald)
    - "Risks exist with all energy sources but these will be managed, controlled and carefully monitored. The Royal Society and Royal Academy of Engineering published a joint report in June 2012 which concluded that the health, safety and environmental risks of shale gas and hydraulic fracturing ('fracking') can be managed effectively." (Fermanagh Herald)
    - "Any risks here are reduced by the fact that we get our drinking water not directly from local aquifers, as in parts of the US, but from mains supply where it's treated and checked." (Impartial Reporter)
    - "Mention "fracking" in some parts of the country (we're looking at you, Leitrim) and the reception might be less than welcoming. Presumably aware of this, the Government has been cautious on deciding whether it likes or dislikes the practice. Advocates point to a new, cost-effective source of fuel; enemies cite potential risks to water supply." (Irish Times)
    - "Last year, the Government sidestepped the controversy by saying it was awaiting further research and, in January, the Environmental Protection Agency stepped into this breach by launching a public consultation on the draft terms of reference for research into fracking." (Irish Times)
- Safety
    - "If this should be lifted then the impact on any landscape where shale gas is evident will be minimal as there are already a host of regulations in place to manage the exploration and drilling of shale gas in the UK. The Government's full regulatory framework seeks to deliver best practice, promoting the safe, responsible and environmentally sound recovery of the UK's unconventional reserves of gas and oil." (Fermanagh Herald)
    - "Tony Bazley told the conference that Tamboran are "dedicated to safe and responsible development, to minimise social environmental impacts." (Leitrim Observer)
    - "Opponents say fracking is linked with earthquakes and environmental damage including water pollution, but the companies involved say it is safe if properly conducted." (Irish Independent)
- Scare Tactics
    - "Minister Foster accused local groups anti-fracking groups of 'scaremongering', and that 'if it (fracking) can be carried out in an environmentally safe way, then it could be a game changer for Fermanagh'." (Fermanagh Herald)
    - "Just watch out for the hyperbole, anecdotal scare-stories and the old cause/correlation confusion. Let's hear the science without the spin, and the politics without the panic." (Impartial Reporter)
    - "The UK's Environment Secretary Owen Paterson has urged the country to wake up to the "massive" potential advantages of fracking and accused opponents of the technique of scaremongering." (Irish Examiner)

Political Discourse

- Mineral Rights

    - "Opposition to fracking has to date centred upon supposed environmental damage and pollution (all unproven) and a slight risk of causing minor earthquakes; but if fracking gets under way in earnest, opposition will start to centre on land ownership and mineral rights issues, noise and traffic disruption. It is worth noting that to date not a single British kettle has been boiled by the energy from shale gas." (Irish Independent)
- Policing
    - "The spokesman also criticised both the media and police for what he described as creating an element of 'fear'." (Fermanagh Herald)
    - "Around 20 campaigners from Fermanagh and Balcombe, West Sussex (where an ongoing campaign against fracking firm Cuadrilla has attracted over 1,000 protesters, and policing costs have risen to £2.3 million) are currently camping on the island. It is believed police are aware of the protest." (Impartial Reporter)
- Politics
    - "Acting County Manager, Martin Dolan, said the Council did not have the legal authority to ban fracking within Co Leitrim and observed that "I don't expect any resolution from Leitrim County Council will have any influence on the (Government's) final decision", but accepted a call for a national ban could be made." (Leitrim Observer)
    - ""As shale-gas exploration activities are progressing, member states have started interpreting the EU environmental legislation in different ways" including bans and moratoriums, the European Commission said in a draft statement to governments to accompany the guidelines. The EU needs a level playing field to respond to a "fast-evolving energy landscape", it said." (Irish Examiner)
- Precautionary Principle
    - "'Precautionary Principals' are supposed to be applied by government departments and local authorities, to ensure that no activity is permitted that might cause damage or pollution." (Impartial Reporter)
- Regulation
    - "Risks exist with all energy sources but these will be managed, controlled and carefully monitored. The Royal Society and Royal Academy of Engineering published a joint report in June 2012 which concluded that the health, safety and environmental risks of shale gas and hydraulic fracturing ('fracking') can be managed effectively." (Fermanagh Herald)
    - "Cameron argued fracking was safe and, if it was properly regulated, there was no evidence it would contaminate water supplies or cause environmental damage." (Irish Independent)
    - "Investors and exploration companies have expressed concern that shale prospects may become too difficult to tap compared with other nations such as the US and Russia because European countries are creating a jumble of new laws." (Irish Examiner)
    - "If allowed, this unregulated, contaminating, heavy industry will cover the area in concrete fracking pads, wells, open waste water pits, heavy machinery and heavy truck traffic." (Irish Examiner)

4. Key Noted Themes

Awareness and Education

- Awareness/Education
    - "The group have been instrumental in raising awareness nationally and internationally with artists working hand in hand with farmers." (Leitrim Observer)
    - "In order to raise awareness about fracking, the organisation of locals who are concerned about fracking, also plan to display banners throughout Enniskillen saying: 'Happy Christmas from Ban Fracking Fermanagh, Wishing you a Frack Free New Year." (Impartial Reporter)
    - "National reporting – more general, less specifics: "Love Leitrim were nominated for its work at raising awareness and advocating policy change for a ban on hydraulic fracturing." (Irish Independent)
- Lack of Knowledge
    - "The piece went on: "And he [Cameron] called on the public to ignore scare stories about the perils of drilling for shale gas – insisting there was a 'lack of understanding' about how fracking works." (Fermanagh Herald)
- Fracking Process Description
    - "It involves the blasting of water, sand and chemicals into the ground in the hope of releasing shale gas. The gas then seeps up through cracks in the stone beneath the soil to be collected by the petroleum companies." (Leitrim Observer)
    - "Hydraulic fracturing, or fracking, involves sinking wells up to 2km below the surface of the earth to access pockets of shale gas trapped in rock. Large volumes of water mixed with sand and chemicals are pumped underground at high pressure to create cracks in the rocks, which frees the trapped gas, allowing it to flow to the surface where it is captured and sent for processing." (Irish Independent)
    - "This is where the controversy arises. A well is drilled and large volumes of water mixed with sand and chemicals are injected underground at high pressure to create cracks in rocks. This frees the trapped gas, allowing it to flow to the surface, where it is captured." (Irish Independent)
    - "Fracking involves the use of very high pressure water and chemicals to shatter shale rock hundreds of metres below ground, in the process releasing usable amounts of trapped natural gas." (Irish Times)

Energy Sources

- Nuclear Energy
    - "However, he said Europe should also look to develop its own energy resources - a veiled reference to environmental resistance to shale gas extraction and nuclear power - and not just count on America." (Irish Independent)
    - "Some EU countries, including the UK, have lobbied the EU to drop binding targets for renewables to allow them to pursue fracking and nuclear energy." (Irish Independent)
- Renewable Energy
    - "Speaking about the issue of utilising renewable energy sources Deputy Colreavy stated, "As Ireland aims to reduce its carbon emissions we must be mindful that renewable sources of energy are developed along with utilising

our oil and gas sources. Renewable sources will become increasingly important in our energy security in coming years." (Leitrim Observer)
    - "Contrary to what has been said about fracking, it is actually renewables that's going to bring down bills and put power back into the hands of consumers and communities." (Irish Examiner)
    - "The high cost of energy for consumers in the EU, particularly compared with the US, where energy prices have fallen sharply due in part to shale gas, has focused attention on the renewable industry, which is heavily subsidised in most countries." (Irish Times)
- Sustainable
    - "James Phelen is adamant that promoting tourism is the only sustainable industry in his mind and referring to fracking says, "Its not going to happen, it can't happen." (Leitrim Observer)
- Wind Energy
    - "His comments come amid widespread controversy about plans to upgrade the national grid to facilitate more renewable energy, wind farms in the Midlands designed to transmit power to the UK, and the prospect of shale gas fracking in the west and northwest." (II_5)
    - "It's simply unfair for mis-informed scaremongers in Leitrim and Cavan to decide the outcome of everyone else's economic future. No one is proposing to industrialise the landscape. Shale gas will certainly have a lower footprint than the thousands of windmills proposed to export electricity to the UK for example." (II_53)

Other Key Terms

- Corrib Gas (Mayo)
    - "The Corrib Gas Project has wreaked havoc and misery on the lives of communities in north Mayo. The interests of local people were bypassed in favour of big industry. This legislation aims to ensure that this never happens to a community again." (Leitrim Observer)
    - "The same psychological war-fare is being got ready for them." (Impartial Reporter)
- Environment
    - "At this early stage the feedback has shown that many are concerned about environmental risks citing the value they place on the areas natural beauty. Others see a need for economic investment and are excited about the job opportunities, but nearly all are interested in finding out more from the relevant bodies and representatives." Despite his findings thus far David will not cast his own verdict on the controversial drilling process just yet." (Fermanagh Herald)
    - "Everyone has a role to play in stopping fracking which is a threat to the sustainability of our environment, indigenous industries, as well as the health of our communities." (Leitrim Observer)
    - "If someone can convince me that fracking will damage the environment of Fermanagh, I will oppose it. But if someone shows me that it can be done safely, I will support it," Mr. Johnston says." (Impartial Reporter)
    - "Several dioceses in areas potentially ripe for fracking have spoken of concerns over the environmental impacts linked to the process, with the latest being Bishop of Chichester Martin Warner." (Irish Examiner)

    - "Energy Minister Pat Rabbitte said "tentative" approaches had been made in recent months but that no exploration licences would be granted until an in-depth study on its environmental effects was completed." (Irish Independent)
    - "The process has been credited with bringing an energy boom to the United States, and President Obama is a supporter. However, opponents insist fracking is environmentally damaging and pollutes groundwater supplies." (Irish Times)
- Local
    - "Diverse local musicians will provide the sounds for this event, starting with the dulcet tones of Sarah Wieghell followed by the soft, folksy feel of 'Pipeline,' (formed specifically to raise funds for the anti-fracking movement) consisting of Melissa McKeague, Martin Mc Namee, Richie Woods, and Richard Ireson." (Fermanagh Herald)
    - "Overall, it seems fracking is like driving – it's as safe as the regulations, construction, technology, local conditions and the people ultimately at the wheel make it, and we can never eliminate all risk. The decision is, like driving, whether it's useful enough to make the risk acceptable." (Impartial Reporter)
    - "About 20 protesters also gathered outside Francis Maude's constituency office, with a spokeswoman for the group saying it was because "he refuses to listen to the concerns of the local people." (Irish Independent)
    - "Despite mounting objections from locals where drilling is planned or under way, Mr Davey said: "I don't believe shale gas is the environmental threat some fear. Cleaner gas will be essential for keeping the lights on, as we replace dirty coal. Our [plan] for cutting carbon emissions assumes Britain will use a lot of gas in the future." (Irish Times)
- New Technology
    - "Similar technologies have been used throughout the US for the past 40 years. Production of shale gas in the US has ramped up from 2005, and represents almost 40pc of all gas production." (Irish Independent)
- Shale Gas Market
    - "The advent of shale gas has confused the energy debate even more. If gas is substituted for coal, it can be a useful bridge to a low-carbon future." (Irish Examiner)
    - "Earlier this month, the British Government announced that it would grant licences for thousands of exploratory wells to be dug in 2014 in the search for shale gas, the "fuel of the 21st century." (Irish Independent)
- Shale Gas Revolution
    - "He said in Ireland we import all our oil and more than 90% of our gas and are vulnerable to interruptions in supplies, "The shale revolution is indeed a game-changer the effects of which must be considered on this side of the Atlantic." (Leitrim Observer)
    - "While the US had experienced a "shale gas revolution" with domestic prices plummeting, a similar scenario was unlikely to arise here, he said." (Irish Independent)
    - "Exploitation of the gas – which is brought to the surface by "fracking", where water, sand and chemicals are used to break apart underground rock formations – has revolutionised the US gas market, leading to major falls in the price of gas there." (Irish Times)