Shale at the Local Scale

Energy (In)Justice, Democracy and Resistance in Ellesmere Port

Hayhurst (2019)

9701265 | Word Count: 9959

MANCHESTER 1824

The University of Manchester

School of Environment, Education and Development - Geography

STATEMENT ON PLAGIARISM

In Submission of work for assessment, I affirm my familiarity with the guidelines on plagiarism laid down by the University of Manchester including:

(1) Coursework, dissertations and essays submitted for assessment must be the student's own work, unless in the case of group projects a joint effort is expected and is indicated as such.

(2) Direct copying from the work of another person is an unfair practice unless the material quoted is acknowledged. This applies of copying from other students' work and from sources such as books, reports, journal articles and the world wide web.

(3) An exact quotation should be indicated by the use of quotation marks. A quotation or paraphrase from another person's work should acknowledge the source of material by giving the author, year of publication and page numbers. The full reference must then be included in the bibliography at the end of the piece of work.

(4) Submitting the same piece of work for different course units is not permitted. This is known as self-plagiarism

I understand that this document, will be held on file in Geography and will be taken to relate to all work submitted by me for assessment.

Registration Number: 9701265

Degree Course: BA Geography with International Study

Date: 04/04/2019

Abstract

Development of unconventional shale gas is firmly on the UK's national agenda in order to solve the energy trilemma of having low carbon energy systems that are both secure and affordable. Critical scholarship however is calling attention to how the rate at which shale development has occurred far exceeds that of research into shale's social and environmental impacts. This research aims to highlight the concern emerging in literature that through a national scale framing, communities where developments are sited become forgotten. Applying the concept of energy justice to the community of Ellesmere Port, Cheshire with a qualitative approach to research, interviewing residents and observing an inquiry on the proposal's future, it will bring attention to the injustices faced. Ellesmere Port is distinctly different to UK studies thus far through being an industrial and traditionally marginalised community. As such, it aims to provide a different perspective on how UK communities suffer and respond to the impacts of shale development. The findings of this research show firstly, that the community suffers multiple forms of injustice even before development has begun. Secondly, that the issue of shale gas has become embedded as an issue of democracy for participants. Finally, through such injustice and disempowerment, a powerful sense of resistance emerges as the community looks to reject the reproduction of spatial and social inequality. Should local considerations continue to lack proper attention in national scale framing then similar instances are likely to arise which will undoubtedly make shale's UK future problematic.

Table of Contents

List of Figures

Acknowledgments

I would like to express my thanks firstly to the residents who agreed to participate in my research who made this such an interesting and insightful dissertation. Secondly, I would also like to thank my dissertation advisor for providing support throughout this process which has been greatly appreciated.

1. Introduction

> Human-induced climate change, by its nature, involves the production of injustice. The impacts of climate change impose spatially uneven harms on present and future generations. (Bickerstaff, 2017, p.438).

Climate change and the world's energy systems are inextricably linked (Solomon and Calvert, 2017). As the world recognises the immediate need to decarbonise, natural gas has risen to prominence with the UK no exception (Haggerty, 2017). Viewed as an integral bridge fuel and one way to solve the energy trilemma (see Hammond and Pearson, 2013, pp. 2-3) gas has become an invaluable resource to the UK's Low Carbon Transition Plan to move us to a clean energy future (Jaspal and Nerlich, 2014). However, the UK's relationship with natural gas has been under significant strain in recent times and as a result the government professed in 2014 that they would go all out for shale gas (Cotton, 2015), an unconventional fossil fuel made commercially viable through the technological process of hydraulic fracturing, more commonly known as fracking (Evensen et al., 2014). A process which transformed the United States into the world's largest producer of natural gas, providing economic benefits, enhancing energy security and creating a scenario the UK would like to replicate (Chyong and Reiner, 2015). Thus far, shale's success has struggled to be recreated outside of the US however, as such the UK has come to be viewed as the litmus test for the rest of the Western world's relationship with the resource (Bradshaw and Waite, 2017).

With the UK government pro-shale, a plethora of licenses for development have been granted nationwide. One such license, granted to test for shale gas, exists in the north-west county of Cheshire, in the community of Ellesmere Port, specifically near the wards of Rossmore and Ellesmere Port Town. As shown in figure 3, the community is located along the Mersey estuary and is already near other major industrial facilities such as the Stanlow Oil Refinery. This heavy industrial presence combined with a lower than average income and health risks vastly above

the national norm (see CWaC, 2017a;2017b) contributing to a sense of structural deprivation. These periphery community characteristics (see Willow, 2014) exemplifying that this locality is distinctly different to those studied so far in the UK context. Work initially focused on rural Lancashire, particularly Preston New Road where the only active fracking site in Western Europe currently exists (Bradshaw and Waite, 2017). This study in Ellesmere Port will look to similarly investigate how the current national framing of shale gas can lead to the communities where material development is sited being forgotten (Short and Szolucha, 2017).

Scholars are keen to stress that the rate at which shale development occurred in the US far exceeded that of scientific research into the social and environmental impacts (Haggerty, 2017). Whereas some believe that the benefits of shale far outweigh any potential costs, others argue further development should wait until such research is conducted (Howarth et al., 2011). The UK is currently taking the approach of the former however, and so it is critical that research is carried out now to catch up and challenge the assumption that gas can play an unproblematic role in our futures. This study will look to contribute by applying an energy justice framework to highlight the injustices suffered by communities as well as detailing their agency to object. The intention is not to provide a conclusion on shale's place in the UK's energy policy but rather highlight and call for a critical engagement with local points of importance in a national debate only likely to further unfold.

The following chapters will firstly provide the academic context for this research before detailing the methodological approach taken to engaging with the community. This will then lead to a critical discussion of the subsequent findings, finally drawing them together and providing the implications of this research moving forward.

1.1 The Study Site

Figure 1: Map of UK highlighting Ellesmere Port region (Source: Ordnance Survey, 2016)

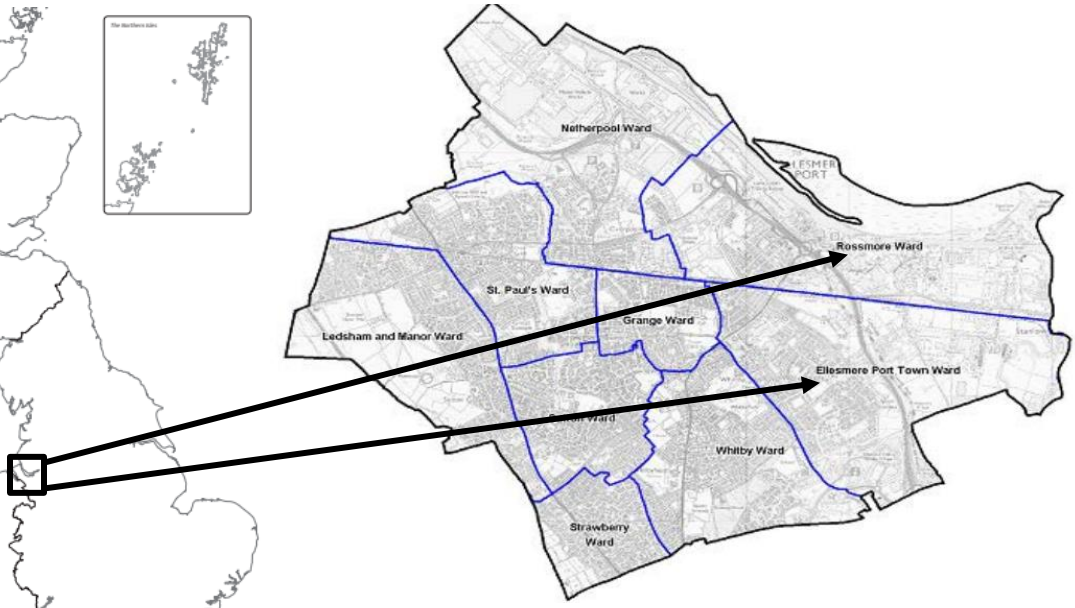


Figure 2: Map of Ellesmere Port Wards showing Rossmore and Ellesmere Port Town (Source: CWaC, 2015)

Figure 3: Aerial view of Ellesmere Port Town and Rossmore Wards and surrounding industrial developments including shale proposal (Source: Digimap,2019)

2. Literature Review

2.1 Natural gas - bridge to a low carbon future?

The immediate need to decarbonise energy systems on a global scale is well documented in the contemporary literature (Söderholm et al., 2011; Stambouli, 2011; Hoggett, 2014).The 2015 Paris Agreement outlined a worldwide commitment to move towards a low carbon future in order to tackle the 'wicked problem' (see Goodspeed, 2015, p.85) that is climate change (Kern and Rogge, 2016). To effectively mitigate the negative environmental impact of high carbon energy generation, scholars believe a drastic structural shift needs to take place (Skea et al., 2011; Sen and Ganguly, 2016). Some indicate that this shift should involve the accelerated uptake and embedding of renewable energies such as solar and wind. (McGowan, 1991; Turner, 1999; Panwar et al., 2011). However, others bring attention to the persistent problems with these sources including barriers limiting their scale and capacity to displace our current fossil fuel focus (Victor and Yanosek, 2011; Moriarty and Honnery; 2016, Foster et al., 2017). As a result, there has been an emerging discourse turning to natural gas, describing it as a crucial 'bridge fuel' to enable transition (Pierce Jr, 2012; Neumann and Von Hirschhausen, 2015). This notion of a bridge comes from the understanding of gas as more environmentally benign than both coal and oil, with creating environmentally benign energy systems seen as a key part of achieving the 21st century energy challenge (Bridge et al., 2013).

2.1.1 Emergence of Shale

As the perceived importance of natural gas in the energy mix grows, nations around the world have become especially concerned about the security of their supply (Cabalu, 2010; Belkin et al., 2013,). The United States in the early 2000's became wary that with falling domestic production, the answers to their energy demands lay once again in the Middle East and North Africa (Rogers, 2011). Due to fears over economic and geopolitical hurdles that could be encountered on this path, attention turned to developing those domestic resources deemed unconventional, including shale gas (ibid.). The technological breakthrough of hydraulic

fracturing enabled the US to experience what has been coined the 'shale boom', that President Obama claimed transformed the US into the Saudi Arabia of gas (Pierce Jr, 2012). The benefits that ensued included the US becoming the world's largest producer of natural gas, accelerating its transition away from coal whilst simultaneously creating thousands of domestic jobs and driving gas prices to exceptional lows (Malakoff, 2014). For Dunn and McClelland (2013) it is a tool that re-established American power on the world stage, promoting a global revolution in shale gas development (Boyer et al., 2011). Pierce Jr (2013, p.25) argues that if the success of the US experience can be replicated globally, then shale could "move the world a long distance toward the goal of effectively mitigating climate change". This thought is contested however, as the rise of shale has not been without significant controversy. In response to the climate argument there are those who believe it doesn't go far enough if we are to reach global objectives, due to its production of methane (Howarth, 2014). Hays et al. (2015) illustrate this concern with evidence that methane is a greenhouse gas 86 times more potent than CO2 over a 20-year period. Scholars here apprehensive about the little time we have to manage climate change and how expansive shale development would further 'lock in' high carbon energy, with it ultimately still being a fossil fuel (McGlade et al., 2018). This concern is connected to the appraisal of gas' place in transition more broadly, with Argetsinger (2011) and Howarth (2014) portraying it as a bridge to nowhere for such reasons.

Lis and Stankiewicz (2017) take another perspective and view the framing of shale as a solution to climate change or the economy as problematic. Detailing how discussion becomes securitised at the national scale which therefore neglects consideration of shale expansion's local impacts (ibid.). This project will look to contribute to the understanding of these issues, discussed in subsequent sections. These clear contentions around shale gas are not limited to academic literature as they have also caused heterogenous approaches to the resource across spatial contexts. Hays et al. (2015) noting how Poland promotes shale to reduce dependence from Russia, Germany is reluctant as it pursues its Energiewende plan whilst the UK has reversed a previous moratorium to try and tap into its benefits. These spatial differences

exemplifying that an appreciation of national scale priorities and issues are worth further exploration.

2.2 UK experience thus far

The UK has long held ambitions of being a global leader in climate change policy (Walker et al., 2007). It has set legally binding national scale climate targets which aim to reduce carbon emissions to at least 80% below 1990 emissions by 2050 as part of its 'Low Carbon Transition Plan' (Bridge et al., 2013). The literature focusing on the various solutions for these radical targets including new nuclear (Doyle, 2011), investment in renewables (Cradden et al., 2012), community energy projects (Seyfang et al., 2013) and of course, natural gas (Grubb et al., 2006). With the high potential costs and safety concerns associated with nuclear (Parkhill et al., 2010; Harris et al., 2013) , the issue of upscaling community projects (Warren and McFadyen, 2010), and the wider barriers to renewables including the government withdrawing funding support for onshore wind (Gabbatiss, 2018), natural gas is seemingly positioned to be the important bridge fuel. However, Rogers (2013, p.2) notes how the UK has been suffering from a "profound paranoia" with its relationship with natural gas. The country has undergone a significant transformation from a self-sufficient net exporter in the early 2000's to a heavy importer today (EU Pocketbook, 2018). This situation arising from the continued decline of domestic supply from North Sea reserves (Stern, 2004), leading to a perceived over reliance on foreign imports, creating concerns over domestic energy security (Rogers, 2013). Considering the huge disparity between the US and UK situation (see figure 4) it is perhaps unsurprising that Prime Minister Cameron professed the UK would go 'all out for shale' (Watt, 2014 cited in Cotton, 2015). Stamford and Azapagic (2014, p.506) claiming that shale could be a "game changing" addition to revitalise the UK energy market. This opinion grew in discourse following the increase in estimates of the amount of British shale deemed technically recoverable (Andrews, 2013). This amount being able to meet the nation's energy needs from anywhere between a generation to 470 years (Stamford and Azapagic, 2014; Bomberg, 2017). A substantial opportunity that would only become a reality if extensive exploration and testing, such as is proposed at Ellesmere Port, takes place (Andrews, 2013).

Producing countries			Importing countries	
Producer	bcm	% world total	Importer	bcm
USA	769	21	Japan	117
Russian Federation	638	18	Germany	73
Iran	184	5	Italy	61
Qatar	164	5	China	56
Canada	164	5	Turkey	48
China	134	4	Korea	43
Norway	122	3	France	39
Saudi Arabia	87	3	Mexico	37
Turkmenistan	83	2	UK	31
Algeria	82	2	Spain	27

Figure 4: The Top 10 countries for producing and importing natural gas in 2015 (Source IEA, 2016 cited in Haggerty, 2017)

Despite sustained supportive national policy, shale gas development remains in its infancy in the UK (Hammond and O'Grady, 2017). The critical literature that has emerged thus far can be categorised into two broad sections. On the one hand there are scholars addressing the hypothetical prospect of UK shale production, focusing on the environmental risks and economic possibilities (Jones et al., 2015; Ochieng et al., 2015). Academic critique in this realm responding to the framing of shale at the national scale, such as ministerial statements claiming it can be positive for security, jobs and the climate (Clark, 2018). A counter-discourse to such claims contending for example that the UK does not have the space in its carbon budgets for shale development (McGlade et al., 2018). On the other hand, authors analyse the socio-political dimensions of shale, with this group split into broad public perceptions (Jaspal and Nerlich, 2014) and case-specific community impacts (Beebeejaun, 2017), this research looking to contribute to the latter. Critique in this group concerned again with scale but also uneven spatial development whereby scholars claim shale's benefits will only be seen at a national level while costs are experienced locally and globally (Short and Szolucha, 2017). These two groups of academic thought are not distinctly separate however with Hilson's (2015) work on which social groups are heard in the environmental framing of UK fracking an example of their potential cross-over. The emergence of pieces taking a similar approach (Patterson and McClean, 2017; Cooper et al., 2018) exemplifying the growing understanding that society is important. Cooper et al. (2016) stating that public opinion is likely to be the main determinant

of shale's UK success. It is therefore crucial for literature to no longer challenge policy on purely the frames it mentions and instead become attentive to those it does not. Moving academic critique to take a more holistic approach to shale's future exploring its scalar, temporal and place dimensions.

2.3 Place and community

Community is important for giving people a sense of belonging and identity, usually to a particular place (Smith, 1999; Antonsich, 2010). Devine-Wright (2009) details how, in the context of energy infrastructure, this sense of place-attachment and identity can lead people to take place-protective action when they feel such things are threatened. Understanding place as important, and not homogenous, allows us to position local scale shale gas research in the wider spatial turn of energy research (Bridge, 2018). This turn emphasising the need to not view place as an unproblematic realm where hegemonic technical, economic and political action unfolds (ibid.). Literature appreciating the significance of place in the shale gas debate first arose in the US. Examples include Barth's (2013) critique on economic benefits being viewed as consistent across states and Alawattegama et al's (2015) finding that severe water contamination experienced in Pennsylvanian communities was absent from mainstream discourse. These findings and more evidenced in Jaquet's (2014) comprehensive review on the community impacts of US shale development. Such literature pointing out shale's ability to create a form of core-periphery model at the national scale whereby those peripheral regions involved in production do not always reap the associated benefits that end up with the core (Potter, 2001). In the UK, this model is akin to the concept of a North-South divide, affixed to uneven spatial development and inequality associated with industrial Northern regions (Massey, 2001). Lord Howell's comments on a 'desolate north' (where Ellesmere Port finds itself) being suitable for shale (Cairney et al., 2016) demonstrating its potential to reproduce such an issue.

The seminal pieces with an appreciation of place within the UK context have focused on Northern regions (Williams et al., 2015; Short and Szolucha, 2017). Williams et al. (2015) taking a multi-site approach whereas Short and Szolucha (2017) brought critical attention to the community of Preston New Road. Despite shales infancy in the UK, these studies already evidence similar negative impacts to the US community experience noted by Jaquet (2014) especially around issues of psychological stress, lack of transparent decision-making and disruptions to place identity. However, disagreements also appear such as the provision of local economic benefits, pushed heavily by the UK government (Evensen, 2017), being discussed favourably in the US context (Brasier et al., 2011) but viewed as controversial in the UK (Cotton et al., 2014). Whilst these benefits may be viewed negatively in academic circles, it is necessary for further empirical research with those directly affected to validate such claims. UK studies also appear to be finding new points of contention in the shale debate notably absent in work from the US, particularly that of local democracy. The issue of democracy is discussed by Short and Szolucha (2017) as being a major contributing factor to their community's experience of collective trauma. As such they call for further research into communities facing similar prospects, describing such studies as "more critical now" (ibid. p.274) than ever before. Whilst building upon such work, this study will also attempt to address some of its shortcomings. Firstly, comparisons to specific issues faced by industrial communities noted by Jaquet (2014) have not been possible yet due to Lancashire's rural setting. Secondly, like much of the literature on shale gas, the focus is on the technological process of fracking, despite research showing shale can have detrimental impacts at all stages of development, including exploration and testing (Stamford and Azapagic, 2014). A study on the proposal in industrial Ellesmere Port should contribute to addressing such gaps.

Returning to Devine-Wright (2009), their notion of communities taking place-protective action to detrimental infrastructure is evident in the case of shale gas. Bradshaw and Waite (2017) provide an explanation, finding that in the UK, companies are currently able to legally proceed with development without possessing a 'Social License to Operate'. An SLO being where a company achieves ongoing acceptance and legitimacy amongst the local community despite its

impactful operations (ibid.). Literature has documented how this has led to a rise of activism in the UK and the building of multi-scalar and multi-sited communities around the notion of 'Frack Free' (Jones et al., 2013). However, academic attention has been less attentive to addressing how these opposition movements come about in specific local scenarios, such as Ellesmere Port. Whitton et al. (2017) believe greater scrutiny is needed to understand how local opposition can impact the material outcomes of our energy systems. As such, a fundamental aim of this research is to understand *how* communities respond in the face of injustice.

2.4 Energy and Justice

The justice implications of our energy systems and their transformations have emerged as a critical domain of geographic scholarly input (Bickerstaff, 2017). Noting the importance of place and community, a concept that allows for the unveiling of injustices suffered at this scale is energy justice. The concept born out of environmental justice with an underlying philosophy of promoting a more democratic and equitable society but taking a specific focus on energy (McCauley et al., 2013). According to Sovacool (2014, p.15) it is fundamentally about acknowledging that "how we distribute the benefits and burdens of energy systems is preeminently a concern for any society that aspires to be fair". This definition would account for distributional justice, one of the three main tenets commonly discussed in literature with the others procedural justice and recognition (Jenkins et al., 2016). Procedural justice is primarily concerned with the processes through which energy decisions such as siting infrastructure are made (ibid.). In this context a procedural justice lens would look at whether stakeholders had an equal say in Ellesmere Port being selected for the proposal. Recognition is closely linked to procedural justice, but also calls for participation that is free from disrespect or threat (Heffron et al., 2015). The misrecognition of local communities is often discussed in the literature around ideas such as NIMBYism (Not In My Back Yard) or the framing of local people as knowledge deficient (Jenkins et al., 2016). Rather than being the case, these are critiqued as attempts to delegitimise local opinion (Batel and Devine-Wright, 2017). This study will look to further understand whether the community has struggled to have a voice in procedure due to similar perceptions.

Energy justice has been used as a lens thus far mostly in work around community energy projects (Gross, 2007; Catney et al., 2014; Simcock, 2016). Simcock (2016) for example applied a procedural justice framework to the siting of wind turbines in Yorkshire, finding deep social conflicts had resurfaced through the decision-making process. This evidence that siting energy infrastructure can foster issues beyond the confines of energy, such as the marginalisation of certain people, is something that this study will look to untangle further. Literature paying attention to the justice components of shale gas has gained significant traction in recent times (Fry et al., 2015; Clough and Bell, 2016; McKenzie et al., 2016). Fry et al. (2015) finding grave injustices suffered in Dallas, Texas and concluding that to rectify such issues the power in decision-making should be based proportionally towards those who are most impacted by development. Such case-specific studies do not yet exist in the UK context however, with Cotton (2017) instead taking a focus on justice at the national scale. One explanation for this is that the US justice studies all took place after the fact, in that development had already taken place, with shales infancy in the UK identical studies are therefore not yet viable. However, Szolucha (2016) argued that much of the injustices of shale will emerge even before material development takes place in communities where it is planned. As such, this research will look to exemplify how the justice dimensions of shale are already evident in UK communities and worthy of academic attention. Through this, calling on scholars to not wait until development has established itself as by then it may be too late for research to influence and enact meaningful policy change.

As previously stated, this research does not simply seek to note the injustices communities suffer. Instead it will aim to build on Bouzarovski and Simcock's (2017, p.640) discussion of energy justice as a tool to build awareness around the "underlying structural dynamics that (re)produce spatial inequalities". Finley-Brook and Holloman (2016) demonstrating this by detailing how community opposition was not only about the pursuit of energy justice but also wider socio-ecological change. For this research to take a similar lens, it will use the concept of political ecology, of which justice is central, to aid critical energy discourse (Zimmerer, 2017).

Mainstream discourse currently neglects to mention the multitude of trade-offs that will be embedded in our low carbon future (ibid.). This approach should therefore not only provide a deeper understanding of the places that will suffer injustices through the siting of shale infrastructure, but also the extent to which these communities have the agency to reject them.

2.5 Research Questions

1. How do the people of Ellesmere Port experience energy (in)justice?
2. To what extent has Shale Gas Development become an issue of local democracy for the Ellesmere Port community?
3. How has the local community responded to the impending development and what does this tell us about the importance of community consideration?

3. Methodology

3.1 Research Approach

The time has come to "embed energy firmly within the conceptual and methodological traditions of geography" (Solomon and Calvert, 2017, p.7). This research aims to reveal the injustices experienced by communities targeted for shale development and understand their subsequent response. Therefore, it focuses on the proposed siting of a shale gas testing facility in close proximity to the community of Ellesmere Port. A case study approach was chosen due to the potential for place-specific study to broaden the understanding of a phenomenon as a whole (Baxter, 2016), in this case the local impacts of shale development in the UK. To access those proximal to the proposal, participants were selected from the wards of Rossmore and Ellesmere Port Town.

3.2 Qualitative Research

A qualitative only approach to research was chosen, a methodological approach that has gained widespread legitimacy in recent times throughout human geography academia (Winchester and Rofe, 2016). A valid approach in this context due to it enabling engagement with communities, furthering the understanding of their lives and environments (ibid.). Quantitative studies on public perceptions of shale in the UK have been conducted but these tend to take a broader scalar focus (see Whitmarsh et al., 2015) and don't allow for detailed insight into community experiences, which was the aim here. This project selected two qualitative methods; interviews and observations. Interviews were conducted with relevant stakeholders in Ellesmere Port whilst observations were undertaken through attending the 12-day public inquiry that took place to determine whether the proposed development would proceed. Both methods aiming to answer this project's research questions and further understanding on the topic as a whole.

3.3 Interviews

The main component of data collection in this research would be interviews. Interviews are a time consuming but rewarding method for research (Dunn, 2016). As a result, it was decided that 10 interviews with the 'right people' (ibid.) would be sufficient to achieve the stated aims.

Local residents, some of whom were members of 'Frack Free', and a local councillor for verification of resident's statements on local politics, were selected. The researcher's proximity to Ellesmere Port allowed for the selection of participants through community contacts, akin to snowball sampling (Stratford and Bradshaw, 2016, p.124). Interviews were seen as an effective method as they can give voice to those often less heard in marginalised communities (Winchester and Rofe, 2016). A semi-structured approach to interviews was taken for conversations to be relevant whilst remaining open for participants to express what matters to them (Longhurst, 2003). From a research perspective, it was important to be critically reflexive throughout (see Dowling, 2016, p.34), allowing residents to express their concerns rather than simply imposing questions on them from existing literature was one way to achieve this. Also, through initial discussions, it was made clear that the area had received much attention in the form of quantitative surveys on other developments, further supporting a qualitative approach being taken. An interview structure (see Appendix 1) was used in interviews to retain relevance whilst building rapport with residents, more natural discussion encouraging the provision of the rich data sought (Dunn, 2016 p.152). Crucial throughout was the acquiring of informed consent, attained by providing each participant with an information form detailing the purpose of the project whilst also leaving dialogue open for any queries to be raised, even after research was concluded.

3.4 Observations

Conducting observations at the public inquiry was beneficial to both complement and contextualise research (Kearns, 2016). It was be complementary through listening to and observing additional opinions from a variety of stakeholders with vested interests in the proposal. These ranged from local residents, social scientists and environmental academics, to members of regulatory institutions and fossil fuel companies. This would greatly contextualise my research, painting the bigger picture of which this case was a part, illuminating the competing views over shale gas and how each perspective is accounted for in the current legal framework. Acknowledging the struggle between differing scales and priorities would provide context for participants' concerns. A further benefit was the creation of a more unbiased

understanding of the issue, important to any research (Winchester and Rofe, 2016) and particularly necessary due to the lack of participants who were supportive of the proposal in my sample. It was critical throughout to not take opinions at face value but to also appreciate and acknowledge the underlying social and political power structures at play (Kearns, 2016). This critical understanding including observing first hand residents' concerns over their voices being heard or community impacts being acknowledged in wider discourse.

3.5 Limitations

A limitation to this methodology is the chosen sample size in a population of approximately 14,000 (CWaC, 2017a;2017b). A larger sample would have added greater validity and reliability to the arguments made henceforth. A further limitation is that unintentionally all residents selected were opposed to the development. This element of bias was attemptedly overcome on numerous occasions through trying to find local residents supportive of the proposal however this was unsuccessful. On the point of bias, it was dealt with in interviews with members of 'Frack Free' by ensuring that questioning remained focused on the Ellesmere Port proposal rather than allowing conversation to go too far into the issue of shale as a whole unless relevant.

3.6 Positionality

During the process it was important to be attentive to positionality (Winchester and Rofe, 2016). In this case the researcher was both an insider and an outsider to the community (Dowling, 2016). An insider through having grown up not far from the area but an outsider in the position of a transient student researcher, who would not necessarily experience the same impacts as participants. To avoid unintentionally creating any power imbalances in the interview process (ibid.), all were held in neutral public places to make the participant feel at ease as well as being ethical and minimising risk for both parties. With stress and anxiety two major impacts found in research thus far (Short and Szolucha, 2017) this was particularly important.

The following chapter will be the outcome of applying this methodological approach alongside the academic context and concepts of Chapter 2 to the case of Ellesmere Port.

4. Results & Analysis

4.1 How do the people of Ellesmere Port experience energy (in)justice?

4.1.1 Distributive Justice

The distribution of risks and compensatory benefits associated with shale gas development are a key concern in the literature (Clough, 2018). As a result, participants were asked to reflect on their personal opinions on their community being selected as the site location and the benefits they had subsequently been offered. With regards to the site selection there was clear discontent:

> "I don't see how it's fair, we've already got plenty of heavy industry around us, you might have noticed the second largest oil refinery in the UK next door"
>
> Participant B

> "Ellesmere Port has always been considered as a convenient dumping ground for the rest of Cheshire and it is time for this to stop"
>
> Local Councillor at inquiry

This echoes a wider concern that shale developments are being disproportionately targeted at those regions seen as the nation's 'traditional heartlands' of industry (Cotton et al., 2014). Shale gas development is not only based upon the country's geology but also where there is existing fossil fuel industry (Cotton, 2017). The pragmatic justification for this is that these peripheral

regions already host the necessary infrastructure, however this neglects to consider how it concentrates risk on vulnerable communities (Blowers, 2010). If the shale gas industry continues to follow the arbitrary value system of the past, seeing the North as more suitable and less valuable than the South, (Cotton et al., 2014) then it risks reproducing spatial inequalities in the UK. As Keeler (2016) discusses, this is a well-documented point of controversy, evidencing Lord Howell's description of the 'desolate north' in his argument to keep development out of Sussex. One Participant commented on that statement:

> "It's like he genuinely believed there's nothing up here, a perfect example of them down there just talking rubbish about us"
>
> Participant D

Shale gas' potential to replicate the North-South divide clearly resonates with concerns that the local community will face an unjust distribution of developments. Furthering this consideration of distributive justice includes looking at how many of these northern communities are also economically marginalised (Cotton et al., 2014), including Ellesmere Port (CWaC, 2017a;2017b). Development is directed at these communities because it is perceived that they are more likely to positively receive the economic benefits offered by companies and state government (Cotton, 2017). When asked about the various community investments made in Ellesmere Port participants were clear in their response:

> "You've got people here looking down the back of the couch for a tenner to try and put food on the table for their kids"
>
> Participant C

> "The local schools, business' and stuff here haven't got anything left of a budget, so when someone comes in offering you free money they're not going to turn it down"
>
> Participant E

Cotton (2017) argues that rather than being a benefit, these investments should actually be seen as economic coercion, enabling companies to gain a foothold in these communities by taking advantage of their situation. This appears to be the case in Ellesmere Port with investments occurring before the planning process began, when knowledge on the proposal was likely less and they are clearly not large enough to transform the structural deprivation the community is suffering from (see IGas, 2018, p.6). Furthermore, participants in my research displayed an axiomatic approach to values (O'Neill et al., 2008) whereby their health, local environment and social relations could not be bought off with these economic incentives:

> "How much is your health worth? How much is the health of your children worth? Even if they build the school a nice little playground they'll still be out there breathing in all this stuff produced"
>
> Participant C

To be more just, it is argued in discourse (and from the participants I spoke to) that the conversation should be on how the benefits of the project itself will be distributed (Griffiths, 2019). This however is absent from almost all discussion on shale development (ibid.) which would seem to support the feelings of one participant when it comes to the allocation of such benefits:

> "The only people who will benefit from shale are the companies and their shareholders, nobody local. We'll just get all the crap, excuse my French"
>
> Participant C

4.1.2 Procedural Justice

Due process is one of the key principles of energy justice (Sovacool and Dworkhin, 2015) and should incorporate the creation of an equitable procedure that engages all stakeholders (Jenkins et al, 2016). With the argument being a fairer procedure should deliver a more just distribution of benefits and burdens (ibid.). Participants were asked to reflect on their experience as local stakeholders in the planning process:

> "I and many others in the community have tried to engage with them [the company] on a number of occasions, we get insulted, spoken down to and they blatantly lie to us or refuse to answer our questions"
>
> Participant B

> "Public consultation and involving us is just a box ticking exercise to them, often nobody goes [to public meetings] because they organise them at really inconvenient times when people are at work or school"
>
> Participant A

This is reflective of a wider concern emerging in the UK context which is increasingly finding that the involvement of community interests in decision making is limited (Witt et al., 2018). Similarly to the current developments in Lancashire, these companies arguably have historically been operating without a 'Social License to Operate' which can cause heavy opposition to any future ventures (Cotton et al., 2014), as is clearly the case in Ellesmere Port. One issue is the approach to engagement, from the participants responses it is clear that the company in question takes a very passive approach to including local people (Grossmann and Creamer, 2017). Exemplified by the companies claim in the public inquiry:

> "We have conducted public consultation in a way that meets what is legally required of us"
>
> Company lawyer

This has been shown in other energy infrastructure developments such as that of wind turbines to create further tension and strain on the relationship between company and community (Cotton, 2013; Simcock, 2016). In my findings, a lack of proactive engagement can subsequently elevate the public's sense of risk as people feel their capacity to participate and be kept informed are inadequate:

> "We don't get told what's going on, there's a school and loads of houses very close and they haven't a clue what to do if something were to go wrong"
>
> Participant D

> "We're just asking to be made to feel safe"
>
> Participant C

The perceived inadequacy of risk governance in shale gas development is an important issue across a multitude of geographical contexts (Small et al., 2014) and understandably remains so here. A community's exclusion from procedure and discussion on such issues can create an atmosphere of fear, intimidation and mistrust (Szolucha, 2016). These development sites are effectively securitised from locals, who come to feel like they are not being treated as a legitimate stakeholder (ibid.). Participants echoed this:

> "It's all very intimidating, they rock up in blacked out 4x4's with their security guards and immediately start taking pictures of us. It's like hang on, this is still our community"
>
> Participant A

These tactics are not unique and have been studied in other localities with companies seemingly acting in a way to prevent local dissipation of relevant information (ibid.), an integral part of procedural justice (Jenkins et al., 2016). This fuels perceptions within communities that things are being hidden from them (Cotton et al., 2014) and again highlights the relevance of procedural justice in determining public acceptance of energy developments such as shale (Whitmarsh et al., 2015).

4.1.3 Recognition

Achieving the justice tenant of recognition means moving beyond simply participation and requires that process is free from disrespect, discrimination or the devaluing of certain people or places (Walker, 2009). My findings so far have already highlighted certain recognition issues such as the disproportionate targeting of marginalised northern industrial communities and the (mis)treatment of local members of society. This section will look to further unpack how the community's situation is impacted upon through their framing by shale developers. A stark extract from one participant allows us to begin to do so:

> "I once tried attending a local meeting and got told 'this is for local people, you shouldn't be here'. They saw how I was dressed and thought I must have been some sort of trouble making hippy."
>
> Participant F

This supplements the view that there is an effort to frame opponents of shale development as militant activists who are out of place interfering in these local affairs (Cotton et al., 2014). Not only does this have xenophobic connotations by suggesting the views of outsiders are worth less, it also acts as a barrier for local people who want an equitable seat at the table in discussions on developments in their locality (ibid.). The treatment of anti-shale activists in the UK is well reported in the media (Perraudin, 2018; Rahim, 2018) and so to frame local people in that collective is arguably an attempt to devalue and misrecognise their contentions (McCauley et al., 2013). Collective labelling to discredit community contestations is a commonly critiqued feature in energy infrastructure discourse and often focuses around the concept of NIMBYism (Boudet et al., 2014; Heffron and McCauley, 2014). Academia however is increasingly realising the lack of substance to this argument, with communities recognising that rejecting developments in their area would simply shift them to another powerless community (Horowitz, 2012). Participants in my research reiterate this misrecognition:

> "We're not NIMBY's, for us it's nowhere, because we understand the negative impacts this industry will have on any community, not just ours"
>
> Participant E

This echoes another misconception that often leads to misrecognition which is that of being regarded as ill-informed on what developments entail (Williams et al., 2015). Rather than this being the case, community members argue that they're knowledgeable on the subject beyond the basic argument that they'd rather it not exist in their locality. Through this research it was clear that members of site communities go to great lengths to gain an understanding of the potential industry. For example, it was evident that local residents were sharing the latest academic literature amongst each other to improve their collective understanding, as documented elsewhere (Short and Szolucha, 2017). This reality of the mobilisation of local knowledge occurring in response to suffering misrecognition will be discussed further in Section 4.3.1. Such findings however emphasise the role that a lack of 'just' recognition can have in

exacerbating local unrest and as has been shown in other contexts, can heavily contribute to the previously mentioned distributive and procedural injustices (ibid.).

4.2 To what extent has Shale Gas Development become an issue of local democracy for the Ellesmere Port community?

4.2.1 Governance

The literature on shale gas has thus far focused on issues of an environmental and economic ilk (Griffiths, 2019). However, more recent studies recognise that communities are increasingly contesting developments on the grounds of their local democracy and thus the debate on UK shale has become politicised (Szolucha, 2016; Short and Szolucha, 2017). One participant stating:

> "Of course we're still worried about the environment and our health, but now it's much more about us trying to preserve our own democracy."
>
> Participant H

UK research has found 'bad governance' to be an increasingly cited point of conflict, used to critique the processes surrounding shale development rather than the development itself (Bomberg, 2017). Examples of 'bad governance' ranging from a perceived lack of accountability and democracy to an unease with close business-government relationships (ibid.). One issue within the UK context stems from its legal framework of mineral ownership rights which places all extraction rights under the ownership of the crown (Whitton et al., 2017). With a pro-shale government this effectively enables licensed companies to undertake operations even when faced with political opposition from local communities and authorities (ibid). This has been shown to create a sense of powerlessness amongst local people who feel subordinate, lacking

the agency to contest the decisions made (Short and Szolucha, 2017). Participants in Ellesmere Port were notably frustrated by the treatment of their democratic process:

> "When they overruled Lancashire County Council up at Preston New Road I could not believe it. I think it's an absolute disgrace, hopefully we won't let them do the same here."
>
> Participant D

> "We don't want it, our councils don't want it. But that simply doesn't matter to them"
>
> Participant A

The fact similar concerns are being raised across different localities builds an image that this is becoming a national problem for the UK. Not only in this work but that of others (Cotton, 2015; Whitton et al., 2017) shale has seemingly not only become politicised but de-politicised or post-political, whereby developments are able to go ahead regardless of opposition showing a dissolution of democratic process (Swyngedouw, 2011). It echoes the sentiment that shale gas is extending itself into the realm of contested civil rights (Short et al., 2015) and subsequently generating questions around community social power (De Rijke, 2013). As Short and Szolucha (2017) note, it ferments unease with the role corporations have in influencing local affairs and overriding local politics. The responses of participants in Ellesmere Port are reflective of the growing notion in discourse that the emerging shale industry is creating new forms of disempowerment by exemplifying their lack of democratic power (Willow and Wylie, 2014). This disempowerment has been shown to create a sense of vulnerability within such communities (Willow, 2014) which adds to their experience of 'collective trauma' (Short and Szolucha, 2017).

4.2.2 Beyond Procedural Justice - Defining One's Future

As mentioned in section 4.1.2, when there is a perceived lack of procedural justice, including the issue of local democracy, the entire process of public involvement can come to be viewed as a simple formality (Smith and McDonough, 2001). This is where the citizen comes to feel as if the crucial decisions on developments have already been made, with their contributions unable to challenge proposals fundamentally (ibid.). In the literature on shale and energy infrastructure more broadly, the corporate strategy of Decide - Announce - Defend is a well-documented example of how this occurs in practice (Bickerstaff, 2017). Through this, companies make decisions in closed expert circles, engaging in public engagement that just about meets legal criteria before defending themselves against the local opposition that unsurprisingly arises (Whitton and Charnley-Parry, 2018). In the case of Ellesmere Port this was evident with the strong community opposition observed at the public inquiry along with particular residents' responses, clearly fed up of procedure and wanting a tangible say in the future of their community:

> "Us just walking through the door [at public consultations] is all they care about. They've already decided what they want to do"
>
> Participant D

> "We are here because thousands of people in our community said no. Our Councillor said no. The science says no. Planet Earth say no. Why won't iGas take no for an answer?"
>
> Local Resident at inquiry

For an explanation on why community opposition remains despite corporations attempting to engage, one can turn to Bottoms and Tankebe's (2012) discussion on procedural justice. Whilst from a different realm of social science, their claim that 'just' procedure is rendered almost meaningless without authorities (in this case corporations) holding a sense of legitimacy in the

public eye (ibid.), resonates strongly. Whilst energy justice may encourage all participants to be involved and free from misrecognition, it arguably doesn't account for situations where the relevant institution or developer is deemed illegitimate or incompatible with a local community. Early work taking this perspective into the realm of shale gas found residents in the Yukon Territory, Canada, were strongly opposed to the emergence of fracking due to the community viewing the decision-making process as illegitimate (Neville and Weinthal, 2016). The authors argued their case, which exemplified a disregard for communities' alternative visions, would set the tone for shale-community conflict beyond the geographic boundaries of the Yukon. The findings of this research appear to add weight to their argument as arguably no amount of fair procedure would change the community's mind. Instead what they are in search of is a true democratic ability to have not only a voice but the political power to decide what kinds of development occur.

> "[This proposal] will rock Ellesmere Port to its core, it will rob communities of the opportunities available to them. Ellesmere Port deserves a clean and happy future".
>
> Local Resident at inquiry

> The people of Ellesmere Port want regeneration that builds an image of a "prosperous area" and requires "a shift in the kind of industries that are invited to operate".
>
> Social Scientist at inquiry

Throughout the public inquiry it was clear that the company and shale gas as a resource held no amount of public legitimacy in Ellesmere Port. Whilst the company had been able to achieve legitimacy on the national scale through enabling the pursuit of pro-shale policy, there was an apparent unwillingness to understand that this legitimacy does not transcend scales

unproblematically. There was a clear failure to appreciate the differing local scale priorities such as the want to regenerate the area towards a future away from the fossil fuels it has so intrinsically been linked to historically:

> "If you have an unconventional gas development in a town that cares about changing its reputation that is going to be problematic".
>
> Social Scientist at inquiry

A sentiment that did not resonate with the relevant authorities or opposition:

> "People may be upset but this is the way of the law"
>
> Planning Inspector at inquiry

> "We can do nothing right in this community as a fossil fuel company, but these kind of developments are deemed of national priority"
>
> Company lawyer at inquiry

Bradshaw and Waite (2017) note how this clear contestation brings up an important issue for emerging shale gas discourse in their discussion on Social Licenses to Operate. Whilst communities may object to proposals and thus deny companies an SLO, there comes a question of how much weight these objections can feasibly be given in terms of their capacity to overrule law (ibid.). When knowing how to interpret local democracy, arguably the legal framework does not yet exist to incorporate such concerns. Therefore, it is likely this will continue to be a contested arena of debate. Whereas the national government once pushed the 'Localism' agenda to give communities more power, in the case of shale this appears to be being retracted (Cotton, 2017). As such, the question of local democracy versus national priority and the

intractable issue of scale is likely to be an obstacle shale gas isn't likely to overcome anytime soon. These findings further supporting the position that contemporary shale gas development has the potential to "reshape the democratic model of governance itself" (Szolucha, 2016, p.77) in its attempts to be successful.

Whilst this issue of democracy is often discussed cynically, it can however have an impact that is quite transformative to communities. As Bomberg (2017) notes in their Balcombe example, the overruling of local will brought a reaction where new social connections flourished. These included the coming together of local environmentalists, residents and diverse community groups in a fight against shale expansion in their locale. The way in which this community resistance emerges from the disempowerment of communities faced with the reproduction of spatially uneven development through shale, including a perceived threat to their democracy, requires further exploration (Hammond and O'Grady, 2017).

4.3 How has the local community responded to the impending development and what does this tell us about the importance of community consideration?

4.3.1 Knowledge mobilisation

As discussed in section 4.1.3, communities often suffer the injustice of misrecognition by being constructed as not possessing adequate knowledge on the matters at hand. This research strongly suggests otherwise. From an auto-ethnographic perspective perhaps one of the most powerful findings observing the process was how informed and engaged locals were on the relevant issues. From citing academic papers they had read to displaying the scientific research they had independently conducted for the purpose of the public inquiry it can only be described as wholly impressive. This section will turn to Whatmore (2009) to further understand this through their examination of 'matters of concern'. These occur where communities look to disrupt the normative production and distribution of expertise from policy makers and academics intrinsically linked to institutional and governmental agendas (ibid). As

Lidskog (2008) writes, there have been increasing calls throughout the last decade for science to become more democratic to improve public acceptance of what is produced. In Ellesmere Port there was clear evidence that firstly the community did not trust the information they had received and secondly, they felt that there were serious gaps in its focus:

> "Their arguments are the same as they've always been. They definitely don't give any weight to the social impacts, it's like they haven't even considered them"
>
> Participant E

This reflects the view that the public understand science produced by governmental bodies is not neutral (Neville and Weinthal, 2016). The apparent 'knowledge controversy' (Whatmore, 2009) here can lead to the creation of a local 'knowledge polity' where citizens collectively produce their own expertise and the power to intervene in normative process (ibid). The result of this, as seen in Ellesmere Port, is the building of local competency as locals share vernacular knowledge both amongst themselves and with sympathetic social scientists and other relevant stakeholders to forge their case against development. As Whatmore (2009) writes this is a way of moving beyond the presentation of knowledge that occurs from regulatory bodies in its final form with no room for dispute, and instead formulates a generative learning process of which the community is very much a part.

4.3.2 Politics of Scale

The community's ability to mobilise knowledge and move beyond the process of disempowerment discussed in Section 4.2 leads us to consider the politics of scale (Cotton et al., 2014). Despite having little democratic power to prevent development going ahead, the local community have transformed themselves from the local scale to be involved in a legal hearing presenting their side of the story in a discussion deemed of national significance. This

has been achieved in other regions by local community groups 'jumping scale' (Smith, 1984 cited in Cotton et al., 2014) by aligning themselves with collectives from other localities as well as NGOs operating in the national arena (Cotton et al., 2014). My research finds consistency with this approach to becoming more empowered:

> "We're one community across a network of many others and we've all got each others back in the fight against this industry"
>
> Participant C

In the face of injustice, communities are increasingly mobilising to act beyond their immediate political and geographical scale to combat social struggle (Kurtz, 2002). As Nyberg et al. (2018) examine, there is the construction of a 'political frontier' in these marginalised communities for opponents of shale to communicate this concern. In Ellesmere Port, this has been achieved through jumping scale and collectively organising with 'Friends of the Earth' and the wider 'Frack Free' community, both observed at the inquiry, to help upscale local concerns. Through this, participants highlighting how they perceive local scale damage to society and environment as incompatible with the national and global need to fight climate change (Szolucha, 2016). What is striking in the case of Ellesmere Port is the influence this has had on the community shaping local politics:

> "At first our tory councillors were all for shale because they were just reiterating the national standpoint ... but now they like the rest of them [other local politicians] are completely on our side"
>
> Participant A

> "They've said their change in opinion is a testament to how we've brought all the expertise to them and helped them gain a deeper understanding"
>
> Participant C

> A local councillor was asked to verify these claims:
>
> "Locals now need to be given the decisive say and the industry needs to be good neighbours"
>
> Local Councillor

The politics of scale plays an intriguing role in this industry, uniquely creating new allegiances between stakeholders across scales who would traditionally make for 'strange bedfellows' (Cotton et al., 2014, p.436). More importantly it shows that these communities do have agency despite their suffering of injustice and disempowerment. The outcome of this agency can be transformative for these marginalised communities in their efforts to resist developments, as will be discussed further in the following section.

4.3.3 Community Resistance not Resilience

The literature on the social impacts of siting shale infrastructure has displayed local communities existing in a hopeless situation with some describing them as suffering from 'collective trauma' (Short and Szolucha, 2017). Whilst work in the US context has began to account for the politics of resistance that emerge in shale communities (Haggerty, 2017) the same has not yet occurred in the UK. It is vital that early research, such as this project, does not label communities who protest and persevere as resilient as has happened elsewhere (Weigle, 2011, Clarke et al., 2012). Resilience is problematic as it evokes an embedded need for communities, often marginalised, to struggle against consistently reproduced adversity (Chatterton and Pickerill, 2010). This including the continued uneven spatial development and

social inequality intertwined with shale gas. Resilience is used as a frame to protect citizens against the negative social, economic and environmental consequences that may arise but simultaneously does nothing to change the underlying structural situation (Kaika, 2017). The result of this being communities will only be more prepared for further "suffering, deprivation and environmental degradation" (ibid. p.95). In the case of Ellesmere Port and shale development there have been attempts to ensure community resilience through the aforementioned economic benefit packages and a promised 'gold standard' of regulation:

> "Not only is this whole gold standard thing another lie…but it also misses the point that we don't want any more of these developments here"
>
> Participant G

> "At the end of the day if something goes wrong in the future people would be harmed at the local scale and then they'd just come up with another way of trying to reassure us, we've had enough"
>
> Participant B

Firstly, this supports the findings of other work that the promise of a greater standard of regulations does little to change public opinion (Hays et al., 2015). Secondly, these responses suggest that the community is aware of the problematic nature of the resilience narrative and is therefore enacting resistance. Resistance a more "oppositional consciousness" where individuals look to tool themselves as political actors with the agency to resist the inequalities they have been subjected to (Chatterton and Pickerill, 2010, p.481). This appeared to be an issue of both intra-generational and inter-generational equity (Griffiths, 2019) as participants wanted to shape a better future both for themselves and their children. What is occurring in Ellesmere Port is therefore a form of political activism beyond the previously mentioned militant activist. A heterogenous coming together of people from all walks of life, both within

this community and others, in a broader struggle to enact meaningful social change (Chatterton and Pickerill, 2010). From a political ecology perspective this resistance is born out of not only the environmental and social injustices discussed hitherto, but the way in which the reproduction of industry in these places threatens their community and identity (Horowitz, 2012). Much research thus far has focused on developments in rural landscapes such as Lancashire where the untouched idyllic aesthetic is at stake (Szolucha, 2016;2018). This research indicates however that of equal importance are the developments which will prevent historically peripheral and industrial localities, such as Ellesmere Port, from imagining a new, cleaner and more equitable sense of place, thus provoking their visceral resistance.

5. Implications & Conclusion

This study has aimed to highlight the injustices suffered by traditionally marginalised communities targeted for shale development through the case of Ellesmere Port. One of the first studies to apply the energy justice framework in a UK setting, it has found that the community already suffers multiple forms of injustice, validating the claim that these are able to manifest even before material development commences. (Szolucha, 2016; 2018). Finding such striking injustice at the local scale further supplements growing work noting how shale in the UK has traversed traditional environmental and economic domains, becoming embedded in a broader struggle around local democracy, community agency and social power (Bomberg, 2017). Through this, those in Ellesmere Port contend they should have the power to reject developments perceived as incompatible with their community. Subsequently mobilising a discourse of resistance when the current national policy and legal framework strips them of the capacity to create their own democratic futures (Szolucha, 2018).

A key contribution of this research is that with the development not being fracking, and the misrecognitions of NIMBY and knowledge deficiency once again quelled, it provides a more complete picture on public opinion towards shale development in its entirety. This having

spatial and temporal implications by indicating that local resistance is not likely to be confined to current shale production sites but also those sites targeted for the future. Scaling up, if the national agenda on shale remains as is, where government-business alliances continue to target geographically and culturally peripheral communities in a top-down fashion (Willow, 2014) then one would expect further instances of conflict and resistance to arise. Indicating as Griffiths (2019) expects, that a lack of UK policy attention to the equity dimensions of shale will lead associated developments to maintain or deepen social inequalities. Such findings exemplify how shale gas is indicative of a wider notion that people are becoming increasingly unsettled around being disempowered by the capitalist system of which they are a part (Willow, 2014).

Studies of this kind remain novel however especially in the UK context and so further research is needed to validate the claims made. Hopefully this work will encourage academics to take an empirical interest in all forms of shale development. Another point of interest that was beyond the scope of this research would be to critically engage with the concept of energy security frequently presented in government discourse. For example, the justice implications of this research could go some way to present an argument that shale gas in fact makes these communities less energy secure.

One limitation of this study is that a decision on the proposal was not made within the time frame, meaning it cannot account for whether community resistance had any impact on the outcome of development. When the decision does come to be made, the further implications will be twofold. Firstly, should the proposal be rejected then it would show that national policy must broaden its scalar framing to account for community considerations. This would require the government to move away from strategies such as the idea that economic benefit packages can solve the local problem, as this research has shown even those communities most marginalised do not receive them positively. Instead calling for policy to acknowledge academic critique in making clear how shale fits into contemporary energy policy despite the growing scientific work on its shortcomings (Keay, 2016). Solutions potentially including the pursuit of a

more equitable and democratic process, reversing the retraction of the Localism agenda and establishing a two-way stakeholder dialogue that looks to tackle the persistent problem of incorporating local views into national agendas (Whitton et al., 2017). Failing to do so is likely to further sustain resistance and the potential for it to have a material impact on the outcome of energy policy. However, if the proposal is successful despite community resistance, it would provide evidence that the low carbon transition is not only going to create new spatial inequalities through encroachment on rural landscapes such as Lancashire but also reproduce inequities associated with communities historically marginalised and of an industrial past. This would importantly challenge the idea that a low carbon future, and the UK's Low Carbon Transition Plan in its current design, will be a universally positive thing for all (Bickerstaff, 2017).

Bibliography

Alawattegama, S.K., Kondratyuk, T., Krynock, R., Bricker, M., Rutter, J.K., Bain, D.J. and Stolz, J.F. (2015). 'Well water contamination in a rural community in southwestern Pennsylvania near unconventional shale gas extraction', *Journal of Environmental Science and Health,* 50(5), pp. 516-528.

Andrews, I.J. (2013). 'The Carboniferous Bowland Shale gas study: geology and resource estimation.', *British Geological Survey,* pp. 1-56.

Antonsich, M. (2010). 'Searching for belonging–an analytical framework', *Geography Compass*, 4(6), pp. 644-659.

Argetsinger, B. (2011). 'The Marcellus Shale: Bridge to a Clean Energy Future or Bridge to Nowhere-Environmental, Energy and Climate Policy Considerations for Shale Gas Development in New York State', *Pace Environmental Law Review,* 29, pp. 321-343

Barth, J.M. (2013). 'The economic impact of shale gas development on state and local economies: Benefits, costs, and uncertainties', *New Solutions: A Journal of Environmental and Occupational Health Policy*, 23(1), pp. 85-101.

Batel, S. and Devine-Wright, P. (2017). 'Energy colonialism and the role of the global in local responses to new energy infrastructures in the UK: A critical and exploratory empirical analysis', *Antipode*, 49(1), pp. 3-22.

Baxter, J. (2016). 'Case Studies in Qualitative Research', in Hay, I. (ed.) *Qualitative Research Methods in Human Geography.* Ontario: Oxford University Press, pp. 130-146.

Beebeejaun, Y. (2017). 'Exploring the intersections between local knowledge and environmental regulation: a study of shale gas extraction in Texas and Lancashire', *Environment and Planning C: Politics and Space*, 35(3), pp. 417-433.

Belkin, P., Nichol, J. and Woehrel, S. (2013). 'Europe's energy security: options and challenges to natural gas supply diversification', *Congressional Research Service*, pp. 1-29.

Bickerstaff, K. (2017). 'Geographies of energy justice: concepts, challenges and an emerging agenda', in Solomon, B. D. and Calvert, K. E. (eds.) *Handbook on the Geographies of Energy.* Massachusetts: Elgar, pp. 438-449.

Blowers, A. (2010). 'Why dump on us? Power, pragmatism and the periphery in the siting of new nuclear reactors in the UK', *Journal of Integrative Environmental Sciences,* 7(3), pp. 157-173.

Bomberg, E. (2017). 'Shale we drill? Discourse dynamics in UK fracking debates', *Journal of Environmental Policy & Planning*, 19(1), pp. 72-88.

Bottoms, A. and Tankebe, J. (2012). 'Beyond procedural justice: A dialogic approach to legitimacy in criminal justice', *Journal of Criminal Law and Criminology*, 102, pp. 119-170.

Boudet, H., Clarke, C., Bugden, D., Maibach, E., Roser-Renouf, C. and Leiserowitz, A. (2014). '"Fracking" controversy and communication: Using national survey data to understand public perceptions of hydraulic fracturing', *Energy Policy*, 65, pp. 57-67.

Bouzarovski, S. and Simcock, N. (2017). 'Spatializing energy justice', *Energy Policy*, 107, pp. 640-648.

Boyer, C., Clark, B., Jochen, V., Lewis, R. and Miller, C.K. (2011). 'Shale gas: A global resource', *Oilfield review*, 23(3), pp. 28-39.

Bradshaw, M. and Waite, C. (2017). 'Learning from Lancashire: Exploring the contours of the shale gas conflict in England', *Global Environmental Change*, 47, pp. 28-36.

Brasier, K.J., Filteau, M.R., McLaughlin, D.K., Jacquet, J., Stedman, R.C., Kelsey, T.W. and Goetz, S.J. (2011). 'Residents perceptions of community and environmental impacts from development of natural gas in the Marcellus Shale: A comparison of Pennsylvania and New York case', *Journal of Rural Social Sciences,* 26(1), pp. 32-61.

Bridge, G., Bouzarovski, S., Bradshaw, M. and Eyre, N. (2013). 'Geographies of energy transition: Space, place and the low-carbon economy', *Energy policy,* 53, pp. 331-340.

Bridge, G. (2018). 'The map is not the territory: a sympathetic critique of energy research's spatial turn', *Energy research and Social Science,* 36, pp. 11-20.

Cabalu, H. (2010). 'Indicators of security of natural gas supply in Asia', *Energy Policy*, *38*(1), pp. 218-225.

Cairney, P., Fischer, M. and Ingold, K. (2016). 'Hydraulic fracturing policy in the United Kingdom: Coalition, cooperation, and opposition in the face of uncertainty', *Policy Debates on Hydraulic Fracturing*, pp. 81-113

Catney, P., MacGregor, S., Dobson, A., Hall, S.M., Royston, S., Robinson, Z., Ormerod, M. and Ross, S. (2014). 'Big society, little justice? Community renewable energy and the politics of localism', *Local Environment*, 19(7), pp. 715-730.

Chatterton, P. and Pickerill, J. (2010). 'Everyday activism and transitions towards post-capitalist worlds', *Transactions of the institute of British Geographers*, 35(4), pp.475-490.

Cheshire West and Chester Council (CWaC) (2015). *Locality dashboard Ellesmere Port Profile.* Available At: file:///C:/Users/User/Downloads/localitydashboardellesmereportprofile%20v2.1%202015-11-24%20(2).pdf (Accessed 10th March 2019).

Cheshire West and Chester Council (CWaC) (2017a). *Rossmore ward snapshot.* Available At: http://inside.cheshirewestandchester.gov.uk/find_out_more/datasets_and_statistics/statistics/population/ward_snapshots (Accessed 12th January 2019).

Cheshire West and Chester Council (CWaC) (2017b). *Ellesmere Port Town ward snapshot.* Available At: http://inside.cheshirewestandchester.gov.uk/find_out_more/datasets_and_statistics/statistics/population/ward_snapshots (Accessed 12th January 2019).

Chyong, C.K. and Reiner, D.M. (2015). 'Economics and politics of shale gas in Europe', *Economics of Energy & Environmental Policy*, 4(1), pp. 69-84.

Clark, G. (2018) *Written Ministerial Statement on Energy Policy.* Department for Business, Energy and Industrial Strategy. Available At: https://www.parliament.uk/business/publications/written-questions-answers-statements/written-statements/?page=1&max=20&questiontype=AllQuestions&house=commons%2clords&member=1578&keywords=shale (Accessed 22nd January 2019).

Clarke, C.E., Evensen, D.T., Jacquet, J. and Stedman, R.C. (2012). 'Emerging risk communication challenges associated with shale gas development', *European Journal of Risk Regulation*, 3(3), pp. 424-430.

Clough, E. and Bell, D. (2016). 'Just fracking: a distributive environmental justice analysis of unconventional gas development in Pennsylvania, USA', *Environmental Research Letters*, 11(2), pp. 1-9.

Clough, E. (2018). 'Environmental justice and fracking: a review', *Current Opinion in Environmental Science & Health*, 3, pp. 14-18.

Cooper, J., Stamford, L. and Azapagic, A. (2016). 'Shale gas: a review of the economic, environmental, and social sustainability', *Energy Technology*, 4(7), pp. 772-792.

Cooper, J., Stamford, L. and Azapagic, A. (2018). 'Economic viability of UK shale gas and potential impacts on the energy market up to 2030', *Applied Energy*, 215, pp.577-590.

Cotton, M. (2013). 'Shale gas—community relations: NIMBY or not? Integrating social factors into shale gas community engagements', *Natural Gas & Electricity*, 29(9), pp. 8-12.

Cotton, M. (2015). 'Stakeholder perspectives on shale gas fracking: a Q-method study of environmental discourses', *Environment and Planning A*, 47(9), pp. 1944-1962.

Cotton, M. (2017). 'Fair fracking? Ethics and environmental justice in United Kingdom shale gas policy and planning', *Local Environment*, 22(2), pp. 185-202.

Cotton, M., Rattle, I. and Van Alstine, J. (2014). 'Shale gas policy in the United Kingdom: An argumentative discourse analysis', *Energy Policy*, 73, pp. 427-438.

Cradden, L.C., Harrison, G.P. and Chick, J.P. (2012). 'Will climate change impact on wind power development in the UK?', *Climatic change*, 115(3-4), pp. 837-852

De Rijke, K. (2013). 'Hydraulically fractured: Unconventional gas and anthropology', *Anthropology Today*, 29(2), pp.13-17.

De Silva, P.N.K., Simons, S.J.R. and Stevens, P. (2016). 'Economic impact analysis of natural gas development and the policy implications', *Energy Policy*, 88, pp. 639-651.

Devine-Wright, P. (2009). 'Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action', *Journal of community & applied social psychology*, 19(6), pp. 426-441.

Digimap (2019). 'Aerial view of Ellesmere Port Town and Rossmore Ward's and surrounding industrial developments including shale proposal'. Authors Own.

Dowling, R. (2016) 'Power, Subjectivity, and Ethics in Qualitative Research', in Hay, I. (ed.) *Qualitative Research Methods in Human Geography.* Ontario: Oxford University Press, pp.29-44.

Doyle, J. (2011). 'Acclimatizing nuclear? Climate change, nuclear power and the reframing of risk in the UK news media', *International Communication Gazette*, 73(1-2), pp. 107-125.

Dunn, K. (2016) 'Interviewing', in Hay, I. (ed.) *Qualitative Research Methods in Human Geography.* Ontario: Oxford University Press, pp. 149-188.

Dunn, D.H. and McClelland, M.J. (2013). 'Shale gas and the revival of American power: debunking decline?', *International Affairs*, 89(6), pp. 1411-1428.

European Union (2018). *EU energy in figures Statistical Pocketbook 2018.* Available At: https://online.manchester.ac.uk/bbcswebdav/pid-6362804-dt-content-rid-27170669_1/courses/I3028-GEOG-30201-1181-1SE-030729/EU_Energy_pocketbook_2018.pdf (Accessed 8th February 2019).

Evensen, D. (2017). 'On the complexity of ethical claims related to shale gas policy', *Local Environment*, *22*(10), pp. 1290-1297.

Evensen, D., Jacquet, J.B., Clarke, C.E. and Stedman, R.C. (2014). 'What's the 'fracking'problem? One word can't say it all', *The Extractive Industries and Society*, *1*(2), pp. 130-136.

Finley-Brook, M. and Holloman, E. (2016). 'Empowering energy justice', *International journal of environmental research and public health*, 13(9), pp. 1-19

Foster, E., Contestabile, M., Blazquez, J., Manzano, B., Workman, M. and Shah, N. (2017). 'The unstudied barriers to widespread renewable energy deployment: Fossil fuel price responses', *Energy Policy*, 103, pp. 258-264.

Fry, M., Briggle, A. and Kincaid, J. (2015). 'Fracking and environmental (in) justice in a Texas city', *Ecological Economics*, 117, pp. 97-107.

Gabbatiss, J. (2018) 'Two-thirds of British public oppose 'ban' that has destroyed country's onshore wind industry, poll says', *The Independent* 16 July [online]. Available At: https://www.independent.co.uk/news/uk/politics/onshore-wind-ban-lift-voters-renewable-energy-renewableuk-yougov-a8449381.html *(Accessed: 14th February 2019)*

Goodspeed, R. (2014). 'Smart cities: moving beyond urban cybernetics to tackle wicked problems', *Cambridge Journal of Regions, Economy and Society*, 8(1), pp. 79-92.

Griffiths, J. (2019). 'Fracking in the UK: expanding the application of an environmental justice frame', *Local Environment*, pp. 1-15.

Gross, C. (2007). 'Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance', *Energy policy*, 35(5), pp. 2727-2736.

Grossmann, M. and Creamer, E. (2017). 'Assessing diversity and inclusivity within the Transition movement: an urban case study', *Environmental Politics*, 26(1), pp. 161-182.

Grubb, M., Butler, L. and Twomey, P. (2006). 'Diversity and security in UK electricity generation: The influence of low-carbon objectives', *Energy policy*, 34(18), pp. 4050-4062.

Haggerty, J.H. (2017). 'A horse that has left the barn: expanding geographies of natural gas', in Solomon, B. D. and Calvert, K. E. (eds.) *Handbook on the Geographies of Energy.* Massachusetts: Elgar, pp. 57-61.

Hammond, G.P. and O'Grady, Á. (2017). 'Indicative energy technology assessment of UK shale gas extraction', *Applied energy*, 185, pp. 1907-1918.

Hammond, G.P. and Pearson, P.J. (2013). 'Challenges of the transition to a low carbon, more electric future: From here to 2050', *Energy Policy*, 52, pp. 1-9.

Harris, G., Heptonstall, P., Gross, R. and Handley, D. (2013). 'Cost estimates for nuclear power in the UK', *Energy Policy*, 62, pp. 431-442.

Hayhurst, R. (2019). *UK firsts for public inquiry into IGas test plans at Ellesmere Port opening today.* Available At: https://drillordrop.com/2019/01/15/uk-first-for-public-inquiry-into-igas-test-plans-at-ellesmere-port/ (Accessed: 2nd April 2019).

Hays, J., Finkel, M.L., Depledge, M., Law, A. and Shonkoff, S.B. (2015). 'Considerations for the development of shale gas in the United Kingdom', *Science of The Total Environment*, 512, pp. 36-42.

Heffron, R.J. and McCauley, D. (2014). 'Achieving sustainable supply chains through energy justice', *Applied Energy*, 123, pp. 435-437.

Heffron, R.J., McCauley, D. and Sovacool, B.K. (2015). 'Resolving society's energy trilemma through the energy justice metric', *Energy Policy*, 87, pp. 168-176.

Hilson, C. (2015). 'Framing fracking: which frames are heard in English planning and environmental policy and practice?', *Journal of Environmental Law*, 27(2), pp. 177-202.

Hoggett, R. (2014). 'Technology scale and supply chains in a secure, affordable and low carbon energy transition', *Applied Energy*, 123, pp. 296-306.

Horowitz, L.S. (2012). 'Power, profit, protest: Grassroots resistance to industry in the global North', *Capitalism Nature Socialism*, 23(3), pp. 20-34.

Howarth, R.W., Ingraffea, A. and Engelder, T. (2011). 'Should fracking stop? Extracting gas from shale increases the availability of this resource, but the health and environmental risks may be too high', *Nature*, 477(7364), pp. 271-276

Howarth, R.W. (2014). 'A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas', *Energy Science & Engineering*, 2(2), pp. 47-60.

iGas (2018). *Community Fund: grants awarded by location.* Available At: https://www.igascommunityfund.co.uk/documents/Grantsawardedbylocation_2018.pdf (Accessed 10th March 2019).

Jacquet, J.B. (2014). 'Review of risks to communities from shale energy development', *Environmental science & technology*, 48(15), pp. 8321-8333.

Jaspal, R. and Nerlich, B. (2014). 'Fracking in the UK press: Threat dynamics in an unfolding debate', *Public Understanding of Science*, 23(3), pp. 348-363.

Jenkins, K., McCauley, D., Heffron, R., Stephan, H. and Rehner, R. (2016). 'Energy justice: a conceptual review', *Energy Research & Social Science*, 11, pp. 174-182.

Jones, P., Hillier, D. and Comfort, D. (2013). 'Fracking and public relations: rehearsing the arguments and making the case', *Journal of Public Affairs*, 13(4), pp. 384-390.

Jones, P., Hillier, D. and Comfort, D. (2015). 'The contested future of fracking for shale gas in the UK: risk, reputation and regulation', *World Review of Entrepreneurship, Management and Sustainable Development*, 11(4), pp. 377-390.

Kaika, M. (2017). ''Don't call me resilient again!': the New Urban Agenda as immunology… or… what happens when communities refuse to be vaccinated with 'smart cities' and indicators', *Environment and Urbanization*, 29(1), pp. 89-102.

Kearns, R.A. (2016) 'Place Observation in the Research Toolkit', in Hay, I. (ed.) *Qualitative Research Methods in Human Geography.* Ontario: Oxford University Press, pp.313-333.

Keeler, J.T. (2016). 'The politics of shale gas and anti-fracking movements in France and the UK' *The Global Impact of Unconventional Shale Gas Development,* pp. 43-74

Kern, F. and Rogge, K.S. (2016). 'The pace of governed energy transitions: Agency, international dynamics and the global Paris agreement accelerating decarbonisation processes?', *Energy Research & Social Science*, 22, pp. 13-17.

Kurtz, H.E. (2002). 'The politics of environmental justice as the politics of scale: St. James Parish, Louisiana, and the Shintech siting controversy', *Geographies of power: Placing scale*, pp. 249-273.

Lidskog, R. (2008). 'Scientised citizens and democratised science. Re-assessing the expert-lay divide', *Journal of risk research*, 11(1-2), pp. 69-86.

Lis, A. and Stankiewicz, P. (2017). 'Framing shale gas for policy-making in Poland', *Journal of Environmental Policy & Planning*, 19(1), pp. 53-71.

Longhurst, R. (2003). 'Semi-structured interviews and focus groups', *Key methods in geography,* pp. 117-132.

Malakoff, D. (2014). 'The gas surge', *Science,* 344(6191), pp. 1464-1467.

Massey, D. (2001). 'Geography on the agenda1', *Progress in Human Geography*, 25(1), pp. 5-17.

McCauley, D.A., Heffron, R.J., Stephan, H. and Jenkins, K. (2013). 'Advancing energy justice: the triumvirate of tenets', *International Energy Law Review*, 32(3), pp. 107-110.

McGlade, C., Pye, S., Ekins, P., Bradshaw, M. and Watson, J. (2018). 'The future role of natural gas in the UK: A bridge to nowhere?', *Energy Policy*, 113, pp. 454-465.

McGowan, F. (1991). 'Controlling the greenhouse effect The role of renewables', *Energy Policy*, 19(2), pp. 110-118

McKenzie, L.M., Allshouse, W.B., Burke, T., Blair, B.D. and Adgate, J.L. (2016). 'Population size, growth, and environmental justice near oil and gas wells in Colorado', *Environmental science & technology*, 50(21), pp. 11471-11480.

Moriarty, P. and Honnery, D. (2016). 'Can renewable energy power the future?', *Energy Policy*, 93, pp. 3-7.

Neumann, A. and Von Hirschhausen, C. (2015). 'Natural gas: an overview of a lower-carbon transformation fuel', *Review of Environmental Economics and Policy,* 9(1), pp. 64-84

Neville, K.J. and Weinthal, E. (2016). 'Mitigating mistrust? Participation and expertise in hydraulic fracturing governance', *Review of Policy Research*, 33(6), pp. 578-602.

Nyberg, D., Wright, C. and Kirk, J. (2018). 'Dash for gas: Climate change, hegemony and the scalar politics of fracking in the UK', *British Journal of Management*, 29(2), pp. 235-251.

Ochieng, E.G., Price, A.D., Egbu, C.O., Ruan, X. and Zuofa, T. (2015). 'Fresh driver for economic growth: Fracking the UK nation', *International Journal of Energy Sector Management*, 9(3), pp. 412-431.

O'Neill, J., Holland, A. and Light, A. (2008). *Environmental values*. Routledge. pp.114-140.

Ordnance Survey. (2016). *Outline Map of the United Kingdom*. Available At: https://www.ordnancesurvey.co.uk/docs/outline-maps/uk-outline-admin-maps.pdf (Accessed: 12th March 2019).

Panwar, N.L., Kaushik, S.C. and Kothari, S. (2011). 'Role of renewable energy sources in environmental protection: A review', *Renewable and Sustainable Energy Reviews*, 15(3), pp. 1513-1524.

Parkhill, K.A., Pidgeon, N.F., Henwood, K.L., Simmons, P. and Venables, D. (2010). 'From the familiar to the extraordinary: local residents' perceptions of risk when living with nuclear power in the UK', *Transactions of the Institute of British Geographers*, 35(1), pp. 39-58.

Patterson, A. and McLean, C. (2017). 'The regulation of risk: the case of fracking in the UK and the Netherlands', *Science and Public Policy*, 1, pp. 45-52.

Perraudin, F. (2018). 'Blackpool activists jailed for anti-fracking protest', *The Guardian,* 26 September [online]. *Available At:* https://www.theguardian.com/environment/2018/sep/26/anti-fracking-activists-jailed-for-blackpool-cuadrilla-protest *(Accessed 12th February 2019)*

Pierce Jr, R.J. (2012). 'Natural Gas: A Long Bridge to a Promising Destination', *Utah Environmental Law Review*, 32, pp. 245-252.

Pierce Jr, R.J. (2013). 'Natural gas Fracking addresses all of our major problems', *George Washington Journal of Energy & Environmental Law*, 4, pp. 22-25

Potter, R. (2001). 'Geography and development: 'core and periphery'?', *Area*, pp. 422-427.

Rahim, Z. (2019). 'Police force admits passing disabled anti-fracking protestors' details to DWP', *The Independent,* 24 December [online]. Available At: https://www.independent.co.uk/news/uk/home-news/police-disabled-protesters-fracking-blackpool-lancashire-dwp-fraud-a8696381.html (Accessed 12th February 2019)

Rogers, H. (2011). 'Shale gas—the unfolding story', *Oxford Review of Economic Policy*, *27*(1), pp. 117-143.

Rogers, H. (2013). 'UK Shale Gas–hype, reality and difficult questions', *Oxford Institute for Energy Studies,* pp. 1-11

Sen, S. and Ganguly, S. (2017). 'Opportunities, barriers and issues with renewable energy development–A discussion', *Renewable and Sustainable Energy Reviews*, 69, pp. 1170-1181.

Seyfang, G., Park, J.J. and Smith, A. (2013). 'A thousand flowers blooming? An examination of community energy in the UK', *Energy policy*, 61, pp.977-989.

Short, D. and Szolucha, A. (2017). 'Fracking Lancashire: The planning process, social harm and collective trauma', *Geoforum*, 98, pp. 264-276

Short, D., Elliot, J., Norder, K., Lloyd-Davies, E. and Morley, J. (2015). 'Extreme energy,'fracking'and human rights: a new field for human rights impact assessments?', *The international journal of human rights*, 19(6), pp. 697-736.

Simcock, N. (2016). 'Procedural justice and the implementation of community wind energy projects: A case study from South Yorkshire, UK', *Land Use Policy*, 59, pp. 467-477.

Skea, J., Ekins, P. and Winskel, M. (2011). *Energy 2050: Making the transition to a secure low carbon energy system*. Routledge.

Small, M.J., Stern, P.C., Bomberg, E., Christopherson, S.M., Goldstein, B.D., Israel, A.L., Jackson, R.B., Krupnick, A., Mauter, M.S., Nash, J. and North, D.W. (2014). 'Risks and risk governance in

unconventional shale gas development', *Environmental Science & Technology,* 48(15), pp. 8289-8297

Smith, D.M. (1999). 'Geography, community, and morality', *Environment and Planning A*, 31(1), pp.19-35.

Smith, P.D. and McDonough, M.H. (2001). 'Beyond public participation: Fairness in natural resource decision making', *Society & Natural Resources*, 14(3), pp. 239-249.

Söderholm, P., Hildingsson, R., Johansson, B., Khan, J. and Wilhelmsson, F. (2011). 'Governing the transition to low-carbon futures: A critical survey of energy scenarios for 2050', *Futures*, 43(10), pp. 1105-1116.

Solomon, B.D. and Calvert, K.E. (2017). *Handbook on the geographies of energy.* Massachusetts. Elgar.

Sovacool, B.K. and Dworkin, M.H. (2015). 'Energy justice: Conceptual insights and practical applications', *Applied Energy*, 142, pp. 435-444.

Sovacool, B.K. (2014). 'What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda', *Energy Research & Social Science*, 1, pp. 1-29.

Sovacool, B.K., Heffron, R.J., McCauley, D. and Goldthau, A. (2016). 'Energy decisions reframed as justice and ethical concerns', *Nature Energy*, 1(5), pp. 1-6

Stambouli, A.B. (2011). 'Fuel cells: The expectations for an environmental-friendly and sustainable source of energy', *Renewable and Sustainable Energy Reviews*, 15(9), pp. 4507-4520.

Stamford, L. and Azapagic, A. (2014). 'Life cycle environmental impacts of UK shale gas', *Applied Energy*, 134, pp.506-518.

Stern, J. (2004). 'UK gas security: time to get serious', *Energy Policy*, 32(17), pp. 1967-1979.

Stratford, E., Bradshaw, M. (2016) 'Qualitative Research Design and Rigour', in Hay, I. (ed.) *Qualitative Research Methods in Human Geography.* Ontario: Oxford University Press, pp.117-129.

Swyngedouw, E. (2011). 'Interrogating post-democratization: Reclaiming egalitarian political spaces', *Political geography*, *30*(7), pp. 370-380.

Szolucha, A. (2016). 'The human dimension of shale gas developments in Lancashire, UK: towards a social impact assessment', *Repower Democracy,* pp. 7-107

Szolucha, A. (2018). 'Anticipating fracking: Shale gas developments and the politics of time in Lancashire, UK', *The Extractive Industries and Society,* 5(3), pp. 348-355

Turner, J.A. (1999). 'A realizable renewable energy future', *Science*, 285(5428), pp.687-689.

Tyndall Center (2011). *Shale gas: a provisional assessment of climate change and environmental impacts.* University of Manchester. Available At: http://www.gegen-gasbohren.de/wp-content/uploads/2011/01/tyndall-coop_shale_gas_report_final.pdf (Accessed 09/03/2019)

Victor, D.G. and Yanosek, K. (2011). 'The crisis in clean energy: stark realities of the renewables craze', *Foreign Affairs*, pp. 112-120.

Walker, G. (2009). 'Beyond distribution and proximity: exploring the multiple spatialities of environmental justice', *Antipode*, 41(4), pp. 614-636.

Walker, G., Hunter, S., Devine-Wright, P., Evans, B. and Fay, H. (2007). 'Harnessing community energies: explaining and evaluating community-based localism in renewable energy policy in the UK', *Global Environmental Politics*, 7(2), pp.64-82.

Warren, C.R. and McFadyen, M. (2010). 'Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland', *Land use policy*, 27(2), pp.204-213.

Webber, C. (2010). 'The Evolution of the Gas Industry in the UK', *Oslo: IGU*, pp. 198-220.

Weigle, J.L. (2011). 'Resilience, community, and perceptions of Marcellus Shale development in the Pennsylvania wilds: reframing the discussion', *Sociological Viewpoints*, 27(1), p.3.

Whatmore, S.J. (2009). 'Mapping knowledge controversies: science, democracy and the redistribution of expertise', *Progress in Human Geography*, 33(5), pp. 587-598.

Whitmarsh, L., Nash, N., Upham, P., Lloyd, A., Verdon, J.P. and Kendall, J.M. (2015). 'UK public perceptions of shale gas hydraulic fracturing: The role of audience, message and contextual factors on risk perceptions and policy support', *Applied Energy*, 160, pp.419-430.

Whitton, J. and Charnley-Parry, I. (2018). 'Shale gas governance in the United States, the United Kingdom and Europe', in Whitton, J., Cotton, M., Charnley-Parry, I. and Brasier, K. (eds.) *Governing Shale Gas: Development, Citizen Participation and Decision Making in the US, Canada, Australia and Europe*. Routledge, Chapter 14.

Whitton, J., Brasier, K., Charnley-Parry, I. and Cotton, M. (2017). 'Shale gas governance in the United Kingdom and the United States: Opportunities for public participation and the implications for social justice', *Energy research & social science*, 26, pp. 11-22.

Williams, L., Macnaghten, P., Davies, R. and Curtis, S. (2017). 'Framing 'fracking': Exploring public perceptions of hydraulic fracturing in the United Kingdom', *Public Understanding of Science*, 26(1), pp. 89-104.

Willow, A. (2014). 'The new politics of environmental degradation: un/expected landscapes of disempowerment and vulnerability', *Journal of Political Ecology*, 21(1), pp. 237-257.

Willow, A. and Wylie, S. (2014). 'Politics, ecology, and the new anthropology of energy: exploring the emerging frontiers of hydraulic fracking', *Journal of Political Ecology*, 21(12), pp. 222-236.

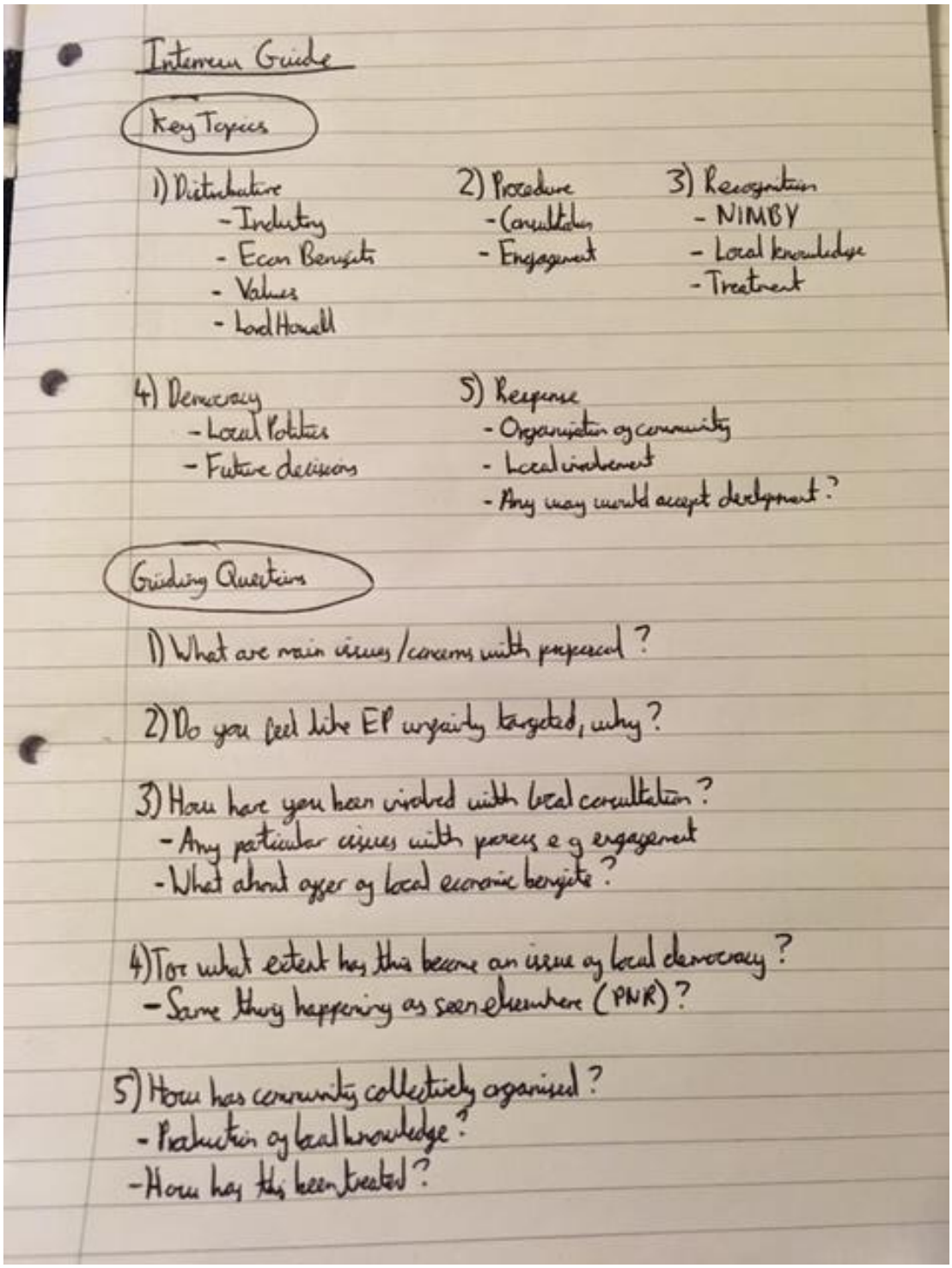
Winchester, H.P.M., Rofe, M.W. (2016) 'Qualitative Research and Its Place in Human Geography', in Hay, I. (ed.) *Qualitative Research Methods in Human Geography.* Ontario: Oxford University Press, pp. 3-27.

Witt, K., Whitton, J. and Rifkin, W. (2018). 'Is the gas industry a good neighbour? A comparison of UK and Australia experiences in terms of procedural fairness and distributive justice', *The Extractive Industries and Society*, 5(4), pp. 547-556.

Zimmerer, K. S. (2017). 'The political and social ecologies of energy', in Solomon, B. D. and Calvert, K. E. (eds.) *Handbook on the Geographies of Energy.* Massachusetts: Elgar, pp.465-476

Appendices

Appendix 1 – Rough Interview Guide



Interview Guide

Key Topics

1) Distributive
- Industry
- Econ Benefits
- Values
- Lord Howell

2) Procedure
- Consultation
- Engagement

3) Recognition
- NIMBY
- Local knowledge
- Treatment

4) Democracy
- Local Politics
- Future decisions

5) Response
- Organisation of community
- Local involvement
- Any way would accept development?

Guiding Questions

1) What are main issues/concerns with proposed?

2) Do you feel like EP unfairly targeted, why?

3) How have you been involved with local consultation?
- Any particular issues with process e.g. engagement
- What about offer of local economic benefits?

4) To what extent has this become an issue of local democracy?
- Same thing happening as seen elsewhere (PNR)?

5) How has community collectively organised?
- Production of local knowledge?
- How has this been treated?