

Advantages and disadvantages of fracking



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Research Review

Due to the nature of the question its structure appears to be formulaic; one side looking at the potential benefits and the other presenting counter arguments centring on environmental and social impacts. This structure led naturally to researching the potential benefits of fracking first. A good starting point was the official government report *Shale gas and fracking* [1] , this gives a wide overview of the situation regarding fracking in the UK; however the area that is of particular interest for this project refers to the “Economic implications”. Regular comparisons are made with the United States; where fracking has been implemented on a large scale, dramatically changing their energy landscape for the better. These comparisons have led to the conclusion that “ shale gas was unlikely to be a “ game-changer” as in the US”, this is down to the comparable shortage of land on which to drill in the UK. Suggesting that UK fracking will yield considerably lower economic benefits than the US, despite this according to a May 2013 report referenced in the document a scenario has been put forward “ Where UK shale gas production attracts £3. 7 billion per year and supports up to 74, 000 jobs”, clearly showing the potential benefits of fracking.

As expected from a government report counter arguments are provided very effectively, this is a vital part of a cost benefit analyse; the main purpose of the document. A large portion of the document is dedicated to “ Environmental considerations”, relating well to the environmental and social impacts section of my dissertation, therefore this source covers arguments both for and against fracking in the UK and will prove very useful when writing my dissertation.

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Looking at the origin of the source it appears credible, published on the 22nd January 2014 suggests that up to date information has been used, it has also been written by a plethora of different writers, thus decreasing the chances of any bias influencing conclusions. Finally it is an official government document therefore likely to be highly reliable with informed decisions being made following the collation of large amounts of research data. Although the report made clear there is a distinct lack of information regarding fracking in UK, for example “ the amount of shale gas that could be commercially extracted” is not known, possibly making any further assumptions such as how far could fracking bring down energy costs, unreliable as no exact calculations can be made.

Shale gas and fracking raised the idea of Shale gas being used as “ bridge” from coal to clearer renewable sources of energy. A similar idea is addressed in Michael Levi’s research paper *Climate Consequences of Natural Gas as a Bridge Fuel* [2] ; this explores the use of natural gas as a bridge fuel. The main function of this bridge fuel is “ smoothing a transition ... from fossil fuels to zero carbon energy by temporarily offsetting the decline in coal use”. Levi takes a research orientated approach using hypothetical scenarios to answer this question; he begins with 6 traditional stabilization scenarios before constructing “ six new “ bridge” scenarios” and finally “ six delayed transmission scenarios”. This modelling demonstrates the effects of these different scenarios on CO₂ concentration and temperature change; this is significant when assessing the potential benefits of fracking as if it can lower CO₂ output and potentially reduce dependency on coals leading to “ zero carbon energy” it could suggest there is a strong case for its implementation.

Again this source presents both sides of the argument, the converse of which is that methane emissions from the extraction of natural gas “ will severely reduce or entirely negate the climate benefits of lower CO2 emissions”.

Despite this potential downfall not necessarily fitting my counter argument of the environmental and social impacts, it could be used to evaluate the potential benefits of fracking.

Dr Levi, a David Rubenstein senior fellow for energy and the environment, is highly regarded having published many scholarly articles for a number of academic papers such as the Oxford press. Therefore this source seems highly credible as the author has extensive experience in the field of energy and fracking. Despite this there is considerable ambiguity over the conclusions made, he is aware that he has only used a limited number of scenarios and that “ examination of additional scenarios could further reinforce or challenge his result”.

Upon appraisal it was evident that a clear fracking debate was emerging, this led me to a particular TED talk entitled *The Fracking Debate* [3] delivered by Terry Engelder, a leading authority on the Marcellus gas shale play. Engelder believes that the economy will only grow in proportion to its availability to energy and that fracking should be used to fuel this growth. Engelder arguments are not constructed in such a way that champions fracking but instead by deposing its alternatives, for example if America was to implement wide scale renewable energy programs such as solar and wind then it would experience numerous problems. Such as, extensive use of solar panels become susceptible to sudden voltage shocks from the emerging sun causing failure in transmissions systems. He also raises the fact that these

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are heavily subsidised; unlike fracking. Finally the counter argument over methane emissions from fracking offsetting the reduction in CO₂ in Levi's paper is disproved, Engelder suggests that Co₂ emissions will have a far more severe effect on global temperature change as oppose to Methane emissions because of its short ½ life.

In terms of utility this source is highly subjective; Engelder's has a strong pro fracking stance, which may result in bias thus limiting objectivity. Although having said this the arguments raised demonstrate the potential benefits of fracking are very logical therefore it will prove useful when writing my dissertation.

During this TED talk Engelder refers to the book *the end of country* [4] by shamus McGraw, this provides a valuable case study with personal insight into the effects of fracking on a local scale. McGraw acts a detached narrator recalling the discovery of the Marcellus gas shale play worth an estimated \$1 trillion. He demonstrates how some benefited from this discovery selling their land to oil companies, but at the same time explores the complex moral issues behind selling land that generations have relied on, for a quick profit; resulting in it becoming permanently scared.

McGraw is an experienced freelance writer; therefore this book is likely to give an accurate account from a neutral perspective avoiding any subjectivity. However he may be prone to exaggeration for dramatic effect, which could influence the reader. On its own *The end of country* cannot be given considerable weighting as it only refers to one example and is therefore not representative of every Fracking scenario. Although it is a good

piece of supplementary evidence to support the arguments raised in my dissertation.

These local economic benefits raised *The end of country* could be seen as a positive. Yet Prof. Susan Christopherson of Cornell University argues that these are short-term and that the communities will suffer in the long run, these views are presented on her Green choices website[5]. She refers extensively to the “ ripple affect” that occurs once natural gas extraction has begun in an area, these include “ Direct effects on property values, the local tax base ... costs associated with increased use of infrastructure, especially roads and bridges”. This source will prove extremely useful when examining the social impacts of fracking as it allows a deeper level of analysis looking at the longer term impacts rather than more immediate ones. It could also provide a good link between my two arguments, as on the one hand you have the short term gain but this is countered by the long term impacts.

The Green choices movement is a product of Cornell University; therefore we would expect the information provided to be very reliable, having been collated and assed by a number of academics who have devoted many hours of research into these conclusions. However we must consider the number of case studies used to come to these conclusions, if they used a limited number then results may not be representative of all areas.

The environmental impacts of fracking are also explored in the Sustainalytics research paper *Fracking under Pressure: The Environmental and Social Impacts and Risks of Shale Gas Development* [6] . It has subdivided environmental impacts into “ land” and “ water” as well as a specific case

study into ground water contamination. It also deals with social impacts such as “light and noise pollution” from continuously running rigs. However this paper had a disappointing lack of counter arguments, none the less it is still of great use as I am only using to strengthen the Environmental and social impacts side of my argument, thus it is not imperative that it contains counter arguments; the fact that it is a high reliable scholarly article is more important. Although it was published in 2011 so it may be subject to out of date information.

The final source to add weight to the environmental and social impacts side of my argument is the ReFINE[7] project; this is the biggest research project of its kind in Europe, dedicated to researching “the issue of shale gas and oil exploitation using fracking methods and its potential risks”. It not only referred to the already established environmental and social costs of fracking, but also raised some new issues that would add to my argument against fracking e. g. the argument over orphaned wells and who should take responsibility for them. One of most important factors associated with ReFINE is the fact that it has been carried out in Europe rather than America, making it the most relevant source that I have found as I plan to centre my dissertation around fracking in the UK. A common weakness in many of my other sources is that they may not be applicable to the UK. The source is objective, simply presenting the facts rather than trying to influence opinions.

After reading the ReFINE paper I decided to try and gain a deeper insight into the implications behind it and try to find out what those behind it personally thought of Fracking in the UK. To do this I emailed the project lead who

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forwarded me on Dr Liam Herringshaw who was also involved in formulating the project, he agreed to answer any questions I had for him.

This is an extremely valuable primary source; however I am aware it is highly subjective as it is only one persons opinion. Therefore I plan to use his responses not to base whole arguments on but rather to support arguments that have already been established.

I believe there is no definitive answer to my question; views tend to be a result of the perspective, rather than hardened evidence. I hope that by formulating my ideas in a logical way using my sources both as the basis for my reasoning as well as to supplement my arguments; I will be able to construct a well-balanced argument from which a conclusion made.

[1]Edward White, Mike Fell, Louise Smith, Matthew Keep, *Shale gas and fracking*, (London 2014).

[2]Michael Levi *Climate Consequences of Natural Gas as a Bridge Fuel* , (January 2013)

[3]Terry Engelder, *The Fracking Debate*, video, TED, (June 2013)

[4]Shamus McGraw, *The end of country*, (2012)

[5]<http://greenchoices.cornell.edu/development/shale/>

[6]Sustainalytics, *Fracking under Pressure: The Environmental and Social Impacts and Risks of Shale Gas Development*, (August 2011)

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[7]ReFINE project, (2013)