



UK public beliefs about fracking and effects of knowledge on beliefs and support: A problem for shale gas policy

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ABSTRACT

This paper discusses a survey of public opinions on hydraulic fracturing ('fracking') for shale gas, conducted with a representative sample of 1745 British adults. Unusually, it examines beliefs about positive and negative statements about fracking as well as support/opposition. A majority of respondents correctly answered an initial question testing basic knowledge of shale gas extraction. More respondents supported fracking in Britain (36%) than opposed it (32%) but only 22% supported fracking locally, while 45% were opposed. Respondents were more united in negative beliefs than positive beliefs about fracking. More knowledgeable participants held more polarised views and were significantly more likely than others to agree with negative statements and to oppose fracking in their local area. More respondents disagreed than agreed that it is possible to compensate for fracking risks by payments to local communities. Policy implications include: increasing public knowledge about fracking will not necessarily lead to more positive beliefs and support regarding shale gas developments; promoting alleged economic benefits of shale gas is not enough to ensure support; engaging in genuinely inclusive participatory decision-making may be more likely to increase support than offering payments to communities; alternatively, developing more renewable energy capacity promises to be more popular than fracking.

1. Introduction

In January 2014, then Prime Minister David Cameron announced that the UK was 'going all out for shale', arguing that developing shale gas resources would ensure jobs and economic security (UK Government, 2014). The UK's shale gas potential is believed to be considerable, though there are as yet no national estimates of how much gas could actually be recovered, due to uncertainties about the geology and costs of production (Jones et al., 2015; Williams et al., 2017). Shale gas is extracted using a process of hydraulic fracturing, otherwise known as 'fracking', which involves drilling horizontally into layers of rock and injecting water, sand, and chemicals at high pressure to fracture the rock and release the gas. There has been vociferous opposition to fracking in the UK (Jones et al., 2013), including protests at shale gas exploration sites and damage to a drilling rig owned by oil and gas company Cuadrilla (Vaughan, 2017a). Cuadrilla has complained of 'harassment' by 'irresponsible protesters' (Vaughan, 2017b), while police are alleged to have illegally bullied and intimidated protesters (O'Riordan, 2015).

Overcoming opposition and securing support for fracking is important to policymakers. For example, David Cameron, writing in *The Telegraph*, stated that 'Fracking has become a national debate in Britain – and it's one that I'm determined to win' (Cameron, 2013). Institutional

rhetoric suggests that the issue is that the public do not understand 'the facts' about fracking and therefore fail to recognise the benefits and worry unnecessarily about environmental impacts (Williams et al., 2017). However, although there have been several surveys asking about support for fracking, and some deliberative studies exploring public attitudes in more detail, there has been little research involving a representative sample examining what the British public think about a wide range of arguments for and against fracking. This paper addresses that gap, presenting the findings of a survey which investigated support and beliefs about positive and negative statements about fracking, among respondents with and without basic knowledge about shale gas extraction.

In the next section I review the literature on arguments for and against fracking for shale gas, and findings of other research into public opinion in Britain. In Section 3 I then detail the survey design and methods of data collection and analysis for this study. I present and discuss the results in Section 4, and Section 5 considers conclusions and policy implications that can be drawn from the study.

2. Literature review: the great fracking debate

Bomberg identifies two clear discourse coalitions in UK fracking debates. The pro-shale gas group, promoting a 'shale gas as opportunity'

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storyline, frames the debate in terms of economic growth, energy security, reassurance about risks of fracking, and shale gas as a ‘bridge’ to a lower-carbon energy future. The anti-fracking group, which regards shale gas as a threat, frames fracking in terms of environmental and health risks, fossil fuel ‘lock-in’, and bad governance. She argues that although neither of these narratives has achieved total dominance, the anti-fracking one has the upper hand because the pro-shale gas coalition lacks trustworthy messengers, and their opponents ‘have successfully expanded the debate beyond economic or environmental concerns to include potent issues of local power and democracy’ (2017: 72).

These debates are largely played out through the media. There was a rapid rise in media coverage about fracking from 2011, starting in the USA and spreading to the UK and Australia, mirrored by an increasing number of Google searches using the term ‘fracking’, and growing public concern and opposition (Mazur, 2014). Jaspal and Nerlich (2014) analysed the coverage in four British newspapers, which showed that *The Telegraph* and *The Times* are in favour of fracking and *The Guardian* and *The Independent* are against; this influences their coverage of events. For example, *The Guardian* and *The Independent* focussed a lot of attention on reports of drilling-related seismic activity in Blackpool in 2011, while *The Times* and *The Telegraph* minimised the threat. McQueen (2017) examined the top twenty stories about fracking on the BBC website between January 2013 and December 2015 and found that while most articles made some effort to include views from both sides of the debate, the majority of contributions were either broadly in favour of fracking or else presented the view that science supports the case for it.

2.1. Arguments for and against fracking

2.1.1. Economic arguments

Claims about the economic benefits of shale gas – economic growth, job creation, lower gas prices, and financial benefits for local communities – form the main part of the pro-fracking argument (for example, see Cameron, 2013). In 2008 Pennsylvania gained \$238 million in tax revenues and 29,000 new jobs due to shale gas extraction, while by 2011 the Barnett Shale in Texas yielded \$11.1 billion in annual output and 100,000 jobs, nearly 10% of regional employment (Sovacool, 2014: 254). Natural gas prices in the USA have fallen dramatically from \$13 per million BTUs to \$1 to \$2 in 2012 due to shale gas, and cheap gas also creates cheap electricity (Sovacool, 2014: 253). In January 2014, UK Prime Minister David Cameron announced that local councils would keep all the business rates associated with shale gas sites, which the Government claimed ‘could be worth up to £1.7 million a year for a typical site’; local communities would receive £100,000 when fracking occurs at a test well, and 1% of revenues if shale gas is successfully produced (UK Government, 2014).

However, Sovacool (2014) argues that over the long term, and taking all costs into consideration, fracking may not actually be profitable. Uncertainty arises from the fact that this is a young industry; predictions of well performance over years are based on little experience. In their first year of operation, most shale gas wells experience very fast decline rates of 60–80%, though this then slows, and MIT researchers have estimated that most USA shale gas wells failed to make an expected 10% return (Sovacool, 2014: 259). A review by Kinnaman (2011) concludes that industry estimations of the economic benefits of shale gas extraction are very likely to be overstated, due to questionable assumptions. Furthermore, the chair of fracking company Cuadrilla, Lord Browne, has contradicted UK Government claims that fracking will reduce gas prices (Carrington, 2013).

Regarding jobs, if shale gas extraction proceeds similarly to conventional energy developments, local people and especially women may fail to gain high-paying jobs in the industry, which demands particular experience and skills, attracting a male-dominated workforce from beyond the region (Measham et al., 2016). This could lead to significant local income inequalities between those working in the shale

gas industry and other businesses and services. Regions where fossil fuel extraction occurs often have lower income growth than those that don’t, due to over-specialisation and limited growth in alternative sectors; additionally, a concentrated male workforce on short-term contracts can lead to social problems (Measham et al., 2016).

It is also argued that exploiting shale gas can reduce reliance on uncertain foreign sources of energy, thus improving energy security (Dernbach and May, 2015). However, this could equally be true of replacing imported fossil fuels with renewable energy.

2.1.2. Environmental arguments

Shale gas is associated with lower emissions of mercury, sulphur oxides, and nitrogen oxides than coal and oil (Sovacool, 2014). It is also claimed that shale gas will lead to lower carbon dioxide (CO₂) emissions than coal and act as a ‘bridge’ to a lower-carbon future, helping to meet energy demand until enough renewable and nuclear capacity can be developed to do so (Engelder, 2011; Leadsom, 2015). Sovacool (2014: 253) states that in the USA, the use of shale gas has decreased CO₂ emissions associated with the national electricity grid, due to displacing coal, and could potentially reduce emissions by up to 17% compared to a ‘business as usual’ scenario.

However, this may be an over-simplification. The reduced use of coal in the USA has simply led to more use in Europe and Asia, due to increased American coal exports (Cotton et al., 2014; Sovacool, 2014). Broderick and Anderson (2012: 2) calculate that ‘more than half of the emissions avoided in the US power sector may have been exported as coal.’ In a globalised world it does not make sense to limit analysis of the effects of shale gas production to a single country.

Furthermore, the claim that shale gas production results in lower greenhouse gas emissions than coal is contested; Howarth and Ingraffea (2011) assert that over timescales of less than about 50 years, the greenhouse gas footprint of shale gas is greater than that of coal, due to methane gas leakage during production.

Critics also argue that investment in shale gas extraction is likely to be at the expense of renewables (Bosworth, 2014; Howarth and Ingraffea, 2011). Lower gas prices mean that wind energy has not overtaken natural gas in terms of new electricity generating capacity installation in the USA, as was expected before the shale gas boom (Sovacool, 2014). Researchers at the Tyndall Centre for Climate Change Research claim that ‘without a meaningful cap on global carbon emissions, any emissions associated with shale gas are likely to be additional, exacerbating the problem of climate change’ (Tyndall Centre, 2011: 109). Kersting et al. (2017) calculate that over the long term, increased availability of shale gas leads to higher greenhouse gas emissions for most countries and the world as a whole, and greater costs of compliance with climate policy for most countries.

Cotton et al. (2014) suggest that the UK Government’s pro-fracking arguments focussed on energy security and economic benefits frame shale gas increasingly as a destination rather than as a transition fuel, undermining the ‘bridge’ argument. Arguments about the abundance of supply (Sovacool, 2014) also weaken this contention, and threaten to create fossil fuel ‘lock-in’.

Environmental impacts (and related health risks) form a major part of the argument against fracking. Apart from climate change-related concerns, these include water contamination and availability, earthquakes and tremors, noise and disruption to local residents, general damage to the local environment, and health risks from, for example, air pollution (Dernbach and May, 2015; Howarth and Ingraffea, 2011; Sovacool, 2014). Effects of shale gas extraction on water quality and availability are among the most prominent and well-documented risks (Dernbach and May, 2015; Sovacool, 2014). Industry representatives claim that fracking does not cause water contamination; this may be technically correct in that it is not generally the process of hydraulic fracturing per se that is to blame, but water contamination due to shale gas extraction (mostly because of faulty well-casing and cementing) is well-documented (Dernbach and May, 2015). The UK Government

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