

# The UK's big fracking problem

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## 1. Introduction

In the UK, the fracking industry has been met with significant public opposition, with opinions favouring 'cleaner' renewable energy<sup>[1]</sup>. Fracking is a unconventional technique of extracting shale gas, whereby cracks are induced in shale rock to release the gas. The UK government has historically supported the industry, believing it will provide significant economic growth and greater energy security. However, there are many environmental and public safety concerns surrounding the fracking process, including potential groundwater contamination, induced earthquakes, congestion and carbon emissions.<sup>[2]</sup> In 2011, fracking in the UK to be halted for 6 years after fracking triggered a seismic event of magnitude 2.3M<sub>L</sub>.<sup>[3]</sup> Opinion remains divided over the technology, with ongoing resistance to active fracking sites and planning applications.



Figure 1<sup>[3]</sup>: Anti-fracking protests in Yorkshire, UK

## 2. What is fracking?

Hydraulic fracturing (fracking) is a method of extracting unconventional hydrocarbons from low-permeability reservoirs<sup>[5]</sup>.

- ① Test boreholes are drilled to a depth up to 5000 ft to assess the viability of the shale gas deposit<sup>[6]</sup>.
- ② If exploitable, boreholes are lined with steel tubes, down which a fracturing fluid (99.95% water and sand, 0.05 chemical additives) is pumped at high pressure<sup>[5]</sup>.
- ③ This forms a network of fractures radiating from the borehole, which are kept open by the sand particles, which releases gas from the deposit.<sup>[6]</sup>
- ④ The gas returns up the tubes, which may then be collected and stored until being piped to market.<sup>[6]</sup>

## 3. Arguments for hydraulic fracturing

The UK government have historically been advocates of shale gas exploration, with Prime Minister David Cameron promising to go 'all out' for shale in 2014.<sup>[7]</sup> The main arguments to back fracking include:

- ▶ The UK government predicts that 75% of gas will be imported by 2030.<sup>[8]</sup>
- ▶ The UK sits on a potential 25-50 years' worth of recoverable shale gas.<sup>[9]</sup>
- ▶ Cuadrilla report that drilling a test well provides 250 jobs, with commercial extraction peaking at 5,600 jobs created between 2016 and 2019.<sup>[10]</sup>
- ▶ Natural gas can be used as a lower carbon alternative than coal or oil, alleviating greenhouse emissions by up to 50% in some power plants.<sup>[11]</sup>

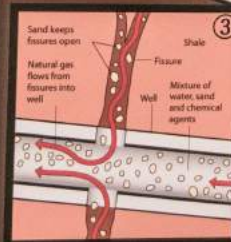


Figure 2<sup>[5]</sup>: function of fracturing fluid

## 4. Opposition to hydraulic fracturing

In April 2017, UK public support of fracking hit a record low of just 16%.<sup>[12]</sup> The largest anti-fracking demonstration occurred in West Sussex in 2013,<sup>[7]</sup> including around 1000 protesters blocking access to a Cuadrilla oil-exploratory site.<sup>[13]</sup>

- ▶ In 2011, a fracking operation by Cuadrilla in Lancashire caused two earthquakes of magnitude ( $M_L$ ) 2.3 and 1.5,<sup>[3]</sup> triggering anti-frack campaigns and protests.<sup>[14]</sup>
- ▶ Potential environmental and health risk of groundwater contamination by 'fugitive' methane or migration of fracking fluid due to poor well design.<sup>[15][16]</sup>
- ▶ Investment in shale gas endorses the use of fossil fuels and release of CO<sub>2</sub>, contributing to climate change. Opponents argue that investors ought to turn to renewable energy.<sup>[7]</sup>
- ▶ Locals fear that increased traffic congestion and industrial development will cause significant environmental disruption and affect their 'rural' identity.<sup>[14]</sup>
- ▶ Fear that fracking will be allowed on national parks, with many underlain by shale deposits (figure 3).<sup>[17]</sup>



Figure 3<sup>[17]</sup>: Geographic extent of shale deposits in relation to nation park and areas of outstanding natural beauty

## 5. Conclusion

Although shale gas is economically an attractive prospect for securing a source of gas for the UK's future, opposition to the non-conventional fracking process remains staunch, with public opinion favouring renewables. Objections to the technology focus mainly around environmental concerns, catalysed by the induced seismicity in 2011, followed by a spate of negative media coverage. The UK government remain keen to push ahead with shale gas exploration, despite public opposition looking set to persist into the foreseeable future.

### References

[1] [https://www.bbc.com/news/energy-2017-04-17-uk-public-support-of-fracking-hits-record-low](#)

[2] [https://www.bbc.com/news/energy-2017-04-17-uk-public-support-of-fracking-hits-record-low](#)

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