

Fracking can be undertaken safely if best practice and effective regulation are enforced

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Hydraulic fracturing (often termed "fracking") can be managed effectively in the UK as long as operational best practices are implemented and robustly enforced through regulation. That is the conclusion of a review by UK's Royal Society and the Royal Academy of Engineering.

"There has been much [speculation](#) around the safety of shale gas extraction following examples of poor practice in the US. We found that well integrity is of key importance but the most common areas of concern, such as the causation of earthquakes with any significant impact or fractures reaching and contaminating [drinking water](#), were very low risk. This is not to say hydraulic fracturing is completely risk-free. Strong regulation and robust [monitoring systems](#) must be put in place and best practice strictly enforced if the Government is to give the go-ahead to further exploration. In particular, we emphasise the need for further development and support of the UK's [regulatory system](#), together with Environmental Risk Assessments for all shale gas operations and more extensive inspections and testing to ensure the integrity of every well," said Professor Robert Mair FREng FRS, Chair of the review's working group.

The review examined the scientific and engineering evidence relating to the environmental and health and safety risks associated with the onshore extraction of shale gas. Findings that led to the conclusion that the practice could be undertaken safely include:

- Hydraulic fracturing is an established technology that has been used by the oil and gas industries for many decades in the UK;
- The risks of contamination of aquifers from fractures is very low provided that shale gas extraction takes place at depths of many hundreds of metres;
- Seismicity (or earth tremors) induced by hydraulic fracturing is likely to be of a smaller magnitude than the UK naturally experiences or than is related to coal mining activities, which are, of themselves, low by world standards;
- Open ponds for storing wastewater (which have been historically used in US fracking operations and carry a possible risk of leakage) are not permitted in the UK and there are numerous facilities in the UK for the treatment of similar wastes from the industrial sector;

Well established procedures have been developed for the disposal of naturally occurring radioactive materials (which are present in the hydraulic fracturing wastewaters) by the UK's extractive industries.

A particular cause for concern is that that poor cementation and casing failures of wells could lead to leakages and wider environmental contamination, as they have in some cases in the US. Therefore, the review concludes that the priority must be to ensure the integrity of every well throughout its lifetime.

Assessment of systems of regulation in the UK and examples of best practice led to a number of recommendations that should be implemented if shale gas extraction is to be undertaken safely in the UK. These include:

- Strengthening the UK's regulators, including providing additional

resources as needed;

- Allocating lead responsibility for regulation of shale [gas extraction](#) to a single regulator;
- Strengthening the system of well inspections to ensure that well designs are considered not only from a health and safety perspective, but also from an environmental perspective;
- Undertaking appropriate well integrity tests as standard practice;
- Mandating and enforcing Environmental Risk Assessments for all shale gas operations, which should be submitted to the regulators for scrutiny
- Ensuring robust monitoring of methane in groundwater, seismicity and methane leakages before, during and after hydraulic fracturing;
- Establishing integrated management processes to ensure water is used sustainably and to minimise wastes

Professor Mair added: "As we made clear at the start, this review is not an exhaustive analysis of all the issues associated with shale gas and we have highlighted a number of issues that we believe merit further consideration, including the climate risks associated with the extraction and subsequent use of [shale gas](#), and the public acceptability of [hydraulic fracturing](#). "

More information: The report is available at royalsociety.org/policy/projects/shale-gas-extraction/report/ and www.raeng.org.uk/news/publications/reports/Shale_Gas.pdf

Provided by University of Cambridge

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