Hydraulic fracturing or fracking, similar to drilling a well, is a temporary operation during which the hard scale shale rock deep underground is stimulated to release the gas. It involves pumping fluid at high pressure, into certain pre-defined locations in the wellbore to create lots of tiny fissures in the shale rock, which are then propped open by the sand carried in the frack fluid mixture.

Shale gas is no different from North Sea gas or gas imported from overseas it’s the rocks that the gas comes from that are different. Shale gas is found trapped within deeply buried shale formations where the shale rock is very hard and has to be stimulated through hydraulic fracturing to give up its gas. North Sea gas, however, is typically found within permeable sandstone formations and stimulation is often not required. Hydraulic fracturing, also known as fracking, is an important, but very short term part of the process for extracting shale gas. In the UK, during the early days, a typical fracking programme would see equipment on site for 3–4 weeks with the actual hydraulic fracturing operation done in short bursts (stages) of around 60 minutes at a time.

The Government has recognised that shale gas has the potential to provide the UK with energy, jobs and growth, and would be particularly beneficial for the chemicals industry and wider manufacturing sector. Done properly, responsible shale gas extraction, within a strict regulatory framework presents significant opportunity for the UK with minimal environmental impact.

Frack fluid consists of water (98%), sand (1.5%) and chemical additives (0.5%).

Hydraulic fracturing is a well-stimulation technique in which rock is fractured by a hydraulically pressurised liquid containing water, sand and chemical additives.

The fracture properties and times have been pre-determined in advance of the operation often following pressure flow tests and analysis of data gathered during drilling. When fracking the rock engineers will seek to make hairline fractures up to a maximum length of 125m. The fractures are measured and mapped using sensitive equipment at surface.

Fracking has been used in the oil and gas industry for over 50 years worldwide, there have been around 1.1 million wells hydraulically fractured.
WATER
A frack uses about 2–6 million gallons of water, which sounds like a lot, but this is just a few days in the life of well, which may then produce for a couple of decades. It is important to put this water use in perspective compared to other practices.

The Royal Society and Royal Academy of Engineering, for instance, note that the amount of water used by a shale gas well over ten years is equivalent to the amount used by an 18-hole golf course in one month, or a 1,000MW coal-fired power plant in 12 hours, or the amount lost in leaks in the northwest of England every hour. Similarly, the Chartered Institution of Water and Environmental Management (CIWEM) has recognised that compared to other fossil fuels, shale gas has relatively low water use.

SAND
The high purity crush resistant sand is the same as that used in water filtration plants and children’s sandpits.

CHEMICAL ADDITIVES
Any chemical additives used in fracking will be publicly disclosed as part of the planning process and approved by SEPA (Scotland) or the Environment Agency (England).
FURTHER FACTS:

- SEPA: www.sepa.org.uk/customer_information/energy_industry/unconventional_gas/frequently_asked_questions.aspx
- UKOOG: www.ukoog.org.uk
- Frackland Blog: www.frackland.blogspot.co.uk
- No Hot Air: www.nohotair.co.uk/index.php/library
- ReFINE: www.refine.org.uk
- Frac Focus: www.fracfocus.org
- The Boom: www.russellgold.net/books/the-boom
- US EPA: www2.epa.gov/hydraulicfracturing
- PENN State University: http://stateimpact.npr.org/pennsylvania/tag/fracking/
- Range Resources: www.rangeresources.com
- CONSOL Energy: www.consolenergy.com

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