

# Shale Gas: The Facts

**CIA** | Chemical  
Industries  
Association

Working for chemical and  
pharmaceutical businesses

## Unconventional gas offers a vital new source of raw materials for chemical products

As a major energy user, the UK chemical industry supports the development of unconventional gas (including shale gas) while protecting the environment and ensuring that the public are both safeguarded and receive associated benefits. Sources of unconventional gas offer a secure and

potentially competitive feedstock (raw material) as well as energy itself, at a time when supplies from the North Sea are in decline. Development of unconventional gas will improve the business case for investment in and development of UK chemical capacity.

- Shale gas will help to sustain and grow the UK chemical industry which has turnover of £60bn and supports 500,000 jobs directly and indirectly throughout the economy.

- Producers will provide communities with financial benefits of £100,000 per well site during exploitation and 1% of production revenues.

## Gas will underpin intermittent renewables like wind power

As North Sea reserves decline, the UK has become heavily dependent on gas imports which now represent almost half of UK gas consumption. The energy regulator Ofgem predicts that spare electricity generating margins could fall to 2% by the middle of the decade as more carbon intensive coal fired capacity closes<sup>1</sup>. The government's gas generation strategy<sup>2</sup> recognises the UK will therefore need to invest in more gas generation which

will then continue to play a major role alongside low carbon generation sources (eg: for fast response back-up to intermittent renewables). Currently, gas is also by far the main source of heat for households and industry and, for many uses, there are no viable alternatives. Locally sourced shale gas will improve security of supply and lessen the risk of high and volatile prices due to uncertainty about gas imports.

The recently updated assessment of the UK's Bowland shale reserves by the British Geological Survey (BGS)<sup>5</sup> suggests there are reserves of 1300 trillion cubic feet. This rich reserve is 10 times the depth of any US shale reserves and producers estimate exploitable reserves are equivalent to 40 years of UK needs. Firstly, more test wells need to be drilled to

establish gas flow rates, and commercial viability. However, the UK has extensive experience from "conventional" drilling for gas both offshore and onshore and can draw on the major technological advances made in the US. A major company like Centrica has shown confidence by investing in Cuadrilla's shale gas operations.

## Shale gas development will create economic benefits and jobs

Extraction of shale gas will create skilled jobs, directly increase GDP and help to reduce our trade deficit. It is likely to bring downward pressure on energy prices, and lead to further gains in output in the rest of the economy, as in the US, which is seeing a \$100bn boom in petrochemicals

investment<sup>3</sup>. Shale gas producers will pay substantial taxes to Treasury on their production income and will also provide benefits to local communities.

- Investment in shale gas production could reach £3.7bn a year, supporting 74,000 new jobs<sup>4</sup>.

## Seismic activity from fracking is equivalent to background motion caused by vehicles

Fracking may cause some disturbance as we saw in Blackpool but this will be minor and not as significant as other natural seismic activity that happens around us today. Extensive risk assessment measures are now in place which include a traffic light system to ensure that seismicity induced by fracking is minimised

to very low levels that will not be dangerous or disruptive. Action will be taken if a seismic event breaches 0.5ML which the Department of Energy and Climate Change (DECC) explains<sup>6</sup> is barely detectable on the surface and within the normal background of ground motion caused by vehicles.

<sup>1</sup> Ofgem - [Electricity Capacity Assessment Report](#), May 2013

<sup>2</sup> The Department of Energy and Climate Change's [Gas generation strategy](#), December 2012

<sup>3</sup> Bloomberg Business News, [Chemical companies rush to the US](#) - 25 July 2013

<sup>4</sup> Estimates by the Institute of Directors: [Infrastructure for Business: Getting shale gas working](#), May 2013

<sup>6</sup> BGS [Bowland Shale Gas Study](#), 15 July 2013

## Each well's total water use is equivalent to that used on a golf course in a month

It is true that fracking does need a lot of water. The water is used under pressure to open fissures in shale. DECC cite a use range of 10–30 million litres per well. This is approximately the same as the amount used to water a golf course for a month. Water UK, the body representing all major UK water and wastewater service suppliers, says that it

supplies over 16 billion litres of water a day to domestic and commercial customers<sup>7</sup> – or about 6 trillion litres per year. So fracking 100 wells would only require around 0.03% of current usage. In the UK, fracking fluids that flow back to the surface may be recycled and reused if this is a more appropriate option than disposal<sup>6</sup>.

## Carbon emissions from UK shale gas will be comparable to conventional gas

Techniques for “green completion” of wells to reduce emissions to air have been developed in the US and adopted in the UK. Any venting and flaring is regulated by the DECC and is required to be kept to a minimum. Routine venting is not allowed but where venting is necessary, eg: for safety,

the preferred option is to flare to reduce greenhouse gas emissions<sup>6</sup>. A report by DECC concludes that, if adequately regulated, the overall carbon footprint of piped shale gas will be comparable to conventional pipeline gas and will be lower than that for imported liquified natural gas<sup>9</sup>.

## Fracking takes place at sufficient distance from groundwater and surface activities are regulated

Fracking takes place at a depth sufficiently distant from groundwater to ensure that any risk of fractures extending into aquifers (the water table) is negligible. The Royal Society<sup>8</sup> considered this question in a report for DECC and concluded that upward flow of gas or fracking fluids from the zone of shale gas extraction to overlying aquifers via fractures to be highly unlikely.

Well integrity is a critical aspect of ensuring the safety of the well to protect the environment as the well bore and casing pass through aquifers.

DECC and the regulators have worked with the UK Onshore Operators Group to codify best practices for onshore shale gas wells. Consents for Hydraulic Fracking will require operators to develop a system for ensuring well integrity throughout the well life<sup>6</sup>.

Concerning the risk of contaminating surface water, there are several regulatory measures to ensure flow-back water from fracking does not escape and a safe and appropriate re-use or disposal method must be agreed with the environmental regulator<sup>6</sup>.

## Once a well is bored the well pad will have a visually low impact

Fracking is only visible while the bore is being sunk and there will inevitably be some noise from drilling and transport but this will be temporary. After drilling and once the gas is flowing, the well pad (which is smaller than a football pitch) will have a visually low impact. DECC report there has been

no evidence of property blight in the UK in over half a century of onshore oil and gas exploration and production. The impacts on health, local amenities, traffic movements, etc., are expected to be broadly similar; and the activities will be subject to the same robust safety and environmental regime<sup>6</sup>.

## Use of chemicals is permitted on a well by well basis and subject to public disclosure

Fracking fluid consists mainly of water and sand, which acts as, ‘proppant’ to keep fractures open. Small quantities of chemicals are added (usually less than 0.5%) to enable the fluid to pass easily through fractures, to kill bacteria and to prevent build up of scale in the well. Such chemicals are also often used in conventional hydrocarbons drilling. In the UK the environmental regulator specifies the chemicals

that can be used in the operator’ permit on a well-by-well basis and the operator is required to fully disclose these<sup>6</sup>. The chemical industry supports the public disclosure of the composition of fracking fluids. All operators in the chemical supply chain need to meet the requirements of REACH<sup>10</sup>, the Biocidal Products Regulation and other pertinent environmental regulation.

<sup>6</sup> DECC, *About shale gas and about shale gas and hydraulic fracturing (fracturing)*, 30 July 2013

<sup>7</sup> Water UK, *Water Resources*

<sup>8</sup> Royal Society, *Shale gas extraction in the UK: a review of hydraulic fracturing*, June 2012

<sup>9</sup> DECC, *Potential Greenhouse Gas Emissions Associated with Shale Gas Extraction and Use*, September 2013

<sup>10</sup> REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals



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