

Additional information

Geostatistical analysis

- Out of the UK's original recoverable oil & gas resource only about 10% remains.
- Our oil and gas reserves will run out within 10-20 years.
- The UK's true fracking potential is exposed as being slight.

Analogue test

- No clear match is found between UK geology and that of top US shale-gas plays.
- For fracking to be successful eight key geological prerequisites need to be met. These requirements cause problems for one UK region after another:

Weald & Wessex basins	-	Excellent organic richness, but too shallow and thermally immature.
Much of N. England	-	Low and wrong sort of carbon (too woody).
Ireland	-	Respectable thermal history spoiled by a very poor organic content.
South Wales	-	Some source rocks have been overheated; complex structural system.
North Wales	-	Shales too clayey to fracture easily; variable organic content.
Scotland	-	Thin, shallow shales; carbon limited; complex geology; much faulting.
Offshore	-	Deep water fracking can be dismissed as being far too expensive.

- A few data-sparse locations survive as plausible prospects. These include deep rocks in parts of the Yorkshire, Lancashire & Cheshire basins, and in concealed sub-basins in the Midlands. Although of limited acreage and of unknown brittleness and permeability their rocks otherwise have good potential to generate hydrocarbons.

Aerial extent

- A basic difficulty is that even if fracking should be locally successful, it may well be too restricted to develop the all-important economies of scale.
- Arguably, fracking has to operate as a vast, super-efficient production-line within an intensively competitive environment so that costs can be driven down. The scale of the resource calls for thousands of wells for fracking to have any significant impact on the UK's energy requirement.

Surface disturbance

- It is found that surface disturbance would be much more extensive than previously indicated if fracking for shale-gas should be attempted in the UK.
- A surprisingly small estimate of just 20 Scottish fracking sites was adopted in a recent report by KPMG. In contrast geo-tectonic reasoning shows that hundreds of wells would be necessary in order to produce enough gas to form a meaningful Scottish industry.

2nd golden age

- The stark statistics revealed by the new study sharply diverge from pronouncements made throughout Scotland's last independence referendum, such as "*there can be little doubt that Scotland is moving into a second oil boom ... lasting for another century*".
- Regrettably no-one has subsequently been able to present any substantive geotechnical evidence for major additional fossil-fuel reserves anywhere in the UK.

To frack or not to frack in Scotland?

- If current hydrocarbon exploration in England turns out to be unsuccessful, or cost-effectively borderline, then that would provide the clearest of signals that a vibrant shale-gas industry is an extremely unlikely outcome for Scotland.
- The Holyrood government should maintain its moratorium and await developments in England.

Energy landscape

- A determined move towards greater use of renewable energy sources, particularly offshore wind and advanced solar energy technologies, is recommended instead of trusting to dwindling fossil-fuel reserves and possible fracking.

Data sources

- UK oil and gas production: www.ogauthority.co.uk/data-centre/data-downloads-and-publications/production-data/
- UK oil and gas reserves: www.ogauthority.co.uk/data-centre/data-downloads-and-publications/reserves-and-resources/
www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review-2017/bp-statistical-review-of-world-energy-2017-full-report.pdf
- US shale plays: US Energy Information Administration www.eia.gov/ ; U.S. Department of Energy / Office of Fossil Energy www.all-llc.com/ ; ALL Consulting www.all-llc.com/