Briefing notes for Scot. E3: Ineos and Fracking. July 2017.

Prior to the recent June general election it looked certain that a new Tory government would further ease the mineral planning regulations in order to 'liberalise' the exploration and extraction environment for prospective oil and/or gas shale fracturing activities. One particular beneficiary of such a move would have been the petrochemical giant ***Ineos*** *which over the past two years has continued to add considerable gas and oil infrastructure and gas onshore as well as offshore deposits to its Scottish monopoly portfolio.*

However, the subsequent hung parliament has put such legislative moves on hold, although despite prevailing unfavourable market conditions outlined below, Ineos continues to lobby hard with a Scottish government ever attuned to the interests of corporate power. ***Brian Parkin*** *explains.*

Does Ineos need onshore fracked gas?
Since its acquisition of the Grangemouth refinery and petrochemical plants in 2008, Ineos in addition to smashing union organisation at the plants, has also benefitted greatly from the largesse of the Westminster and Scottish governments. In December 2013 the company received at **£230 million** open-ended credit guarantee from the UK government backed up with a **£9 million** *grant* from the Scottish government for a new jetty and 60,000 Cu metre cryogenic storage facility at Grangemouth.

This development, completed in mid-2016 now allows Ineos to import **Liquefied Natural Gas (LNG)** from dedicated bulk carriers. For this purpose Ineos has commissioned a fleet of eight *Dragon class* LNG carriers each weighing in with a payload of **27,000 Cu metres.** These ships are currently the largest registered LNG bulk carriers in the world. The first Firth of Forth shipment was landed on 28th of September 2016 from the Ineos carrier *Ineos Intrepid,* which like the rest of the fleet has 'Shale Gas For Progress' emblazoned along its hull.

With some 300+ such crossings and off-loadings planned each year from what Ineos boasts to be a new 'Trans-Atlantic fracked gas pipeline', an annually delivered quantity of **8.1 million cubic metres** of LNG, far exceeds the Grangemouth ethylene requirement. However, there is the prospect that around half of this load could go to the Ineos Norwegian plant at **Rafnes**- but as Ineos has recently acquired BP's onshore infrastructure as well as in 2014 obtaining full extraction rights from the offshore **Breagh** fields (with an annual output from 4 production platforms representing 10% of the entire UK domestic gas demand)- as well as a further 16 exploration licences, it seems unlikely that Ineos requires further UK gas resources to meet its needs.

Dirty gas
For its US shale gas supply Ineos has struck a long-term contract with the (mainly) Pennsylvania based company **Range Resources** who own considerable extraction licence blocks in the northern Appalachian region of West Pennsylvania.

As in the UK, US legislation allows for a minimum of accountability for the degree of environmental responsibility as far as the disclosure of fracking chemical agents and site restoration are concerned. The fracked gas from the extraction platforms is transported via a £300 mile *Mariner East* dedicated pipeline to the *Marcus Hook* terminal near Philadelphia, and thereon via bulk carrier to Europe.

Yet however lenient US environmental legislation regarding the 'imperative' of shale gas extraction, it has not prevented Range Resources being fined from time to time for spillages and contamination. Indeed, last year the company was fined an almost record sum of **$4.15 million** for the pollution and contamination of woodland and natural water courses.

Shale gas galore?

In June 2013, the British Geological Survey in conjunction with the Oil and Gas Authority produced a third report on the status of shale gas reserves in the UK. The report identified the Hodder-Bowland measures in the carboniferous series which range intermittently from Sussex in the South through to the 'Midland Valley' (Central Belt) of Scotland.

Unlike in parts of the US, the shale gas bearing strata in the UK tend to be thin, discontinuous and highly faulted. And unlike in the US where the gas (the Total Organic Content- TOC) in the seams might be as high as 7%, the UK seams tend to a TOC of less than 3%. And also most gas bearing shales in the UK are deep at an average depth of more than 2km.

Also, unlike some shale gas resources in the US where rates of extraction can be as high as 40% of gas in place, most industry estimates for UK conditions put extraction levels as low as 10%. This means that at best, the UK shale gas resource is marginal compared with geological conditions obtaining in other regions. However, two factors have tended to over-rule these marked disadvantages. One is that as the UK government has ruled that shale gas extraction now constitutes a national energy security imperative, the negative economics case can be cancelled out through tax breaks and exploration and production subsidies.

The other factor is the technical possibility of enhancing the extraction of low yield measures by adding more energy, pumping pressure, more water and more chemical solvents to release the reluctant gas. Of course this adds negatively to the economics of extraction, but with a highly subsidised national energy security imperative, what the hell.

The Ineos gas empire

For its UK gas extraction operations, Ineos runs two separate operations. The aforesaid **Ineos Breagh** is a mainly offshore operation acquired from a fire sale disposal after a Russian owned N Sea operation was forced out of business following EU sanctions on Russia over the Ukraine crisis.

Ineos Shale, on the other hand is a UK onshore operation that oversees the company's now considerable licenced exploration and development blocks that now cover over 1.2 million acres of the UK- with something like 1,200 sq/km of that total in the Central Belt and the Solway areas of Scotland. At an initial stage Ineos hedged its bets through joint venture bids with other companies - initially Delta and then more recently with the French gas major **Engie**. However in March 2017 Engie withdrew from the deal, selling its share to Ineos for an undisclosed sum. This also coincided with Ineos Shale announcing over £1 billion to be set aside for its forthcoming UK operations.

In Scotland a Scottish government imposed embargo on shale gas fracking has been in place since late 2013, which has nevertheless not persuaded Ineos to relinquish its licensed blocks. Indeed the possession of a Petroleum Exploration and Development Licence (PEDL) still allows for a degree of surface geological survey work such as geo-technic and pulse exploration work used to prove TOC levels. And another factor that will have to be taken into account, the longer Ineos hangs on to its PEDL rights over swathes of open land there will be long-term planning blight associated with areas ear-marked in perpetuity for industrial exploitation.

However, in England and Wales where no moratorium exists, Ineos has quickly got to work at a site in North Derbyshire. At Eckington - a former mining village- a borehole to the depth of 2km began drilling on 6th January 2017. The company has stated that with positive - but commercially confidential borehole results - a fracking licence for extraction would be a formality. And there is every reason to expect that with a positive find in Derbyshire, Ineos would want to turn its attention to Scotland. Witness the effort it put into influencing the Scottish Government fracking consultation.

Market factors

According to *Oil and Gas Price Insider* in their Oil Price newsletter 14th July 2017 internationally traded natural gas prices were languishing at around $2.99 per unit (MMbtu's). At the same time it was reported that the biggest natural gas exporters - Russia and Iran - were both setting up massive supply and storage/pipeline projects throughout Eurasia as well as flooding the market with LNG in line with the world gas price.

In other words, the world energy markets are awash with cheap gas - and gas that is set to remain cheap well into the next decade. So much so that US shale gas producers, with far more favourable geological 'plays', are having to abandon or mothball reserves. This is in sharp contrast with the UK with significant unproven gas 'in place' but at TOC levels that by any reasonable standards are hopelessly uneconomic. Indeed in a recent report (Jan 2016) the International Energy Agency estimated that the world traded gas price would have to rise to $9.00 per unit for UK shale gas to break even.

In the world energy markets fossil fuels (oil, gas and natural gas) are pegged to the traded value of the calorific value of a barrel of oil. Due to the relative ease of storage and transport of oil and coal, the market for these fuels has been divided into 3 price bands. The first is the long-term contract price with a hedge premium for assurance of supply and quality of crude product. The second tier of the market is for short-medium duration contracts with a lower assurance premium. Large supply stocks, surpluses and speculation, drive the third market tier; this is the 'spot market'.

In May 2017 a large LNG carrier was ordered to turn around mid-way through the Panama Canal and redirect its cargo to a European port. For many energy analysts, this one event has been seen as the beginnings of a spot market in natural gas - and if the evidence with oil and gas is anything to go by, then such a development will only serve to act as a dampener on gas prices. It is within such a developing market environment that UK shale gas at $9 per unit will be expected to compete.

Finally

Whatever the economic inconsistencies of the case for UK shale gas, its future production would have to be measured by more than its market price. Tom Crotty of Ineos is quoted as saying that as much of Scotland's Central Belt has previously been extensively industrially exploited, its inhabitants will not feel uneasy with another period of environmental despoliation.

The crassness of such comments aside, the additional environmental downsides of shale gas fracking will be in the delay in Scotland developing a low or even zero carbon energy strategy and eschewing the regions massive and barely tapped renewable energy resources. That is a cost that Scotland can ill afford.