

# **Extractive Industries Sector Inquiry**

## **The Business, Innovation and Skills Committee**

This is an Engineering the Future response to the BIS Committee Extractive Industries Sector inquiry.

The development of this response has been led by:

- **The Royal Academy of Engineering**

The response has been written with the assistance of and endorsed by:

- The Energy Institute
- Engineering Council
- The Institution of Chemical Engineers
- The Welding Institute

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*Engineering the Future is a broad alliance of engineering institutions and bodies which represent the UK's 450,000 professional engineers.*

*We provide independent expert advice and promote understanding of the contribution that engineering makes to the economy, society and to the development and delivery of national policy.*

This evidence is submitted on behalf of the Engineering the Future (EtF) alliance. The development of this submission has been led by the Royal Academy of Engineering and is supported by The Energy Institute, The Engineering Council, The Institution of Chemical Engineering and The Welding Institute. EtF is a broad alliance of engineering institutions and bodies which represent the UK's 450,000 professional engineers. We provide independent expert advice and promote understanding of the contribution that engineering makes to the economy, society and to the development and delivery of national policy.

## **1. Executive Summary**

1.1 The UK is heralded globally as a leading centre for the extractive industries, including the provision of services (consulting, engineering, procurement, construction management), financial investment and trained professionals. The UK has a reputation of being tightly, yet appropriately, regulated.

1.2 The UK is not considered a major producer in its own right within the mining sector. For oil and gas the UK is not a major exporter but produces over 1.5 million barrels oil equivalent per day. The UK remains in the top 25 global producers of oil and gas, and within the top three for oil and gas production in the EU.<sup>1</sup>

1.3 Mining and oil and gas remain two of the UK's strongest sectors in terms of our international competitiveness. This is demonstrated by the proportion of the world's largest companies, in both sectors, that are UK quoted FTSE100 companies.

1.4 Additionally, the UK is regarded as an example of best practice in corporate governance and regulation for mining and oil and gas extraction. Increased regulation, or more prescriptive regulation, could subsequently limit the UK's influence in the sector.

1.5 Widely seen as a leader, the UK attracts both new and existing businesses as well as supporting international businesses. UK financial institutions are in a strong position to take on the growing number of UK-listed companies and are not considered to be at reputational risk.

1.6 Skills development and the adequacy of mining and petroleum engineering courses at higher education institutions (HEI) are a cause for concern. Camborne School of Mines at the University of Exeter is the only institution that offers an undergraduate degree in mining engineering. A small number of MSc and other postgraduate training (PGT) level courses are being relied on to meet the skills need. There are concerns about the supply of skills to specialist areas relevant to extraction including geomechanics and corrosion engineering. There is growing importance for education beyond the conventional HEI pathway and a need for collaborative research centres between major companies with UK universities.

1.7 There is an increasing demand for professionals with skills that blend technical and financial engineering with a business perspective. A skills base trained across these disciplines will be essential to retain the UK's competitiveness in the 21st century.

1.8 It is in the UK's interest to sustain its position as a leader in the extractive industries sector. This will involve continuing to train a competitive skills force; continuing to lead as a technical, financial and service centre; and to partner towards responsible mining (including energy extraction) in resource rich developing economies.

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<sup>1</sup> Oil and Gas UK (2013), Economic Report 2013, <http://www.oilandgasuk.co.uk/cmsfiles/modules/publications/pdfs/EC038.pdf>

1.9 This submission focuses on (and distinguishes between) the mining sector and oil and gas sector, unless otherwise stated. We note that the extractive industries sector covers a broad scope of industries such as the aggregates industry (for construction and building materials) which have been covered in less depth in this submission.

## **2. What is the contribution to the UK economy of extractive industries in the UK?**

2.1 The mining sector and oil and gas sector are central to the UK economy.

2.2 The UK delivers world class capabilities to the global mining sector, with four of the top five leading globally diversified mining companies listed in London. In 2012, UK-listed mining companies had a total market capitalisation of \$425 billion, more than any other financial market in the world<sup>2</sup>.

2.3 The UK oil and gas industry also significantly contributes to the UK economy. In 2012, UK production of oil and gas boosted the balance of payments by £32 billion, the industry paid £6.5 billion in corporation taxes and supported 450,000 UK jobs.<sup>2</sup> It has been predicted that in 2013 a record capital investment of £13.5 billion will be reached<sup>1</sup>.

2.4 The extractive industries also make a major contribution to the energy economy, through extraction of coal, conventional oil and gas and unconventional shale oil and shale gas. In addition, the aggregates industry for construction and building materials is a major contributor to UK plc, including companies such as Aggregate Industries, Tarmac-Lafarge and Hansons. This response is largely focused on the metal mining, mineral-related activities and oil and gas, unless stated otherwise.

## **3. How do UK based extractive industries support employment a) in the UK and b) for UK citizens overseas?**

3.1 British-trained engineers, natural scientists, lawyers, accountants and bankers are ubiquitous in the international mining and oil and gas sectors.

3.2 Active mining operations in the UK are essentially limited to the Boulby potash, Hatfield Colliery and Kellingley Colliery in Yorkshire, and Thoresby Colliery in Nottinghamshire. There are numerous open pit coal operations in the UK and kaolin mining in south west England. The North Sea oil fields remain a major strategic benefit for the economy.

3.4 In addition, there is a current project in development for the re-opening of a tungsten and tin mine in south west England. Owned by Wolf Minerals, an Australian-listed company, the finance needed for the construction phase has been raised and is planned to start shortly.

3.5 Within the oil and gas extraction industry, there is significant employment in Aberdeen with oil and gas service companies and suppliers spread widely across Glasgow, Edinburgh, Newcastle, Cheshire, North Wales, Norfolk, Reading, London and the Home Counties. In addition to supporting 450,000 UK jobs<sup>1</sup>, there are several tens of thousands of UK citizens working overseas in the oil and gas industry who remit significant wealth to the UK during their overseas employment, to support families and homes.

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<sup>2</sup> UK Trade & Investment (2013), UK – Delivering Global Mining Solutions, <http://www.ukti.gov.uk/download/file/534420.html>

3.6 Current conventional oil and gas extraction is a major employer and supports a skill base in the UK which provides individuals with well-paid employment, opportunities overseas and enables the UK to export services globally. The UK has many world-leading products and services. UK citizens are valued for their education and management skills throughout the oil industry internationally. Additionally, the United Kingdom Continental Shelf is recognised world-wide in the oil and gas industry as a highly innovative and professional area of operation.

**4. Does UK industry benefit more widely from the UK's position as a centre for extractive industries i.e. in sales of machinery and services to international businesses in the sector?**

4.1 The UK indeed benefits much more widely than is often realised by its position as a centre for the extractive industries.

4.2 The UK is not a major producer of extracted materials in its own right. This, however, is offset by its leading position in the training of the workforce, providing services and support to the extractive industries sector. The UK is a major seller and producer of mining machinery.

4.3 For the oil and gas industry, wider benefits include: employment (as noted in question two); world class companies locating their global business or regional headquarters in the UK (with overseas companies often locating their EU or EU/Africa or EU/Middle East headquarters in the UK); secondary supply chain benefits from having leading oil and gas project engineering design and project management activity located in the UK (often from overseas owned companies).

4.4 The UK provides a wide range of engineering and consulting services that have global experience in providing engineering, procurement and construction management services to the international mining and oil and gas production industries.

4.5 In addition, the UK provides specialist services in the field of rock mechanics, ventilation, vehicle scheduling, renewable energy, materials handling, tunnelling, renewable energy, desalination and pumping.

**5. Has the boom in London-listed extractive companies with businesses overseas over the last two decades resulted in a strengthening in the UK's competitive position in this sector?**

5.1 Mining and oil and gas remain two of the UK's strongest sectors in terms of our international competitiveness. This is demonstrated by the proportion of the world's largest companies in both sectors that are UK quoted FTSE100 companies. The FTSE 100 includes the following mining companies: Anglo American plc; Antofagasta plc; BHP Billiton; Eurasian; Fresnillo; Glencor Xstrata; Randgold Resources; Rio Tinto Group; Vedanta. The FTSE 100 includes the following oil and gas companies (producers, and equipment and services): BG Group; BP; Tullow Oil; Royal Dutch Shell plc; Randgold Resources; AMEC; Petrofac; Wood Group. All have either headquarters or major offices in the UK. The London Stock Exchange (LSE) and AIM (formerly Alternative Investment Market) has several hundred natural resource companies listed with assets all over the world.

5.2 In addition to providing direct employment of British professionals in relation to their projects, all UK-based or listed mineral and metal companies depend on UK local and accounting services for both listing requirements and statutory reporting. Professional

organisations such as the Institute of Materials, Minerals and Mining (IOM3), Institution of Chemical Engineers (IChemE), The Welding Institute (TWI) and the Energy Institute (EI) ensure that engineering standards are maintained through professional registration, accreditation programmes and corporate membership requirements.

5.3 Whether based in the UK or abroad, major and mid-tier metal and minerals holding companies are very comfortable with the financial services offered by investment banks based in the UK. Many have large natural resource teams, such as: Barclays Capital; BMO Capital Markets; BNP Paribas; Citibank; Commerzbank; Deutsche Bank; GMP Securities; HSBC; JP Morgan; Macquarie; Renaissance Capital; Societe Generale; West LB.

5.4 Toronto is the only other centre that compares to London in the range of services offered to natural resource companies. London is, however, considered the senior exchange for a primary listing reflecting the UK's strong position as one of the leading financial centres.

5.5 The UK has often struggled to get global mining corporates to undertake long term strategic partnerships within the UK as these companies have to be seen to be placing resource into their operational communities and countries. As a result, the UK's main role is around strategic talent creation for the national and wider markets and in leading innovation in research.

## **6. What are the corporate governance concerns raised by the number of extractive industries companies listed in the UK? Are there reputational risks for the UK and UK financial institutions in being a centre for such businesses?**

6.1 Recent events leading to a Serious Fraud Office (SFO) enquiry and a move to de-list a major mining company from the London Stock Exchange (LSE) clearly indicate that the UK takes corporate governance issues seriously. The Financial Conduct Authority (FCA) (formerly the Financial Services Authority) has also acted on alleged insider trading in natural resource shares.

6.2 The UK has some of the toughest anti-bribery legislation in the world (Bribery Act 2010). The listing and reporting requirements are designed according to international best corporate governance standards. If companies or their directors choose to break this legislation they are more likely to be discovered and prosecuted in the UK than almost anywhere else. The Act has a near-universal jurisdiction, allowing for the prosecution of an individual or company with links to the UK, regardless of where the crime occurred.

6.3 While its intentions are commendable, the practical implementation of the Bribery Act merits review to ensure UK companies are not being inappropriately disadvantaged. One area to review concerns the building of proper and appropriate relationships with overseas Joint Venture partners who are wholly or partly Government-owned subsidiaries (for example National Oil Companies). This is a globally widespread feature of the mining and oil and gas industries. Because the UK Bribery Act treats employees of such companies as Government officials, this places significant constraints on marketing, training and team-building activities designed to familiarise such prospective and actual overseas partners with the capabilities (and building relationships with the staff) of the UK companies involved.

6.4 London has a large pool of experienced professionals who are available to take up non-executive appointment on the Boards of metal and mining companies. Promoters hoping to raise funds in the UK understand that their boards of directors should include individuals who are respected by institutions that invest in an Initial Public Offering (IPO) or a rights issue. This ensures that, up to a point, the mining industry is self-regulating.

6.5 The UK's regulatory regime for the oil and gas industry (based around safety case etc.) is copied and considered very positively internationally. It is seen as leading the industry in all parts of the world where a purely prescriptive regime is understood to be limiting.

**7. Is there sufficient engagement between UK extractive industries and the NGO sector? Are there examples of best practice in engagement between the extractive industries and NGOs?**

7.1 Any major project that hopes to secure project finance from UK investment banks has to demonstrate that it is compliant with the Equator Principles.<sup>3</sup> A major project must also hold a social licence to operate in the country in which the mineral deposits are located. NGOs play a key role in ensuring that there is an independent perspective on the development of mining projects and there is a great deal of engagement with many NGOs – both in the environmental and in the socio-economic arena. Climate change, water, indigenous peoples, transparency, ethics, and socio-economic development are all areas for collaborative work with NGOs.

**8. Does the UK have the skills base to remain a centre for the extractive industries and to ensure that UK based businesses benefit from potential future opportunities such as shale gas?**

8.1 Several universities across the UK offer a range of courses in, or related to, mining engineering; however, the small number of courses in mining engineering at the HEI level is a cause for concern.

8.2 There are conversion courses<sup>4</sup> at Camborne School of Mines (CSM) at the University of Exeter, to produce mining engineers. CSM is the only institution that offers an undergraduate degree in mining engineering. At CSM there are over 100 undergraduates per year studying mining and applied and engineering geology, over 60 MSc students each year in similar subjects, and roughly 20 PhD students. This is a significant part of the UK's contribution to the mining sector related innovative R&D.

8.3 In today's market, the skills base is regarded to be just adequate. The fact that there is only one university (CSM at Exeter) providing undergraduate courses in mining engineering and a few more offering related MSc qualifications is a cause for concern. Furthermore, there is no doubt that there is a skills gap in specific areas relevant to extraction, specifically in geomechanics, that mining and oil companies are finding increasingly significant.

8.4 Skills gaps in mining engineering may be filled by postgraduate training (PGT) such as an MSc course. Funding for these courses is a concern, given the fee structure now in place for undergraduates.

8.5 However, most postgraduate courses on soil/rock mechanics are mainly aimed towards civil engineering. A shift of focus to cover other extractive industry issues would be also highly desirable in such courses.

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<sup>3</sup> The Equator Principles are a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The Equator Principles are closely aligned to the relevant International Finance Corporation (IFC) Performance Standards.

<sup>4</sup> A conversion course is a vocational postgraduate qualification usually taken by graduates wanting to change subject areas after their first degree and better prepare themselves for the job market.

8.6 To ensure that the UK remains a leading centre postgraduate courses must employ a cross-disciplinary approach to teach students about the technical, financial and business issues within the industry. The development of university course programmes with industry partners enables students to be more knowledgeable upon graduation.

8.7 For example, Imperial College London offers a range of MSc mining engineering courses graduating 160 students each year, including Metals and Energy Finance (MEF). The MEF course is offered jointly with Imperial College Business School, and teaches quantitative financial analysis, strategic management and technical geological concepts in the context of metals and energy projects. The course overlaps with other finance-related MSc courses and builds on Imperial College's relationship with the minerals and energy industries. Imperial College London also delivers a range of MSc programmes in the field of petroleum geosciences, geophysics and engineering.

8.8 With regard to oil and gas extraction, there remains a shortage of petroleum engineering graduates and of specialist engineers in particular in the fields of corrosion engineering which is offered by few institutions nationally. The University of Manchester Corrosion Control Engineering MSc course is outstanding in this respect. There are further petroleum-related MSc courses offered at Leeds, Edinburgh, Aberdeen, Dundee, London South Bank, Robert Gordon and Herriot-Watt universities.

8.9 There is a disappointingly low proportion of women in HEI engineering courses at graduate and post-graduate level. This is increasingly a competitive disadvantage, given the need to attract the best and brightest into engineering degrees, and subsequently into employment in these industries, in order to sustain the international success of our oil and gas and mining companies.

9.0 The importance of collaborative research centres between major companies (such as Schlumberger, Rio Tinto, BP) with UK universities must be highlighted. Such centres help to provide not only relevant research results but also support and deep insight into innovations being undertaken by the companies. This is over and above the more obvious role of training graduates. One such example is the newly opened National Structural Integrity Research Centre<sup>5</sup> (NSIRC) based at The Welding Institute (TWI) near Cambridge. Established to address the shortage of structural integrity engineers worldwide, the Centre is a unique collaboration between industry, research and technology organisation TWI, lead academic partner Brunel University, together with the University of Manchester and University of Cambridge. Its aims are to help advance research and development and the qualification of 500 engineers over the next ten years, offering industry-driven postgraduate degree programmes in structural integrity.

9.1 In regard to future opportunities, the UK potentially has the skills needed to address the extraction of shale gas, but this needs to grow in volume. The University of Birmingham is keen to support the hydraulic fracturing skill base.

9.2 It must be noted however that, even with the appropriate university courses available, graduates are also in high demand from the investment banking community; the new business development divisions of major mining and petroleum groups; and independent business analysis and consultancy groups focused on the mining, metals, power, energy, cables, fertilizer and chemical sectors.

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<sup>5</sup> NSIRC (2013), <http://www.nsirc.co.uk/>

## **10. What is the impact of the industry of the UK signing up to the EITI?**

10.1 The Extractive Industries Transparency Initiative (EITI) is but one of several forums involved in international mining industry activities. Forums include the International Council on Mining and Metals (ICMM) and its predecessor organisation the International Council on Metals and the Environment (ICME). This has involved, among other things, very active roles in the Global Mining Initiative, industry input to the Johannesburg World Summit on Sustainable Development, the World Bank's Extractive Industries Review, the International Finance Corporation (IFC) review of its safeguard policies and engagement with the banking sector on the Equator Principles<sup>3</sup>. All provide an entirely constructive means of communicating to society the key role that metals and energy have in sustaining growth and development both in the industrial countries and emerging economies.

10.2 The impact of the EITI is viewed as positive. Most of the major companies (in particular the members of the ICMM) are already signed up. It has been noted that there has been a lack of participation from some developing economies, such as South Africa and Brazil. Opposition viewed the EITI as a 'first world' imposition on the developing world. However, the relatively recent commitments by the US<sup>6</sup> and UK<sup>7</sup> will help extend the reach of this valuable voluntary initiative.

## **11. Would increased regulation for London listed extractives companies result in competition from elsewhere or can it be used to make the UK a centre of excellence for best practice and corporate governance?**

11.1 It is seen as unclear what areas for increased regulation would be considered. As highlighted above, London is already one of the most tightly regulated markets. Further tightening could result in less influence as companies move away (or at least new possible registrants decide to list elsewhere). The UK is already regarded as a centre of excellence for best practice and corporate governance, and widely seen as a leader.

11.2 The main criticism of the success the London Stock Exchange (LSE) had in attracting new mining listings was the proportion of the shares required to be floated freely. At 25% it is considered that too large a proportion of the shares are held by vested interests and this restricts the influence of the independent non-executive directors.

## **12. What is the competitive landscape for the extractive industries in the 21st Century and is it in the UK's interest to remain a global centre for them?**

12.1 Major changes in the international mining industry over the last decade have significantly increased the demand for professionals with skills that blend technical and financial engineering with a business perspective. The UK is already well-placed to participate in this activity as outlined in the UK Trade & Investment June review and the type of promotion provided through such initiatives provide very real support to maintain the profile of the large network of organisations involved in the extractive industries.

12.2 The World Bank, the EU, UK's Department for International Development and many other bilateral aid agencies are coming to the view that responsible mining can serve as a catalyst and driver for both economic and social development in resource rich developing economies. If we wish to see more global progress towards sustainable development, then the UK has a key role to play in working with the extractive sector as a Development Partner.

<sup>6</sup> US Department of the Interior (2011), U.S. Extractive Industries Transparency Initiative, <http://www.doi.gov/EITI/index.cfm>

<sup>7</sup> EITI (2013), France and United Kingdom commit to global transparency standard, <http://eiti.org/news/france-and-united-kingdom-commit-global-transparency-standard>



This is where the new competitive ground will be in the 21st century and UK can play a major role.

12.3 In regard to oil and gas extraction, the UK is not a global centre on the scale of Houston (USA), but it carries a lot of weight internationally. However, Aberdeen is seen as a global hub, primarily for offshore production. Internationally, OGP, BSI (through CEN and ISO) and the Energy Institute (EI) maintain industry standards. Good practice guidance documents produced by the EI are seen as leading the technical agenda in many areas, particularly on corrosion management, asset integrity, process safety and environmental critical elements. Organisations such as Oil and Gas UK and Subsea UK, as UK trade associations, represent the interests and sustainability of the offshore industry and support UK-based manufacturers and service providers. It is certainly in the UK's interest to remain a leading technical centre in oil and gas. TWI, as an independent Research and Technology Organisation (RTO), supports these industries with confidential single-client and joint industry projects to provide technology solutions that are applied worldwide. A significant amount of collaborative and pre-competitive research is also published in best-practice guidance, and TWI involvement in international committees and regulatory bodies draws on its extensive knowledge-base to inform standards and regulations for integrity of equipment and structures, and personnel competence assurance

12.4 We also flag that the UK metallurgical community is leading innovative research and development of secondary recovery methods, for example decrepitation of metal and rare earths from waste magnets and electronic materials. This is an area of strategic importance for long term sustainability of metals. This is reflected in training of graduates and postgraduates at specialist research centres in the UK (University of Birmingham) and will be important in taking the UK forward in the 21st century.

12.5 Not only are the mining and oil and gas sectors central to the UK economy, they are crucial to the world in terms of economic and social progress. As two of the UK's strongest sectors, the UK is in a position to remain central to the extractive industries sector and vice versa.