I am pleased to report that we continued to make progress within the onshore oil and gas sector throughout 2016. We maintained operation of 300 wells across the country safely and with due environmental care, producing enough oil and gas to heat a million homes, or fuel a million family cars. As we enter 2017, we have four shale gas exploration sites across the country with planning permissions and environmental consents and a number of others in the pipeline. We also saw some exciting flow test data in the Weald Basin.

In 2016, a number of the myths that have been perpetuated about the industry were debunked: the Committee on Climate Change report stated that if three tests were passed, the industry could make a useful contribution to the UK’s energy supplies, whilst meeting the carbon budgets, and we believe that these tests are met; an independent report by the ReFINE group indicated that decommissioned wells did not leak significant quantities of methane; and finally a number of independent reports for the Scottish Government put into context issues such as transport numbers, seismicity, health and decommissioning.

Our industry firmly believes in a balanced energy mix on both economic and environmental grounds. As a country, we have important decisions to make, particularly around heating and transport, where gas could make a significant direct impact be it through compressed natural gas vehicles or indirectly through the use of hydrogen through our gas pipes. All these future low or zero carbon options will take a source of gas to make them happen. It is therefore illogical to close down options purely based on ideological grounds. We will continue to make these arguments to those open minded enough to listen and I was pleased to welcome further support from the trade union movement through the Community Union, adding to our existing agreement with the GMB. More recently it was good to see after thoughtful consideration, guidance and advice from the Church of England.

As we start to discuss industrial strategy, I strongly believe that one of the key elements that needs to be addressed is the reversal of the UK’s growing energy import dependency. Over the last 15 years alone, the UK’s homegrown energy production has fallen by 57%. Shale gas, onshore oil, nuclear, renewables and offshore oil and gas will all have a part to play to make our country energy resilient once again. Those that advocate just one technology as a silver bullet are sorely misguided.

In 2015, we made a commitment to build an institution that would fill the skills gaps we forecast and during 2016 we were able to secure significant investment in the National College for Onshore Oil and Gas, which now stands ready to train the next generation of engineers. We also responded positively to the Government’s Shale Wealth Fund consultation and I was delighted to hear the new Prime Minister support the need to ensure local communities benefit from infrastructure where they live.

We don’t see this industry as merely providing a homegrown source of energy but direct benefits to communities, jobs and future skills. We acknowledge that some will not see it our way and we believe in their democratic and peaceful right to have their say. What we ask in return is that our disagreements are conducted without intimidation, violence or criminality towards our staff, contractors or sites. If you use those tactics it is clear you have lost the argument. I also believe the efforts of certain institutions would be more profitably guided towards helping the industries they support in practical activity. It has always surprised me the effort made to raise money which isn’t used to further low carbon activity but to stop other industries such as ourselves.

Ken Cronin
CEO of UKOOG
UKOOG is the representative body for the UK onshore oil and gas industry including exploration and production.

Vision
To create an industry that provides reliable, secure and affordable heating for homes, fuel for transport, power and feedstock for industry and good jobs by exploring for and producing natural gas and oil from Britain.

Mission
To lead the development of the UK-based onshore oil and gas industry and supply chain for the long term by producing large quantities of natural gas and oil with care for the environment and respect for local people.

Core Values
- A commitment to open and honest communication
- A commitment to best practice and best available techniques across the industry
- A commitment to ensuring local communities benefit from our industry
- A commitment to creating a UK based supply chain and skills base
- A commitment to disclosure

Objectives
- Enhance the profile of the whole onshore industry, both conventional and unconventional
- Promote better and more open dialogue with key stakeholders
- Deliver industry-wide initiatives and programmes
- Ensure the highest possible standards in safety, environmental management and operations

UKOOG is a membership organisation fully funded by its members. Full membership is open to all UK onshore licence holders and operators, and associate membership is open to all suppliers to the UK onshore oil and gas industry.

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2016
ReFINE report on emissions
IMechE well integrity report published
Industry granted permitted development rights for monitoring boreholes
Committee on Climate Change clears onshore production on climate grounds, subject to conditions
Shale Wealth Fund consultation announced
Successful HVHF appeal at Preston New Road, Lancashire
14th Licensing Round final awards completed
Judicial Review challenge against Kirby Misperton planning award rejected by the High Court
MoU with Community Union agreed
Scottish reports provide clear demonstration of case for lifting moratorium
Successful shale planning application at Springs Road, Nottinghamshire
First ethane from shale arrives at Grangemouth, preserving 10,000 jobs
2017

[Timeline with events]
In 2016, oil is one of the world’s most important sources of energy. Its products underpin modern society, mainly supplying the materials to drive industry, manufacture goods and provide fuel for vehicles and aeroplanes to carry goods and people all over the world.

In the UK, oil provides 98% of the fuel used in transport. Although electricity makes the headlines, Britain uses more than twice as much energy from oil as from electricity.

Oil also directly benefits our lives as it is vital to the production of many everyday essentials. Oil’s refined products are used to manufacture almost all chemical products, such as plastics, fertilisers, detergents, paints and even medicines, plus a whole host of other goods that you might not expect. Ink for pens, coatings for pills, contact lenses, cosmetics, non-stick pans, roofing tiles, road surfaces, computers and phones are all made with oil.

How oil is used in the UK

Britain consumes about 1.4 million barrels per day, almost none of which is used for electricity generation.

Production in the UK has fallen by nearly two thirds, and offshore production is forecast to continue to fall.

Britain’s growing oil import dependency

UK Oil Production UK Oil Demand

Million tonnes of oil equivalent

2000 2015 2030

60% demand met by imports

1/3 demand met by imports

Onshore oil production at scale could deliver major economic benefits. A recent report by EY projected that Kimmeridge Limestone oil production in the South of England could reach up to 330,000 barrels a day at peak production in the High scenario. By 2030, onshore oil could contribute about 27% of current UK consumption and this would represent oil that would no longer need to be imported. At an oil price of £40 a barrel, this would boost the UK’s balance of payments by £13 million each day, or nearly £5 billion a year.

The UK also has substantial onshore oil resources. The Weald basin in the South of England has been estimated to hold 124 billion barrels of oil in place, including 19.5 billion barrels in the Kimmeridge Limestone, which has seen successful initial flow-tests during 2016.

Onshore oil production could also contribute between £7.1 billion to gross value added (GVA) in the Low scenario and £52.6 billion to GVA in the High scenario, generating a peak of 8,000-49,000 jobs and paying taxes of £2.1-£18.1 billion over 20 years.

Road Transport (53%)

Air Transport (17%)

Chemical feedstock (10%)

Other (9%)

Industry (11%)

The Committee on Climate Change has confirmed that continued use of oil is compatible with the UK’s climate change commitments, stating that oil use only needs to fall slightly by 2030 to meet the fifth carbon budget. But relying increasingly on imports will have major costs for the UK economy. Based on a low oil price of £40 a barrel, Britain will be spending more than £11 billion a year importing oil by 2030, money that will not be supporting jobs or generating tax revenues in this country.

“In the UK, oil provides 98% of the energy used in transport. Although electricity makes the headlines, Britain uses more than twice as much energy from oil as from electricity.”
The aim of the Shale Wealth Fund is to ensure that the benefits of shale developments are shared by the communities and regions where operations take place.

The Government announced its intention to set up a Shale Wealth Fund in November 2015, and consulted on implementation in August 2016. The Fund will initially consist of up to 10% of tax revenues from shale gas production, up to a maximum of £10 million for each community. It will be in addition to business rates from shale pads and the industry’s community benefits scheme. It will also be additional to existing government funding.

The Fund will contribute directly to communities and more broadly to projects that will benefit regions where shale is developed. Two key principles have been emphasised – local communities will be the first to benefit and communities will be able to decide how a portion of the fund is spent.

Examples of how the money could be spent include:

- Improving access to public services where there is a specific local need;
- Contributing to the local economy by providing training, enhancing skills or improving infrastructure;
- Investing in the local natural environment;
- Providing funding for community groups and the development of community assets, such as libraries or sports facilities.

The Government will also consider making direct payments to households.

The Government’s Shale Wealth Fund is a very welcome complement to the industry’s community benefits scheme, which is detailed in UKOOG’s Community Engagement Charter. It means that local communities and local authorities will gain from:

- Industry community benefit payments;
- Business rates, which will be 100% retained by the local authority;
- The Shale Wealth Fund;
- Local jobs and contracts to supply goods and services from local companies.

Natural gas from shale could be developed in many parts of the UK, and it is right that communities hosting the industry should directly share the benefits of its development.

UKOOG and its operators are committed to working within local communities to provide support and opportunities to its residents. Alongside community benefits packages operators run a number of initiatives in local areas, a selection of which are highlighted below:

### Cuadrilla

In 2016, Cuadrilla Resources were the proud sponsors of the Young Engineers Competition in Lancashire for the fourth consecutive year, and will continue again in 2017. Creating new skills and jobs is one of the industry’s top priorities as we aim to meet the challenge of supplying cost effective, secure and safe energy for the future. There is a prize fund of £12,000 up for grabs to improve Science, Technology, Engineering and Maths (STEM) facilities within schools and foster the engineers of the future.

IGas awarded £4,000 for tools and equipment in 2016 for the “Growing Together” project which saw young people from the Gainsborough Academy school, under supervision of expert tradesman from the ACIS Group, building and maintaining raised allotment beds for elderly and disabled residents of two sheltered housing estates.

Third Energy has been a proud sponsor of Scarborough Athletic FC, a club run by the supporters trusts, since June 2012 and work with them to extend participation within the local community. Initiatives have included brokering reduced ticket prices for local apprentices; providing signed shirts and tickets as prizes for school fundraisers and making co-presentations with Club players and managers. Third Energy have supported the club during their extremely successful run over the last four years, rising from Step 9 in the English football league pyramid up to the Northern Premier League Division One (North), not to mention their appearance in the Final of the Northern Premier League Challenge Cup in April 2016.
Climate Change

Committee on Climate Change Assessment
The Infrastructure Act 2015 requires the Committee on Climate Change (CCC) to make periodic assessments of whether onshore oil and gas production is compatible with the UK’s carbon budgets. The first assessment was published in July 2016.

The report used several shale gas production scenarios. In the highest scenario, shale gas meets more than half the UK’s gas consumption in 2030. The report concluded that a high level of shale gas production would be compatible with the UK’s carbon budgets subject to three tests, which we believe are met.

**Tests**

Test 1: "Well development, production and decommissioning emissions must be strictly limited. Emissions must be tightly regulated and closely monitored in order to ensure rapid action to address leaks."

Test 2: "Gas consumption must remain in line with carbon budgets requirements... This means that UK shale gas production must displace imported gas rather than increasing domestic consumption."

We agree with this and note that under the higher shale gas production scenario and the lowest gas consumption scenario in the CCC report, the UK is still a net importer of gas. With North Sea production declining, there is considerable room for shale gas to replace imported gas.

It is important to note that gas imports can be up to 10% more harmful than the equivalent home grown source of gas due to the process of transportation. However, the impacts of this are not accounted for in UK carbon budgets, even though from a global point of view the environmental impact is less from homegrown sources.

Test 3: "Additional production emissions from shale gas wells will need to be offset through reductions elsewhere in the UK economy, such that the overall effort to reduce emissions is sufficient to meet carbon budgets."

The report states that with a high level of shale gas production, fugitive methane emissions would be around 11 million tonnes of CO2-equivalent per annum in 2030. This is around 3% of the annual average allowance in the Fifth Carbon Budget period (the Fifth Carbon Budget recommends a level of 1.75 Gt of CO2-equivalent for 2028-32, an average of 353 million tonnes a year). The Government has confirmed its commitment to meeting the Fifth Carbon Budget, and at up to 3% of the total, shale gas emissions can be accommodated.

The key issue here is that emissions from UK production of shale gas are included within the carbon budgets, whereas emissions from the production and transportation of imported gas are not. With lifecycle emissions from shale gas around 10% lower than from imported LNG, this bias against indigenous production in the carbon accounting rules needs to be addressed.

The Committee on Climate Change concluded: "If these conditions are met, then shale gas could make a useful contribution to UK energy supplies, including providing some energy security benefits."

Section of Test 1 | Action to date
---|---
"A range of technologies and techniques to limit methane emissions should be required, including ‘green completions’ (also known as ‘green completions’) and liquid unloading mitigation technologies (e.g. plunger lift system) should these be needed."

The Environment Agency (EA) has already stated that it considers green completions to be a ‘best available technique’. Best available techniques will evolve as the industry moves to production. The report recognises that the CCC’s view of the current UK situation does not include further techniques and technologies that are likely to be required by the EA. The industry will continue to work proactively with regulators to minimise fugitive emissions from our operations.

"A monitoring regime that catches potentially significant methane leaks early is essential in order to limit the impact of ‘super-emitters’.

Environmental permits will include the need to monitor emissions to air to demonstrate compliance with the permit. In addition, Section 50 of the Infrastructure Act 2015 states that hydraulic fracturing cannot take place unless appropriate arrangements have been made for monitoring emissions of methane into the air.

"Production should not be allowed in areas where it would entail significant CO2 emissions resulting from the change in land use (e.g. areas with deep peat soils)."

CO2 emissions resulting from a change in land use will be taken into account in the planning process.

"The regulatory regime must require proper decommissioning of wells at the end of their lives. It must also ensure that the liability for emissions at this stage rests with the producer."

It is the responsibility of the licence holder to decommission the well in accordance with regulations, and the Health and Safety Executive (HSE) will ensure that the well is properly decommissioned. In addition, the environmental permits can only be relinquished once the EA is satisfied that environmental risks are no longer present or are sufficiently low. Finally, provision for restoration may be required as a condition of the planning permission.

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Decarbonising natural gas
All the UK energy scenarios and forecasts see gas demand remaining roughly stable for the next 20 years. We therefore have a choice of whether to import that requirement or produce it ourselves. In the longer term, the UK’s heating needs to be decarbonised. At present, there are two clear choices:

1. **Electrify heating:** A recent report by Policy Exchange found that installing electric heat pumps in 80% of homes would require an additional 105 GW of electricity generating capacity, equivalent to more than 30 Hinkley Point C nuclear power stations. Much of this new electricity infrastructure would lie idle in the summer when heating is not needed. At the same time, consumers would face massive disruption, with entire central heating systems needing to be changed at a cost of £10,000 per household. Without major upgrades to power lines and distribution networks, the electricity grid would be unable to cope.

2. **Use the existing gas network:** Hydrogen could be transported using the existing gas distribution network, reducing disruption to consumers and meaning that winter peak demand could still be met. The major ‘H21’ project in Leeds has demonstrated that hydrogen could reduce carbon emissions from domestic heating and cooking by 73%. Hydrogen has the potential to reduce CO2 and air pollution from transport, and the most cost-effective way to produce hydrogen at scale is from natural gas with Carbon Capture and Storage (CCS). This method is already being used in North America, and the UK has more than 100 years of CO2 storage offshore.

There are of course options between these two pathways, but all of these future low or zero carbon options will need a source of gas to make them happen. We believe that for economic and environmental reasons, this should be gas produced in the UK, including from shale.
A DAY IN THE LIFE OF... THANKS TO OIL AND GAS

6.30am Wake-up call
- 84% of homes in the UK rely on natural gas central heating. That means when you venture out from under the duvet, the radiators keeping you warm and the hot water in the shower are there thanks to gas.
- Plus up to 80% of today’s cosmetics and toiletries from your showergel and shampoo to your perfume/aftershave and make up, are made from chemicals derived from oil and gas, including oils, waxes and dyes.

8am Head out
- Petrol, diesel and aeroplane fuel make up about 72% of petroleum consumption in the world, and gas accounts for 30% of Britain’s electricity, so whatever your mode of transport to work – car, bus, train or plane, oil and gas have played their part.
- In fact if you drive, you may be surprised at how much oil and gas is used in the rest of your car – and that includes electric cars. Car parts made from high-performance plastics have replaced heavier materials throughout the average vehicle, both inside and out, all helping to reduce weight, improve fuel economy and enhance safety.
- The tyres are made of synthetic rubber which is yet another product made from petrochemicals and even the nice colour of your car’s paint-job exists only thanks to oil and gas products – so the same applies if you cycle too.
- And don’t forget, once your car has been made, you still need something to drive it around on. There over 11 million miles of paved road in the world and tarmac is made from oil and gas.

9am At the desk
- Within those desk essentials, there are around nine litres of oil in the average casing of a computer and monitor and two litres in the keyboard plus around 40% of the materials for mobile phones come from oil and gas.

8.30am Sofa moment

9am Lunch
- From food preservatives, flavourings, and colourings and the fuel used to transport it all over the world, it’s hard to find food that hasn’t been touched by oil and gas in some way. Plus the fridge that keeps your lunchtime sandwich fresher for longer, needs oil and gas products to do what it does best. Tough, impact and corrosion-resistant plastics are used to make the fridge and very thin layers of plastic foam insulation are used to keep your food cool.

1pm Lunch
- 61% of homes in the UK use gas hobs to cook with and just under 30% also have gas ovens. That means that for a large proportion of the country – no gas would mean you would be having a raw and cold dinner and a grumpy family around the dining room table.
- In the UK, we rely on natural gas for 30% of our electricity demands – essential for that evening TV watching, playing games consoles or computers for homework – let alone our social media obsessions which are so reliant on broadband connectivity.
- Your average sofa contains 60 litres of oil

5.30pm The other day job routine begins
- 84% of homes in the UK rely on natural gas central heating. That means that for a large proportion of the country – no gas would mean you would be having a raw and cold dinner and a grumpy family around the dining room table.
- In the UK, we rely on natural gas for 30% of our electricity demands – essential for that evening TV watching, playing games consoles or computers for homework – let alone our social media obsessions which are so reliant on broadband connectivity.
- Your average sofa contains 60 litres of oil

10:30pm Time for bed
- Next time you dive into those fresh clean bedsheets, look on the back of almost all cleaning products and you will find a list of the chemicals and components that ensure the products keep your house and clothes clean, sterile or simply smelling nice.
Education

National College funding

In May, we were delighted to welcome the announcement by the then Skills Minister Nick Boles of the award of £5.6 million of capital funding for the National College for Onshore Oil and Gas (NCOOG).

The resources will be used to purchase a full suite of training equipment, enabling NCOOG to offer world-class technical and professional training and education at its headquarters in Blackpool and across its partners, and will also unlock industry equipment donations worth a further £2.25 million.

New HSSE training standard and course

In November 2016 it was announced that, together with OPITO, the skills and standards-setting organisation for the oil and gas industry, UKOOG and NCOOG had established:

- Health, Safety, Security and Environment (HSSE) training standard: A new onshore oil and gas HSSE training standard, for both a 1-day and 2-day course, certified by OPITO.
- HSSE course: A 1-day and 2-day HSSE course developed by Blackpool and The Fylde College on behalf of NCOOG and certified by OPITO, which is designed to meet the OPITO-approved training standard.
- Passport system: A ‘passport’ system for HSSE training, which allows operators to check whether site workers have taken the HSSE course, by recording attainment in OPITO’s Vantage database, which is also used offshore.

The training standard and course is designed to ensure that site workers understand the general HSSE context of the onshore oil and gas industry, the key safety and environmental measures, and how each individual must contribute to safety and good community relations through appropriate behaviour.

It is additional to existing relevant certifications. More details can be found in the UKOOG Health, Safety, Security and Environment Training and Induction Guideline here: http://www.ukoog.org.uk/images/ukoog/pdfs/HSSE_Training_and_Induction_Guide.pdf

See https://ourfuture.energy/ for more details.

Trade Unions

At UKOOG we believe that we need to build a broad alliance of organisations to ensure that we make progress on development in the right way.

This includes working for the benefit of local communities but also with other interested parties such as trade unions. We are open to discussions with all stakeholders.

In November 2016, UKOOG agreed a partnership with Community, the steel, iron and manufacturing industries trade union, to promote the importance of home-grown oil and gas and to protect British jobs.

A memorandum of understanding between the two organisations was signed to ensure that the country has access to reliable and secure supplies of home-grown oil and gas. UKOOG and Community agree that oil and gas produced in the UK will have a key role in securing future energy supplies, reducing the UK’s reliance on foreign imports, creating highly skilled jobs and helping Britain move to a low carbon energy future.

"The future development of home-grown oil and gas has the potential to support thousands of jobs through its supply chain, including in the steel industry, as long as it is part of a joined-up industrial strategy for the UK. We look forward to working with UKOOG as this vitally important industry continues to develop.”

Roy Rickhuss, General Secretary of Community – Nov 2016

"GMB will organise the gas workers in the industry and will work with the regulatory authorities to ensure health and safety and environmental issues are dealt with properly. The gas industry is a source of premium, highly skilled jobs."

Stuart Fegan, GMB National Officer for the Gas Industry – Oct 2016

Agreements with Community and the GMB Union all work towards helping build understanding amongst local communities and further bolster the strong safety and regulatory standards of the sector.

UKOOG is proud to be able to work closely with two of the country’s largest and most influential unions and will continue its work engaging bodies such as Community and the GMB Union in the coming year.

"Acknowledgements: We would like to thank the Glasgow Science Centre, and will also encourage young people to develop an interest in science, technology, engineering and maths (STEM) subjects to enable them to pursue rewarding and exciting careers within the energy sector.

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See https://ourfuture.energy/ for more details.

For further information please contact:

Nick Green, Director of Operations, UKOOG
Tel: 0113 386 5800
Email: info@ukoog.org.uk
requirement of UK practice as defined in the UKOOG baseline monitoring guidelines. The environmental regulators base all permitting decisions on the existing condition of the site, which is publicly available as a ‘Site Condition Schedule’. All activities are monitored to ensure no change from this schedule.

Key environmental pathways and receptors that may be affected by onshore oil and gas operations including soils, surface water and groundwater, ground gases, air, ecology, naturally occurring radioactive material and seismicity. Monitoring throughout the life of a project enables any potential hazard sources or pathways, directly attributable to a project, to be assessed as a potential precursor to health disorders.

For example, air pollutants can, in certain circumstances, present a potential risk to respiratory and cardiovascular health.

Continuous monitoring of emissions, measured from a robust baseline provides an effective means to not only attribute the potential impact from a specific activity and project to the wider environment, but should they come close to breaching the objectives set to protect health, then it is possible to intervene before there are any health impacts.

The protection of human and animal health is very important to the onshore oil and gas industry and so in November 2016, UKOOG launched guidelines for addressing public health in Environmental Impact Assessments.

Who regulates health?

The issue of health is examined in detail by several regulators, including the Local Mineral Planning Authority and the Environment Agency, as well as Public Health England (PHE).

As part of the regulatory process, the developer of a site must provide information to those regulators on any potential health issues that might arise from their plans. This is often through the development of an Environmental Impact Assessment (EIA) and the publication of an Environmental Statement or Environmental Report, in consultation with the local Director of Public Health.

The founding principle and purpose of EIA is to investigate potential environmental effects that may pose a risk to the environment and public health at an early development planning stage.

In addition, environmental permitting exists to regulate industrial processes to ensure that they operate within defined environmental standards and a raft of wider regulations set to protect health. These include how water is protected and how any wastes must be managed.

Developers are asked to look at all risks, the likelihood of that risk happening; whether that risk can be physically connected to a human or animal and how the impact of the risk can be reduced.

A risk might exist, but if it cannot be physically connected by a ‘pathway’ to a human or animal then there is no cause for concern.

Regulators actively reduce the impact of risks in many ways, including not allowing hazardous chemicals to be used, ensuring that they are properly stored on site and by ensuring there are robust monitoring arrangements in place.

**Environmental Monitoring and Health**

Much of the criticism of health and onshore oil and gas comes from US examples due to inadequate baseline data being taken.

This cannot apply in the UK, as robust environmental baseline and monitoring programmes are a formal requirement of UK practice as defined in the UKOOG baseline monitoring guidelines. The environmental regulators base all permitting decisions on the existing condition of the site, which is publicly available as a ‘Site Condition Schedule’. All activities are monitored to ensure no change from this schedule.

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**What do the experts say?**

*"Many of these social (and environmental) impacts can be mitigated if they are carefully considered at the planning application stage. Added to which there are already considerable legislative safeguards to ensure such impacts are not realised"*

Independent Panel of Experts for the Scottish Government, June 2014

*"An assessment of the currently available evidence indicates that the potential risks to public health from exposure to the emissions associated with shale gas extraction will be low if the operations are properly run and regulated"*

Public Health England, June 2014

*"PHE continues to review the literature to assess whether its conclusions and recommendations remain valid and to date this is the case."*

Public Health England report to North Yorkshire County Council Planning Committee, April 2016

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**Key**

- **Source**
- **Pathway**
- **Receptor**

When a hazardous substance or activity is present

A potential route for the hazardous substance or activity to come into contact with a receptor where it could cause harm

A person, population or environment where the hazardous substance could cause harm
Environment & Regulation

Ensuring the environment is protected from harm during oil and gas exploration, development and production is at the core of the onshore industries operational culture. 2016 saw the publication of two key documents.

Environment Agency - Onshore Oil & Gas Sector Guidance

In August 2016, the Environment Agency published sector guidance for the industry. This guidance set out clearly which environmental permits are needed for onshore oil and gas operations in England, providing direction on how existing environmental legislation applies and what operators need to do to comply. It explains the permits needed, both Standard Rules and where Bespoke can be used, and which Best Available Techniques (BAT) should be applied to meet regulatory requirements.

Future updates of the guidance will be embedded on GOV.UK, the Government’s website.

UKOOG’s High Volume Hydraulic Fracture Plan Guidance

In recognition of the importance of providing consistent and clear messaging for the industry and the public on how the sub-surface is managed, UKOOG developed guidelines for the development of High Volume Hydraulic Fracturing Plans in March 2016. This brings together the regulatory requirements of the GGA, the EA and the Secretary of State for Business, Energy and Industrial Strategy (BEIS) into one standard method for presenting the relevant information. This ensures that both regulators and public receive consistent messaging from us.

Permitted Development Rights for Monitoring

In order to protect the environment, in April 2016 the industry was granted the right ("permitted development") to drill boreholes to carry out the monitoring of groundwater, background seismicity and to locate old mine workings.

The rights enable operators to drill monitoring boreholes for up to 28 consecutive days, with equipment up to 15 metres high. The boreholes can then be used for monitoring purposes for up to 24 months for groundwater and up to 6 months for seismic and the appraisal of the condition of mines.

DCLG Funding for Shale Exploration – Support for Mineral Planning Authorities

Further to the Department for Communities and Local Government (DCLG) funded programme announced in the 2014 Autumn Statement, the Government made £800,000 available for 2016/17 to support Mineral Planning Authorities dealing with shale planning applications.

The fund supports the capability and capacity of Mineral Planning Authorities to deal with applications, with due process and a fair hearing, in an efficient and timely manner.

In addition, Mineral Planning Authorities can request complementary support from the Advisory Team for Large Applications (ATLAS) to help them with the development of their community engagement strategy. The Planning Advisory Service (PAS) is also supporting knowledge sharing, with PAS capturing learning from those Mineral Planning Authorities dealing with shale planning proposals and delivering Planning Committee training.

Seismic Acquisition

In summer 2016, the British Geological Survey (BGS) announced the launch of a National Geophysical Survey (NGS) to generate better data over a wider underground area. The overall aim of the NGS is to build better models based on freely available data across a number of industries that will help develop resources and manage and protect the environment. BGS has proposed that the Carboniferous basins of northern England would be chosen as the first survey areas. This would complement work already completed as part of the BGS/BEIS/oil industry offshore Palaeozoic part of the 21st Century Exploration Roadmap.

The first surveys will be undertaken during 2017.

“Further to the DCLG funded programme announced in the 2014 Autumn Statement, the Government made £800,000 available for 2016/17 to support Mineral Planning Authorities dealing with shale planning applications.”
In January 2015, the Scottish Government introduced a moratorium on certain onshore oil and gas activities until further research was completed and consultation with the general public had been undertaken.

The industry welcomed this approach. In Autumn of 2016 the Scottish Government published the research that it had commissioned on economic impact, review of decommissioning, transport impact, health impact, seismicity and climate change. UKOG believes that the research highlights no reason why shale gas extraction cannot be undertaken in Scotland in the current regulatory environment. We believe there are some important reasons why Scotland now needs to look at the onshore oil and gas sector.

Maintaining a source of gas to consumers

In Scotland, there are nearly 2m homes and over 22,000 commercial businesses that are connected to gas. 79% of domestic heating is provided by gas in Scotland and 43% of all gas consumed is by industry.

The UK Government estimates that without shale 80% of our gas will come from outside the UK by 2035.

Estimates show that Scotland could have 134.6 trillion cubic feet (tcf) of gas under its feet. To put this into context the annual demand for gas in Scotland in 2014 was 0.28 tcf.

“53% of people in Scotland agreed with the following statement: We should prioritise using gas produced in the UK, including shale gas produced by hydraulic fracturing, over energy imported from overseas.”

Gas Coalition, January 2016

New jobs

The independent report produced by KPMG for the Scottish Government in November 2016 stated that up to 3,100 jobs could be created in Scotland. This excludes any share of the estimated 64,000 jobs that could be created using Scottish expertise by a wider industry in the UK.

Other economic benefits

The independent report produced by KPMG for the Scottish Government in November 2016 stated that up to £6.5bn could be spent in Scotland with an additional £4bn created in tax receipts across the UK. This excludes the positive economic impact on other sectors, such as petrochemicals, of not having to import their raw materials and the impact of Scotland using its skills and resources to supply shale companies across the UK and Europe.

Sustaining current jobs

Currently most natural gas consumed by industry in Scotland is in Falkirk and Fife which is unsurprising given the manufacturing bases in both of those regions. Principal in this is the Grangemouth site which employs directly 1,300 people and indirectly up to 10,000. The requirement for gas at this site as a feedstock used to make chemicals and also as an energy source is one of the largest in Scotland.

"Tightly regulated domestic production would therefore reduce the risk that the greenhouse gas footprint of gas supply is high and would also provide greater control over the level of such emissions."

Independent report for Scottish Government by the Committee on Climate Change, November 2016

Shale Gas to Grangemouth

On the 27th of September 2016, the first shipment of US shale gas to be delivered to the UK arrived in the Firth of Forth destined for the Grangemouth petrochemicals plant owned by INEOS.

The brand-new Dragon-class tanker, carrying 27,500 cubic metres of ethane, was the very first time that US shale gas has ever been exported to the UK and provides both Scottish and British industry as a whole the chance to benefit from US shale gas economics which did so much to revitalise manufacturing on the other side of the Atlantic.

“The first tanker carrying US shale derived ethane arriving today at Grangemouth will herald a renaissance for the Grangemouth site, the protection of jobs and a boost to the Scottish economy. We can and should be allowed to develop our own shale creating even more value for our economy and environment.”

Ken Cronin, CEO UKOG
Visual Impact

At the end of 2016, UKOOG developed a White Paper called “Developing Shale Gas and Maintaining the Beauty of the British Countryside”.

The paper, along with a video demonstrating the low impact of potential shale development in the UK, demonstrated that approximately 400 well pads, each the size of two football pitches, developed across the UK between 2020 and 2035 could reduce the UK's gas import dependency by 50%.

This compares to 88,000 electricity pylons, 9,000 municipal waste treatment facilities and 5,300 individual wind turbines already in existence.

There is no single model that will cover all licence areas in the UK as the geology will be different and much more will be understood once the industry has completed its exploration phase. The report looks at what considerations an operator goes through in choosing a site and, as an illustration, a typical example from the US is used of a 10 well site, or pad. Based on that model there could be between seven and eleven pads of two hectares each in a typical 10km by 10km licence block, taking up 0.2% of land in the block. Each pad would have around 10 wellheads leading to 10 horizontal wells extending underground between 1.5 km and 2.5 km at a depth of around 2,400 metres (approx. 8,000 ft). Temporary drilling rigs, which are on site for a matter of weeks, will be between 24m (80ft) and 53m (175ft), similar in height to an electricity pylon but smaller than a wind turbine. During gas production, the wellhead would only be around 2m (6.5 ft).

This study shows how shale gas can be developed in the UK while preserving the natural beauty of the British countryside. The oil and gas industry has operated onshore for over a century, drilling over 2,000 wells, yet few people would know we are there.

Notes

Disclaimer: Whilst every effort has been made to ensure the accuracy of data contained in this report, no representation or warranty as to the accuracy of any information set out or as to the potential for achievement or reasonableness of any forecasts, projections, prospects or returns is made.