

1. Annexes

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1.1 Method

Information on the method can be found in the introduction to the main report. More detailed information on the sample design, recruitment methods, and how stimulus was developed is included below.

Sample design

The locations for the workshops were chosen in order to capture a breadth of populations: exhibiting a range of urban and rural characteristics and providing a broad geographic as well as socio-economic spread across the country. A spread of types of home ownership was seen as a key factor in communication. All three areas were sites of conventional oil and gas sites. Liverpool and Winchester were sites of potential unconventional oil and gas sites (though no licences have been granted in Winchester), while Northampton was chosen as a 'control' area (where there is no prospect of licensing) to serve as a comparison group. All three locations were chosen on the basis that no public engagement was known to be occurring in or near the areas. The sample design was agreed by TNS BMRB, DECC and the Oversight Group. Participants were recruited by quota, aiming to be locally representative of the local population across the following variables: age, gender, ethnicity, SEG, urban/rural location, and type of housing (whether in privately owned, rented, or social housing). The agreed sample is shown below:

Area	SEG (socio-economic grade) breakdown	Urban/ rural split	Age groups	Gender
Liverpool: 24 people	AB: 4 C1C2: 12 DE: 8	All urban	18-34: 9 35-54: 8 55+: 7	M: 12 F: 12
Winchester: 24 people	AB: 7 C1C2: 11 DE: 3	Urban: 12 Rural: 12	18-34: 6 35-54: 9 55+: 9	M: 12 F: 12
Northampton: 24 people	AB: 5 C1C2: 12 DE: 7	Urban: 16 Rural: 8	18-34: 10 35-54: 8 55+: 6	M: 12 F: 12

Recruitment

Recruitment was managed by TNS BMRB's in-house team of qualitative recruitment specialists. Participants were recruited using free-find methods ('on the street' recruitment) – eligibility for participation was determined via a short screening questionnaire (Annex 1.2), developed in agreement with DECC. Participants were offered an incentive of total £160 to participate, being given £60 at the end of the first workshop and £100 after the second.

Methodology

The deliberative events took place in Northampton, Liverpool and Winchester. At the deliberative events, participants were divided into three sub-groups, whose discussions were recorded and transcribed. These transcripts were then analysed using a matrix mapping technique. This robust analysis method allows researchers to draw out the diversity of opinions as well as identify common themes across interviews. Following a researcher brainstorm, an analytical matrix was produced based on the emerging themes and research objectives. Perceptions of shale gas and oil and of different models of public engagement were then mapped onto the matrix for each discussion group to provide granular analysis of individual interviews, and to facilitate thematic comparisons between groups. A sample of a completed matrix map (for two groups) is shown below, for illustrative purposes:

Moderator	Unprompted views on shale gas				Rapid ranking exercise: results	Rapid ranking exercise: discussion/ debate
	Perceived awareness / knowledge of shale gas	Unprompted attitudes to shale gas	Source of info/ awareness - where seen/ discussed			
Dan	<p>Awareness mixed - some claim to have never heard of shale gas before, whilst others make associations with protests, earthquakes, pollution and 'fracking'.</p> <p>"Nothing. No. I've heard nothing." (m, p.14)</p> <p>"Just relate it to protestors coming in and sort of obviously stopping all the work being done." (f, p.16)</p> <p>"Fracking is how I know it better." (f, p.14)</p> <p>Knowledge poor - tend to hear more about conventional oil and gas, coal, and nuclear energy in the media.</p> <p>Confusion over extraction processes.</p> <p>"Correct me if I'm wrong but it's a big sort of mechanic arm, or something, that hammers into the ground... until it reaches the supply in the... earth... and then it pumps it out." (m, p.17)</p>	<p>Attitudes mixed - positives = job creation and potential self-sufficiency / negatives = earthquakes, pollution and non-renewable energy.</p> <p>"I've heard that it creates jobs." (f, p.16)</p> <p>"I know that they want to bring it in so that we can produce energy for ourselves." (f, p.16)</p> <p>"It causes some earthquakes." (f, p.14)</p> <p>"I've heard that there could be pollution." (f, p.16)</p> <p>Pros and cons very much unknown.</p> <p>One respondent believes that there could be a spin to make it more attractive than it actually is.</p> <p>"So maybe there's some spin on it to make it look a bit more attractive as</p>	<p>TV news is the main source of info - followed by radio.</p> <p>"It's only because it's mentioned on the news about the fracking, and the company behind it." (m, p.15)</p> <p>Many respondents raise hesitations over single sources of info.</p> <p>"I try not to rely on a single source because I'm very aware that the news is highly controlled, and in a way, it's a propaganda tool. So, I try to obtain information from different sources and try to collate them together and create my own [opinion]." (m, p.18)</p> <p>"The problem is renewable sources aren't necessarily given the most media attention. I think it more focuses on sort of the oil, the gas and the coal aspects of things... I personally believe that solar energy, wind energy and tidal energy should... have more media attention</p>		<p>Low risk: using detergents; eating GM food.</p> <p>Medium risk: living close to electricity pylons; living on a fault line; buying a house near a fracking site.</p> <p>High risk: living near to a nuclear station; driving on the motorway; buying a house on a flood plain.</p>	<p>Living near to a nuclear station presumably less risky in the UK (unlike Japan where tsunamis).</p> <p>"It's like in Japan where they've had the... tsunami... living near a nuclear power plant... it's a massive risk because you're right on the coast. But here, in land, the weather is much more favourable." (m, p.20)</p> <p>Some respondents find it "unfair" to rank as don't feel informed enough.</p> <p>"The thing is, it's not fair because we don't know enough about this to put it in a fair place." (f, p.21)</p>
AO	<p>Limited awareness/knowledge about shale gas; knew it had been on the news a lot recently but not knowledgeable of details; associate it with particular areas "I've heard it's up north" "Somewhere in Sussex isn't it?" and negative reactions to fracking e.g. demonstrations. "I don't know much about it but what I have heard is negative." Vague awareness (among some) of process/ negative aspects associated "Do they sort of crack open the ground to extract the gas? Sort of create mini earthquakes and things like that?" but little else. One had heard it started in America and landowners were making money from it. Level of awareness, knowledge not dissimilar to other energy types, but less knowledge because shale gas newer and some had personal experience</p>	<p>Limited views on shale gas (unprompted) due to lack of knowledge. Neither positive nor negative: some feel it could help reduce reliance on other countries (driven by surprise from energy mix stim of amount imported currently); could be a good idea, but don't know what the dangers are. Highlight that it's hard to tell with the media, want to know facts. "If you've got reserves underneath your feet here, why not explore it... [other resp: "Unless it's dangerous... that's the thing you want to know more... to know are there any dangers, what's the risk?"]</p> <p>General lack of understanding "I've looked at fracking diagrams on the BBC website that explain it and I couldn't tell you a thing about it. I've looked at it and it's just gone"</p>	<p>Awareness/knowledge of other energy types from local knowledge of e.g. oil refineries; people knocking on doors (seeing solar panels)</p> <p>Main source of info/ awareness for shale gas = news. One resp. had friend who was against it because they were proposing to track in her local area. Not a subject discussed with others generally however.</p>	<p>Fracking</p> <p>Driving on motorway</p> <p>Living nr nuclear plant / living near pylons</p> <p>Living on floodplain</p> <p>Using household chemicals</p> <p>Eating GM food</p>	<p>Mainly agreement among group, some disagreement where personal experience came into play (e.g. pylons, one resp. had friend who live by pylon and thought it was safe because of this, others more concerned about health risks); and roads - some debate about motorways ("I used to work in Bracknell and every day I would get stuck in traffic because there'd be a nine car pile up or something. So I would say every time you're on the motorway you're putting yourself at risk" vs "I drive on the motorway a lot, there's a lot of immediate danger there but I guess I've just driven on them so much I just think I feel safe because know that I'm a competent driver.")</p> <p>Distinguished different levels of danger - perceived living on</p>	

Dr. Jason Chilvers, project advisor, conducted a peer review of the wave 2 completed matrix charts, as well as early analysis and reporting. A draft report was written and circulated to the Oversight Group, before the final report was published.

1.1.1 Screener questionnaire

“Good morning/afternoon, I’m from TNS BMRB, an independent research organisation. We have been asked to carry out research exploring people’s views about potential options for future energy sources. The research is on behalf of the Department for Energy and Climate Change, which is the government department responsible for setting energy policy and taking action on climate change. We were wondering if you would be interested in taking part.”

Please understand that
 The research is totally confidential.
 TNS BMRB is completely independent of DECC
 TNS BMRB will not be giving DECC any details of respondents that could be traced back to them or their families and they do not know who TNS BMRB are contacting.

- Advertising 1*
- Market Research 2*
- Marketing 3*
- Journalism 4*
- Public Relations 5*
- Lobbying or campaign group 6*
- Local, regional or national politics 7*
- Energy industry 8*
- Employees of Local Authorities/Central Government 9*
 (especially those involved in planning or other decision-making roles)

Q2 What age were you at your last birthday?

- 18-34 1
- 35-54 2
- 55+ 3

Q3 Note sex of respondent [DO NOT ASK]

- Male 1
- Female 2

NOTE the need for equal number of males and females in each group

Q4 How would you describe your ethnicity?
[DO NOT read out – just code as appropriate]

White

White British	1
White Irish	2
White Any other white background (specify)	3
Mixed	
White and Black Caribbean	4
White and Asian	5
Any other mixed background	6
Asian or Asian British	
Asian – Indian	7
Asian – Pakistani	8
Asian – Bangladeshi	9
Asian – Other (specify)	10
Black or Black British	
Black – Caribbean	11
Black – African	12
Black – Other (specify)	13
Chinese or other ethnic group	
Chinese	14
Any other ethnic background (specify)	15

Q5 How would you describe your environmental views?

Actively involved in environmental campaigns	1
Very environmentally conscious (recycle etc.)	2
Some concern about the environment	3
No concern about the environment	4
Neutral/no strong opinion	5

Q6 What is the occupation of the chief income earner in your household?

PROBE FULLY
WRITE IN, AND CODE BELOW _____

AB	1
C1C2	2
DE	3

Q7 How would you describe the area you live?

Urban	1
Rural	2

Q8 Which of the following best describes your current situation?

Rent from housing association / local authority	1
Rent from a private landlord	2
Owner occupier (owned outright)	3
Owner occupier (with mortgage)	4
Live with friends / parents	5
Other	6

ELIGIBILITY

E.1 Have you ever taken part in a questionnaire survey, interview or discussion before?

Yes 1

No 2

E.2 In the last **5 years** how many group discussions or interviews have you taken part in?

None 1

1 – 6 2

7 or more 3

E.3 How many group discussions or interviews have you attended in **the last 6 months**?

None 1

1 or more 2

E.4 Thinking about all the times you’ve taken part in a survey or discussion group, what were the subjects you were asked about?

(WRITE IN)

CHECK QUOTA, RECRUIT AND GO TO NEXT SECTION:

We would like to invite you to take part in two daytime group workshops. The discussions will be confidential, by which we mean anonymous, and you will receive **[£60 for the first workshop, and £100 for the second]** from TNS BMRB to thank you for your time. We won’t be testing your knowledge, simply asking for your opinion about energy related issues.

The discussions will each **last from 10am to 4pm** and there may be a few people from the Department for Energy and Climate Change there to answer questions and be on hand to talk about the issues under consideration.

Would you be willing to take part? Yes 1

No 2

If no, give reason.....

If YES, please ask respondent if they need glasses for reading, and if so, ask them to **have their glasses close by during the group discussion**

RECONTACT QUESTION

Q Thank you for taking part in this research. There may be occasions in the future where we would like to contact you again about this research on behalf of the Department for Energy and Climate Change, for instance for evaluation purposes. Would you be happy for us to do this?

Yes 1

No 2

THANK AND CLOSE

1.1.2 How stimulus was developed

Various stimulus materials were used in the workshops, including presentations (including audio/video clips), printed handouts, activity cards, and a range of reference materials. The majority of the information presented in the stimulus was based on materials already in the public domain, with the addition of stakeholder comments (for example, see annex 1.3.7). The materials were developed and reviewed by TNS BMRB in conjunction with DECC, the Oversight Group and other stakeholders, in the following process:

Wave 1:

- TNS BMRB reviewed DECC fact sheets¹; converted into deliberative material and sent to Oversight Group with suggestions of where the gaps in viewpoints were (including suggested additional wider stakeholders to fill gaps²)
- Oversight Group reviewed material; provided missing information, where they were able, and agreed/suggested wider stakeholders who could provide remaining information
- TNS BMRB reviewed Oversight Group (second set) material and converted to deliberative material
- TNS BMRB generated and agreed a sample of seven stakeholders, including 2 academic scientists, Non-Governmental Organisations (Greenpeace, National Farmers' Union, The Wildlife Trust), industry representatives and a planning officer.
- The sample was peer reviewed by Dr. Jason Chilvers, project advisor.
- TNS BMRB undertook 10-15 minute telephone interviews with these stakeholders to explore their understanding of UGO development, and views on benefits and disadvantages to both proximate communities, and the wider UK public. They were asked to comment on the subjects they held relevant information/opinion on; which was converted into deliberative material
- Oversight Group and project advisor reviewed all stimulus material before DECC provided final sign off
- The Northampton workshops acted as 'pilots' to the subsequent two locations, as materials, presentations timings were slightly adjusted in Liverpool and Winchester. Please note all materials included in the annex are these 'final' versions.

Wave 2:

- TNS BMRB reviewed the 'regulatory process' material³ from DECC; converted into deliberative material and sent to Oversight Group with suggestions of where the gaps in viewpoints were (including suggested additional wider stakeholders to fill gaps)
- Oversight Group reviewed material and provided missing information where they were able
- TNS BMRB reviewed Oversight Group (second set) material and converted to deliberative material
- TNS BMRB generated and agreed a sample of four stakeholders and undertook 10-15 minute telephone interviews with them. Stakeholders included an Environment Agency

¹ <https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking>

² For example, the Oversight Group lacked scientists – geologists, engineers – who could help with the technical information; and other interest groups with different knowledge and perspectives

³ <https://www.gov.uk/government/publications/regulatory-roadmap-onshore-oil-and-gas-exploration-in-the-uk-regulation-and-best-practice>

representative, an industry representative, a parish councillor and a planning officer. The stakeholders were asked to comment on the subjects they held relevant information/opinion on; then converted this into deliberative material too

- Oversight group and project advisor reviewed all stimulus material before DECC provided final sign off
- As in wave 1, the Northampton workshop acted as a 'pilots' to the subsequent two locations, as materials, presentations timings were slightly adjusted in Liverpool and Winchester.

1.2 Limitations of the methodology

Dialogue scope and design: The findings on models of engagement were shaped by the particular design, format and setting of the deliberative process that participants found themselves in. This section addresses the context in which the dialogues were designed, and the resultant limitations of the findings.

The specific objectives of the dialogue focused on informing local engagement plans for local authorities, operators and others to use, with feasibility considerations based on the current policy and regulatory context. This narrowed the scope of plans for engagement to existing governance and regulatory arrangements (though gaps in confidence in regulation were explored, the engagement approaches had to be feasible in the present setting). The level and timeframe of engagement was also more strongly focused on local areas subject to operators' applications, rather than longer term and national level engagement.

These objectives, as well as the amount of time available in workshops, meant that it was beyond the scope of the project to discuss in depth the full breadth of issues relating to shale gas development and public engagement. A balance had to be struck around the information presented and the extent to which they could be pursued in discussion. Some of the suggestions made by Dr. Jason Chilvers, the project advisor, were therefore not taken up in the dialogue design.

There was also a need to delimit the stakeholder perspectives included in stimulus materials – participants often commented that they would like to know the views of protesters of fracking developments, though these sources were not included in materials. In addition, given the need to focus on public engagement and to develop workable models in the report, much of the broader discussion in the workshops (including in-depth detail around risks, mitigations, climate change and energy futures) has not been fully developed in the report.

Sample of participants: Given that participants spoke from a layperson's perspective on engagement, while they were able make suggestions for the experience and provision they would like to see, they could not comment in detail on the particular mechanisms required to implement this. For example, as outlined in the report, participants lacked awareness of alternative, or non-traditional public engagement activities, and notably could not ask for things they did not know existed. In this context, findings should be viewed as indicative rather than providing definitive answers. The study provides a starting point for future planning and further research in this area, rather than a blueprint. Practitioners are invited to

think broadly about engagement activities that meet the stated needs of participants, and fulfil the principles of engagement outlined in the report.

Limitations of the models: the findings are therefore subject to key limitations:

- They make assumptions about the governance system in place (as at present)
- They do not address wider concerns that participants raised, and may constitute conditions of acceptability for shale gas and oil development. Though the models of engagement go some way to address concerns, they may not be effective in responding to these wider concerns on the rationale for shale (affordability, sustainability and security) or at the local level, in relation to risks and benefits.
- They were generated in a hypothetical setting by tasked participants. This is unlikely to accurately reflect the reality of local public responses to a notification of operators' plans.

1.3 Wave 1 stimulus

1.3.1 Discussion guide

Purpose of workshop 1: to explore views on shale gas / fracking; to provide participants with information about shale gas / fracking in order to help inform discussion about engagement in Wave 2

Timings	Content	Stimulus needed
9.30-10am	Arrival and registration	
10	<p>Welcome (plenary) <i>Purpose: To introduce format for day and purpose of workshops</i> TNS BMRB Introduction</p> <ul style="list-style-type: none"> • Housekeeping • Ground rules • Purpose of workshop (to include what we are as well as what we are not setting out to do) • Role of different parties <p>DECC introduction Introduce 'issues' board</p>	Introduction presentation
10.10	<p>Energy discussion (break out) <i>Purpose: To get top of mind thoughts on energy use and energy sources to provide context for later discussion; to understand unprompted levels and sources of awareness and knowledge of shale gas and benchmark (qualitatively) attitudes to shale gas / fracking</i></p> <p>Group introductions and ice breaker – what energy have you used so far this morning?</p>	
10.15	<p>Broad discussion around energy and people's concerns</p> <ul style="list-style-type: none"> • What does energy mean to you? <ul style="list-style-type: none"> ○ How interesting is energy to you? ○ How important is it to you? • What do we use energy for? • Where does energy come from? • What do you see as the main challenges when it comes to thinking about energy? <ul style="list-style-type: none"> ○ For you ○ For society • What, if any, are your main concerns about energy? • In an ideal world, what would you like have happened with regards to energy in 30 years' time? 	

10.35	<ul style="list-style-type: none"> • What proportion of the energy mix do you think gas makes up at the moment? And what proportion of energy use do you think is for domestic use (compared to transport or industry)? • <i>Show diagrams showing different types of energy and how they are used</i> • Anything new / surprising? How do these figures compare to what you had expected (previous question)? • Anything unclear • <i>Moderator to make sure that participants clearly understand energy spread across electricity / heat / transport – and fact that overall proportions are unlikely to change significantly in the future</i> <p>Introducing shale gas</p> <ul style="list-style-type: none"> • What have you heard about shale gas? • To what extent is shale gas important in meeting the energy challenges discussed earlier? <ul style="list-style-type: none"> ◦ How does it compare to other types of energy? • How much would you say you know about shale gas? <ul style="list-style-type: none"> ◦ Which types of energy do you feel most / least informed about? ◦ How does your knowledge about shale gas compare with your knowledge about other types of energy? Why? • (Briefly) Where have you heard information from? PROMPT around: <ul style="list-style-type: none"> ◦ Media – which sources? ◦ Friends / family – is this something you’ve ever discussed? Why / why not? ◦ Other sources of information? 	2 x diagrams illustrating energy sources and uses and future scenarios (Annex 1.4.5)
10.50	<p>Perceptions of risk (break out) Purpose: <i>To explore perceptions of risk to understand where consumers need more / less reassurance / information; to provide information on potential risks relating to fracking and regulation in place to mitigate against risk</i></p> <ul style="list-style-type: none"> • Rapid risk grouping exercise – split group into two (2 x 4 participants) - participants asked to group images by the risk to them as individuals into high, medium and low <ul style="list-style-type: none"> ◦ Explore rationale for groupings ◦ Any differences in options within the group? ◦ What’s driving perceived risk / lack of risk in different scenarios • What do you see as the main risks in relation to fracking? <ul style="list-style-type: none"> ◦ Explore reasons for views ◦ Where perceptions/ information comes from 	Risk images with labels e.g. buying a house on a flood plain, buying a house near a fracking site, driving on the motorway, living close to a nuclear station, living close to electricity pylons, living on a fault line, using detergents, eating GM food etc.
11.10	Break	
11.25	<p>Introduction to shale gas (plenary) Purpose: <i>To provide an overview of top level information on shale gas, including the regulatory framework</i> Presentation on shale gas – with accompanying handouts</p> <p>Lead moderator to explain: - that there are other perspectives to come (stakeholder views) - will be covering risks later on</p>	Slide presentation & Participant hand-outs (Annex 1.3.6 and 1.3.7)

	<p>DECC REPRESENTATIVE PRESENTS SLIDES – explaining there will be a Q+A later in the morning.</p> <p><i>Researcher: introduce handouts to participants. Explain these include stakeholder additions to the presentation, reiterating that these have been included to present a balance of different opinions on the issues.</i></p>	
11.50	<p>Thoughts and questions on shale gas (break out) Purpose: <i>To gauge response to introductory information and understand impact on views on shale gas and questions it raises</i></p> <ul style="list-style-type: none"> • What are your thoughts on what you just heard? <ul style="list-style-type: none"> ○ Views on video clips as a way of presenting information • What is new? • What is surprising? • What (if any) concerns do you have? • What do you require further information about? <p><i>Moderator work through the stakeholder additions, reading them out and signposting participants to review them</i></p> <ul style="list-style-type: none"> • Responses to these perspectives • What (if any) concerns do you have? • What do you require further information about? <p><i>Moderator to compile list of questions from group – and prioritise the key questions to feed back to the plenary (in next session)</i></p>	<p>Print out of presentation, with stakeholder additions and glossary of terms (Annex 1.3.7 and 1.3.11)</p>
12.15	<p>Q+A on information seen (plenary) Purpose: <i>To share the key questions from each group, and get answers where possible from DECC. To understand any additional information needs and for participants to hear back from other groups</i></p> <p>Individual tables to feed back on their 3 key questions, and what further information they require</p> <p>DECC PRESENTER ANSWERS – lead facilitator to explain next steps re: questions (will be answered in Wave 2)</p> <p>Lead facilitator to remind people of issues board if not enough time to cover everything and reassure that will answer questions in Wave 2</p>	
12.35	Lunch	
1.25	<p>Introduction to risk and mitigation (plenary) Purpose: <i>To provide an overview of the risks associated with shale gas extraction, and current mitigation measures in place</i></p> <p>DECC REPRESENTATIVE PRESENTS SLIDES – explaining there will be a Q+A to follow</p> <p><i>Researcher: introduce handouts to participants. Explain these include stakeholder additions to the presentation.</i></p>	<p>Slide presentation & Participant handouts (Annex 1.3.8 and 1.3.9)</p>
1.40	<p>Thoughts and questions on risk and mitigation (breakout) Purpose: <i>To gauge response to introductory information and understand impact on views on shale gas and questions it raises, and to explore views in-depth, once familiarised with the information</i></p>	<p>Handouts on following elements of fracking:</p> <ul style="list-style-type: none"> ○ Water contamination ○ Water supply ○ Earth tremors

	<ul style="list-style-type: none"> • Spontaneous discussion on each area first, then participants given handouts – as follows: • What are your thoughts on what you just heard? • What is new? • What is surprising? • What (if any) concerns do you have? • What are thoughts about the risks associated with fracking – overall <ul style="list-style-type: none"> ○ Ensure all participants’ views are fed back • Working through each risk in turn: <ul style="list-style-type: none"> ○ How much of a risk do you consider this to be? ○ What are your key concerns/ considerations ○ To what extent do you feel that enough is done to mitigate against this risk? <ul style="list-style-type: none"> ▪ Reasons for this • What do you require further information about • Do you have questions around a) the degree of risk and b) the regulations in place to mitigate against it? • What else do you need to know to feel fully informed about shale gas? (<i>Note to moderator – informed enough to be feel in a position to have an informed viewpoint NOT to find it acceptable</i>) <p><i>Moderator compiles list of questions to feed back to the plenary</i></p> <ul style="list-style-type: none"> • How should these risks and the regulations put in place be communicated to the public? • What are the most important things to consider in relation to regulation? <p><i>Moderator to flip chart considerations ensuring below topics are all included. PROMPT around:</i></p> <ul style="list-style-type: none"> ○ About shale gas exploration / development in the UK generally ○ About shale gas exploration / development in your local area ○ Security of supply ○ Cost ○ Environment – local and climate change ○ Fairness / impact on society (e.g. who benefits / who bears risk 	<ul style="list-style-type: none"> ○ Air pollution ○ Climate change ○ Local disruption <p>Stakeholder perspectives (Annex 1.3.10)</p>
2.35	Coffee and biscuits break	
2.45	<p>Q+A on risk / mitigation (plenary) Purpose: <i>To share the key questions from each group, and get answers where possible from DECC. To understand any additional information needs and for participants to hear back from other groups</i></p> <p>Individual tables to feed back on their 3 key questions, and what further information they require</p> <p>DECC PRESENTER ANSWERS – lead facilitator to explain next steps re: questions (will be answered in Wave 2)</p>	
3pm	<p>Views and concerns about the regulatory framework Purpose: <i>To explore views on what is needed from a regulatory framework, once familiarised with the information</i></p> <ul style="list-style-type: none"> • Who do you feel should be involved in making decisions about shale gas? <ul style="list-style-type: none"> ○ About its role in the future national energy mix? 	

	<ul style="list-style-type: none"> ○ About its development / exploration at a more regional / local level? • Which bodies / organisations will speak <i>to</i> you most effectively with regards to shale gas? Who do you trust to give you information about shale gas? PROMPT: <ul style="list-style-type: none"> ○ National government ○ Local government ○ Industry – domestic vs international organisations ○ Local communities ○ Environmental groups ○ Regulators ○ Media / press • Which bodies / organisations will speak <i>for</i> you most effectively with regards to shale gas? PROMPT: <ul style="list-style-type: none"> ○ National government ○ Local government ○ Industry – domestic vs international organisations ○ Local communities ○ Environmental groups ○ Regulators ○ Media / press • What is good / what are you reassured about in terms of the regulatory road map? • Are there any key gaps/ causes for concern in the regulatory road map as it stands – what and why? <ul style="list-style-type: none"> ○ What else would you like to see? • Overall, what needs to happen or change for you to be confident in the regulatory framework? <ul style="list-style-type: none"> ○ In the UK generally ○ In your local area • How do you expect regulations to be enforced? And who by? 	<p>Regulatory road map from risk presentation hand-outs (Annex 1.3.9)</p>
3.45	<p>Final reflections and next steps (breakout) <i>Purpose: To understand how / if views have shifted</i></p> <ul style="list-style-type: none"> • Following everything you've heard today, how have your views on fracking changed? <ul style="list-style-type: none"> ○ More or less positive? Why? ○ What information have you found useful in helping to inform your views today? ○ What other information would be useful? • At the next session we will be talking to you about engaging the public around fracking in local communities, specifically: <ul style="list-style-type: none"> ○ Understanding how you would want to be involved if a shale development was happening in your areas ○ Who you would want to hear from, why and at what stage etc. • Homework tasks: <ul style="list-style-type: none"> ○ 1) Planning handout to read ○ 2) Find out about what happens when local developments happen in your area 	<p>Homework task hand-out (Annex 1.3.13)</p>
3.55	<p>Thank and close (plenary)</p> <ul style="list-style-type: none"> • Remind of dates, timings etc. for Wave 2 	

1.3.2 Welcome presentation and agenda

Introduction

- Introductions
 - TNS-BMRB
 - DECC
 - Sciencewise
 - Icaro Consulting
- Housekeeping (toilets, mobiles etc.)
- Format of day
- Issues board

Agenda

- | | |
|-----------------|--|
| • 9.30 – 10am | Registration |
| • 10am – 10.15 | Welcome and introduction |
| • 10.10 – 11.10 | Group discussion on energy |
| • 11.10 – 11.25 | <i>Break</i> |
| • 11.30 – 11.50 | Presentation on shale gas |
| • 11.50 – 12.10 | Group discussion on shale gas |
| • 12.15 – 12.35 | Q & A on shale gas |
| • 12.35 – 1.25 | <i>Lunch</i> |
| • 1.25 – 1.40 | Presentation on risks and mitigation |
| • 1.40 – 2.35 | Group discussion on risks and mitigation |
| • 2.35 – 2.45 | <i>Break</i> |
| • 2.45 – 3pm | Q & A on risks and mitigation |
| • 3pm – 3.55 | Group discussion on regulation |
| • 3.55 – 4pm | Next steps |

Purpose of research

1. To explore public understanding and beliefs about shale gas
2. To understand how people would want to be involved with shale gas developments in their local areas

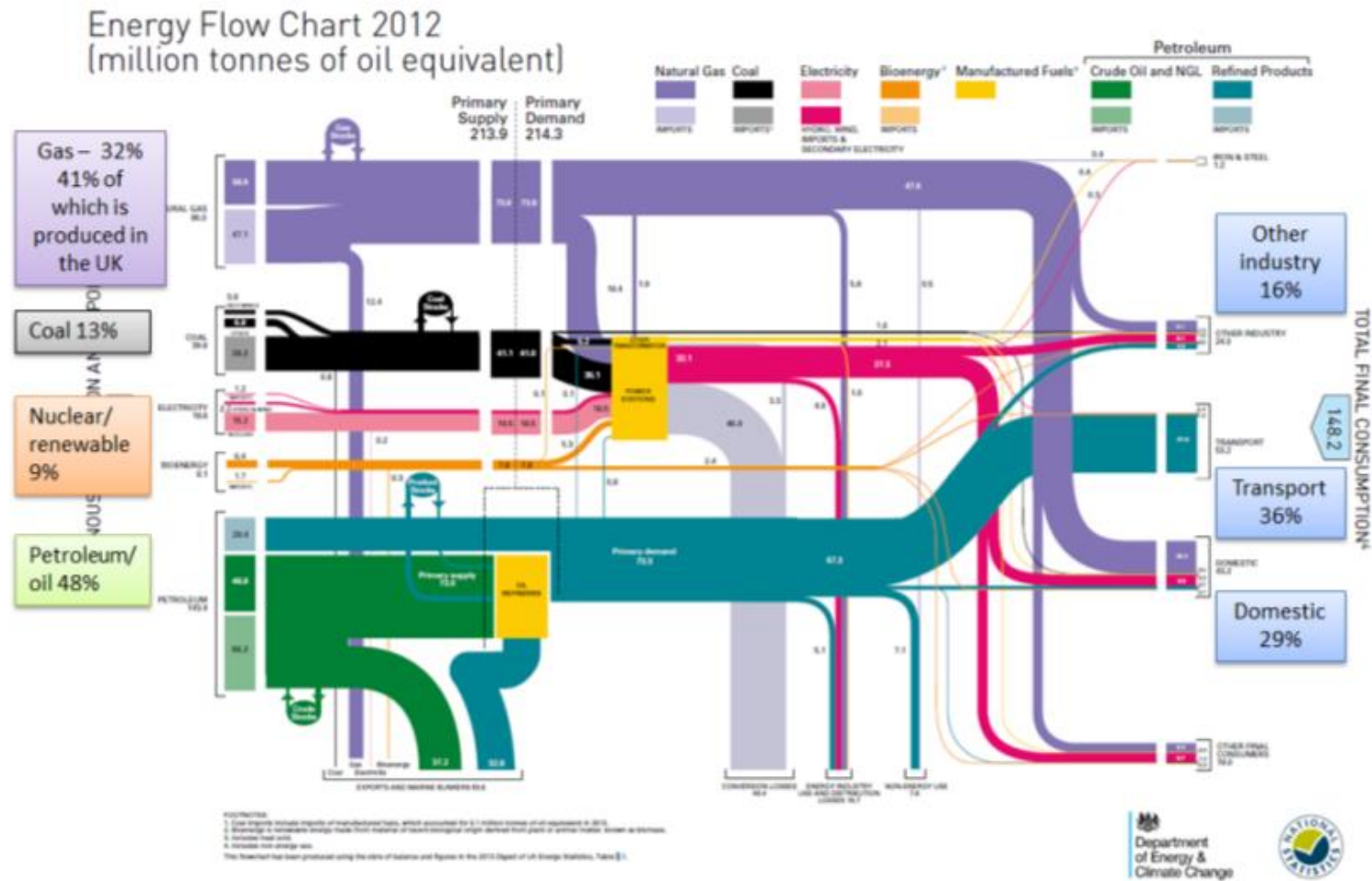
1.3.3 Burning issues board

'Burning issues' boards were used by moderators to help 'park' and move on discussions about a certain issue that was not the focus of the workshop e.g. beyond the scope of the research. They were blank pieces of paper stuck on the walls, where participants could write their concern, and explained to participants as follows.

"Issues board: As the day progresses there may be questions or comments you have on how the day is run or on the subject matter. We will be inviting questions to what is being discussed and where possible our experts will answer them, although they may not be able to answer everything today. Some of the things raised may be covered later in the day or at the next workshop and we will note these on flipcharts to ensure they are not lost. There may also be things that you wish to discuss that we don't have time to cover in detail today. So if there are questions or feedback which you have then you can write it on post it notes and put them on the 'issues board' here."

1.3.4 Energy sources and uses

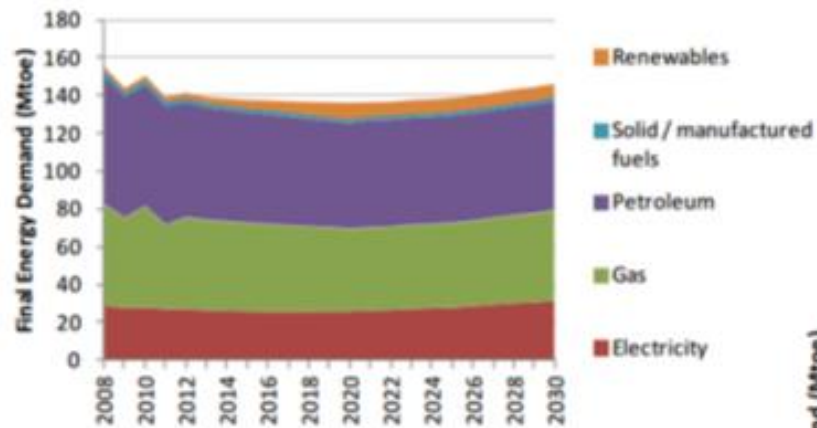
The following energy hand-outs were used by moderators to help spark discussion on energy and the participants' priorities for it. The projections were noted as the current understanding of future demand and only areas where policies were already in place.



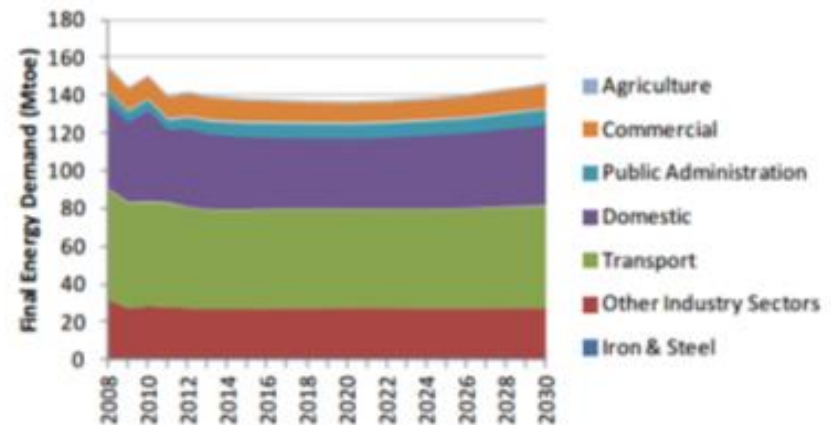
1.3.5 Energy projections

Projected Energy Demand

By fuel type



By sector

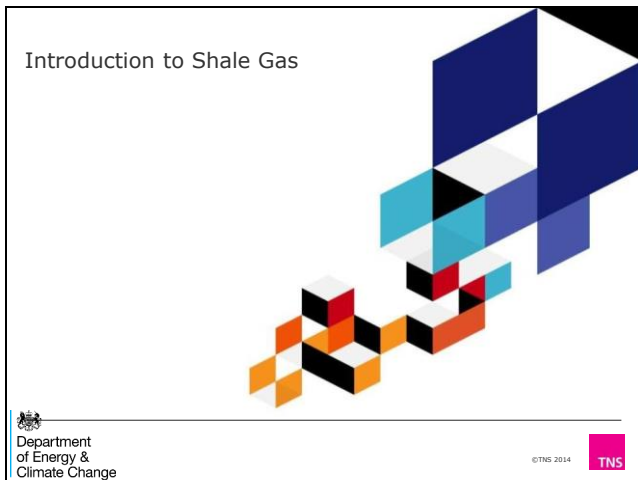


Mtoe = million tonnes of oil equivalent
 Source: DECC energy projections 2012

1.3.6 Introduction to shale gas presentation (with notes for DECC presenter)

This presentation was given at the start of the workshop by a DECC representative. The notes below each slide were provided to presenters and acted as a guide for the presentation, rather than being used as a script.

Slide 1



I am XX. I work in the Office of Unconventional Gas and Oil within the Department of Energy and Climate Change. The office was set up in March 2013 to develop shale gas and oil and Coal Bed methane in the UK.

I am a civil servant, not a geologist, engineer, economist or scientist, and so I will be able to answer most of your questions, but may need to come back to you if something is particularly technical.

Like all oil and gas development, shale gas and oil is allowed through licences nationally. Where the developments are sited is decided by the location and features of the site, through planning permission and permits.

Therefore the research does not focus on whether shale gas or oil should be allowed or not, instead we want to understand what it means for you and what engagement you feel is important locally.

I'm going to give an overview of why gas is in our energy mix, how gas and oil is extracted, the regulatory system and how gas and oil is developed in an area. We will come back to the risks associated with these, and more on the regulation, later today.

Slide 2

Terminology

- **Shale gas** and **coalbed methane** are natural gas (predominantly methane); the same as we use in cooking and heating
- **‘Conventional’ gas and oil** fields are usually situated in sandstone, through which the gas flows more easily. Shale gas and oil is extracted from denser shale rock, which is usually deeper too. Coal bed methane is extracted after pumping water out of coal beds that haven’t been mined
- Hydraulic fracturing, or **fracking**, is a technique used in the process of extracting shale gas and oil, to enable the gas or oil to flow



Department
of Energy &
Climate Change

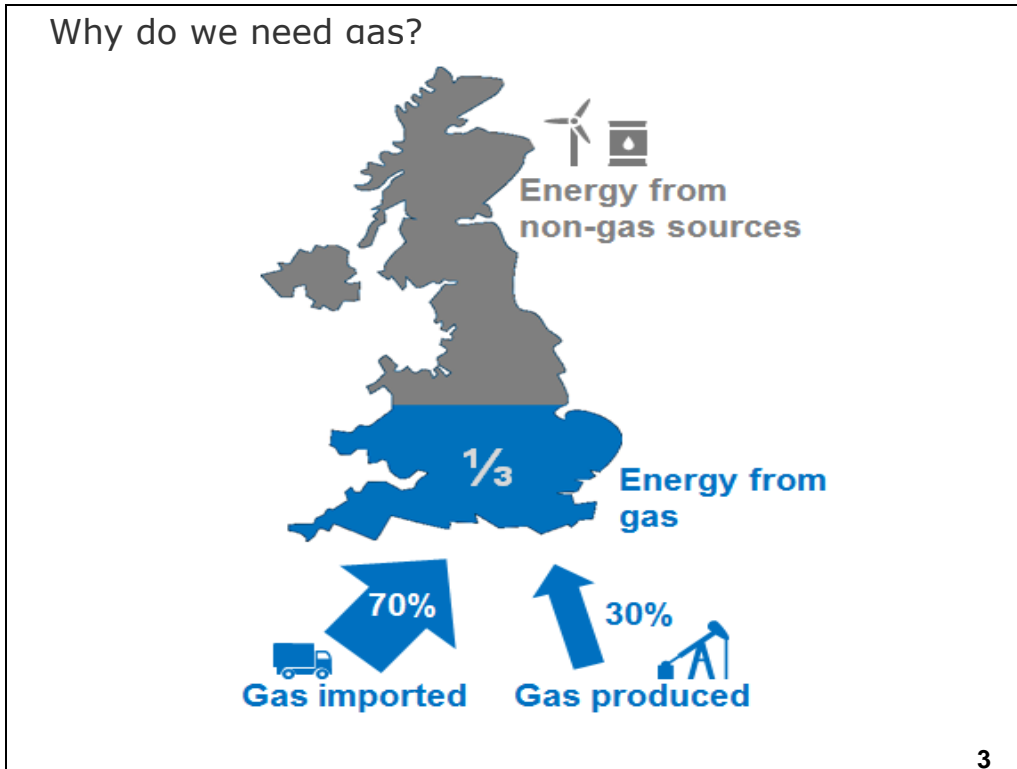
©TNS 2014



Shale gas and coalbed methane are natural gas (predominantly methane); the same as we use in cooking and heating

‘Conventional’ gas and oil fields are usually situated in sandstone, through which the gas flows more easily. Shale gas and oil is extracted from denser shale rock, which is usually deeper too. Coal bed methane is extracted after pumping water out of coal beds that haven’t been mined

Hydraulic fracturing, or fracking, is a technique used in the process of extracting shale gas and oil, to enable the gas or oil to flow ‘Frack fluid’ - the name given to the water and sand solution that is used in fracking. It may also contain chemicals to lubricate or disinfect the water.



DECC updated energy projections suggest that a **third of UK energy demand** is met by gas, and it is forecast that this will still be the case in 2030

In 2003 we were a net exporter of gas, but North Sea production is declining and we are now a net **importer from countries such as Qatar and Norway**

By 2025 it is expected that the UK will import close to **70%** of the gas it consumes (assuming it doesn't develop shale)

What is shale gas and how do we get it out of the ground?

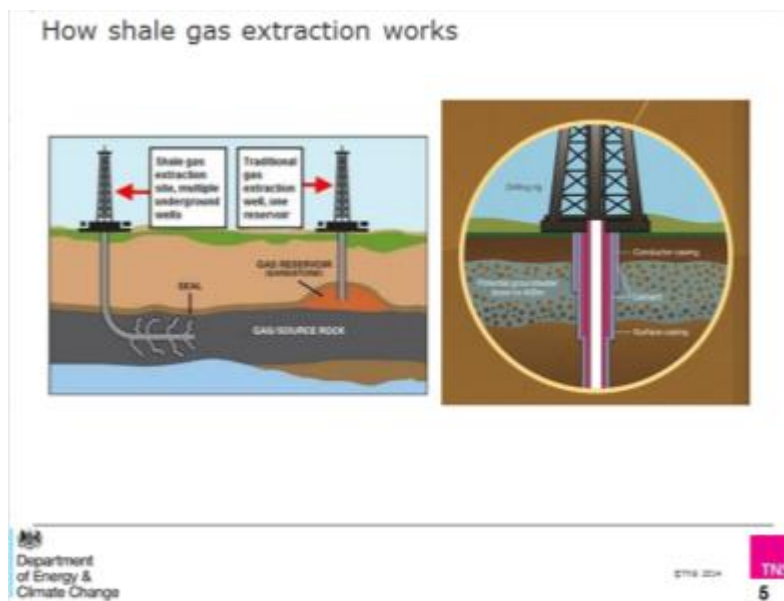
Video links:

<https://www.youtube.com/watch?v=evPJx-pLlNg>

<http://www.bbc.co.uk/news/uk-14432401>

<https://www.youtube.com/watch?v=76adHkCCyC0>

You're about to see three videos, two of which are from the British Geological Survey, the UK's academic institute for geology.



'Conventional' gas and oil deposits (such as in the North Sea) are contained in permeable rocks (which gas and water can pass through) shale gas is trapped in impermeable shale rock (which gas and water cannot pass through)

The fracking technique has been used in the UK for many years with 200 low pressure fractures in conventional oil and gas wells. Worldwide, over 2 million wells have been hydraulically fractured: mostly in North America, mainly onshore

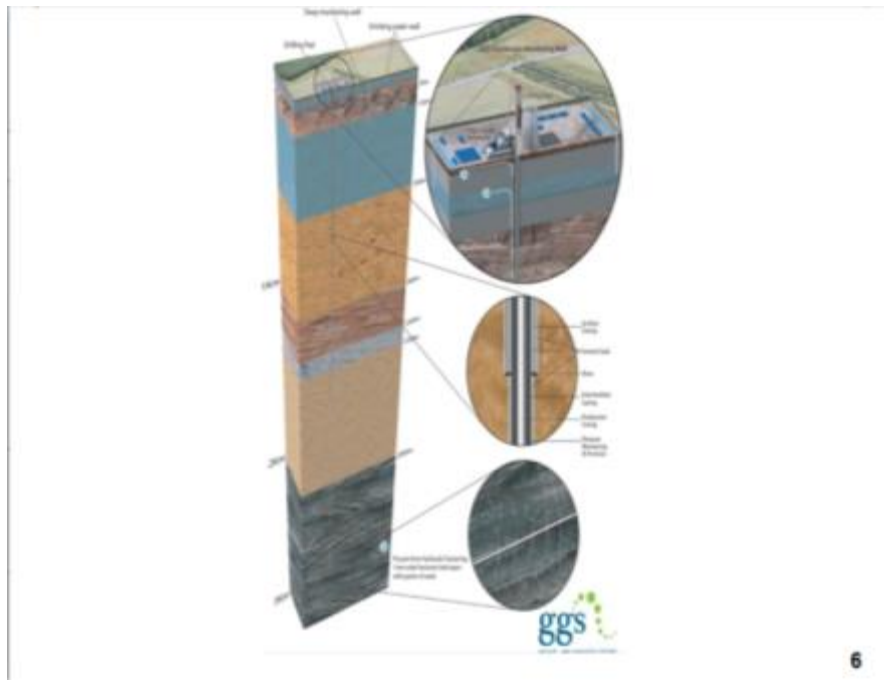
Like other gas and oil exploration or production, a well is drilled and several stages of metal pipes ('casing') are set in concrete within the well to seal it and prevent contamination or surrounding groundwater.

In extracting shale gas they will drill down and then across with the fracking done in the horizontal part of the well.

Ref: Image from UKOOG fact sheet:

<http://www.ukoog.org.uk/elements/pdfs/UKOOG%20Onshore%20Oil%20and%20Gas%20in%20the%20UK.pdf>

Slide 6



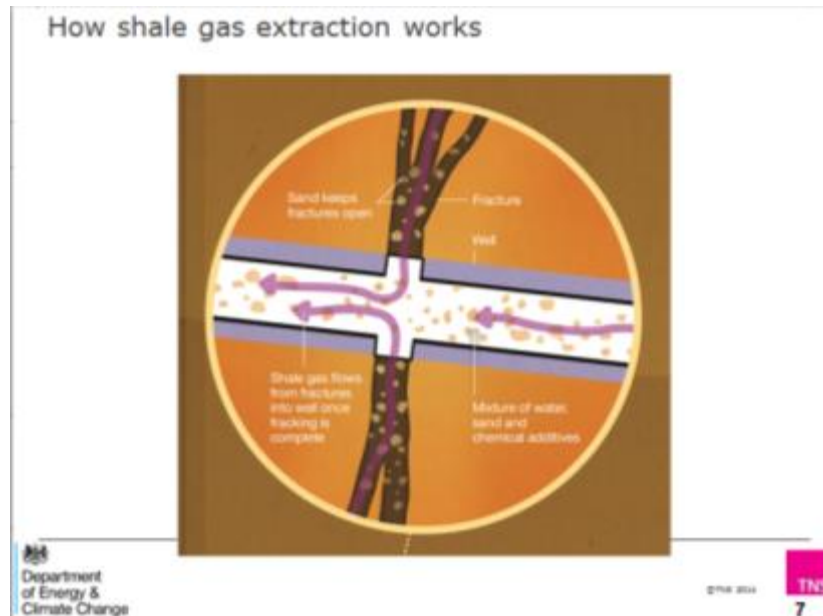
This image illustrates how deep shale gas reservoirs are. There is a pad at the top, a base about the size of a football pitch, from which the drilling is done.

Shale reservoirs are usually 5,000 feet or more below the surface. This is well below any underground sources of drinking water, which are typically at depths no more than 300 to 1,000 feet.

Ref: Image from UKOOG fact sheet:

<http://www.ukoog.org.uk/elements/pdfs/UKOOG%20Onshore%20Oil%20and%20Gas%20in%20the%20UK.pdf>

Slide 7



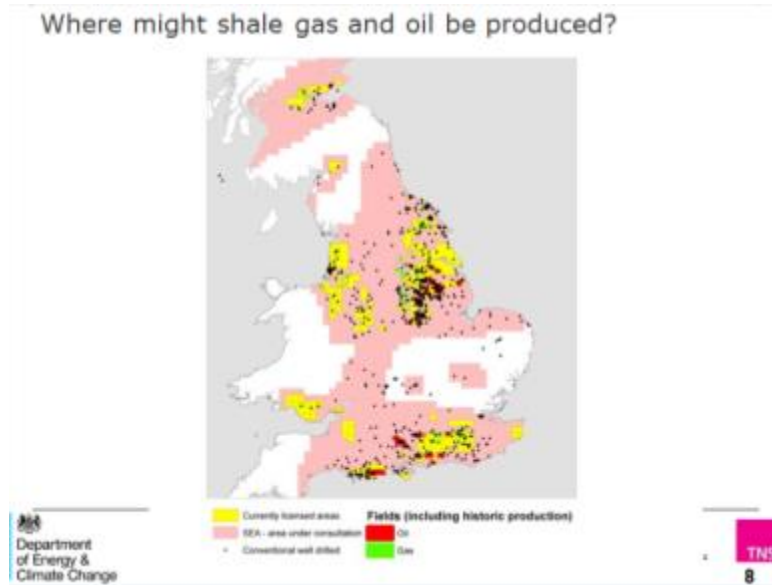
If oil is recovered, it will be taken to an oil refinery or petrochemical plant

Any gas discovered at exploration is likely to be flared as the operators can't make a profit from it. It reduces emissions by about 80% compared to letting it directly into the atmosphere.

Exploration occurs for only a short time, for example fracking can take a few hours and the site will be in use for 2-6 months.

If a gas well goes into commercial production, it will be connected to the country's network of gas pipelines.

We don't know how many wells we will need to explore before proceeding to production.



British Geological Survey studies suggest the areas with most potential for shale gas exploration are where existing conventional gas has been found, and most drilling is expected to be in these existing areas

The black dots on the map are existing wells, the yellow is areas that are already licenced and the pink is areas that may be licenced in the next year, in the next licencing round.

Decisions are made based on analysis of the local geology

We don't know yet how much shale gas or oil may be practically and commercially recoverable.

As a scenario, the Institute of Directors believes that UK shale gas production could attract annual investment of £3.7 billion and support up to 74,000 jobs directly, and it can mean fewer imports

Under consultation = potential area for shale gas drilling

Currently licensed = licensed for oil and gas drilling



Conventional wells = existing drilling sites

Ref: Map from

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/66172/uk-onshore-shalegas.pdf

How do operators get permission?

- There are currently around 176 licences for onshore oil and gas in the UK
- DECC plans to conduct a new round of onshore licensing (the 14th) in 2014 and is conducting the necessary Strategic Environmental Assessment
- As well as licences, operators need:
 - Landowner agreement
 - Planning permission – which may require environmental impact assessment
 - Permits from Environment Agency (or Natural Resources Wales or the Scottish Environmental Protection Agency)
 - Their plans are examined by the Health and Safety Executive and an independent competent person reviews the well design
 - Consent for drilling or production from DECC

  27th 2014 9

There have already been 13 licencing rounds and there are currently around 176 licences for onshore oil and gas in the UK

DECC plans to conduct a new round of onshore licensing (the 14th) in 2014 and is conducting the necessary Strategic Environmental Assessment

Before they can drill a well, operators need:

Landowner agreement

Planning permission –

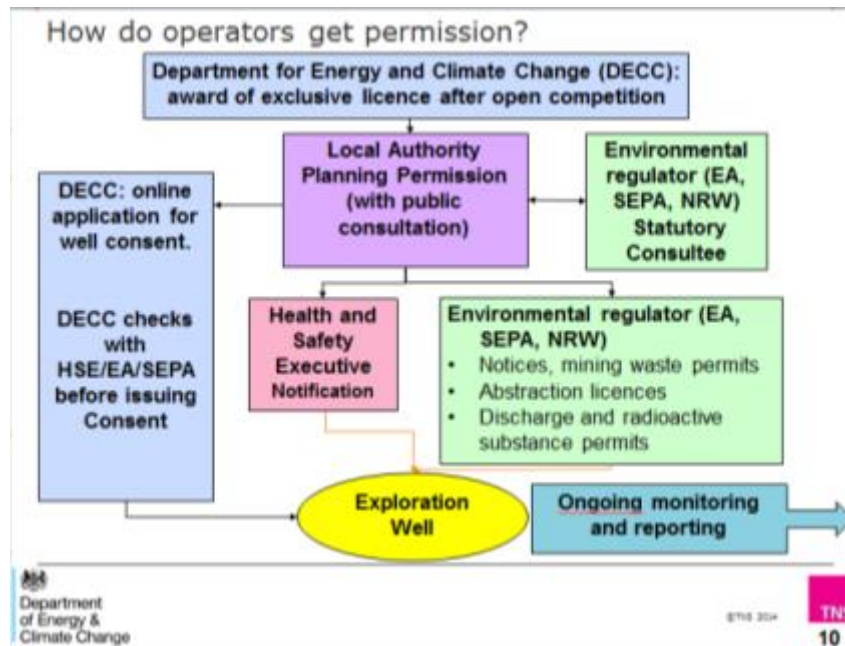
They will order the operator to complete an environmental impact assessment before making a decision on planning permission if they think there may be a significant environmental impact. This requirement is made on a case-by-case basis.

Permits from Environment Agency (or Natural Resources Wales or the Scottish Environmental Protection Agency) for their waste, use of chemicals and a range of other permits as appropriate

Their plans are examined by the Health and Safety Executive and an independent competent person reviews the well design at least 21 days before drilling is due to start.

The HSE inspects the well design to ensure that measures are in place to control major hazards to people from well-related activities and accidents.

Final consent for drilling operations rests with DECC. It will check with the relevant environmental agencies and HSE that they have no objections, and review the operator's plans to minimise the risk of seismic activity, before giving consent.



This regulatory map is unique to the UK; it's not like their regulation in other countries. These steps aren't the end of the regulation.

During drilling:

Well operators have a legal duty to manage and control the risks to people. The HSE monitors well operations to check these legal duties are carried out. Its specialists will review the weekly operations reports it receives from the well operator, to check construction matches the design. HSE intend to jointly inspect drilling and fracking operations with the Environment Agency or Scottish Environmental Protection Agency during the exploratory phase.

HSE inspectors can visit any site at any time if there is a matter of concern. The relevant environmental regulator will monitor the environmental impacts through monitoring and inspections of the operator's reports. The greater the potential risk, the greater the scrutiny by environmental regulators. Conditions attached to permits will give the minimum level of site-based monitoring and reporting.

Planning authorities are responsible for enforcing any conditions attached to the planning permission. For example, this may include monitoring of noise or dust levels.

Restoring the environment and long-term monitoring

When operations finish, the operator is responsible for safe abandonment, a technical term, of the well and for restoring the well-site to its previous state or a suitable condition for re-use. The relevant planning authority will require suitable restoration of the site as a condition of the planning permission.

The procedures for abandoning a well ensure that all the fluids it contains are permanently sealed. This is done by inserting cement plugs to seal the well, removing some of the steel casing and

fitting a steel cap, in compliance with the Oil & Gas UK guidelines for the suspension and abandonment of wells.

Slide 11



You can expect to see three stages of shale gas and oil exploration

The first is **exploration**, where companies will do seismic surveys, drill for samples of the shale rock, try one or more fracks and flow-test to see if oil or gas can be produced profitably. Once permissions are in place this can take from 2-6 months. There will be a 30metre drilling rig, equipment and lots of vehicles bringing the equipment and water onto the site.

Slide 12



If the testing is successful, the company will bring that site into **production** which will take a couple of years. The site may not be where the exploratory wells were drilled and will depend on the testing. The pad will need to be bigger and more wells will be drilled and fracked.

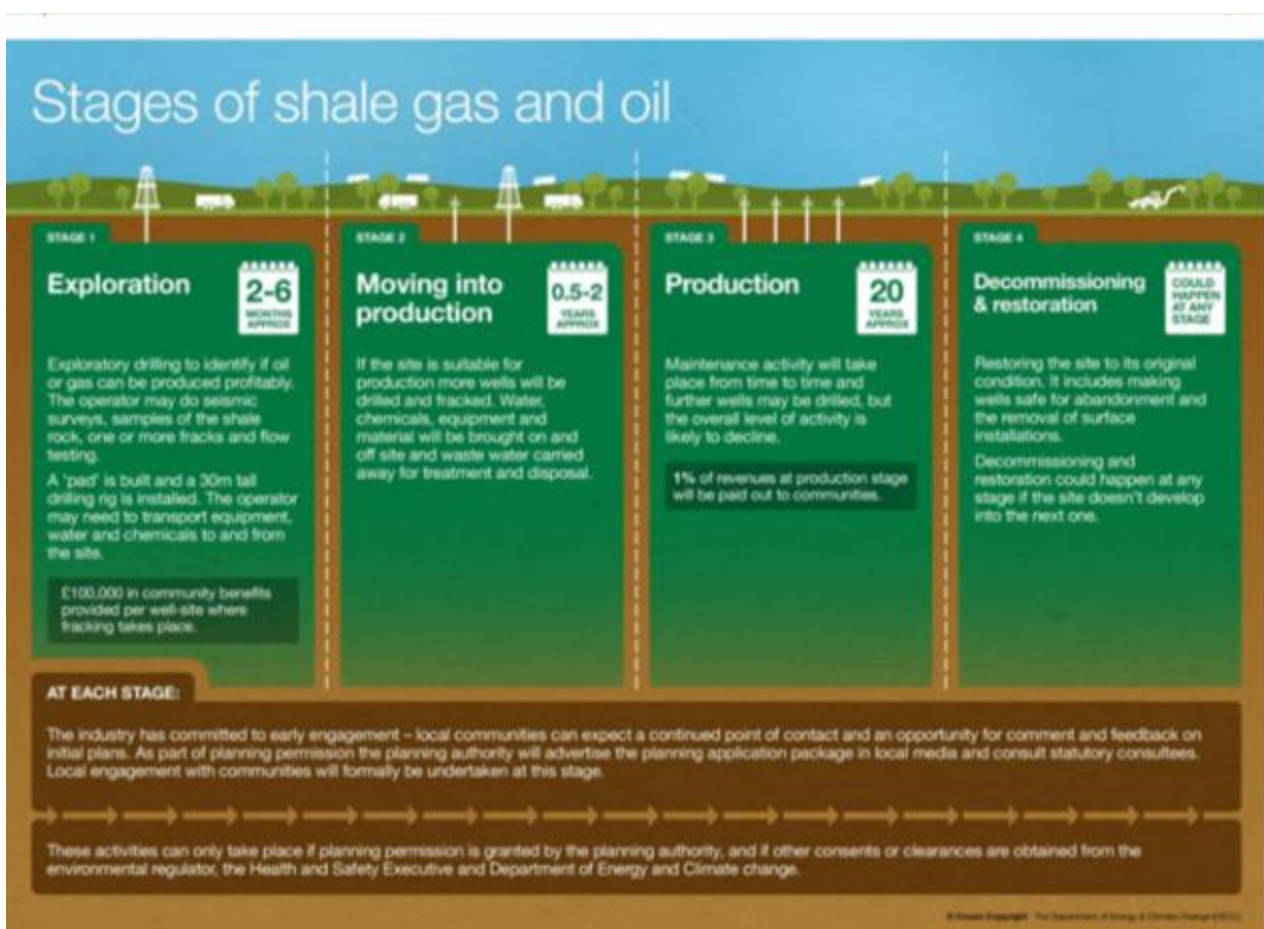
Once the site is 'in production' there will be less activity, except for regular maintenance. The site can produce for 20 years.

At any point, wells can be **decommissioned** by sealing them off according to industry guidelines. If the site overall is decommissioned the operator is required to return it to at least its original condition.

Permissions must be repeated for any change in the site. The industry has committed to engage early at each stage, and to provide a package of community benefits. This is £100,000 during exploration, where a well is fracked, and 1% of revenues, not the profits which would take longer, when the site comes into production.

They are working with the UK Communities Foundation, who work with the Lottery, to pilot projects delivering community benefits.

Slide 13

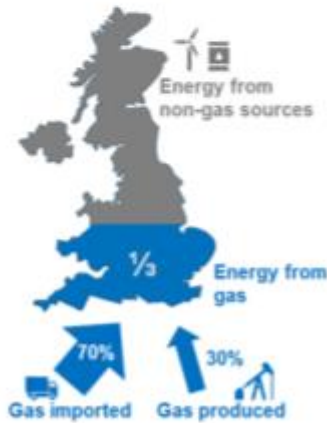


1.3.7 Introduction to shale gas participant hand-outs

Page 1

Why do we need gas?

- DECC updated energy projections suggest that a **third of UK energy demand** is met by gas, and it is forecast that this will still be the case in 2030
- In 2003 we were a net exporter of gas, but North Sea production is declining and we are now a net **importer**
- By 2025 it is expected that the UK will import close to **70%** of the gas it consumes (assuming it doesn't develop shale)



"This is not compatible with decarbonisation of power by 2030 as recommended by the Government's independent climate advisors."

Greenpeace

"There is a wider debate here about energy security, and about going about your daily life: having a hot shower, switching on your lights, having your house heated. These are at risk if we don't potentially explore this asset."

Industry Representative

"Energy security has potential to have both a local and a national impact. In terms of energy security nationally, it's obviously important. And it can add jobs from a national perspective and from a local perspective. Gas is also needed as a raw material for heavy industry."

Planning Officer

"These facts are presented as if they are the only possible realities that will happen. In fact there are a number of possible scenarios. We would have hoped that DECC would base its policies... on scenarios as proposed by the Climate Change Committee where Britain is properly dealing with climate change."

Greenpeace

Page 2

What is shale gas and how do we get it out of the ground?

Video links:

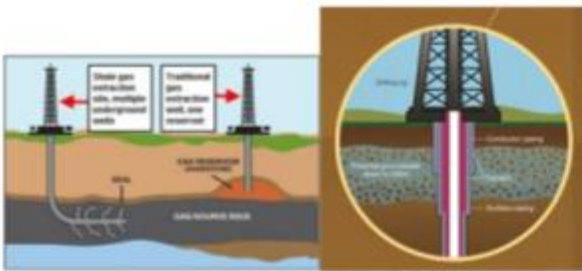
<https://www.youtube.com/watch?v=evPJx-pLlNg>

<http://www.bbc.co.uk/news/uk-14432401>

<https://www.youtube.com/watch?v=76adHkCCyC0>

How shale gas extraction works

- 'Conventional' gas and oil deposits (such as in the North Sea) are contained in **permeable** rocks (which gas and water can pass through), shale gas is trapped in **impermeable** shale rock (which gas and water cannot pass through)
- The hydraulic fracturing, known as fracking, technique has been used in the UK for many years with conventional deposits, mainly offshore. Worldwide, over 2 million wells have been hydraulically fractured: mostly in North America, mainly onshore
- Like other gas and oil exploration or production, a well is drilled and several stages of metal pipes ('casing') are set in concrete within the well to seal it and prevent contamination of surrounding groundwater



"This implies that fracking has been done for a long time and it's a well-known technology, but that's not true either. It's a very new technology and some of the chemicals involved are very new to science."

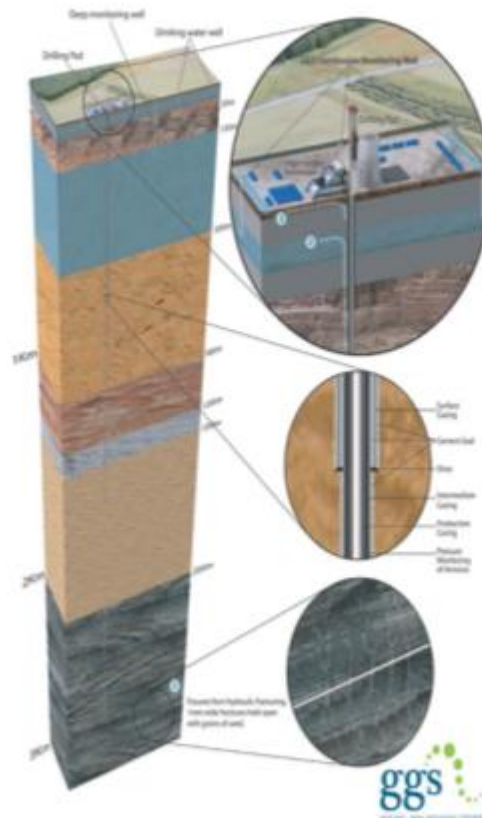
**Academic Scientist,
Exeter University**

"When we talk about fracking, we mean shale fracking. That's different to the sandstone fracking which is what's been done in the past. They say they've been fracking all over the country, but it's a different sort of fracking."

National Farmers Union

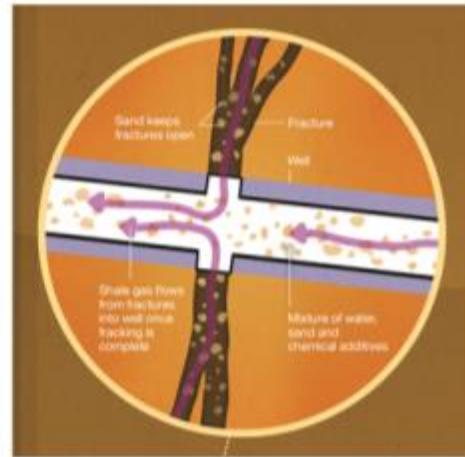
"This is simply untrue. High volume fracking, which is being proposed here, has not been used in the UK – apart from at Preese Hall, where operations caused earth tremors and prompted the government to bring in a moratorium. Fracking has been used to maximise reserves of conventional gas... [but] fracking unconventional oil and gas is new to the UK. Fracking these harder to reach reserves is called "high volume" fracking because it uses far more water and chemicals."

Greenpeace



How shale gas extraction works

- The rock is then fractured by injecting water at high pressure, an established technique for conventional gas or oil, but used more intensively for shale.
- 98-99% of the mixture is water and sand. Small quantities of chemicals are normally added to improve efficiency, for example, by reducing friction. Some of this fluid returns to the surface where it is sealed in containers before treatment
- Once the rock is fractured, small particles (usually sand) are pumped into the fractures to keep them open when the pressure is released
- If oil is recovered, it will be taken to an oil refinery or petrochemical plant
- Exploration occurs for only a short time (for example flow testing can take as little as a couple of weeks) and any gas discovered at that stage is likely to be flared, but if a gas well goes into commercial production, it will be connected to the country's network of gas pipelines.
- We don't know how many wells we will need to explore before proceeding to production.



Where might shale gas and oil be produced?

- British Geological Survey studies suggest the areas with most potential for shale gas exploration are where existing conventional gas has been found, and most drilling is expected to be in these existing areas
- Decisions are made based on analysis of the local geology
- Little drilling or testing has taken place in Britain's shale deposits, so it is not yet possible to estimate how much shale gas or oil may be practically and commercially recoverable
- The Institute of Directors believes that UK shale gas production could attract annual investment of £3.7 billion and support up to 74,000 jobs directly, indirectly and through broader economic stimulus



"What we're really talking about is a band in the North of England, a band in Scotland, and a band in the South of England."

Planning Officer

"The people who will make the most money out of this are the businesses who are going to be doing the fracking. ... Another area is the health and wellbeing of the workforces – if they are talking about generating thousands of jobs, one would want to know that the health and safety of the workers in the area is covered. Those workers will be members of local communities."

Academic Scientist, Exeter University

"Why is DECC's own study not cited here? Their study found that this figure could be as low as 2,500 jobs or a maximum of 32,000 – less than half that claimed by the Institute of Directors."

Greenpeace

How do operators get permission?

- There are currently around 176 licences for onshore oil and gas in the UK
- DECC plans to conduct a new round of onshore licensing (the 14th) in 2014 and is conducting the necessary Strategic Environmental Assessment
- As well as licences, operators need:
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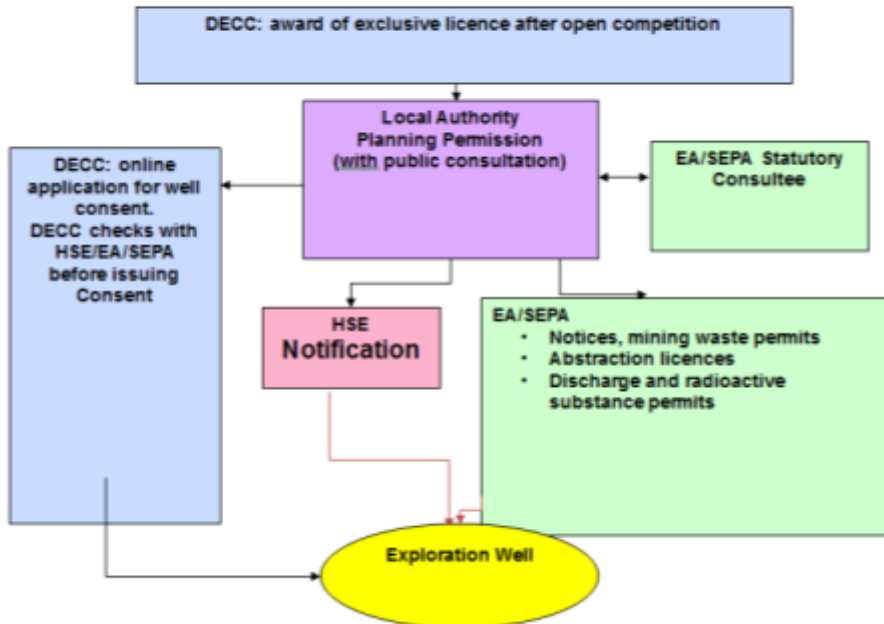
"It doesn't say what people have to do in order to get a licence... What do the operators have to demonstrate or what information do they need to provide in order to get a licence?"

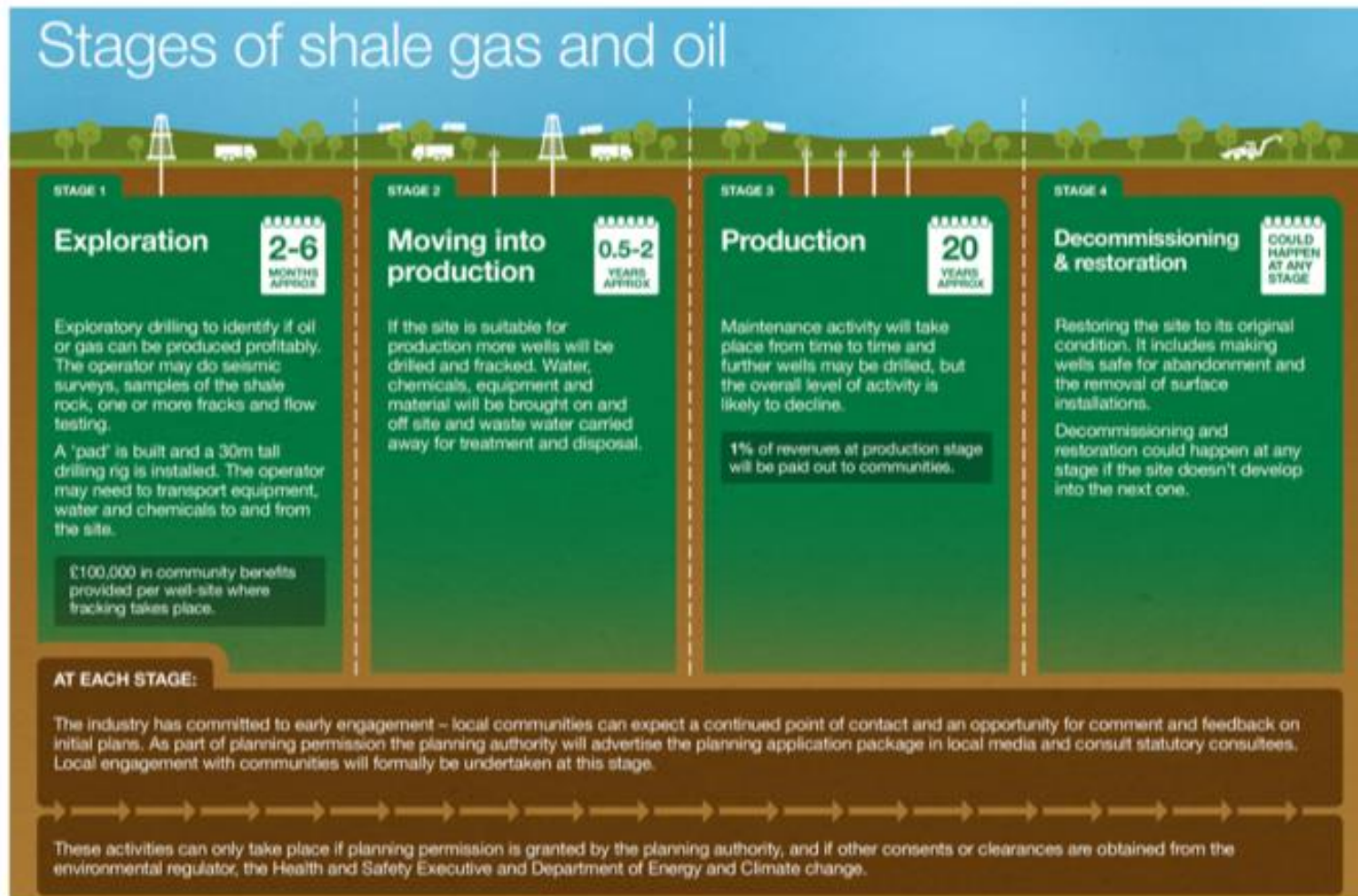
Wildlife Trusts

"But only until the government changes the law in order to push fracking onto communities, and removes property rights in order to override people's opposition."

Greenpeace

How do operators get permission?



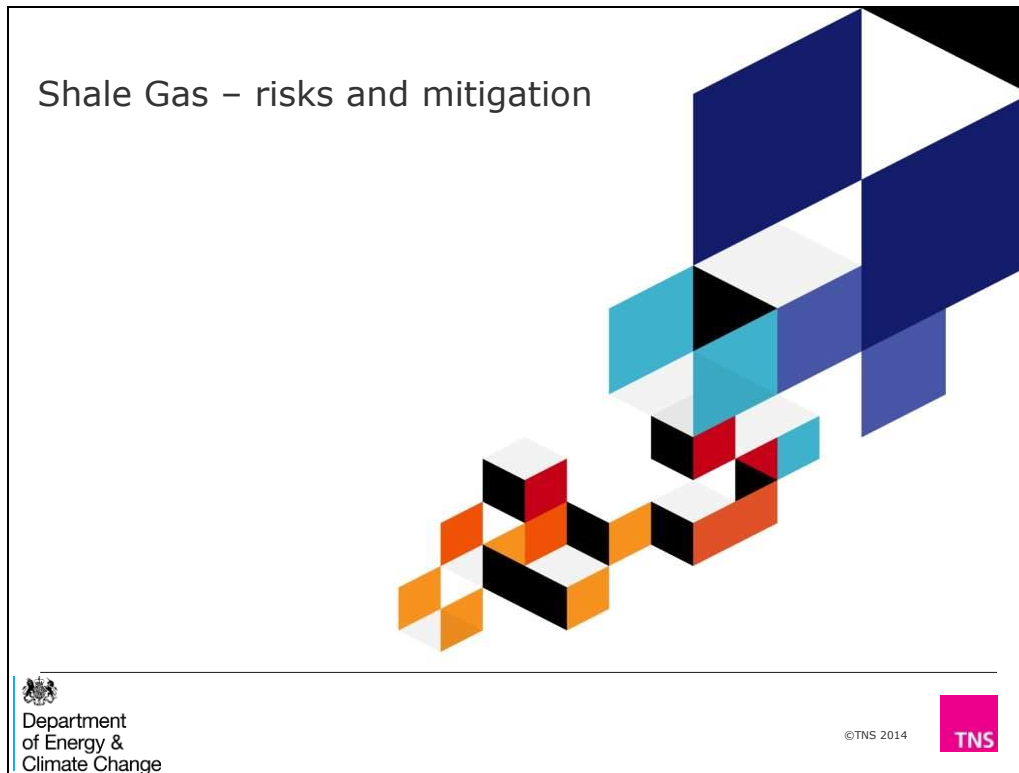


"What are the timescales? At the moment we're thinking about fracking for 20 years. ... What happens if newer, more efficient energy sources come online before then?"

Academic Scientist, Exeter University

1.3.8 Introduction to risks and mitigation presentation (with notes for DECC presenter)

Slide 1



{If needed} I am XX.

I'd like to run you through some of the risks of shale gas and oil extraction and the ways in which we can avoid or reduce these risks, known as mitigations.

You will be going into breakout sessions after this presentation, in which there will be more detailed handouts. I will cover the key areas people are concerned about, but we're interested in what these mean to you and how confident you are that they will be mitigated.



There are concerns that the fractures in the rock could lead to gas or frack fluids, the water, sand and chemical mixture injected in the rock, leaking up into groundwater and affecting soil or drinking water.


There is no evidence of this. The UK's Royal Society for science and Royal Academy of Engineering looked at the risks of fracking and the US's experience in a study in 2012. They highlighted that in the UK there's often a layer of 'sealing' rock above the shale rock.

In the US Duke University have found an association between methane in water supplies and close to oil and gas wells.

The regulation in the UK is very different to US regulation. Operators must submit plans to the environmental regulator, including details of the chemicals used. If the proposals or chemicals would be hazardous, the environmental regulator would not grant a permit.

Water supply

- 10,000 and 30,000m³ (10,000 to 30,000 tonnes or 2 to 6 million gallons) of water
- This is similar to the amount a coal power station uses in 12 hours.
- The average person in England uses 54m³ a year



Final water resources management plan
SEPTEMBER 2009

United Utilities

Department of Energy & Climate Change

©TNS 2014 TNS 3

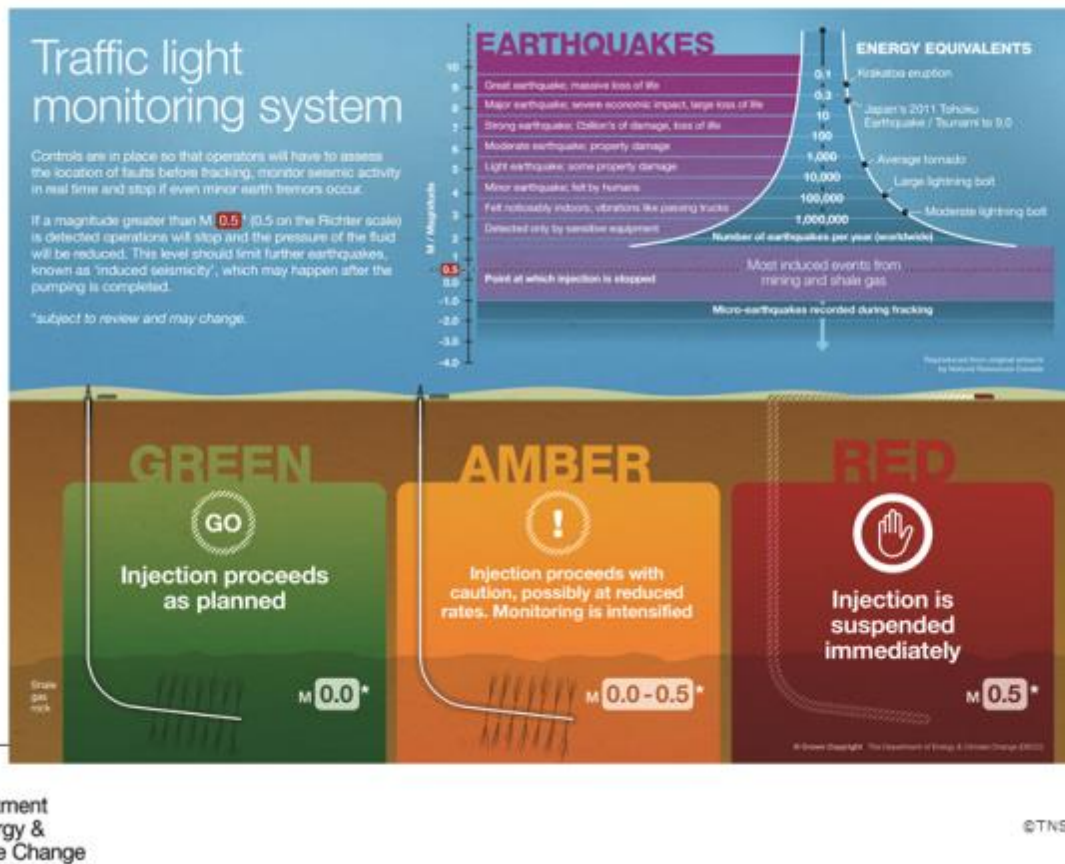
Fracking involves injecting large quantities of water into the shale rock, which people are concerned is not sustainable, particularly in areas where there are water shortages.

In the US the amount used is between 10,000 to 30,000m³ per fracking operation. To put this into context, personal water use is about 54m³ per year and the amounts used are about the same as a 1,000 MW coal fired power station over 12 hours.

Water can be supplied by water companies, for example by connecting to the mains. Water companies have to have a 5 year plan for water, they will assess the amount available before providing it to oil and gas operators.

Or the operator can extract it directly from groundwater. The environmental regulator will only permit this if there is a sustainable water supply.

Earth tremors



In 2011, Cuadrilla’s operations near Blackpool caused two earthquakes, measuring 1.5 and 2.3 on the Richter Scale. These magnitudes are a level that is generally hard to feel at the surface, let alone cause damage. Above 0.5, which is a very low level, the operator must stop immediately.

The Government had independent experts consider the reasons for the earthquake and has introduced new controls. These require operators to monitor seismic activity at the site and use a traffic light system to decide whether it is safe to proceed.

The experts said that the possibility of any further earthquakes would be limited and could be no more than 3 on the Richter scale. We have earthquakes of this size 3-4 times a year.

Air pollution



In exploration companies may burn off waste natural gas, called flaring, as it has no commercial use. They can only vent it directly into the atmosphere for safety reasons.

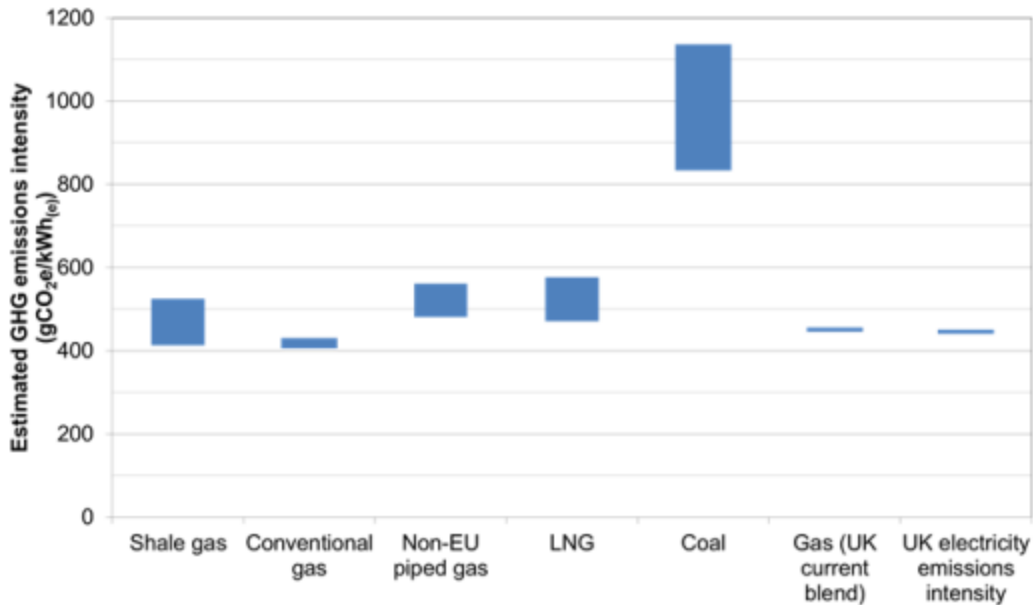
In production, pollutants may be released when the water comes back up and from processing the gas. The gas will be captured as companies profit most from selling it.

Onsite generators, vehicle exhausts and dust created are also sources of pollution.

DECC licences require operators to minimize the release of gases. Operators are also required to have waste and dust management plans to get permits from the environmental regulators.

As part of these steps they will need to monitor air quality and share that with the regulators, keeping it within limits set out in the permits.

Climate change



Methane can be released into the air in the same ways outlined in the last slide.

Professor David MacKay, DECC's chief scientist, and Dr. Tim Stone looked at the potential emissions from shale gas last year.

They found that the carbon footprint of extracting and using shale gas is lower than imported liquefied natural gas and coal when used in electricity generation. Liquefied natural gas is produced overseas, liquefied and transported to the UK before de-liquefying it.

They found that most of the emissions will come from using gas in heating or generation.

Shale gas in the UK will be used within our binding carbon budgets. They will need to be offset if they would increase emissions. Internationally, without binding climate agreements there is a chance these could include

DECC requires excess methane to be flared rather than vented, except for safety reasons. There are a number of techniques that companies can use called 'green completions' to separate and capture the methane.

Local disruption and damage

- Vehicle movements – these will depend on what is happening at the site, but estimates range from 16-51 HGV movements per day per pad over a 73-145 week period to 4-17 per day over 5 years where a site is connected to mains water
- Noise - as well as noise from vehicles, there will be noise from the site equipment
- Visuals - At a typical exploration site there will be: flood lights; rig equipment; piping and storage; mobile 'portakabins' for offices; worker restrooms; the well head itself.



There is the potential for activities associated with any oil and gas exploration and production to have negative effects on the local population, particularly during well site construction, exploration drilling and production development stages. This disruption could impact in the following areas:
Vehicle movements – these will depend on what is happening at the site, but estimates range from 16-51 HGV movements per day per pad over a 73-145 week period to 4-17 per day over 5 years where a site is connected to mains water

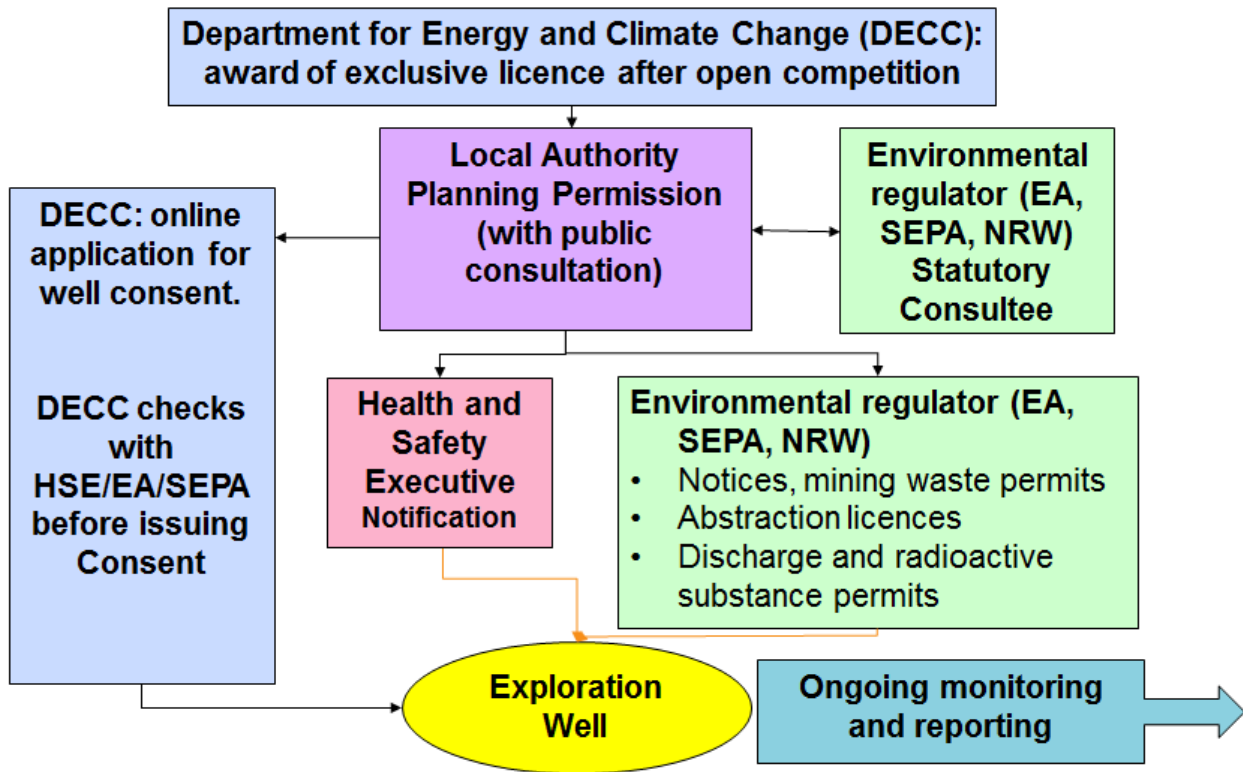
Noise - as well as noise from vehicles, there will be noise from the site equipment

Visuals - At a typical exploration site there will be: flood lights; rig equipment; piping and storage; mobile 'portakabins' for offices; worker restrooms; the well head itself. The rig can be up to 30m high, but the visual impacts will depend on whether there are trees or hills to screen it.

Planning authorities have a number of tools to manage these impacts through planning conditions – they can ask for a transport plan that includes commitments to use specific routes or times of day, noise limits and requirements to screen the site.

The planning authorities will also put conditions for restoration and aftercare of the site, to require it to be carried out to high environmental standards once the production stage is complete

How do operators get permission?



The UK's approach to managing health and safety risks is risk based, rather than prescribing detailed standards, regulators apply the regulation based on the level of risk from each proposal.

I'd like to bring you back to the regulation in the UK, and the system of consents needed for operations:

We mentioned the seismic risks - In this slide, DECC issues the licences but also checks the seismic monitoring plans of the companies before issuing consent to frack.

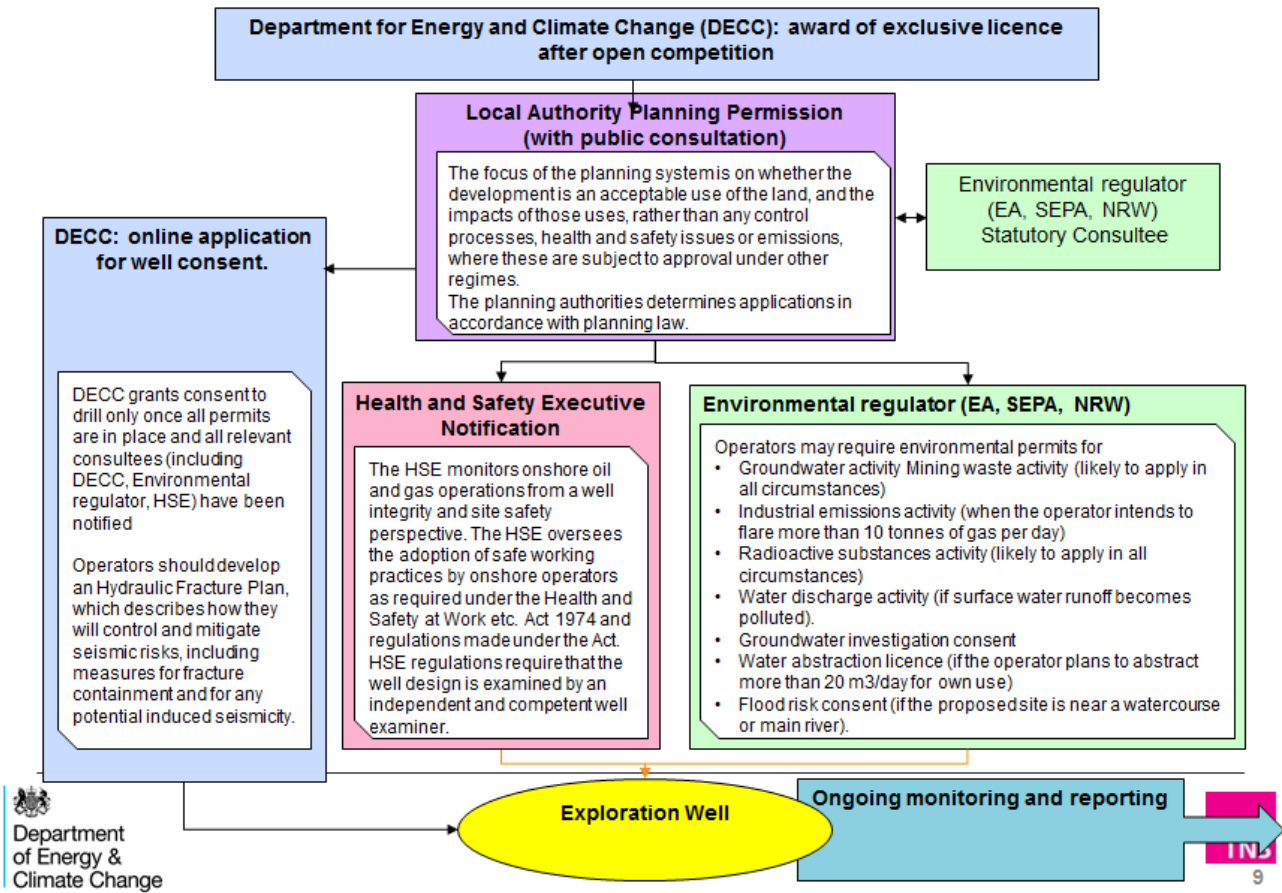
The planning authorities will consider many of the local impacts, including vehicle movements, noise and the visual impacts and has tools to require companies to lessen the impacts.

The Health and Safety executive monitors the well design and construction stages. These are important to the safety of the site and the risk of water contamination from the construction or maintenance of the well.

The Environmental regulator – the Environment Agency in England – will permit activities that don't mean an unacceptable risk to the environment.

If a site goes forward to production, or further wells are drilled, the operator will need to get all the consents again for the new activity proposed.

How do operators get permission?



1.3.9 Introduction to risks and mitigation participant hand-outs



Water contamination

Risks	Mitigation
<ul style="list-style-type: none"> Hydraulic fracturing creates tiny cracks in shale rocks. Some worry gas might be able to move through these fractures into groundwater, but there is no evidence of this to date Poorly constructed wells could lead to contamination of groundwater by gas 'Frack fluid' is the name given to the water and sand solution that is used in fracking. It may also contain chemicals 	<ul style="list-style-type: none"> Before any gas or oil operation starts in the UK, operators must submit details of their plans to the relevant environmental regulator who assesses the risks If groundwater could be contaminated – either directly by drilling fluids or frack fluid, or indirectly by a substance disturbed by the borehole or fracking – the authority may find the risk to the environment unacceptable and not grant a permit

Water supply

Risks	Mitigation
<ul style="list-style-type: none"> Hydraulic fracturing is likely to involve the use of large quantities of clean water Each fracking operation requires between 10,000 and 30,000m³ (10,000 to 30,000 tonnes or 2 to 6 million gallons) of water. This is similar to the amount a coal power station uses in 12 hours. The average person in England uses 54m³ a year The water may be purchased from the local water supply company or taken ('abstracted') from surface or groundwater 	<ul style="list-style-type: none"> The environmental regulator will only grant a licence to an operator to take ('abstract') water from local groundwater where a sustainable water supply is available Water companies must produce, and then update every 5 years, a long-term plan with contingency reserves in case of a drought. Water companies will assess the amount of water available before providing it to operators

Earth tremors

Risks	Mitigation
<ul style="list-style-type: none"> • In 2011, there were small tremors at Preese Hall near Blackpool, where hydraulic fracturing operations were taking place • There are no documented cases of hydraulic fracturing causing subsidence or tremors large enough to cause damage at the surface • Independent experts consider that any earthquake that could be triggered by fracturing in the UK could be no more than magnitude 3 on the Richter scale. This magnitude of earthquake typically occurs 3 to 4 times a year in the UK 	<ul style="list-style-type: none"> • Following the tremors in Lancashire, DECC introduced new controls and checks for operators using hydraulic fracturing • During fracturing operations, seismic activity at the site will be monitored. A traffic light system determines whether injection of water is safe to proceed • Operations stop if a tremor of magnitude 0.5 or greater is detected, to investigate and prevent a larger tremor

Air pollution

Risks	Mitigation
<ul style="list-style-type: none"> • The main potential cause of air pollution in the exploratory phase is from burning off waste natural gas (a process called 'flaring') • In the production phase there are two potential air pollution risks: pollutants that come up the well while it is being completed ('flowback'); and pollutants released from production itself (e.g. in processing the gas) • Onsite diesel generators, exhaust from vehicles travelling to and from the site, and the dust created by disturbing the landscape may potentially contribute to local air pollution 	<ul style="list-style-type: none"> • In the UK, all oil and gas operators must minimise the release of gases as a condition of their licence from DECC • Operators must monitor air quality and share their results to the relevant environmental regulator. They must be able to show that their activities have not led to air pollution at levels higher than those set out in their environmental permits • Operators must also submit a waste management plan and a dust management plan to the relevant environmental regulators

Climate change

Risks	Mitigation
<ul style="list-style-type: none"> • The process of extracting shale gas has the potential to release methane (a powerful greenhouse gas) into the atmosphere. It could increase the carbon footprint of shale gas and in large quantities, it could lessen the climate benefits of using natural gas over oil or coal • A DECC study found that the carbon footprint for shale gas is lower than imported liquefied natural gas and significantly less than that for coal when used for electricity generation • Most carbon emissions will come from its final use as a fuel 	<ul style="list-style-type: none"> • Technologies that can help prevent greenhouse gas emissions from shale gas sites already exist. During exploratory drilling, operators can burn off any excess methane (a process called 'flaring'), which greatly reduces the greenhouse gas emissions. In production, operators can capture emissions that might otherwise flow into the atmosphere with 'green completions' – mobile equipment that collects and filters the initial flow of water, sand and gas • The UK has legally binding climate budgets. Local emissions will need to be offset by cuts elsewhere in the economy if they would increase emissions beyond the level acceptable under our carbon budgets

Local disruption and damage

Risks	Mitigation
<ul style="list-style-type: none"> • There is the potential for activities associated with shale oil and gas exploration and production to have negative effects on the local population, particularly in the following areas: <ul style="list-style-type: none"> • Vehicle movements – these will depend on what is happening at the site, but estimates range from 16-51 HGV movements per day per pad over a 73-145 week period to 4-17 per day over 5 years where a site is connected to mains water • Noise - as well as noise from vehicles, there will be noise from the site equipment • Visuals - At a typical exploration site there will be: flood lights; rig equipment; piping and storage; mobile 'portakabins' for offices; worker restrooms; the well head itself. 	<ul style="list-style-type: none"> • The potentially adverse effects of vehicle movements can be mitigated by regulators and planning controls, which could cover the development of a transport plan; the scheduling, timing and frequency of movements; speed restrictions and the use of alternative routes to and from the site • Planning authorities should ensure that unavoidable noise emissions are controlled, mitigated or removed at source • Any operations in urban areas or in areas of scenic beauty will be either temporarily or permanently screened depending on the location and phase of drilling

1.3.10 Risks and mitigation participant hand-outs

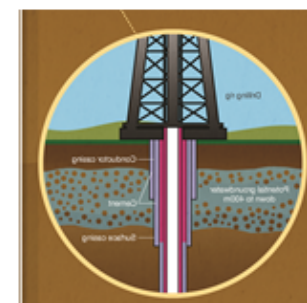
1. Water Contamination (Risks)

Hydraulic fracturing creates tiny cracks or fractures in shale rocks. The fractures release natural gas from the rock to travel back up the well. Some worry gas might be able to move through these fractures into groundwater. In the USA, where commercial fracking operations have been established for 30 years, the risk of gas and fracturing fluids entering groundwater from the fractures in the rock is extremely low, the conclusion of a report by the Royal Society and Royal Academy of Engineering conclude. The thickness and properties of rock surrounding the fractures limit how far the fractures can reach. The depth of most shale gas deposits – from hundreds of metres to kilometres down – makes contamination even less likely when compared to much shallower groundwater. The geology of the UK means that generally there are layers of rock above the shale rock that are impermeable and act as a barrier to contamination.

Shale gas wells are holes drilled through the soil and rock to reach gas-bearing shale rock. Each hole is lined with stages of steel casing, cemented into place to prevent leaks. In the USA, there is some evidence that poorly constructed wells have led to contamination of groundwater by gas, for example studies by Duke University. Groundwater contamination could also be caused by the well linking groundwater aquifers, causing poorer quality groundwater to contaminate good quality groundwater.

'Frack fluid' is the name given to the water-and-sand solution that is used in fracking. It may also contain non hazardous chemicals added to disinfect the water or to reduce friction during extraction of gas. Drilling fluids are fluids used to drill the boreholes for the well and can be used at the drilling stages and are used to help the drill move through the earth. Some of the fracking fluid returns to the surface and is known as 'flowback fluid'. This fluid may contain: sand and chemicals (used to assist the fracturing process); small quantities of dissolved minerals such as chloride and sodium, and iron and other metals; or naturally occurring radioactive minerals.

In the US, flowback fluid can be stored in open pits. In some cases, overflows from such wastewater pits have caused surface water contamination.



"The chemicals used in things like lipsticks and contact lens solution are the same as would potentially go into frack fluid... The chemicals that are used are all things that are used in our daily lives already."

**Industry
Representative**

1. Water Contamination (Mitigation)

Before any gas or oil operation starts in the UK, operators must submit details of their plans to the relevant environmental regulator (the Environment Agency in England). The plans must contain a hydro-geological assessment, including details of the presence of groundwater or surface water, details of borehole constructions, monitoring plan, fracturing fluids, naturally occurring radioactive minerals, water abstraction and management of abstracted water.

The environmental regulator assesses the proposal's risks and decides whether to issue the relevant permits after a period of public consultation. If groundwater could be contaminated – either directly by drilling fluids, frack fluid or indirectly by a substance disturbed by the borehole or fracking – the authority may find the risk to the environment unacceptable and not grant a permit. A permit may be issued if the risk can be limited by, for example, the design of the well, monitoring or limiting the concentration of chemicals.

All operators must comply with a comprehensive set of health and safety regulations on well design, construction, operation and monitoring to minimise the risk of leaks. Like all oil and gas operations, drilling must be done in accordance with best industry practice and standards established by the industry body, the UK Onshore Operators Group, in consultation with the Department of Energy and Climate Change (DECC), the environmental regulator and Health and Safety Executive (HSE).

Chemicals used in drilling and frack fluids are assessed for hazards on a case-by-case basis for each well by the appropriate environmental regulator. Operators must declare the full details of the chemicals to the regulator and publish a brief description of the chemical's purpose and any hazards it may pose to the environment on the UKOOG website.

In the UK, the regulations prevent flowback fluid contaminating water sources by requiring the operator to: make appropriate plans for storing fluid safely and not in open pits; design the site so spills are avoided (and are contained if they do happen); and to dispose of flowback fluid safely. The operator must obtain an environmental permit for the disposal of flowback fluid from the relevant environmental regulator and have an agreed waste management plan in place.

“How will the [flowback fluid] be disposed of safely? Because it's a lot of water. 10 to 30,000 tonnes going down, maybe 20-30% of that coming back up... Piping it out and disposing of it is a major issue. It's not like a few lorry loads of sludge that you've got off a farm – it's a huge volume of water that needs to be treated.”

**Academic Scientist,
Oxford University**

“[The assessment of risks] is also considered through the planning application process – when deciding whether to grant or refuse planning permission.”

Planning Officer

2. Water Supply (Risks)

Hydraulic fracturing for shale gas and oil is likely to involve the use of large quantities of clean water – although the amount of water used in ‘fracking’ is not exceptional compared with other industrial activities.

Each fracking operation requires between 10,000 and 30,000m³ (10,000 to 30,000 tonnes or 2 to 6 million gallons) of water. There may be 10 operations per well over the approximate 25-year production life.

The volume will depend on the site, but estimates suggest that the amount needed to operate a fracked well for a decade may be equivalent to the amount needed to water a golf course for a month, or the amount needed to run a 1,000 MW coal-fired power plant for 12 hours. The average person in England uses 54m³ a year. Fracked wells do not use a constant supply of water and are likely to be fracked only a few times in a 10-year period.

The water may be purchased from the local water supply company or taken (‘abstracted’) from surface or groundwater (if permitted by the relevant environmental regulator – i.e. the Environment Agency in England).

As of September 2013, the only company to have hydraulically fractured in the UK, Cuadrilla, used water from the local water utility company.



“Depending on the pace and scale of development, continued drilling activity could place significant additional stress on freshwater systems across the UK. Moreover, local constraints around managing water supplies, especially in areas of water stress or at times of prolonged drought, may arise as a result of fluctuating water needs of the shale gas industry throughout the year. Therefore, the phasing of onsite activities to reduce peak demand and avoid times of water scarcity is an essential consideration for the industry.” *

Wildlife Trusts

“There would be local disruption [as a result of supplying water].”

National Farmers Union

*FREYMAN, M. & SALMON, R. (2013) *Hydraulic fracturing & Water Stress: Growing Competitive Pressures on Water*. Boston, MA, USA: Ceres; BRODERICK, J., ANDERSON, K., WOOD, R., GILBERT, P., SHARMINA, M., FOOTITT, A., GLYNN, S. & NICHOLLS, F. (2011) *Shale gas: an updated assessment of environmental and climate change impacts*. Manchester, UK: Tyndall Centre for Climate Change Research, University of Manchester.

2. Water Supply (Mitigation)

The environmental regulator will only grant a licence to an operator to take ('abstract') water from local groundwater where a sustainable water supply is available. The application will be assessed in the same way as any other application from industry or business.

Water companies must produce, and then update every 5 years, a long-term plan with contingency reserves in case of a drought. Water companies will assess the amount of water available before providing it to operators.

"There may be potential to use sea water, depending on the location of the development."

Planning Officer

"The potential impact on water supply will also be addressed through the planning application process. We rely on studies and advice from the Environmental Agency."

Planning Officer

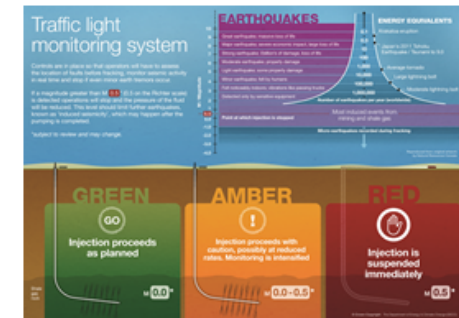
3. Earth Tremors (Risks)

In 2011, there were small tremors at Preese Hall near Blackpool, where hydraulic fracturing operations were taking place. The Department of Energy and Climate Change (DECC) suspended all operations while investigating the cause. The tremors measured magnitude 2.3 and 1.5 on the Richter scale. Earthquakes of this size are not usually felt at the surface. Detailed technical investigations and independent review showed that the tremors were probably caused when 'frack fluids' flowed into a geological fault, a crack running through one or more layers of the underground rocks. There are thousands of fracking operations in the US and Canada each year and there are a few reported cases of induced seismicity. Other US operations involving injecting waste water into rock formations that it did not come from have been associated with larger earthquakes, generally registering up to magnitude 4 or 5 on the Richter scale. This is not currently permitted in the UK.

There are no documented cases of hydraulic fracturing causing subsidence or tremors large enough to cause damage at the surface. Unlike coal mining, shale gas production does not remove large quantities of rock from underground which can cause subsidence. Subsidence can happen when rock is compressed and collapses in on itself. But shale rock is not easily compressed, so subsidence is unlikely.

After a decade of extensive fracturing activity in the US, there is no evidence to suggest that ongoing fracturing increases the likelihood of earthquakes. In the UK, the British Geological Survey National Earthquake Monitoring System provides continuous seismic monitoring. It would alert scientists to any changes in the level of natural background seismic activity.

A group of independent experts (from Keele University, the British Geological Survey and a consultant on the technology) consider that any earthquake that could be triggered by fracturing in the UK could be no more than magnitude 3 on the Richter scale. This magnitude of earthquake typically occurs 3 to 4 times a year in the UK.



“Local earthquakes can affect the integrity of the drill well – which can in turn cause other problems, such as water contamination.”

Greenpeace

3. Earth Tremors (Mitigation)

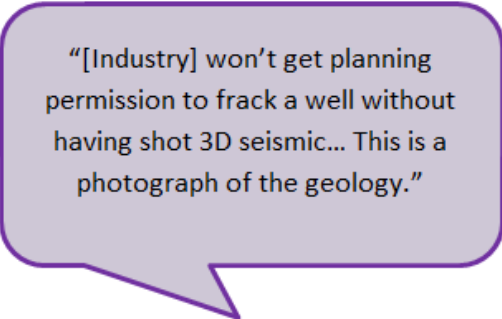
Following the tremors in Lancashire, DECC introduced new controls and checks for operators using hydraulic fracturing. They are required to: use all available geological information to assess the location of faults before wells are drilled to avoid hydraulically fracturing near faults; use British Geological Survey records to assess baseline levels for seismic activity (vibrations of the earth's crust); ensure wells are sited where there will be no unplanned interaction between them; inject as little fluid as necessary into the rock during fracturing; monitor seismic activity during and after fracturing; and adopt a 'traffic light' system that controls whether injection can proceed or not, based on that seismic activity.

During fracturing operations, seismic activity at the site will be monitored. A traffic light system determines whether injection of water is safe to proceed: green (less than magnitude 0 on the Richter scale) means that injection proceeds as planned; amber (magnitude 0 to 0.5) means that injection proceeds with caution (possibly at reduced rates and with monitoring intensified); and red (magnitude 0.5 or higher) means that injection is suspended immediately.

Operations stop if a tremor of magnitude 0.5 or greater is detected. The pressure of fluid in the well is reduced immediately. The magnitude 0.5 threshold was set on the basis of a report by a group of independent experts. This level is well below what could be felt at the surface. However, it is above the level expected from normal 'fracking' operations and so serves as early warning of the possibility of larger tremors. As more data becomes available, DECC and its advisers will keep effectiveness of these rules, including the trigger level, under review.

The operator will be required to submit its monitoring to DECC promptly and to publish up-to-date information on its website.

Where there is particularly vulnerable infrastructure, the planning process requires that operators engage stakeholders and address any concerns before planning permission is granted.



"[Industry] won't get planning permission to frack a well without having shot 3D seismic... This is a photograph of the geology."

Industry Representative

4. Air Pollution (Risks)

The main potential cause of air pollution in the exploratory phase is from burning off waste natural gas (a process called 'flaring'). Exploration is brief, so it is unlikely that this gas could be processed or sold. Flaring is the most effective and safe way to reduce the carbon emissions from disposing of it. Flaring reduces greenhouse gas emissions by about 80% compared to simply 'venting' it into the atmosphere.

After exploration and further planning permission, the well may move into production. This involves two potential air pollution risks: pollutants that come up the well while it is being completed ('flowback'); and pollutants released from production itself (e.g. in processing the gas). Emissions during these stages may include various pollutants. Most occur during 'well completion' after 'fracking', when the 'frack fluid' (a combination of water, sand, hydrocarbon liquids and natural gas) flows back to the surface. These emissions can be controlled using 'green completions' – mobile equipment that collects and filters the initial flow of water, sand and gas. Green completions and flaring can reduce the emission of volatile organic compounds, and other air pollutants that can damage health, by as much as 95%. After flowback, emissions during production and processing can come from compressors, pumps, dehydration equipment, chemical processing and accidental leaks – these can be reduced by rigorously maintaining the machinery, and using vapour recovery units to limit venting from storage tanks.

Onsite diesel generators, exhaust from vehicles travelling to and from the site (typically for removal of water), and the dust created by disturbing the landscape may potentially contribute to local air pollution. These emissions can be reduced by using electric drills, and by using diesel machinery with three-way catalytic converters. Vehicle emissions will depend on the site's location: for example how far it is from materials, the local water supply and a suitable wastewater treatment facility. Reuse of water during production could reduce water demand, and thus the amount of journeys taken.

Abandoned wells may affect air quality if they are not properly sealed. This is a low risk in modern, properly designed wells.



“Flaring is nothing new. It is something that other industries (such as chemical factories) use... Anything you flare, is money you are losing into the atmosphere so it is not in industry's interests to flare.”

Industry Representative

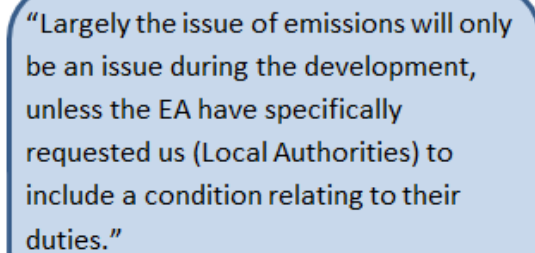
4. Air Pollution (Mitigation)

In the UK, all oil and gas operators must minimise the release of gases as a condition of their licence from the Department of Energy and Climate Change (DECC). Natural gas may only be vented for safety reasons. Operators must monitor air quality and share their results to the relevant environmental regulator (the Environment Agency in England) or, when appropriate, to the Health and Safety Executive (HSE). They must be able to show that their activities, including flaring during exploration, have not led to air pollution at levels higher than those set out in their environmental permits. Operators must also submit a waste management plan to the relevant environmental regulators. In it, operators will state what waste gases they expect and how they will minimise them. The relevant environmental regulator may carry out spot-check monitoring and unannounced inspections depending on the risk to the environment posed by a site. Minerals planning authorities will also visit sites to ensure the operator complies with the conditions attached to their planning permission.

The rules for monitoring and reducing emissions during shale production and operation will likely be similar to those enforced during exploration. The requirements for mining waste permits will be considered during these later stages.

Operators need to submit a dust management plan to the relevant environmental regulator before they can start drilling. Environmental Impact Assessments will consider these emissions before any operations begin. The local environment and residential areas must not be harmed by dust. If it is, drilling will be suspended until dust control measures are improved.

Before planning permission is granted, operators must present a plan to the planning authorities showing how the well will be shut down and the site restored to a high standard, at least to the standard of its previous state. The relevant planning authorities are responsible for ensuring these plans are followed through the conditions attached to the planning permission. After initial exploration, activity at the well is usually suspended and abandoned for a period of time. Operators must notify the HSE when wells are abandoned and demonstrate that the process complies with UK Onshore Operators Group Guidelines.



“Largely the issue of emissions will only be an issue during the development, unless the EA have specifically requested us (Local Authorities) to include a condition relating to their duties.”

Planning Officer

5. Climate Change (Risks)

The process of extracting shale gas has the potential to release methane (a powerful greenhouse gas) into the atmosphere. Such 'fugitive methane' could increase the carbon footprint of shale gas. In large quantities, it could lessen the climate benefits of using natural gas over oil or coal. Potential sources of emissions include when the 'frack fluid', which contains natural gas, flows back to the surface, associated equipment such as on-site diesel generators and exhaust from vehicles travelling to and from the site.

On 9 September 2013, the Department of Energy and Climate Change (DECC) published a report by its Chief Scientist, Professor David MacKay, and Dr Timothy Stone examining the carbon footprint and climate change implications for UK shale gas. The study found that the carbon footprint for shale gas is lower than imported liquefied natural gas and significantly less than that for coal when used for electricity generation. The study also found that, if well regulated, local greenhouse gas emissions from shale gas operations should represent only a small part of the carbon footprint. Most carbon emissions will come from its final use as a fuel.

"Research suggests that a UK shale gas boom would leave UK carbon emissions pretty much unchanged, and could cause global emissions to increase." *

Greenpeace

"The use of natural gas extracted from shale reservoirs has significant scope to reduce the UK's overall carbon emissions, as gas will probably displace coal in the energy mix." **

Industry Representative

"Shale gas is still contributing to greenhouse gases and all the evidence is that when you do shale gas you have a cheap energy supply locally so that enables you to export your oil and gas which would be burnt somewhere else in the world and contribute to greenhouse gas emissions. So in fact the overall greenhouse gas emissions go up dramatically when you start adding in shale gas as well... It is a consequence of fracking in the US where they have managed to produce so much shale gas that now they're wanting to export that as well and in order to do that they have to cool the gas down into a liquid, put it on tankers and ship it off around the world. And the cooling process is enormously energy consuming... You emit even more greenhouse gases because of the cooling process."

Academic Scientist, Exeter University

*David MacKay https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237330/MacKay_Stone_shale_study_report_09092013.pdf

**<http://www.ukoog.org.uk/elements/pdfs/UKOOG%20Onshore%20Oil%20and%20Gas%20in%20the%20UK.pdf>

5. Climate Change (Mitigation)

The UK is legally committed to cutting greenhouse gas emissions by at least 80% from 1990 levels by 2050. This raises the question of whether we can extract shale gas, and meet our carbon commitments. It is the Government's view that we can extract shale gas and meet our carbon commitments.

Technologies that can help prevent greenhouse gas emissions from shale gas sites already exist. During exploratory drilling, operators can burn off any excess methane (a process called 'flaring'), which greatly reduces the greenhouse gas emissions. In production, operators can capture emissions that might otherwise flow into the atmosphere with 'green completions' – mobile equipment that collects and filters the initial flow of water, sand and gas.

Local emissions will need to be offset by cuts elsewhere in the economy if they would increase emissions beyond the level acceptable under our carbon budgets, such as reductions in emissions from heating or transport. However, the continued combustion of gas is consistent with carbon budgets at least over the next couple of decades.

It is in our interests for much of our future oil and gas to be produced in the UK, where about the UK has more control of environmental and safety standards. We have robust regulations to protect people and the environment, and ensure safe working. We will need the industry to maintain high standards.

To ensure that shale gas exploitation doesn't increase cumulative greenhouse gases, it is crucial that society maintains efforts to drive down the costs of low-carbon technologies, including carbon capture and storage.

"McCubbin and others argue that comparisons between unconventional hydrocarbons and coal may be misleading, particularly if one considers that the average life-cycle GHG emissions of shale gas (500 g-CO₂/kWh) are about 16 times higher than wind power (30 g-CO₂/kWh). This argument, in particular, makes it difficult to reconcile the development of unconventional gas resources with UK's statutory commitments on climate change." *

Wildlife Trusts

"In a groundbreaking life-cycle study of the Green House Gas footprint of natural gas obtained by fracking, Howarth et al found the production of a unit of shale gas to be at least 30% more GHG-intensive than that of conventional natural gas."

Wildlife Trusts

"Shale gas bridges the gap between now and reaching the renewables agenda."

Planning Officer

*Sovacool (MCCUBBIN, D. & SOVACOOOL, B. (2011) The hidden Factors That Make Wind Energy Cheaper than Natural Gas in the United States, The Electricity Journal, 24 (9), 84-95.)

(HOWARTH, R.W., SANTORO, R. & INGRAFFEA, A. (2011) Methane and the greenhouse-gas footprint of natural gas from shale formations. Climatic Change, 106 (4): 679-690. DOI: 10.1007/s10584-011-0061-5.)

Planning Officer

6. Local Disruption (Risks)

There is the potential for activities associated with any oil and gas exploration and production to have negative effects on the local population, particularly during well site construction, exploration drilling and production development stages. This disruption could impact in the following areas:

Vehicle movements: Actual vehicle movements will depend on a number of factors including: the number of wells drilled and their phasing; the volumes of water needed; how water is sourced and whether it is tankered to the site; the volumes of waste and wastewater generated; the methods of waste treatment; and the extent to which treatment occurs on or off site. Vehicle movements will depend on what is happening at the site. For example DECC's recent Strategic Environmental Assessment had a high scenario of 16-51 HGV movements per day per pad over a 73-145 week period whereas the Institute of Directors estimate it to be 4-17 per day over 5 years where a site is connected to mains water.

The additional vehicle movements could lead to congestion on local roads that lead to the site, depending on site access, timing and existing traffic flows. Increases in vehicle movement could generate emissions and dust potentially affecting those with respiratory problems as well as noise and vibrations which may cause stress/anxiety to residents and disruption to wildlife principally alongside local transport corridors within rural areas. The effects on the local community and habitats will be highly dependent on the location of sites; the frequency, timing and routing of HGV movements; the proximity to sensitive areas; existing levels of noise/air pollutants and prevailing health issues.

Noise: As well as noise from vehicles, there will be noise from the site equipment.

Smell: There are no specific odours associated with shale gas exploration.

Visuals: At a typical exploration site there will be: flood lights (which only light up the site itself and are switched on at dusk and off again at dawn); rig equipment; piping and storage; mobile 'portakabins' for offices; worker restrooms; the well head itself.



6. Local Disruption (Mitigation)

Vehicle movements: The potentially adverse effects can be expected to be mitigated by regulators and planning controls, which could cover the development of a transport plan; the scheduling, timing and frequency of movements; speed restrictions and the use of alternative routes to and from the site. The extent to which these will mitigate the impact will vary; for urban areas and communities adjacent to major roads, and at a regional or national level, these effects from increased vehicle movements are not expected to be significant.

Noise: The National Planning Policy Framework produced by the Department of Communities and Local Government (DCLG) makes it clear that planning authorities should ensure that unavoidable noise emissions are controlled, mitigated or removed at source. Applications are subject to a maximum of 55dB, measured from the edge of the well site. To put this into perspective, a normal conversation is the equivalent of 60-65dB at about 3 feet away. In addition, mineral planning authorities recognise that there should be lower evening limits (19.00h – 22.00h) and even lower night time limits (22.00h – 07:00h) which should not exceed 42dB.

In any areas which are deemed close dwellings, all measures will be taken to reduce noise. For example, the site may have sound walls constructed and sound mitigation equipment will be used to maintain noise limits.

Restoration: The National Planning Policy Framework requires that planning authorities should provide for restoration and aftercare of the site to be carried out to high environmental standards once the production stage is complete.

Visuals: In accordance with the mineral planning authority, any operations in urban areas or in areas of scenic beauty will be either temporarily or permanently screened depending on the location and phase of drilling.

Health and wellbeing

“At the moment there’s only a small number of fracking licences granted for exploration and not much in terms of production so there’s a really great opportunity to do this properly in the UK and design studies that would detect if anything were going wrong at an early stage with the health and wellbeing of both the fracking workers and the communities that are going to be exposed to fracking operations... If well designed epidemiological studies were put in place now, where you assess the health and wellbeing of the local community and then in a few years, at a time that fracking is being operated, you assess it again and see if there is any evidence that the community’s health has been affected. And the same might apply to the environment – get the environmental analyses conducted now so that we have a baseline to compare what changes take place in the future as a result of fracking.”

**Academic Scientist,
Exeter University**

1.3.11 Glossary

- **Abandonment/decommissioning-** is the procedures for abandoning a well to ensure that all the fluids it contains are permanently sealed. This is done by inserting cement plugs to seal the well, removing some of the steel casing and fitting a steel cap, in compliance with the Oil & Gas UK guidelines for the suspension and abandonment of wells.
- To **'abstract'** – take water from local groundwater
- **Aquifer** - The bodies of rock that hold groundwater are known as aquifers. Perhaps the best way of imagining an aquifer is as a giant sponge. Water aided by gravity naturally fills the aquifer from the bottom upwards.
- **Capping (of wells)** - inserting cement plugs to seal the well, removing some of the steel casing and fitting a steel cap.
- **Coal bed methane** is extracted after pumping water out of coal beds that haven't been mined
- **'Conventional'** gas and oil fields are usually situated in sandstone, through which the gas flows more easily.
- **Decarbonisation** – reducing the amount of carbon, in the case of energy it means changing the way energy is used and sourced to limit greenhouse gas emissions.
- **Department for Energy and Climate Change (DECC)** is the Government department with responsibility for energy development. It issues Petroleum Exploration and Development Licences and grants consent to drill only once all permits are in place and all relevant consultees (including DECC, EA, HSE, BGS) have been notified
- **Environmental Regulators** are the **Environment Agency** in England, the **Scottish Environmental Protection Agency** in Scotland and **Natural Resources Wales** in Wales. Their role is to protect and improve the environment and to contribute to sustainable development.
- **Exploration** - Exploration is where companies will do seismic surveys, drill for samples of the shale rock, try one or more fracks and flow-test to see if oil or gas can be produced profitably. Once permissions are in place this can take from 2-6 months. There will be a 30metre drilling rig, equipment and lots of vehicles bringing the equipment and water onto the site.
- **Flaring** – the burning of natural gas that is released during drilling but is deemed not to be economically beneficial to capture
- **Flowback fluid** – waste water from the fracking process
- **Green completions** - mobile equipment that collects and filters the initial flow of water, sand and gas
- **Groundwater** - water soaks into the soil and continues its journey downward to rock layers beneath the soil. The water contained in tiny inter-connected spaces between individual rock grains is groundwater.
- **Health and Safety Executive** - The HSE monitors onshore oil and gas operations from a well integrity and site safety perspective. The HSE oversees the adoption of safe working practices by onshore operators as required under the Health and Safety at Work etc. Act 1974 and regulations made under the Act.
- **Hydraulic fracturing, or fracking**, is a technique used in the process of extracting shale gas and oil, to enable the gas or oil to flow **'Frack fluid'** - the name given to the water and sand solution that is used in fracking. It may also contain chemicals
- **Induced seismicity** - minor earthquakes and tremors that are caused by human activity

- **Licences** - Petroleum Exploration Development Licences (PEDL) are issued in competitive offerings (licence rounds) that grant exclusivity to operators in the licence area. They do not give consent for drilling or any other operations. There are currently 176 licences for onshore oil and gas in the UK.
- **Local or Mineral Planning Authority** - The focus of the planning system is on whether the development is an acceptable use of the land, and the impacts of those uses, rather than any control processes, health and safety issues or emissions, where these are subject to approval under other regimes. The planning authorities determines applications in accordance with planning law.
- **Operator** – this is the company that is responsible for the well and will run the exploration and production operations.
- **Pad** – the area on which the facilities and drilling equipment are based, usually the size of a football pitch it is sealed and has a concrete base.
- **Production** - If exploration is successful, the company will bring that site into production which will take a couple of years. The site may not be where the exploratory wells were drilled and will depend on the testing. The pad will need to be bigger and more wells will be drilled and fracked. Once the site is 'in production' there will be less activity, except for regular maintenance. The site can produce for 20 years.
- **Public Health England** – PHE's role is to protect and improve the nation's health and to address inequalities.
- **Shale gas and coalbed methane** are natural gas (predominantly methane); the same as we use in cooking and heating. Shale gas and oil is extracted from denser shale rock, which is usually deeper too.
- **Venting** – releasing the gas directly into the atmosphere

1.3.12 Bibliography

This bibliography was given to moderators and made available during the workshops for participants, if they wanted to check the sources of the information provided or follow up on anything themselves.

Bibliography

Developing Onshore Shale Gas and Oil – Facts about 'Fracking', Dec 2013,

[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/270980/Developing Onshore Shale Gas and Oil Facts about Fracking 140113.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/270980/Developing_Onshore_Shale_Gas_and_Oil_Facts_about_Fracking_140113.pdf)

Onshore Oil and Gas in the UK, UKOOG,

<http://www.ukoog.org.uk/elements/pdfs/UKOOG%20Onshore%20Oil%20and%20Gas%20in%20the%20UK.pdf>

Strategic Environmental Assessment for Further Onshore Oil and Gas Licensing, Amec, Dec 2013,

[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/273997/DECC SEA Environmental Report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/273997/DECC_SEA_Environmental_Report.pdf)

The following documents can all be found here: <https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking>

Fracking UK shale: climate change

Fracking UK shale: local air quality

Fracking UK shale: planning permission and communities

Fracking UK shale: understanding earthquake risk

Fracking UK shale: water

More information

The Department of Energy and Climate Change, Environment Agency (England), Scottish Environment Protection Agency and Health and Safety Executive have worked with the UK Onshore Operators Group to agree best practices for onshore shale gas wells. The [UK Onshore Operators Group's UK Onshore Shale Gas Well Guidelines](#) provide a description of the Hydraulic Fracturing Programme (HFP):

<http://www.ukoog.org.uk/elements/pdfs/ShaleGasWellGuidelines.pdf>

Oil & Gas UK publishes [guidelines](#) on well integrity that the onshore industry has committed to meet. The guidelines describe what is believed to be good industry practice and refer to relevant legislation, standards and practices. The guidelines concentrate on "typical" wells and "standard" operations.

<http://www.oilandgasuk.co.uk/publications/viewpub.cfm?frmPubID=445>

The American Petroleum Institute publishes information on well construction and integrity:

http://www.api.org/policy-and-issues/policy-items/hf/api_hf1_hydraulic_fracturing_operations.aspx

Water UK, the body for the Water Industry, has set out its [conclusions on the impact of shale gas production on water usage](#) and signed a Memorandum of Understanding with the shale gas and oil industry.

<http://www.water.org.uk/home/policy/positions/shale-gas/water-uk-shale-gas-briefing-paper-update-nov-2013.pdf>

The British Geological Survey has information on shale gas and groundwater on its website, including information on the national methane baseline study.

<http://www.bgs.ac.uk/research/groundwater/shaleGas/home.html>

The Environment Agency and Health and Safety Executive have published an agreement that explains their [joint approach to the regulation of unconventional oil and gas developments](#).

<http://www.environment-agency.gov.uk/business/topics/133885.aspx>

Public Health England produced a radon map for England and Wales.

<http://www.ukradon.org/map.php?map=englandwales>

A Royal Society and Royal Academy of Engineering report considered the earthquake risk.

<http://royalsociety.org/policy/projects/shale-gas-extraction/report/>

DECC commissioned 3 independent experts to write a report on the causes of the Lancashire earthquakes: Brian Baptie from the British Geological Survey, Peter Styles from Keele University and Chris Green from G-frac. They were selected because of their knowledge of geology, seismicity, and fracking. A range of other materials on the earthquakes in Lancashire is available on the gov.uk website, including reports submitted by Cuadrilla at the time.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48330/5055-preese-hall-shale-gas-fracturing-review-and-recomm.pdf

<https://www.gov.uk/oil-and-gas-onshore-exploration-and-production#annexes>

A note by Professor Peter Styles and Brian Baptie on earthquakes and seismicity in the UK.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/15747/5073-background-on-induced-seismicity.pdf

The Department of Energy and Climate Change has published a Regulatory Roadmap setting out the process operators should follow when seeking to drill for onshore oil and gas in the UK. The Roadmap is intended as a first point of reference for operators, planners and the public. It covers the regulatory differences between England, Scotland, Wales and Northern Ireland. It focuses on the exploration and appraisal phases, rather than production and decommissioning.

<https://www.gov.uk/government/publications/regulatory-roadmap-onshore-oil-and-gas-exploration-in-the-uk-regulation-and-best-practice>

For more information on earthquake magnitudes, visit the British Geological Society site.

<http://www.bgs.ac.uk/downloads/start.cfm?id=661>

The Environment Agency and Health and Safety Executive have published a paper explaining their joint approach to the regulation of unconventional oil and gas developments.

<http://www.hse.gov.uk/offshore/unconventional-gas.htm>

The Health and Safety Executive is responsible for regulating the requirements that ensure operators manage and control safety risks.

<http://www.hse.gov.uk/offshore/unconventional-gas.htm>

The Scottish Environment Protection Agency (SEPA) has more information on environmental regulation in Scotland, including the Water Environment (Controlled Activities) (Scotland) Regulations 2011, which are used to control borehole drilling, water abstraction and the discharge of fracking fluids.

http://www.sepa.org.uk/customer_information/energy_industry/unconventional_gas.aspx

SEPA has powers under the Pollution Prevention and Control (Scotland) Regulations 2012 for certain

activities, such as those involving refining of gas, gasification or other heat treatments, combustion, or disposal of solid or liquid wastes. It also has powers to control any naturally occurring radioactive materials (NORM) via the Radioactive Substances Act (1993). The Mining Waste Directive is regulated by the planning authorities in Scotland.

Natural Resources Wales has more information on environmental regulation in Wales.

<http://naturalresourceswales.gov.uk/?lang=en>

The Environment Agency has more information on environmental regulation in England. The primary legislation is the Environmental Permitting Regulations 2010, which incorporate the requirements of several different pieces of legislation, such as the Mining Waste Directive, Water Framework Directive, the Groundwater Daughter Directive and the Radioactive Substances Act 1993.

The Environment Agency and Natural Resources Wales also have the provisions of s30 and s199 of the Water Resources Act 1991 available to them.

<http://www.environment-agency.gov.uk/business/topics/126689.aspx>

The Department of Energy and Climate Change issues exclusive licences in competitive offerings (licence rounds).

<https://www.gov.uk/government/policies/providing-regulation-and-licensing-of-energy-industries-and-infrastructure/supporting-pages/oil-and-gas-licensing>

To find your planning authority and find out more about planning across the UK there is more information on the Planning Portal.

http://www.planningportal.gov.uk/wps/portal/genpub_LocalInformation?docRef=LocalInformation&scope=202&langid=0

Guidance on the role of planning system in handling applications for all phases of development in England is available on GOV.UK.

<https://www.gov.uk/government/publications/planning-practice-guidance-for-onshore-oil-and-gas>

Information on the planning framework for minerals in Scotland.

<http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/minerals>

Information on the planning framework for minerals in Wales.

<http://wales.gov.uk/topics/planning/policy/minerals/mineralsplanning/?lang=en>

The onshore oil and gas industry body, the UK Onshore Operators Group (UKOOG) has committed companies to engage with local people, residents and other stakeholders in their Community Engagement Charter.

<http://www.ukoog.org.uk/elements/pdfs/communityengagementcharterversion6.pdf>

A recent study by DECC's Chief Scientist looked at the potential greenhouse gas emissions from shale gas production and discusses its compatibility with global climate change targets.

<https://www.gov.uk/government/publications/potential-greenhouse-gas-emissions-associated-with-shale-gas-production-and-use>

The University of Texas recently published research into the extent of methane emissions from shale gas pre-production and production stages.

<http://www.pnas.org/content/early/2013/10/09/1304880110>

The Government has published a Gas Generation Strategy setting out why we believe gas will be important for UK energy security and as part of our low carbon transition.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65654/7165-gas-generation-strategy.pdf

The British Geological Survey has information on shale gas and groundwater on its website, including information on the national methane baseline study.

<http://www.bgs.ac.uk/research/groundwater/shaleGas/home.html>

The Air Quality Standards Regulations 2010 provide the legislative basis for air quality in England.

<http://www.legislation.gov.uk/uksi/2010/1001/contents/made>

The Environment Agency have released a review of evidence relating to fugitive emissions. Fugitive emissions are gases which are released because they can't be captured as they are extracted.

<http://publications.environment-agency.gov.uk/PDF/SCHO0812BUWK-E-E.pdf>

1.3.13 Homework task

At the end of workshop 1, participants were given a homework task to complete before the second workshop. Other than to maintain engagement in the dialogue process, the purpose of the task was to get participants to think about and research the ways in which the public are currently consulted on planning permissions, and how they would like to be engaged.

Shale Gas Homework before Workshop 2

Task 1

Imagine a supermarket chain was trying to build a new store in your local area. Please investigate what happens when a development like this is planned in your area – what happens when a supermarket submits a planning application? How and when are the public consulted? How would you go about having your say?

Task 2

Please read the following document

Fracking: planning and the impact of fracking on communities

This guide explains the planning process involved with hydraulic fracturing (known as 'fracking'), and what industry is doing to engage communities.

Impacts on communities

Type of operations involved in extracting shale gas and oil are broadly similar to those used in existing onshore gas and oil extraction methods and the planning system treats them in the same way. Shale gas and oil developments will be covered by the same robust safety and environmental regulatory regime, supplemented by new controls against the risk of earthquakes.

There are several stages of oil and gas development, shown within the appendix. Local impacts will depend on each site and its state of development.

The industry has made a commitment to work with local communities to minimise the impact of shale gas and oil operations wherever possible.

Obtaining planning permission for fracking

Planning permission must be acquired at each stage of a site's development: for exploratory wells, to drill further wells, and before the site goes into production.

During the planning process, authorities will make the plans available to local people and ask for their comments. These comments will be considered with the planning application. Other organisations – such as the relevant environmental regulator (the Environment Agency in England) – will also be consulted on any application.

The planning authority will assess economic, social and environmental factors like local jobs, noise, dust, air quality, levels of traffic and other important environmental issues before making its decision.

Beyond this, the site operator will be required to make an Environmental Impact Assessment. This will consider any potential risks to people, plants, animals, soil, water, climate, the landscape, architecture, archaeology, and other factors.

In England and Wales, there is no set minimum distance for any industrial activity from populated areas. The Scottish Government has announced plans to set a minimum distance between sites and populated areas.

Asking local people for their views

Each planning application must be publicised by a display onsite and in local newspapers. Information must also be available on local authority websites. This must include a section on how interested people can submit representations about the application, giving a period of at least 14 days.

Representations must be submitted in writing, either on paper or electronically. Members of the public can also speak at a planning committee meeting.

The onshore oil and gas industry body, the UK Onshore Operators Group (UKOOG), has committed to engaging with local people, residents and other stakeholders. Operators agree to discuss their plans, and listen and respond to concerns before each of the three stages of operation.

Community benefits

In its Community Engagement Charter, the UKOOG has committed to a community benefits package, to be regularly reviewed. The operator will: at exploration/testing stage, provide £100,000 in community benefits per well-site where fracturing takes place; at production stage, pay 1% of revenues to communities; and publish evidence each year on how they have met these commitments.

Impacts on house insurance

While the government does not comment on the commercial practices of individual insurers, there is no evidence that current exploration will adversely affect insurance or property values in the vicinity.

Fracking in house buyer 'searches'

When a house is sold, buyers normally organise searches of records held by local authorities and others. This search may show that the site lies within, or near, the area covered by a Petroleum Act licence (PEDL). These areas may be very large – possibly tens of thousands of square kilometres – and can include locations far from an actual site of operations.

If a licence has been granted, the search report will name the operator. House buyers should ask the operator if they want to know more about their plans.

Operators' insurance

In its Community Engagement Charter, the industry promises that operators will have adequate insurance and response plans for all possible events.

Operators of oil and gas sites are fully responsible for any damage caused by their activities. The Department of Energy and Climate Change (DECC) ensures that operators have appropriate insurance before granting licenses.

Restoring the environment and long-term monitoring

When operations finish, the operator is responsible for restoring the well-site to its previous state.

DECC is discussing with industry suitable arrangements to ensure site restoration and aftercare (including suitable monitoring of abandoned wells) happen, even when the operator goes out of business.

1.4 Wave 2

1.4.1 Discussion guide

Timings	Content	Stimulus needed
9.30-10am	Arrival and registration	
	PURPOSE: introductions and recap the purpose of the event	
10 – 10.10am	<p>PLENARY: Welcome TNS BMRB Introduction</p> <ul style="list-style-type: none"> • Housekeeping • Ground rules • Recap on Wave 1 • Purpose of Wave 2. To include: <p>Like all oil and gas development, shale gas and oil is allowed through licences nationally. Where the developments are sited is decided by the location and features of the site, through planning permission and permits.</p> <p>The public dialogue does not focus on whether shale gas development should be allowed or not, instead we want to understand what shale oil and gas developments mean for you. and what engagement you feel is important locally.</p> <p>We'll be discussing the bigger picture for how people want to be involved in these decisions in future; and in the shorter term and local level, how developments should be managed, what local people's roles in that should be, and how it is ensured that this is accountable to the public</p> <p><i>Introduce slide on the key players we will be discussing: in the next session, we will be looking at the organisations involved in public engagement on the development of shale gas. This is who they are.</i></p> <p>Reminder of 'issues' board (<i>researchers to check board throughout the day and respond where possible</i>)</p>	Introduction presentation (Annex 1.3.2 for slides 1-3, with 1.4.2 for wave 2 agenda)
	PURPOSE: warm-up, reflections since the previous wave, to download from the homework task, and build discussion of the principles of engagement. To introduce the parameters for engagement: the regulatory process, the bodies involved, the points at which public engagement can influence decisions on nature of development and local residents' role in it	
10.10-11.05am	<p>BREAKOUT: Reflections on shale gas</p> <ul style="list-style-type: none"> • Group introductions (if new groups) • What stood out for you after the first session, in what you learned/ what you were interested in? • <i>Moderator read out ONLY the answers to the questions the group focused on in Wave 1</i> • What are your thoughts on this information? <ul style="list-style-type: none"> ○ Does it answer your questions? ○ What's surprising? ○ What's missing? • Moving on to thinking about engagement – let's talk about the homework task. Tell us about what you found out about during the 'homework' task. <ul style="list-style-type: none"> ○ Who did you talk to? 	Info in response to questions from Wave 1 Participants share their homework task findings

	<ul style="list-style-type: none"> ○ What did you tell them about? ○ What research have you done/information have you found? ● In relation to shale gas development, what do you think the principles of good engagement are? <ul style="list-style-type: none"> ○ What's important? ○ What's less important? ○ Who should be involved? ● If you were in an area where shale gas development was licensed and sought by an operator, what arrangements for the planning and management of developments in your area be acceptable to you? ● What degree of involvement would you want? ● Card ranking game – participants to rank in order of preference, who they would want to hear from for the following questions: <i>(Researcher flip-chart participants' responses – to refer back to in later sessions)</i> <ul style="list-style-type: none"> ○ What are the potential benefits and risks for local residents? ○ What are the potential impacts on the local environment –water, tremor etc.? ○ How this will contribute nationally and are there cumulative risks? <ul style="list-style-type: none"> ▪ Explore reasons for this ● What influences your preference for contact with different individuals / organisations? 	<p>Cards to include:</p> <ul style="list-style-type: none"> -Industry representative -Local authorities -DECC -Independent scientists -Parish council -Regulators -Non-Governmental Organisations e.g. NFU, -Greenpeace, CPRE, - Wildlife trusts Activists -Business organisations (Annex 1.4.3) <p>(researcher check briefing for details on local area)</p> <p>Use 1 copy for this whole group exercise</p>
11.05-11.25	<p>PLENARY</p> <p>Presentation introducing the key phases of shale gas introduction to an area – highlighting who is involved at each stage, and the opportunities for public engagement.</p> <ul style="list-style-type: none"> - The timeline for exploration, appraisal and production - The bodies involved, and what their roles and powers are - The opportunities for the public to engage/ to be engaged <ul style="list-style-type: none"> ○ Range of examples 	<p>Presentation by DECC (Annex 1.4.4)</p> <p>Handouts for participants (<i>distributed before the presentation</i>)</p>
11.25-11.35	<p>PLENARY</p> <p>Q+A: check comprehension and initial responses to the parameters for engagement</p>	
	<p>PURPOSE: to understand who the most and least relevant/ appropriate sources of information are, how the public want to express views, engage in decision making and get feedback ; including the role of national and local information sources/decision makers (BREAKOUT)</p>	
11.35-11.45	<p>COFFEE AND BISCUITS</p>	
	<p>PURPOSE: to explore what a successful model of public engagement would look like and what should it avoid, including at what stage/s in the process the public want to be engaged/communicated with, how 2-way dialogue might function, and why; and including the role of national and local information sources</p>	
11.45-12.05	<p>BREAKOUT: WHAT IF...</p> <p><i>Moderator hand out sample communications for participants to read. Researcher emphasise that other materials would also have been received by this point, such as a pack including details of the site, operational plans, information on their procedures for managing the environment and safety and background to the company.</i></p> <p>Having received this, and heard the first indication there may be developments in your area:</p>	<ul style="list-style-type: none"> - Sample letter for all participants; planning authority notice (Annex 1.4.5)

	<ul style="list-style-type: none"> • What would you want to know? • Where would you go to find out more information? • What discussion would you expect? • How would you expect to see someone respond? • What are the best channels of communication and why? How much interaction would you want, including how would you want to hear the answers to your questions? PROMPT: <ul style="list-style-type: none"> ○ Local media – radio / press ○ Local government sources ○ Government-generated info available on the web ○ Local public meetings ○ Newsletters ○ Through community liaison individuals ○ Through local stakeholders 	
12.05-12.45	<p>BREAKOUT: Design engagement – stage 1 (2 groups of 4) <i>Moderator stick the 'brief' on the wall, for reference</i> Moderator introduce chronological map of the shale gas development process, showing key parties involved, the decisions made and the opportunities for public engagement across it.</p> <p>Moderator divide participants into two groups (4 in each) – both given a map.</p> <p>Explain: Building on the situation we have just envisaged, we want to explore how you want public engagement and decisions, including about community benefits and involvement, to be managed at the local level, in the event of exploration plans when things are happening on the ground.</p> <p>Introduce 'brief' – exercise to walk through and devise the best model for how engagement would work in practice. Note that we will discuss local benefits in more detail in the next session.</p> <p>Explain: This is the current system, and you can see the processes that operators will be following. We want to understand what public engagement with this should be, and your views on how this would work best.</p> <p>Participants use timeline graph to plot essential aspects of engagement. Refer to icons as prompts. Write directly on the map, and/ or use post-it notes to describe what they want to happen in more detail.</p> <p>Moderator prompt on all points where 'public' appear:</p> <ul style="list-style-type: none"> • What do you want to happen here? • Which parts do you want to be part of? • Which stages are most important? Is this something you think you would want to participate in or use yourself, or just ensure it is available? <p>To ensure participants provide detail, use the following prompts where needed:</p> <ul style="list-style-type: none"> • At what stages is it most important to be engaged? • What about the national level, as well as local – before developments arrive in the area? • What information should be provided, by who? • What would you expect to be open for discussion? 	<ul style="list-style-type: none"> - 'Brief' for exercise - 2 X chronological map of different stages: pre-application; application; exploration; production – showing the different bodies involved in regulation. - 2 X sets of engagement cards - Refer back to 2 X profile cards - Blu-tack for participants to stick the cards down - Pens to annotate the design <p>(Annex 1.4.7, 1.4.8)</p>

	<ul style="list-style-type: none"> • Who and how do you want to engage with – who do you want to go to with your questions or views? • What degree of involvement in decision-making would you want the public to have, from none to joint ownership of the project? • What forums are most appropriate? How (through what means) should the public be engaged? • Which decisions do you want to be part of? Spontaneous and probe: <ul style="list-style-type: none"> ○ Whether goes ahead ○ Siting ○ Traffic conditions ○ Environmental conditions ○ Safety ○ Nature of local benefits ○ Conditions around decommissioning • What ways would fit into your life, personally? • Which elements would you have time for? • How should this public involvement in the decision be managed? • How should they respond? • What would the benefits to the local area be? What engagement would you want on that? • If you were living closest to the site/ living on a main road/ thoroughfare for the site – what would your considerations be? Would they differ? How could this be taken into account? 	
12.45-1.05pm	<p>BREAKOUT: Design engagement– stage 2 (group of 8) Coming back into a group of 8, participants share the 2 sets of ideas</p> <p>Participants select the model they think is strongest, and add/ edit to improve this, using the elements from the other model that they also liked.</p> <p>Moderator role to offer constructive and critical support: Encourage other participants to pose questions</p> <ul style="list-style-type: none"> • how this would work in practice • whether it would cater for different people’s needs/ interests 	
1.05-1.45	Lunch	
	PURPOSE: to explore public understanding and acceptability of the recently published industry community benefit package proposals	
1.45-1.55pm	<p>PLENARY: UKOOG introduce community engagement charter The UK Onshore Operators Group (UKOOG), the industry body, has published a Community Engagement Charter that includes a commitment to engage with communities early at each stage. It also includes a commitment so that communities that host shale gas developments share in the benefits which are created. Ken Cronin, the Chief Executive of UKOOG, here explains the charter.</p>	Video recording – 3mins (Annex 1.4.10 for slide and transcript of audio)
1.55-2.30pm	<p>BREAKOUT: Appraising the community engagement charter</p> <ul style="list-style-type: none"> • Explore how the principles and suggestions of the engagement charter matches against the group’s discussion 	Moderator to note that onshore renewables have a very similar scheme and new Nuclear will do too, if

	<ul style="list-style-type: none"> ○ What the benefits package means to them ○ What mechanisms they would want for its spending locally ○ Where does it fit well with what's been discussed ○ Any elements/ principles that are particularly liked; reasons for this ○ What differs/ doesn't match up well ○ Any elements that would need to change to fit with participants' engagement models ○ Any adjustments to participants' engagement models that would alter, in view of the charter <ul style="list-style-type: none"> ● Groups consider any final adjustments to their engagement models, based on what they have heard. 	needed.
	PURPOSE: to review, appraise and develop views on an engagement model. To distil the principles of good public engagement on shale gas	
2.30-3.15	<p>PLENARY: Presenting ideal engagement model – to refine specific ideas</p> <p><i>Lead moderator explain: use your individual response cards to help review each group's ideas. Jot down what you think is good about the model, against each of the principles on your sheet.</i></p> <ul style="list-style-type: none"> ● Each group (participant-led) to present back the ideal local engagement model, explaining what they have suggested and why (10 mins per group). After each: ● Q+A/ discussion in plenary ● DECC give a thank you 	<p>Strategies score cards - 1 for each participant (Annex 1.4.11)</p> <p>Lead moderator to record plenary discussion</p>
3.15-3.35	<p>BREAKOUT: appraise engagement models</p> <p>Discussion about preferred aspects of the models, and the best activities and approaches. Participants discuss what they have seen, and moderator encourages them to weigh up and prioritise the activities and approaches they think work best. To help discussion, probe:</p> <ul style="list-style-type: none"> ● Extent to which the model informs people of the relevant facts ● Opportunity for two way engagement ● Extent to which it reassures / assuages concerns ● Extent to which it communicates benefits to local residents ● Timing / stages of engagement ● Source of communication / engagement – who messages come from <p><i>Following discussion, each participant stickers their response</i></p>	1 large score card for each group.
3.35-3.50pm	<p>BREAKOUT: Distil the principles of good engagement</p> <ul style="list-style-type: none"> ● Discussion around preferred models – why were they most popular? ● What does that say about the principles of engagement that are most important? ● In what situations are these most important? ● How do you think they should be assured? ● Based on this, what would you say are the key principles of engagement? <i>Moderator to flip chart</i> ● We have identified the elements you want to be available. Which engagement opportunities do you think you yourself would use, if it happened 	

	in your area? <ul style="list-style-type: none"> Go round group. If you were in charge of public engagement on fracking, what is the ONE thing that you would prioritise? 	
3.50pm	EVALUATOR EXERCISE	
4.00pm	PLENARY: Thanks and close Lead facilitator thanks participants	

Area-specific local planning authority organisation:

Liverpool: in the centre the LPA is Liverpool City Council. Out in the suburbs, smaller borough councils such as Moseley Council, Wirral Council, Sefton Council are LPA. Liverpool the city is 'unparished' but more rural areas nearby have parish councils (not LPAs), e.g. Aintree Village Parish Council.


Northampton: Northampton Borough Council is the LPA. Under the borough council there are also several local parish councils (not LPAs) including Billing Parish Council, Upton Parish Council.

Winchester: The LPA is Winchester City Council. There are also several local parish councils (not LPAs) including e.g. Badger Farm Parish Council, Bishops Waltham Parish Council.

1.4.2 Welcome and presentation


The same slides were used as for wave 1 (annex 1.3.2, first 3 slides), though the agenda had changed as below:

Agenda	
• 9.30 – 10am	Registration
• 10am – 10.15	Welcome and introduction
• 10.10 – 11.10	Group discussion on energy
• 11.10 – 11.25	Break
• 11.30 – 11.50	Presentation on shale gas
• 11.50 – 12.10	Group discussion on shale gas
• 12.15 – 12.35	Q & A on shale gas
• 12.35 – 1.25	Lunch
• 1.25 – 1.40	Presentation on risks and mitigation
• 1.40 – 2.35	Group discussion on risks and mitigation
• 2.35 – 2.45	Break
• 2.45 – 3pm	Q & A on risks and mitigation
• 3pm – 3.55	Group discussion on regulation
• 3.55 – 4pm	Next steps



Department
of Energy &
Climate Change

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1.4.3 Card ranking game: profile cards (1.4.2)

Local Planning Authority




Their Role
The local county or unitary authority which is ultimately in charge of issuing and overseeing **planning permission** for developments in their local area. If planning permission for a shale gas production site is issued, they **set conditions** that the operator must meet.

Department for Energy and Climate Change



Their Role
The central government department who **issue** the initial Petroleum Exploration and Drilling **License**. DECC grants consent to drill, once all permits and permissions are in place. Within DECC, the Office of Unconventional Gas and Oil is responsible for coordination of regulation and public engagement.

Shale Gas Operator




Their Role
The operator is responsible for the site and all the operations. They will negotiate sites with landowners and engage with local communities on the specific plans for the site. The operator must be licenced by the Department for Energy and Climate Change, have planning permission and have environmental permits in place before drilling.

Environment Agency



Their Role
Issue **environmental permits** to the shale gas operator. These permits set the **rules and conditions** that must be followed during development in order to **protect the environment**. The EA is also consulted during the planning permission process.

Independent Scientists



Their Role
A number of scientists are researching the impact of shale gas and the techniques used. The British Geological Society receives the results of tests on the rock.

Environmental Groups



Their Role
Raise awareness of environmental issues in society and campaign on these issues.

Parish Council



Their Role
Represent the local community. Notified of planned development by operator at least 21 days prior to planning permission application. Consulted as part of the planning process.
Parishes represent the most local level of Government in England, a third of areas have them.

Health and Safety Executive

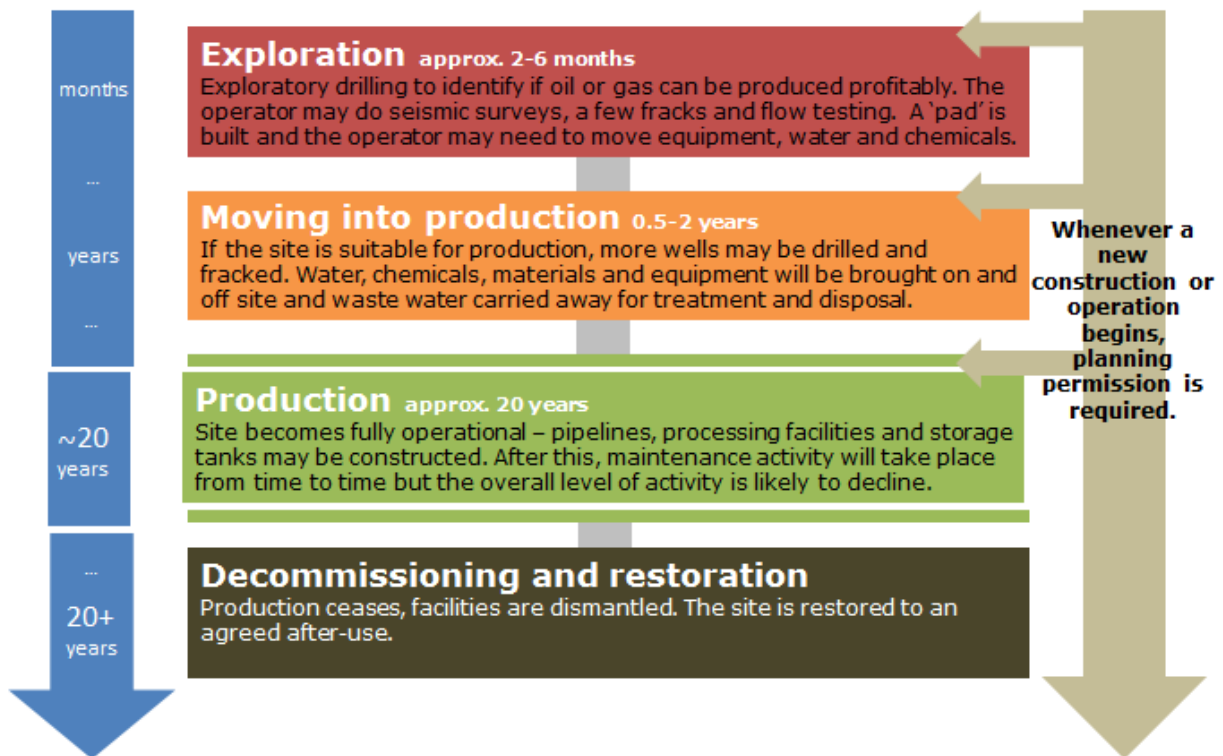


Their Role
During the well design and construction stages, Health and Safety Executive (HSE) regulations require an independent and competent person to **examine the well design and construction**.
The HSE inspects the well design to ensure that measures are in place to control major hazards to people from well-related activities and accidents.

1.4.4 Key phases of shale gas introduction to an area presentation (with script for DECC presenter)

Slide 1

Stages of shale gas and oil development



- I am XX. I work in the Office of Unconventional Gas and Oil within the Department of Energy and Climate Change.
- As discussed last time – there are a number of stages to shale gas development.
- The first is exploration, where companies will do seismic surveys, drill for samples of the shale rock, try one or more fracks and flow-test to see if oil or gas can be produced profitably.
- If the testing is successful, the company will bring that site into production which will take a couple of years.
- Once the site is 'in production' there will be less activity, except for regular maintenance. The site can produce for 20 years.



- At any point, wells can be decommissioned by sealing them off according to industry guidelines. If the site overall is decommissioned the operator is required to return it to at least its original condition.
- Permissions must be repeated for any change in the site.

Slide 2

Key Players in licencing, planning and permitting



Statutory Consultees are organisations which planning law states the Local Planning Authority must consult when deciding whether to grant permission for a planning application. A full list is shown in the [handout](#).

 = responsible for signing off on part of the process
 = responsible for providing/collecting information from operator

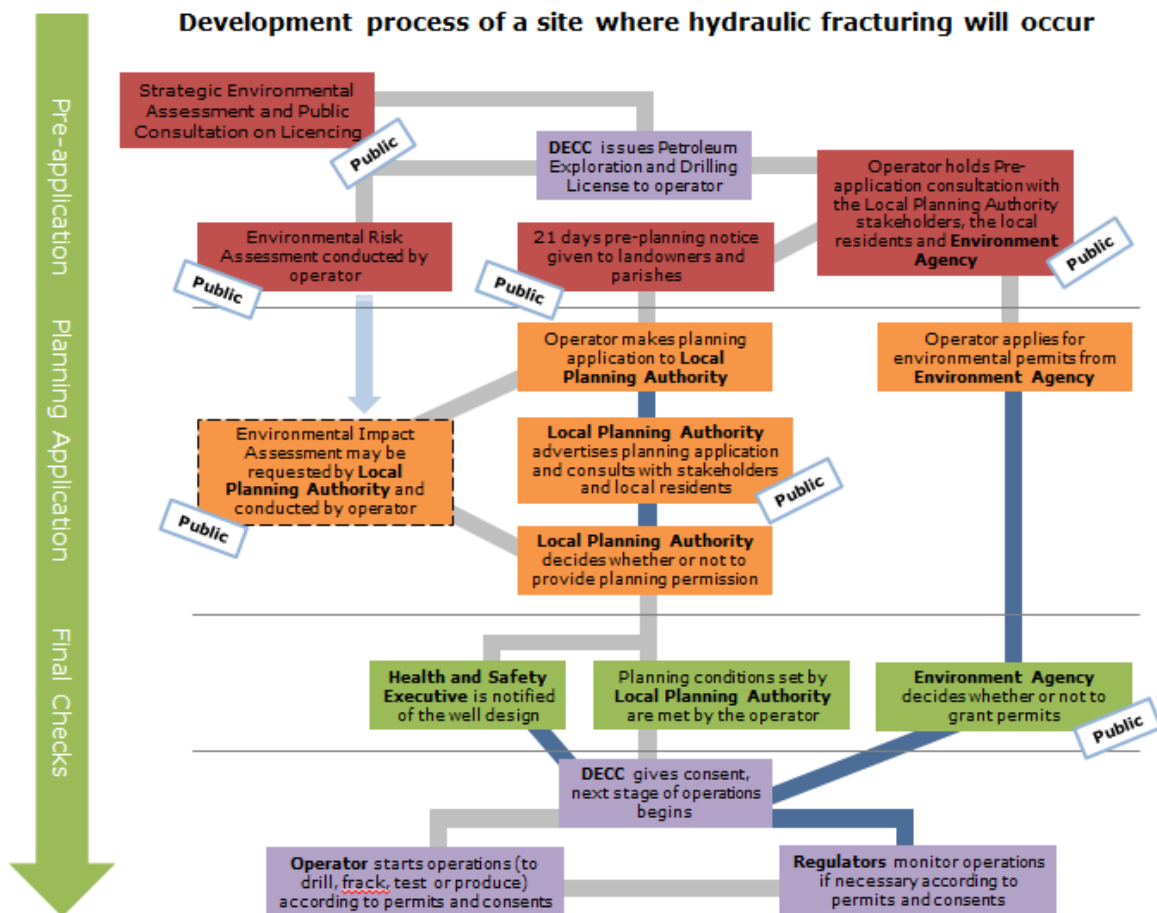
Hopefully these will be familiar from the last session. The key players are:

- **The Local Planning Authority, who issue planning permission, consult** with statutory and non-statutory stakeholders and local residents during planning permission process **and set planning conditions. They may** request that the company do a fuller Environmental Impact Assessment, if appropriate,
- **DECC** issue the initial Petroleum Exploration and Drilling License and give final consent to all applications for a new drill well.
- The **Environment Agency** issue environmental permits, including consulting local residents. They are a statutory consultee in planning permission.
- The **operator** brings forward the plans for the site and develops the planning and environmental permit application. They have committed to early engagement with communities and will prepare the environmental impact assessment if required.

- The **Parish Council**, where one exists, is a statutory consultee to represent the local community at all stages of the planning application process
- The **Health and Safety Executive** checks design and monitors construction of well and it's regulations manage the adoption of safe working practices by operators
- The **Public** are consulted by Local Planning Authority, Environment Agency and operator

To clarify, **Statutory Consultees** are organisations which planning law states the Local Planning Authority must consult when deciding whether to grant permission for a planning application. A full list is shown in the handout.

Slide 3



[NOTE THAT THE SLIDE WILL BUILD IN LINE WITH THE STAGES BELOW – YOU NEED TO CLICK ON]

Click 1 - The first step is the national Strategic Environmental Assessment and Public Consultation on Licencing rounds, conducted by DECC every couple of years. As a result **DECC** issues Petroleum Exploration and Drilling License to operator.

Click 2 - The operator holds Pre-application DECC consultation with the Local Planning Authority stakeholders, the local residents and **Environment Agency**. They will also conduct an

Environmental Risk Assessment and give 21 days' pre-planning notice given to landowners and parishes.

Click 3 - The Operator makes planning application to **Local Planning Authority** and Environmental Impact Assessment may be requested.

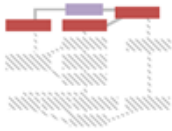
Click 4 - **Local Planning Authority** advertises planning application and consults with stakeholders and local residents. **Local Planning Authority** decides whether or not to provide planning permission

Click 5 - At the same time the operator applies for environmental permits from **Environment Agency**




Click 6 - The final checks are from the **Health and Safety Executive** which is notified of the well design, the Planning conditions set by **Local Planning Authority** are met by the operator and **Environment Agency** decides whether or not to grant permits

Click 7 - Once all of these are in place - and if **DECC** gives consent, next stage of operations begins

Click 8 - Public engagement can continue, as the operations begin. If a site is developed into full production this final stage could run for 20 years.



Pre-application

-  = community meeting
-  = information published
-  = comments received

Operator holds pre-application consultation with Local Planning Authority, stakeholders, the public and Environment Agency

This consultation will be expected to **address issues** such as noise, ecology, and visual impact. It will define arrangements for **contact** with appropriate **regulatory agencies**.



Operator expected to consult with local **communities** e.g. through exhibitions, F2F meetings and surgeries.



Publication of up to date **information** e.g. through websites, press releases and letters.

Local **community liaison groups** may develop out of this process, which can then go on to provide an **ongoing** relationship between the Operator and the community.

The operator should also consult with the Environment Agency ahead of any application for environmental permits, to ensure the EA has access to all necessary information.

Who's involved?

Operator – contacts stakeholders
Stakeholders: including DECC, LPA and Public – communicate with operator and provide input

21 days pre-planning notice given to landowners and parishes

As a minimum: In the 21 days prior to a planning application being submitted the Operator will **write** to the known **landowners** in the immediate area.

The operator will **display a Notice** in the **Parishes or local area** to which the application relates.

They will also circulate an **advert** in the local newspaper.

These notices will inform landowners of the operator's intention to submit an application and provide an **address** to which **comments** can be sent.

Who's involved?

Operator – sends out notices
Public – read notices, send comments to the operator



Environmental Risk Assessment conducted by operator

The operator carries out an **assessment** of environmental **risks** (including risks to human health) resulting from the proposed operations.

This involves the participation of **stakeholders**, including local **communities**. This should be done **as early as possible** in the planning process.

UKOOG recommends that the operator then **engage local communities** on the **contents** of the ERA.

This document will then inform the **Environmental Impact Assessment** and the **environmental permits**.

Who's involved?

Operator – conducts assessment
Stakeholders: including DECC, LPA and Public – contribute to assessment, are informed about results



Operator holds pre-application consultation with Local Planning Authority, stakeholders, the public and Environment Agency

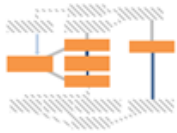
- This consultation will define arrangements for **contact** with appropriate **regulatory agencies**.
- Operator expected to consult with local **communities** e.g. through exhibitions, F2F meetings and surgeries.
- Publication of up to date **information** e.g. through websites, press releases and letters.

21 days pre-planning notice given to landowners and parishes




- The operator will **display a Notice** in the **Parishes or local area** to which the application relates.
- These notices will inform the public of the operator's intention to submit an application and provide an **address** to which **comments** can be sent.

Environmental Risk Assessment conducted by operator

- The operator carries out an **assessment** of environmental **risks** (including risks to human health) resulting from the proposed operations.
- This involves the participation of **stakeholders**, including local **communities**.
- UKOOG recommends that the operator then **engage local communities** on the **contents** of the ERA.




Planning Application


-  = community meeting
-  = information published
-  = comments received


Local Planning Authority advertises planning application and consults with stakeholders and public

The operator must request **planning permission** from the relevant LPA. The focus of the planning system is on whether the development is an acceptable use of the land.

Following submission of the planning application, the LPA launches a **period of public consultation** which lasts **21 days**. This seeks views on the proposed development from stakeholders (including DECC, English Heritage, the Forestry Commission) and the local community.

 The planning application and supporting **documents are made available** on the LPA website.

 The application is **assessed** by the LPA. **Advice** from statutory consultees and **representations** received from stakeholders and the public are taken into account.




Who's involved?
Operator – requests permission
LPA – advertises application, consults stakeholders and public, grants or denies permission
Stakeholders and Public – offer advice and representations

Environmental Impact Assessment may be requested by Local Planning Authority and conducted by operator

As part of the planning permission process, the **LPA may request** that the operator conduct an EIA; an **assessment** of the likely significant environmental effects of the proposed development.

This should build upon the findings of the **Environmental Risk Assessment** conducted by the operator during pre-application.

 The Environmental Statement produced must contain the **operator's plans** for **assessing** and **mitigating** any potential environmental damage caused by the development, including by seismicity.

Impact assessment often submitted with the planning application.

Who's involved?
Operator – conducts assessment
LPA – requests and sets scope of assessment
Stakeholders and Public – contribute to assessment, are informed about results

Local Planning Authority advertises planning application and consults with stakeholders and public




- The operator must request **planning permission** from the relevant LPA.
- Following submission of the planning application, the LPA launches a **period of public consultation** which lasts **21 days**.
- The application is **assessed** by the LPA. **Advice** from statutory consultees and **representations** received from stakeholders and the public are taken into account.

Environmental Impact Assessment may be requested by Local Planning Authority and conducted by operator

- The **LPA may request** that the operator conduct an **assessment** if there are likely to be significant environmental effects as a result of the proposed development.
- The Environmental Statement produced must contain the **operator's plans** for **assessing** and **mitigating** any potential environmental damage caused by the development.



Final Checks

-  = community meeting
-  = information published
-  = comments received

Operator receives environmental permits from Environment Agency

While applying for planning permission, the operator must also apply to the EA for **environmental permits**.

The **rules** and conditions for the environmental permit tell the operator **what they must do** to protect the environment and people.

As part of the process, the Environment Agency will **publish** the operator's application on their website and in a local newspaper, and **seek the views** of the public over a **four to twelve week period**.

Who's involved?

Operator – applies for permits
EA – issues permits and ensures these standards are upheld
Stakeholders and Public – provide views on



Planning conditions set by Local Planning Authority are met by the operator

Before operations can begin at a site, the operator must satisfy the LPA that it has fulfilled the planning conditions set when permission was granted.

Typically, **planning conditions** may be imposed to control any impact on local amenity (such as noise or pollution). The operation of the site's equipment are controlled by the Environment Agency and the Health and Safety Executive.

The LPA has **enforcement** powers under the Town and Country Planning Act 1990 to **ensure** that all required conditions are met.

Who's involved?

LPA – sets and enforces conditions
Operator – applies for permits

DECC gives consent, next stage of operation begins

DECC grants **consent to drill** only once all permits are in place and all relevant consultees (including DECC, Environmental regulator, HSE) have been notified.

Operators should develop an **Hydraulic Fracture Plan**, describing how they will control and mitigate seismic risks, including measures for fracture containment and potential induced seismicity.

Additionally, the operator must seek the **approval of the Coal Authority** if the proposed development is near existing coal seams.

Who's involved?

Operator - applies for consent to drill and fracture if needed.
Coal Authority – issues permit to drill
DECC - checks other consents are in place and the operators Hydraulic Fracturing plan.

Health and Safety Executive checks design of drill well

The HSE must be notified of the well design and operation plans to ensure that **risks** to people from the well and well-related activities are **properly controlled**, at least **21 days** before drilling is planned, the

The operator must establish a **site safety document**, and the HSE will review it before any drilling starts.

Who's involved?

Operator – notifies HSE
HSE – monitors geological stress across UK

Health and Safety Executive checks design of drill well

- The HSE must be notified of the well design and operation plans to ensure that **risks** are **properly controlled**, at least **21 days** before drilling is planned.
- The operator must establish a **site safety document**, and the HSE will review it before any drilling starts.

Operator receives environmental permits from Environment Agency

- The **rules** and conditions for the environmental permit tell the operator **what they must do** to protect the environment and people.
- The Environment Agency will **publish** the operator's application on their website and in a local newspaper, and **seek the views** of the public over a **four to twelve week period**.

Planning conditions set by Local Planning Authority are met by the operator

- Typically, **planning conditions** may be imposed on an operator to control local impacts such as noise or pollution. The operation of the site's equipment are controlled by the Environment Agency and the Health and Safety Executive.
- The LPA has **enforcement** powers under the Town and Country Planning Act 1990 to **ensure** that all required conditions are met.

DECC gives consent, next stage of operation begins


- DECC grants **consent to drill** only once all permits are in place and all relevant consultees (including DECC, Environmental regulator, HSE) have been notified.
- Operators should develop a **Hydraulic Fracture Plan**, describing how they will control and mitigate seismic risks, including measures for fracture containment and potential induced seismicity.

Slide 7

Meet the people...


Planning officer:

- What do you do when you receive a planning application for shale gas development?
- What criteria do you assess the application against?
- Who do you consult, and why?
- How do you involve local residents in having a say?
- How does the decision get made?
- What happens after that?
- Can the decision be appealed? By who?



Parish Council member:

- Tell us about your role regarding an operator's application for shale gas development in your local area
- How would you hear about it?
- What contribution would you have: are you responsible for any decisions?
- How do the council gather information and evidence, to help consider the application?
- How do they take the views of local residents into account?




There are a number of clips of key people in the process

- Planning officer
- Parish councillor

Meet the people...

Industry representative:


- Having been awarded a licence, what do you do next?
- When do you engage with the local community?
- How do you do that?



The icon consists of two parts: on the left, a stylized oil rig with a crane and a truck; on the right, a silhouette of a person with shoulder-length hair wearing a suit and tie.

Environment Agency:

- Tell us about your role in relation to a development application from a shale gas operator.
- What contribution do you make?
- Does the public have any say in the issuing of environmental permits?



The icon consists of two parts: on the left, a document icon with a tree and a recycling symbol; on the right, a silhouette of a person with short hair wearing a suit and tie.

- Industry representative
- Environment Agency



Communication tools

Type of Engagement	Examples of Use
<ul style="list-style-type: none"> • Community Liaison Officer facilitates early engagement- responds to enquires/ concerns 	Wind power
<ul style="list-style-type: none"> • Project information packs or community newsletter distributed locally 	Wind power, nuclear power, National Grid, quarrying, waste management site development
<ul style="list-style-type: none"> • Flyers sent out to all residents within a 5km radius of the proposed development 	Wind power, nuclear power
<ul style="list-style-type: none"> • Dedicated project website with online enquiry service and frequently asked questions section 	Wind power, nuclear power, waste management site development
<ul style="list-style-type: none"> • PR Agency ensures timely release of information through press releases 	Wind power
<ul style="list-style-type: none"> • Local media coverage and advertising 	Nuclear power, wind power, waste management site development
<ul style="list-style-type: none"> • Summary documents of consultations undertaken, showing how local resident's views are being taken into account 	Nuclear power, National Grid

These are some of the communication tools used in other types of developments. These include:

- Community Liaison Officer facilitates early engagement- responds to enquires/ concerns
- Project information packs or community newsletter distributed locally
- Flyers sent out to all residents within a 5km radius of the proposed development
- Dedicated project website with online enquiry service and frequently asked questions section
- PR Agency ensures timely release of information through press releases
- Local media coverage and advertising
- Summary documents of consultations undertaken, showing how local resident's views are being taken into account



Consultation events

Type of Engagement	Examples of Use
• Community Forum established	Nuclear power, National Grid, wind power, waste management site development
• Public exhibitions near development sites and in retail centres	Nuclear power, waste management site development
• Workplace exhibitions at local authority and areas close to proposed sites	Nuclear power, wind power, quarrying
• Town/Parish and community group meetings	Nuclear power, National Grid, quarrying
• 'Drop in' events	Nuclear power
• Stakeholder workshops	Nuclear power, National Grid
• Focus groups/surveys for the 'hard to reach'	Nuclear power
• Business supplier events	Nuclear power
• Opportunity to influence decision through a hearing or Public Enquiry after application submitted	National Grid

Developers have also used other tools to get feedback, involve the public in the decisions and provide responses:

- Public exhibitions near development sites and in retail centres
- Workplace exhibitions at local authority and areas close to proposed sites
- Town/Parish and community group meetings
- 'Drop in' events
- Stakeholder workshops
- Focus groups/surveys for the 'hard to reach'
- Business supplier events
- Opportunity to influence decision through a hearing or Public Enquiry after application submitted

1.4.5 Sample notifications

Tanaquil Energy Ltd

Nobel House

Marks Square

London

SW1N 4RW

Dear Resident

I am writing to invite you to an information session about Tanaquil Energy's exploration plans from 3-7pm on Monday 10 March 2014 at Ormswood Village Hall.

Tanaquil Energy has a number of licences to explore for oil and gas in Daleshire. These licences, Petroleum Exploration and Development Licences awarded by the Department for Energy and Climate Change, are the central part of the company's UK programme to explore whether gas and oil can be developed. We intend to apply for planning permission for two sites in this area later this year.

We are very committed to working with you to make this development one that benefits the whole community. We are keen to explain our plans now before submitting planning applications. I have enclosed an information pack with details of the site, our operational plans and how we manage risks to the public, environment and safety of the operation, details of what you might see at different stages and more on Tanaquil Energy Ltd. We can explain more about our ways of working at the session, but will have a dedicated point of contact for your community.

Our team is a highly experienced with many years of developing energy projects successfully in the UK and internationally. We are a growing company founded on expertise and we look forward to sharing our plans with you at the information session.

Yours Sincerely,

Peter Myars

Chief Executive, Tanaquil Energy Ltd

**TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2010**

NOTICE UNDER ARTICLE 11 OF APPLICATION FOR PLANNING PERMISSION

(to be published in a newspaper and, where relevant, on a website or to be served on an owner* or a tenant)**

Proposed development at (a): ...ORMSWOOD WELLSITE.....
 ...LESSHOOK ROAD.....
 ...GREAT CRAVEN.....
 ...DALESHIRE.....
 ...DS8 2XX.....

Take notice that (b): ...TANAQUIL ENERGY LTD.....

Is applying to the : **Daleshire County Council**
For planning permission to: ...CONSTRUCT A TEMPORARY WELLSITE AND DRILL UP
 TO TWO (2) PETROLEUM APPRAISAL BOREHOLES
 INCLUDING DRILLING RIG (MAX HEIGHT 50M) AND
 ASSOCIATED PLANT AND EQUIPMENT.

Any owner* of the land or tenant** who wishes to make representations about this application, should write to the council at:

**Planning Services
County Hall
Engleby
Daleshire DS1 3PG**

By (d): ...6 AUGUST 2014.....

* 'Owner' means a person having a freehold interest or a leasehold interest, the unexpired term of which is not less than seven years, or in the case of development consisting of the winning or working of minerals, a person entitled to an interest in a mineral in the land (other than oil, gas, coal, gold or silver)

** 'Tenant' means a tenant of an agricultural holding any part of which is comprised in the land.

Signed:
*** On behalf of: ... TANAQUIL ENERGY LTD...
Date: ...16 JULY 2014.....

Statement of owners' rights

The grant of planning permission does not affect owners' rights to retain or dispose of their property, unless there is some provision to the contrary in an agreement or lease.

Statement of agricultural tenants' rights

The grant of planning permission for non-agricultural development may affect agricultural tenants' security of tenure.

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- (a) address or location of the proposed development
 - (b) applicant's name
 - (c) description of the proposed development
 - (d) date giving a period of twenty one days beginning with the date of service, or fourteen days beginning with the date of publication, of the notice (as the case may be)

1.4.6 Statutory consultees on planning and heritage applications

This list of consultees was provided to participants to refer to during discussion and to support the designing public engagement exercise.

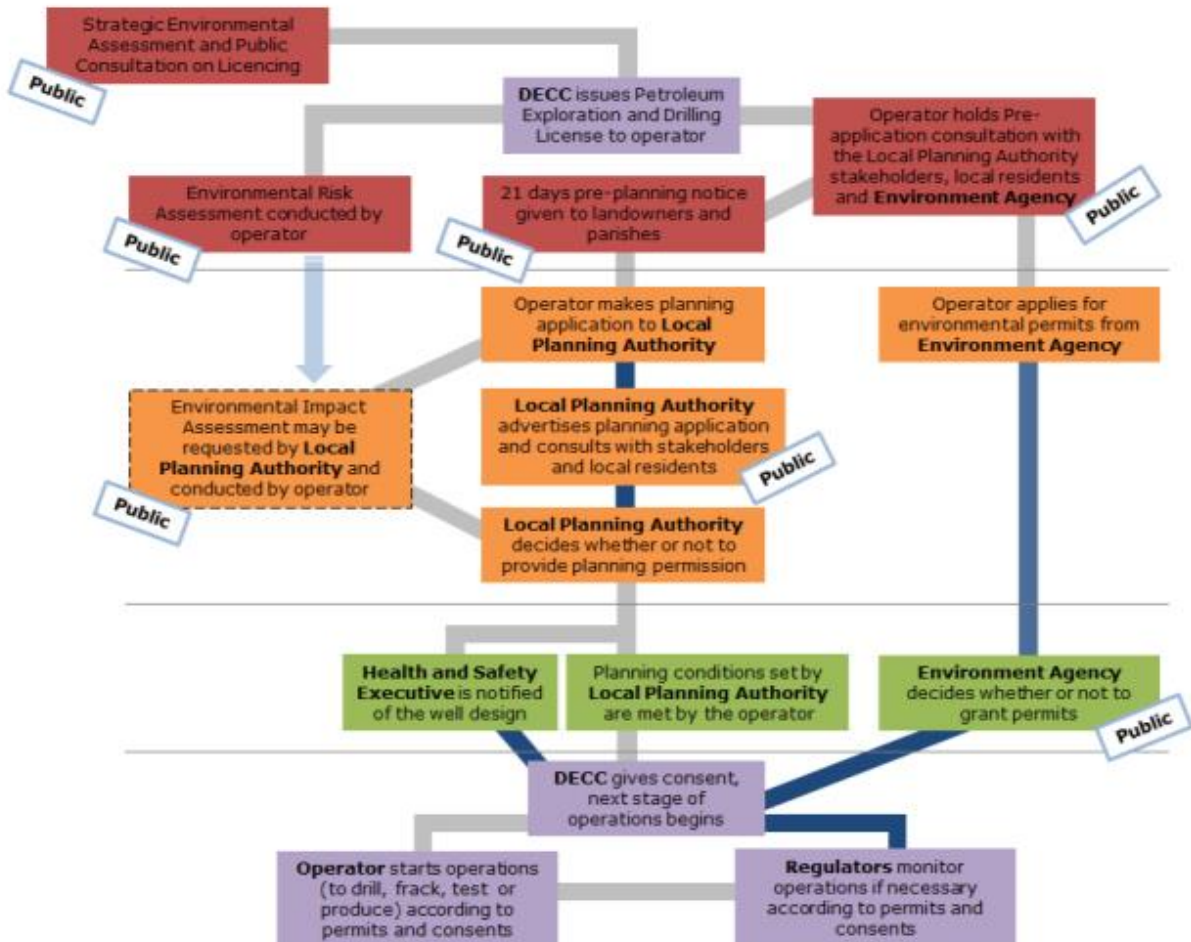
Statutory consultees on planning and heritage applications

Statutory consultee	Type of Development
The Canals and Rivers Trust	Development likely to affect canals or nearby areas.
Coal Authority	Development for minerals exploration on land that has been identified as containing coal.
Crown Estates Commissioners	Minerals planning applications where the Crown Estates Commissioners have given notice to that land in their area contains silver or gold.
Department for Culture, Media and Sport	Developments within 800 metres of any Royal Palace or Park.
Department of Energy and Climate Change	Mineral developments where the Department for Energy and Climate Change have given notice to the local planning authority that the land in their area contains gas or oil.
Defra	Certain Minerals developments.
Highways Agency	New Development likely to result in a material increase in the volume or a material change in the character of traffic entering or leaving a trunk road.
Environment Agency	For types of planning application related to EA's statutory duties on flood risk, protection of land and water quality, mining operations, waste regulation and fisheries.
English Heritage/Garden History Society	English Heritage is to be consulted on planning, listed building and conservation area consents.
Forestry Commission	Mineral operators must consult the FC if the proposed form of post-extraction restoration is for forestry.
Health and Safety Executive	The Health and Safety Executive should be consulted on developments in the vicinity to major accident hazards.
Highways Agency	Developments likely to affect the strategic road network, and certain other highway matters.
Local Planning Authorities	The adjoining local planning authority will need to be consulted where an application is likely to have an impact on a neighbouring area. Where there is a County Council, the district council is required to consult the county council in certain cases and may not decide the application for 21 days or until the county

	council has responded (if earlier). Where the authority considering the planning application is a National Parks Authority they are required to consult with the district council for the area.
Local Highway Authority	Need to be consulted where the proposed development will either involve a new access to the highway network, or an increase or change in traffic movements.
County Planning Authorities	Specific requirements exist for consultation with County Planning Authorities, reflecting their responsibilities as planning authorities for certain specific matters.
The Greater London Authority	The Mayor of London is consulted on and involved in the determination of planning applications within London that area considered to be of potential strategic importance.
Natural England	Developments affecting Sites of Special Scientific Interest, involving the loss of best and most versatile agricultural land, or in an area of particular natural sensitivity or interest. Natural England must also be consulted to determine whether an agricultural after-use is appropriate, and on restoration proposals and aftercare conditions in relation to Minerals and Waste development.
National Parks authorities	Specific requirements exist for consultation with National Parks authorities in relation to development likely to affect land in a National Park Source.
Rail Network Operators	Development likely to result in a material increase in the amount of traffic using a level crossing over a railway.
Sport England	Planning applications where the development is likely to affect the use of land as playing fields.
Theatres Trust	Development involving any land on which there is a theatre.
Toll Road Concessionaries	Development involving the formation, laying out or alteration of any means of access to a highway (other than a trunk road) or the construction of a highway or private means of access to premises affording access to a road in relation to which a toll order is in force.

1.4.7 Brief for designing public engagement

Map for public engagement



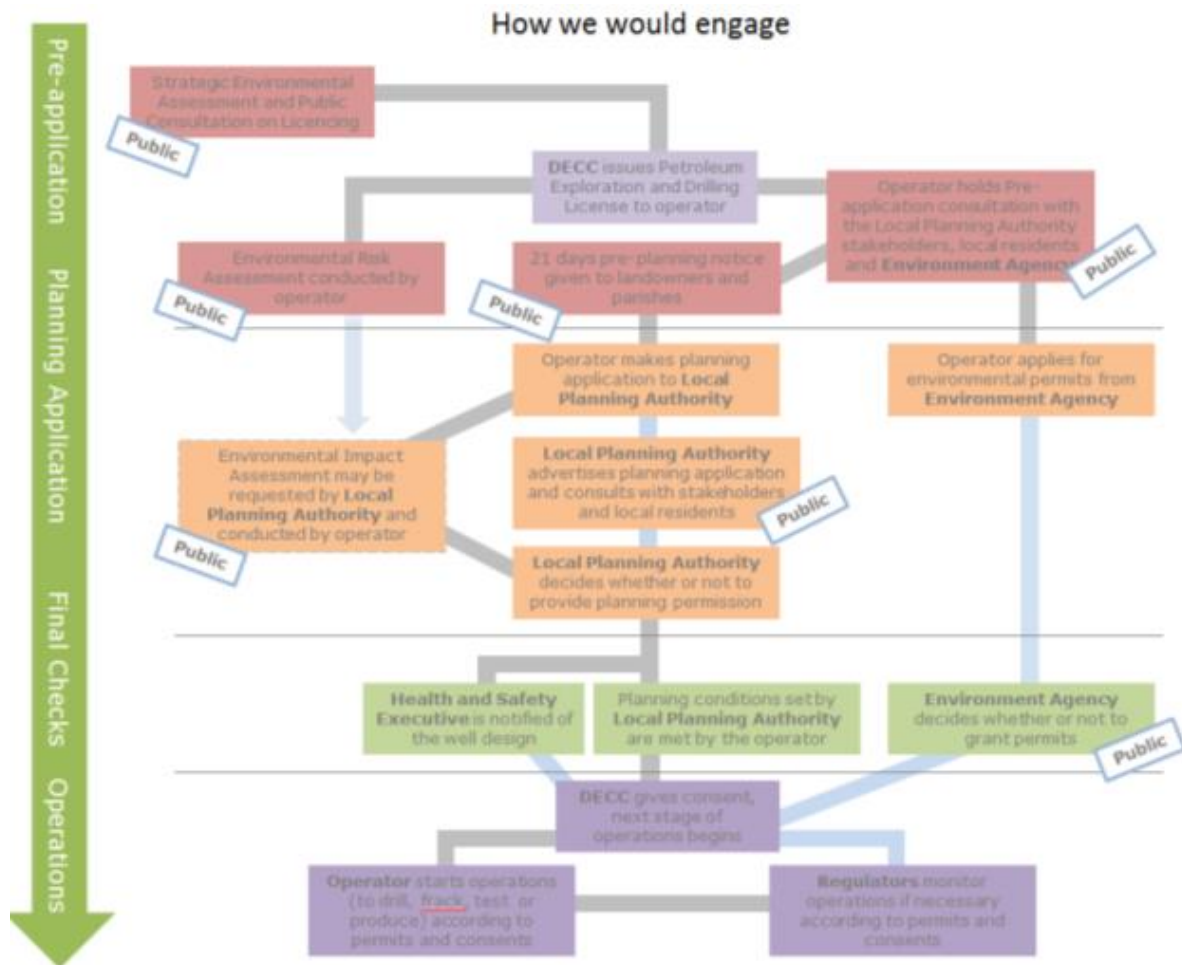
Brief: to design a good engagement process

You have received this letter. An operator has got a licence for shale gas development in your local area.

What would you want to know at the different stages, and how would this change?

How would you want to find it out, and who would you want to hear from throughout?

What issues would you want a say over, and how would you want to get these across and hear back?



1.4.8 Engagement cards

Several copies of the following cards were given to participants to place on the A3 engagement map above. Participants also had post-it notes to add more detail to the cards.





Campaign by interest group/non-governmental organisation (e.g. Greenpeace)



Campaign by activists



Information in media, media campaign



Involvement from business forums (e.g. Chambers of Commerce, Local Enterprise Partnerships)



Learn about the planned activity



Inform about safety measures



An opportunity to voice opinions



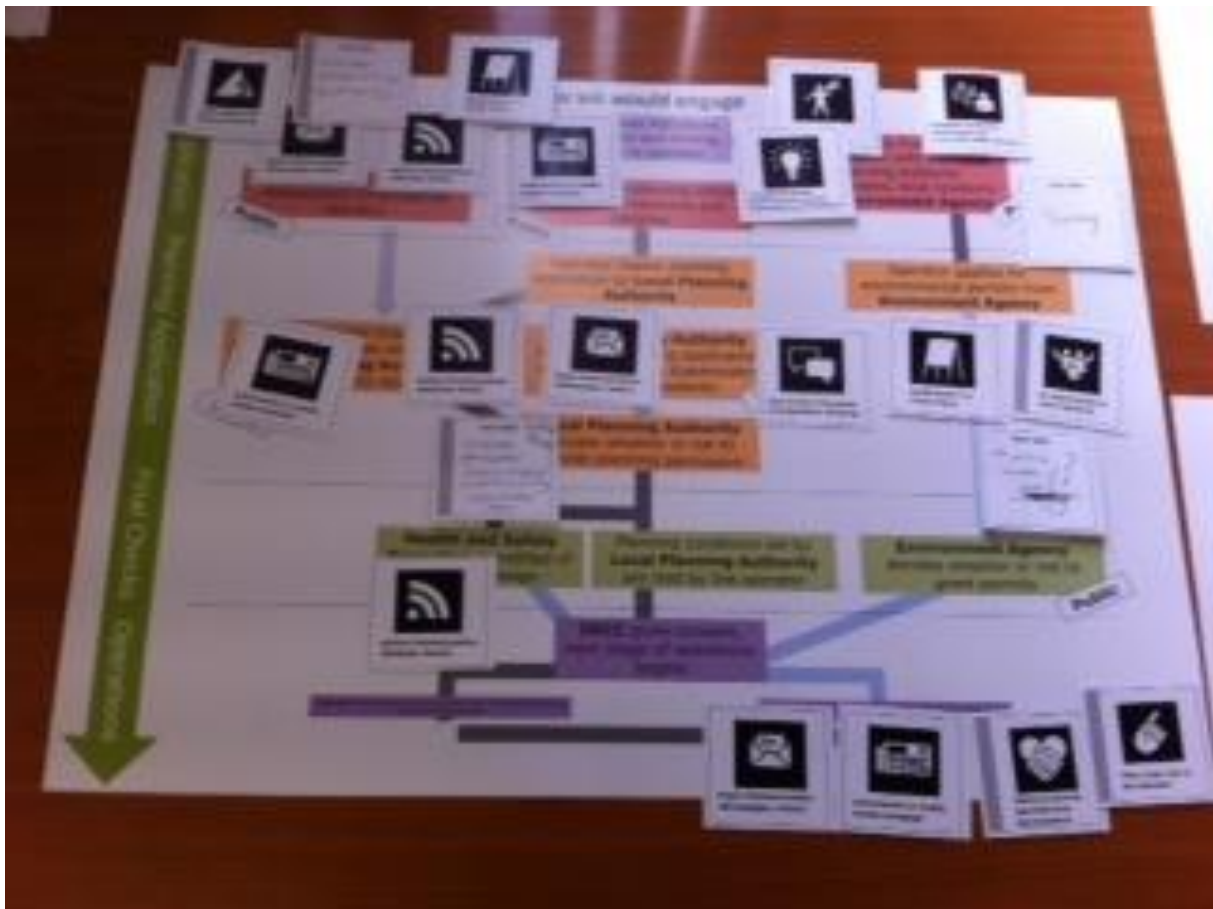
Discuss/receive benefits from development



Play a key role in the decision

Your idea

1.4.9 Example completed engagement model activity



Operator perspective on Community benefits



Transcript of Audio File 1:

"Communities should see benefits from shale sites in different ways. Firstly, directly through community benefits: UKOOG has proposed that for each temporary exploration well, operators will donate £100,000 into a community fund. For a production site, operators will set aside 1% of all the revenues. We expect this to amount to between £5-10 million over the life of the well. Operators will also be keen to create local jobs, and opportunities for both the supply chain and academic institutions in the area that they operate."

Transcript of Audio File 2:

"Communities will have full control over their community funds. UKOOG are currently running a number of pilot exploration schemes with a recognised third-party expert, who will work with local communities to identify local needs and local projects, and also guide them through the process. Operators will provide the money directly to this third party, who will release it to the community."

Transcript of Audio File 3:

"Our community engagement charter aims to provide a consistent approach to shale development across the UK, in terms of communication, transparency and benefits, promising a minimum standard of community engagement, including proper consultation with local communities on the subjects that matter. Before any planning application has been submitted,

each operator to abide by the charter, and adhere to all regulations including the industry's own guidelines on well development. Each operator will publish transparent data with respect to water use, emissions, seismicity, vehicle management, noise, light, hours of operation, noise, light, and any chemicals used. They will also demonstrate commitment to considerate development, by working with the local community to organise logistics in order to minimise disruption to the community during operations: for example, from noise and traffic. UKOOG reviews this charter and its performance every year."

1.4.11 Engagement strategies score card

Engagement Strategies Score Card			
	RED GROUP	GREEN GROUP	YELLOW GROUP
Informs people of the relevant facts?			
Reassures, and addresses concerns?			
Communicates benefits to community?			
Timing and different stages work well?			
Who messages come from – works well?			
Opportunities for two-way engagement?			
Other comments			