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Consultation – summary of responses

Petroleum extraction in Wales Consultation

Prepared by Miller Research Ltd

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Mae'r ddogfen yma hefyd ar gael yn Gymraeg.

This document is also available in Welsh.

Overview	Summary of responses to the Welsh Government's consultation on Petroleum extraction in Wales
Action required	None – for information only.
Further information	<p>Enquiries about this document should be directed to: YmatebionYnni-EnergyResponses@gov.wales</p> <p>Contact</p> <p>Fossil Fuel Policy – Petroleum Consultation Division of Decarbonisation and Energy Department for Energy, Planning and Rural Affairs Welsh Government Cathays Park Cardiff, CF10 3NQ</p>
Additional copies	<p>This document can be accessed from the Welsh Government's website at</p> <p>https://beta.gov.wales/petroleum-extraction-policy-wales</p>
Related documents	<p>https://beta.gov.wales/petroleum-extraction-policy-wales</p>

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Executive Summary

Introduction to the consultation

- i. The Wales Act 2017 devolves further responsibilities to Wales. From 1st October 2018 licensing functions related to onshore petroleum extraction were transferred from the UK Oil & Gas Authority (OGA) to the Welsh Ministers. The new petroleum licencing powers are an opportunity to consider an approach to the extraction of petroleum within the wider legislative and policy context in Wales. Importantly, the Well-being of Future Generations Act requires public bodies in Wales to think about the long-term impact of their decisions in relation to the well-being goals.
- ii. Welsh Government therefore launched the public consultation on the 3rd July, running until the 25th September 2018, with the aim of seeking views on the draft petroleum extraction policy, the available evidence and for the public and organisations to provide any additional evidence. In the Consultation Document, Welsh Government included the draft policy statement “We will not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents”.

About the consultation responses

- iii. There were 1,964 Consultation responses received for the petroleum extraction policy in Wales. Of these, there were 1,569 campaign responses submitted through the Friends of the Earth Cymru campaign and 395 substantive responses.

Overview of responses

- iv. The majority of consultation responses expressed support for the draft policy statement “We will not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents”.

- v. Respondents raised concerns about the long-term effects of petroleum extraction on health, the environment, climate change, and on local communities.
- vi. A small number of organisational respondents disagreed with the draft policy. These respondents suggested that petroleum extraction would deliver benefits, including economic growth and a reduced reliance on imported energy, whilst Wales transitions to low carbon energy solutions.
- vii. Other consultation respondents discussed the draft policy aligned with the move towards a sustainable and prosperous Wales, as set out in the Wellbeing of Future Generations (2015) Act.

Climate change evidence

- viii. A high proportion of consultation responses to Question 1 expressed concerns about the climate change impacts of petroleum extraction in Wales. The dominant view was that greater levels of petroleum extraction would lead to an increase in emissions levels, damaging the climate and limiting Wales' ability to reach its emissions reduction targets. For these reasons, the respondents agreed with the Welsh Government's draft policy position to oppose further petroleum extraction development licences (PEDLs). Respondents requested additional evidence on Coal Bed Methane (CBM) extraction and fugitive emissions. A small number of respondents (from organisations) stated that petroleum extraction could be regulated effectively and have positive impacts on emissions reduction targets.

Socio-environmental evidence

- ix. The majority of consultation responses to Question 2 stated that they were concerned about the socio-environmental impacts of petroleum extraction in Wales. The dominant view was that the policy position to disallow future PEDLs was supported, as the socio-environmental impacts would be numerous and predominantly negative. Environmental concerns extended to local community impacts with key concerns being air pollution, water pollution and water usage;

although a few organisational respondents stated that such impacts could be mitigated through regulation and permits.

Health evidence

- x. The majority of consultation responses to Question 3 stated that they were concerned about the implications to health, as outlined in the evidence. Respondents raised concerns about the short- and long-term effects of petroleum extraction on physical and mental health and wellbeing, including the additional burden this may have on the NHS. A small number of respondents disagreed with the potential health implications raised within the health evidence.

Transport and planning evidence

- xi. A high proportion of consultation responses to Question 4 agreed with the potential implications outlined in the evidence. Respondents believed that petroleum extraction would have negative implications on the areas local to the sites including accidental release of hazardous material on transportation, noise and air pollution, an increase in road traffic accidents and impact on nature conservation. A small number of respondents disagreed with the potential transport and planning implications raised within the evidence and stated that operators have to comply with environmental and planning permits granted by NRW and the local authority.

Decommissioning, site restoration and aftercare evidence

- xii. The majority of consultation responses to Question 5 stated there will be no need for decommissioning, site restoration and aftercare, if petroleum extraction is not permitted within Wales. Respondents raised concerns about the long-term regulation and monitoring of wells, especially due to concerns about methane leaks and the potential long-term environmental damage. In addition, respondents raised the lack of financial provision set aside for long term monitoring of decommissioned wells. However, a small number of responses stated operators have to comply with international standards and industry best practice as part of their environmental permit from NRW.

Economic evidence

- xiii. The majority of consultation responses to Question 6 agreed with the economic evidence that “unconventional gas in Wales is unlikely to be of the scale and nature to create any longer term transformative economic effects for the region”. Respondents suggested that the long-term impact on the environment and the people of Wales, was not worth any potential short-term benefit for the oil and gas industry. Responses raised concerns about the economic impact on other Welsh industries that rely on the natural environment, such as agriculture and tourism. The economic benefit of employment provided through petroleum extraction was seen as quite limited by respondents. However, some organisational respondents felt that the wider economic impacts were not fully captured and suggested that the industry could positively contribute to the domestic energy mix.

1. Introduction and background

- 1.1 The Wales Act 2017 devolves further responsibilities to Wales. From 1st October 2018 licensing functions related to onshore petroleum extraction were transferred from the UK Oil & Gas Authority (OGA) to the Welsh Ministers.
- 1.2 The new petroleum licencing powers are an opportunity to consider an approach to the extraction of petroleum within the wider legislative and policy context in Wales. Importantly, the Well-being of Future Generations Act requires public bodies in Wales to think about the long-term impacts of their decisions in relation to the well-being goals.
- 1.3 Welsh Government therefore launched the public consultation on the 3rd July with the aim of seeking views on the draft petroleum extraction policy, the available evidence and for the public and organisations to provide any additional evidence. The Consultation ran from the 3rd July until the 25th September 2018.
- 1.4 The Consultation Document provided an overview of the following areas:
 - petroleum
 - licensing and consenting petroleum activities
 - policy context
 - evidence for the impact of petroleum extraction
 - analysis to inform the future policy and the proposed future policy.
- 1.5 In the Consultation Document, Welsh Government included the draft policy statement, “We will not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents”. A range of economic, environmental, social and planning evidence was provided alongside the Consultation Document.
- 1.6 Organisations and the public could respond to the Consultation through three channels – online, postal and email. There were nine

questions that focused on the respondents' views of the evidence, the policy question and any additional evidence available.

1.7 Welsh Government disseminated the consultation through the following channels:

- Welsh Government website
- Welsh Government environment and economy social media platforms
- Welsh Government consultation newsletter
- All public libraries in Wales were contacted and supplied with bilingual posters
- Affiliated Councils with One Voice Wales email (including Town and Parish councils)
- Onshore petroleum industry bodies were informed of the consultation
- Membership organisations were informed about the consultation (CBI, IoD, Friends of the Earth, WWF)
- Organisations that provided consultation evidence were informed about the consultation.

Summary structure

1.8 This summary of responses document includes the following sections:

- Section 2 - an overview of responses to the consultation
- Section 3 - an overview of responses on the proposed future policy of petroleum extraction in Wales
- Section 4 to 9 - an overview of responses about the evidence questions
- Section 10 - a list of additional evidence for consideration.

2. Responses to the Consultation

- 2.1 There were 1,964 responses received for the Consultation on petroleum extraction policy in Wales. Of these, 1,569 were campaign responses and 395 were substantive responses¹.
- 2.2 The 1,569 campaign responses were submitted through the Friends of the Earth Cymru campaign. Friends of the Earth hosted the online campaign on their website², that provided individuals with the opportunity to submit a standard campaign response and the option to provide additional comments alongside of their standard response. See Annex A for the full Campaign Response.
- 2.3 Of the 395 substantive responses to the Consultation, four were invalid as they were blank, and these have been omitted from the analysis of substantive responses.
- 2.4 The majority (351) of substantive responses were submitted online with 34 responses submitted via email and six postal responses.
- 2.5 Within the valid 391 substantive responses, there were 19 general responses submitted. There were four respondents that submitted a consultation response form alongside the general response.
- 2.6 Four responses were submitted in Welsh.

Analysis approach of consultation responses

- 2.7 The analysis of the consultation responses has been carried out through two separate approaches, due to the nature of the responses submitted. Firstly, the campaign responses and secondly the substantive responses. This has been outlined in detail below.
- 2.8 All of the 1,569 campaign responses included standard campaign text, which is outlined in full in Annex A. The standard text was analysed and key insight from the standard campaign response was

¹ Substantive consultation responses were unique individual consultation responses that have either completed the response form or submitted a general response.

² The online campaign was run through the following website address:
<https://www.foe.cymru/keep-wales-frack-free-support-consultation>

embedded into the analysis for Question 8. It was included in Question 8 due to the content of the campaign response directly relating to the draft policy on petroleum extraction. In addition, campaign respondents had the opportunity to provide additional comments within their response. The additional comments were extracted from the standard text, reviewed and analysed to draw out holistic themes throughout all of the additional comments. The analysis of these comments is provided in Section 3.

2.9 All submitted substantive responses have been collated into a central database. All responses were reviewed against each question within the consultation to draw out the dominant and alternative views that were coming through the consultation responses. In addition, themes emerged from the analysis of the consultation responses that have been embedded within this summary document. When consultation responses are discussed throughout the document, this is in reference to the substantive responses to the consultation.

2.10 Table 1.1 provides a summary of the responses that have been received per Consultation question.

Table 1.1. Summary of substantive Consultation responses per question

Consultation questions	Number of completed responses	Do you have a view?		
		Yes	No	Did not respond
Q1: Climate change	326	299	27	64
Q2: Socio-environmental	316	264	52	75
Q3: Health	321	282	39	70
Q4: Transport and planning	317	252	62	77
Q5: Decommissioning	304	201	103	87
Q6: Economic	308	247	61	83
Q8: Policy	368	353	15	23
General response to the consultation	19			

Source: Database of Consultation Responses.

3. Overview of responses on the proposed future policy for petroleum extraction in Wales

- 3.1 The key petroleum extraction policy question asked within the Consultation Document was Question 8. “Proposed Future Policy for Petroleum Extraction in Wales: We will not undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents. Do you agree with the proposed policy and why?”
- 3.2 Overall, from the majority of substantive and 1,569 campaign responses there is agreement with the draft policy.

Summary

The majority of substantive and campaign responses to Question 8 were in support of the draft policy. Respondents raised concerns about the long-term effects of petroleum extraction on health, the environment, climate change, and on local communities. The move towards a sustainable and prosperous low carbon Wales as set out in Wellbeing of Future Generations (2015) Act was cited by some responses to the question, in support of the draft policy. The reduction of carbon emissions in the Environment (Wales) Act (2016) was also outlined as aligning with the draft policy. A small number of respondents disagreed with the draft policy, with some citing economic growth and the opportunity to reduce higher carbon imports, while transitioning to low carbon energy solutions.

Agreement with the draft policy

Campaign responses

- 3.3 The 1,569 campaign responses from Friends of the Earth Cymru “completely agree with the draft policy” set out in the Consultation. These stated that there should be no new petroleum licensing in Wales, and applications for hydraulic fracturing petroleum licence

consents should not be supported. In addition, the Friends of the Earth Cymru campaign stated that there should be no new licences granted for Coal Bed Methane (CBM) and Underground Coal Gasification (UCG) in line with policy on hydraulic fracturing. The response reiterates the need to meet climate change targets, to remove fossil fuels and to encourage investment in lower carbon alternatives.

- 3.4 There were a number of unique comments submitted alongside the campaign responses. A core theme within these responses was the impact of petroleum extraction and hydraulic fracturing on the environment in the UK. These responses focused on pollution, contamination of water and land, and global warming. Many responses referred to a wider need to reduce reliance on fossil fuels more widely and move towards renewable forms of energy. Some referred explicitly to the Wellbeing of Future Generations (Wales) Act, as ‘in opposition’ to hydraulic fracturing and use of fossil fuels more generally. Additional comments from one campaign response explicitly mentioned the IPCC assessment that estimates a 1.5 to 2 degrees rise in global temperatures, as well as the Paris 2015 agreement that stated higher temperatures should be avoided at all costs. To therefore prevent the increase in global temperatures requires 100 per cent net decarbonisations of the global economy by 2030. One unique campaign respondent stated that the ban should be extended to cover existing Petroleum Extraction Development Licences (PEDLs) and test drilling.

Substantive responses

- 3.5 A central theme that emerged from the substantive responses in agreement with the draft policy, was the impact of petroleum extraction (and fracking more generally) on the environment, and its contribution to climate change. Some of these concerns related to the impact on the landscape such as an increased risk of landslides and earthquakes. Other concerns related to a risk of water contamination. One respondent, for example mentioned the difficulty of disposing of

contaminated water, and others mentioned the risk of radioactive materials entering water systems. Several respondents mentioned a 'threat to drinking water contamination, and one respondent specifically referred to Birmingham and Liverpool's fresh water supplies as being particularly at risk.

- 3.6 Related to the environment and climate change, a number of responses received were supportive of the policy in relation to renewable energy. Several mentioned that better value for money would be found with developing renewable energy (as opposed to petroleum extraction), alongside the environmental implications. One response, for example, stated that the Swansea Bay Tidal Lagoon would be worth pursuing rather than petroleum extraction, while a different respondent stated that solar and wind energy have dropped in cost.
- 3.7 Among the substantive responses received in agreement with the draft policy, one key theme related to the need for Wales to look more long-term. These responses generally focussed on the use of fossil fuels generally as a short-term act – the longer-term consequences to the environment and health (such as climate change) were said to not be worth the short-term economic gain.
- 3.8 Another theme that emerged from the responses, was that the draft policy provides the opportunity for Wales to lead in developing low carbon energy provision. Some put this in the context of the United Kingdom, stating that Wales (with Scotland) can put pressure on England to end hydraulic fracturing. Others discussed opportunities for Wales to lead more globally in tackling climate change.
- 3.9 A smaller proportion of responses supported the draft policy from an economic perspective. These generally related to certain sectors – such as the potential harm that hydraulic fracturing may cause to agriculture and tourism. One respondent said that “there is no compelling evidence” to support job creation. Citing a study from the Australia Institute 'Be Careful What You Wish For' the respondent

stated that most employment created from hydraulic fracturing is usually for highly-skilled workers and does not benefit local communities. Another respondent disagreed, saying that economic benefit might be achieved for schemes operating under existing licences, and Local Development Plans in relevant areas should support these activities to maximise potential economic benefit.

- 3.10 Some of the responses to the policy question referred to the implications on health. One respondent raised concern about premature births, birth defects, miscarriages, asthma, and migraines. Another referred specifically to vulnerable people as being at risk from carcinogenic and toxic chemicals used in the hydraulic fracturing process.
- 3.11 Two respondents stated that the future of existing PEDLs in Wales was uncertain in the draft policy document. One stated that the future of existing PEDLs should be open to consultation, and the other response stated that governance and regulatory structures should be clarified.
- 3.12 Other responses referred to democracy being “at risk” from petroleum extraction, stating that decisions can be made without consulting with (or consent from) the communities directly affected.

Disagreement with the draft policy

- 3.13 The alternative view from a small number of respondents was a disagreement with the draft policy statement. One key theme that emerged related to the economic benefits of petroleum extraction. Responses included information relating to developing Wales’ infrastructure (road and rail), supporting local strategies (Haven Waterway Enterprise Zone), and tax revenue from hydrocarbon revenues.
- 3.14 A key theme within the responses that disagreed with the proposed policy, was that petroleum extraction could support Wales’ transition to low carbon energy. One organisation (UKOOG) stated that the best

way to reduce Wales' reliance on high carbon imports (such as Liquefied Natural Gas) would be to use domestic gas and oil sources. Related to this is another response, which argues that – as stated in paragraph 2.3 of the Consultation Document – demand for petroleum will increase, therefore driving a higher level of imports. Similarly, another response stated that shale gas extraction in the USA had been proven to decrease CO₂ emissions.

- 3.15 Other responses referred to the security of energy supply as an important driver for exploring domestic sources of energy. Two responses referred to global instability as potentially effecting the supply of imports (such as Brexit, Russia, and the Middle East / Qatar). The response from Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited, for example, stated that national energy supply is “at its greatest threat” in many years given global instability, and pointed to the human rights and environmental records in countries where oil is currently sourced. Related to this were responses that stated demand for oil was likely to decrease due to a growth in the use of electric vehicles.
- 3.16 One organisation (Valero Energy Ltd) did not agree with the proposed policy, as they stated that there was not sufficient evidence to conclude that there are negative impacts of unconventional oil and gas development. The response stated the industry can complement the Well Being of Future Generations (Wales) Act 2015 and play a key role in the transition to a low carbon economy. The organisation proposed an alternative policy position, “We will only undertake any new petroleum licensing in Wales, or support applications for hydraulic fracturing petroleum licence consents, if the development meets the highest international standards of safety and environmental protection and when the development is in the best interests of the people of Wales and its future generations.”

Specific Policy and Legislation

- 3.17 Among the substantive responses received, the most commonly cited policy was the Wellbeing of Future Generations (Wales) Act 2015 (WFGA), in terms of delivering sustainability, and the need to deliver a low carbon future. In support of the draft policy, responses stated that an alternative policy for petroleum extraction would go against the WFGA.
- 3.18 Other responses indirectly mentioned the Act, for example placing wellbeing alongside health, the environment, and communities. Some organisations cited the WFGA in opposition to the policy: UKOOG stated that it is unclear how continuing imports of LNG “will foster a more prosperous, resilient and globally responsible Wales” under the Act. Similarly, the joint response from Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited, stated that petroleum extraction could develop a “prosperous Wales” by developing innovative technologies which could increase productivity (within the context of transitioning to a low carbon economy).
- 3.19 Other Welsh policies mentioned within the substantive responses included the Environment (Wales) Act 2016 and its targets to reduce carbon emissions by 2050 (to reduce emissions by 80 per cent from a 1990 baseline). One response stated that extraction of new gas reserves is not compatible with Welsh Natural Resources Policy, Planning Policy, Marine Planning, Taking Wales Forward, and Prosperity for All. One response outlined that the Welsh National Marine Plan policy does not align with the draft policy and that the requirements for a Marine Licence (under Marine and Coastal Access Act 2009) are not applicable to oil and gas activities and therefore it is unclear how the Consultation Document (paragraph 7.8) aligns with these regulations.
- 3.20 Some of the responses mentioned international policy. Among these, the most frequently cited was the Paris Climate Agreement, and the

associated targets around climate change and carbon reduction. Other responses referred to the policy adopted in countries such as Ireland, France, the Netherlands and Germany, in which there is legislation in place to prevent hydraulic fracturing. One general response mentioned the United Nations Sustainable Development Goals, the EU Biodiversity Strategy, and the Convention in Biological Diversity as aligning with the draft policy.

4. Climate Change Evidence

- 4.1 The first consultation question asked, “Do you have a view on the Climate Change evidence?”. The evidence, provided by the UK Committee on Climate Change (UKCCC), applied the ‘three tests’ for exploitation of shale gas (though Coal Bed Methane was not analysed due to lack of evidence on its greenhouse gas footprint). The Climate Change evidence relates solely to greenhouse gas emissions and the impacts that this would have on the Welsh Government’s carbon budgets.
- 4.2 As reflected in Table 1.1, there were 326 substantive responses to this question in total, with 27 stating that they did not have a view on the climate change evidence, and 299 stating that they did. The comments provided by respondents are summarised below.

Summary

The majority of substantive consultation respondents to Question 1 stated that they were concerned about the climate change impacts of petroleum extraction in Wales. The dominant view was that greater levels of petroleum extraction would lead to an increase in emissions levels, damaging the climate and limiting Wales’ ability to reach its emissions reduction targets. For these reasons, the respondents agreed with the Welsh Government’s draft policy position to oppose further petroleum extraction development licences (PEDLs). Respondents believed that rigorous regulation of the industry was an ineffective way to combat its negative impacts (Test 1). Respondents requested additional evidence on Coal Bed Methane (CBM) extraction and fugitive emissions. . A small number of respondents stated that onshore petroleum extraction could be regulated effectively and have positive impacts on emissions reduction targets.

4.3 Firstly, the responses that directly related to the climate change evidence provided (by the UKCCC) are discussed, with a summary of responses to each ‘test’ within the evidence. Secondly, an overview of the responses provided by respondents to Question 1 is given, drawing out key themes.

Test 1

4.4 The UKCCC concluded that exploiting shale gas by hydraulic fracturing on a significant scale is not compatible with climate targets unless three tests are met. Firstly, Test 1 found that ‘Well development, production and decommissioning emissions must be strictly limited’³, with tight regulation and close monitoring identified as the key methods to limit such emissions (and rapid action to address leaks).

Substantive responses

4.5 The majority of respondents who referred to the evidence provided in Test 1 were against petroleum extraction. However, there were some responses that agreed with the methods of regulation and monitoring systems, believing these to be a justification of permitting further Petroleum Extraction Development Licences (PEDLs) in Wales.

4.6 A key argument made by Valero Energy Ltd was that the UK’s regulatory regime of onshore oil and gas was “extremely strong” and “robust” with “significant industry best practice and forward commitment to proven technologies”. For these reasons and the perceived effectiveness of monitoring agencies (such as Natural Resources Wales) a small number of respondents stated that the risks of negative climate change impacts were minimal.

4.7 As stated above, the dominant view from the consultation respondents was contrary to this argument. A respondent stated that evidence demonstrated “that neither provisions of Test 1 can be met”.

³ Advice to the Welsh Government on Coal Bed Methane (CBM) from the Committee on Climate Change

Firstly, respondents overwhelmingly stated that regulation was an ineffective way to mitigate climate change risks. The predominant justifications of this view were that companies could not be trusted to follow regulations, as they are more concerned with making a profit, and that regulations were poorly enforced.

- 4.8 Respondents also referred to the regulatory 'gold standard' being a false claim. The risk of emissions, despite any level of regulation was deemed insurmountable due to the evidence from both foreign and domestic petroleum extraction sites. This included Kimmeridge Bay in Dorset where a respondent stated that "the Environment Agency reports that 300 tonnes of methane – a greenhouse gas 80 [times] more potent than carbon dioxide over 25 years, was permitted to be released into the atmosphere in 2017".
- 4.9 Fugitive emissions were a key concern for a large number of respondents, with one respondent stating that the proposed methods for limiting emissions in Test 1 were flawed "given the impossibility of gauging and monitoring fugitive emissions, irrespective of regulation in place."
- 4.10 Concern about long-term emissions leaks was also raised by respondents as it was interpreted that local authorities would assume responsibility for monitoring and limiting the emissions from sites once they were no longer in operation. A number of responses alluded to the possibility that the private sector would reap the financial reward and the public sector would be left with the costs in these cases.
- 4.11 Respondents also referred to the method of self-reporting as a highly ineffective way to monitor site emissions, with one respondent who cited the possible impacts, such as earthquakes, as a justification that self-regulation was 'ridiculous'. It was also stated that current monitoring bodies such as Defra could not be relied upon as they do "not police gas extraction properly in the UK". Furthermore, respondents also raised concerns that permits (such as environmental permits) were commonly breached at sites, with sites

in Yorkshire and Lancashire referred to specifically by respondents. A respondent stated that “the regulatory agencies do not appear to have a good record thus far in monitoring and enforcement”.

- 4.12 A single respondent stated that technologies and techniques to guarantee the maintenance of low emissions do not yet exist, which would indicate that, on the grounds of Climate Change, future PEDLs should not be granted until such technology has been developed.

Test 2

- 4.13 Test 2 from the UKCCC’s evidence found that “overall gas consumption must remain in line with carbon budgets”⁴. The UKCCC recommended that UK shale gas production must displace imported gas to achieve this, rather than increasing domestic consumption.

Substantive responses

- 4.14 Consultation respondents did not relate specifically to Test 2 as frequently as Test 1, where regulation was a key issue of contention.
- 4.15 The dominant view amongst respondents was that the carbon budgets were a key commitment (along with the commitment made within the Paris Agreement) that had to be kept by the Welsh Government. Respondents believed that allowing onshore petroleum extraction would jeopardise the country’s ability to meet the carbon budgets. Specifically, a respondent stated that “the extraction of new reserves of unconventional gas will not only fail the three tests but will add to the amount of fossil fuels being burnt and therefore further jeopardise carbon reduction targets”. Another response stressed that all emissions had to be limited in order to reach the targets, not just those of “super-emitters”.
- 4.16 Contrastingly, Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy Limited stated that other industries are also at fault for contributing to emissions levels in Wales (within a single, combined

⁴ Advice to the Welsh Government on Coal Bed Methane (CBM) from the Committee on Climate Change

response). A response commented that emissions levels from the total contribution of the petroleum extraction industry to Welsh emissions “remains small”, with Valero Energy Ltd commenting that the industry could aid the Welsh Government’s achievement of carbon budgets as it would decrease the dependency on other, more polluting energy sectors, such as the coal industry. Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy Limited asked, “why, therefore, is a domestic oil and gas industry in Wales being stymied when it is clear that the issue of Wales’ current emissions level comes from elsewhere”.

4.17 Furthermore, some responses extended this to the notion that domestic shale gas should replace imported gas as stated within Test 2. Reasons for this included that relying on overseas imports was a flawed policy, as it would be in conflict with the carbon budgets and other policies of the Welsh Government. For instance, a respondent stated that countries from which gas is imported “have inferior environmental regulations to that of the UK and weaker climate change policy than that which has been legislated domestically” adding that it “is not a sensible policy to reduce emissions nationally and internationally”.

4.18 Some responses did, however, directly oppose this view. They stated that “there is no proof that any gas recovered from hydraulic fracturing or Coal Bed Methane production in Wales would replace imported gas”. The reason supplied for this was that the oil and gas companies would decide who their gas was sold to, with a statistic quoted repeatedly within the responses that “currently over 30% of gas produced offshore in the UK is exported”.

Test 3

4.19 Within Test 3 the UKCCC stated that additional production emissions from shale gas wells would need to be offset by reductions elsewhere in order to keep emissions in line with carbon budgets.

4.20 Responses that related specifically to Test 3 did not believe that emissions could or should be offset by reductions elsewhere. One response stated that this possibility was unlikely as few measures are taken to reduce emissions in other sectors. Other responses stated that evidence was needed to justify this as a plausible option, with a response that stated there was “no evidence that additional production emissions from shale gas wells will be offset through reductions elsewhere in the UK economy”.

Overall responses to the tests/ evidence provided

4.21 Respondents criticised the tests for their lack of evidence, including CBM and fugitive emissions evidence. They stated that the evidence understated the problems, yet devastating impacts were visible. Any additional evidence cited or suggested by respondents in response to this question has been included within the summary of additional evidence (see Section 10). Respondents also expressed concerns that the tests should not be used as an exercise to justify petroleum extraction sites if the tests were passed, as a “more holistic approach” was needed. Furthermore, respondents expressed doubt that the tests could be met and fulfilled by the shale gas industry with a frequent comment amongst responses that “there has only been one well-fracked site in the UK to date”.

Lack of CBM evidence

4.22 Lack of CBM evidence was seen as an issue by respondents, who believed that it needed to be explored further. As stated above, the evidence provided by the UKCCC reiterated that this was an area that required further exploration. A key issue highlighted by a respondent was the assumption that CBM releases fewer emissions, yet escaped methane was a huge risk that needed to be explored. Furthermore, a respondent stated that “CBM is every bit as environmentally damaging as fracking is”, with another respondent providing examples of “Queensland in Australia that has large tracts of countryside drilled

for CBM, with contaminated aquifers and bubbling rivers to show for it”.

Fugitive emissions

- 4.23 The lack of evidence on fugitive emissions was a key omission from the evidence highlighted repeatedly by respondents. A respondent stated that fugitive emissions make CBM extraction methods “wholly inappropriate”. Respondents were particularly concerned with fugitive methane, with the statistic that “methane is 86-105 times worse than CO₂ over a twenty-year time frame” cited repeatedly. Furthermore, a respondent highlighted methane levels to be far greater than what the industry had declared in a US regulatory study. Additionally, respondents referred to examples from other countries where fugitive emissions from extraction wells are “known to be high, even after the well is productive”. The main concern was that there are complex issues with gauging and monitoring fugitive emissions, and, therefore, further extraction and exploration should be disallowed until such technology has been developed. The organisation, Valero Energy Ltd, assured that such technology (including developments in Carbon Capture and Sequestration and usage) was currently “on the horizon”.
- 4.24 Other consultation responses shared the view that the evidence provided was insufficient; reasons included a lack of acknowledgement of the “wealth” of scientific data, lack of reference to the experiences of other countries, lack of Wales-level data and a need for evidence that considers the alternatives (e.g. renewables).
- 4.25 The most commonly cited scientific data that respondents believed should be considered was a “scientists’ warning” of climate collapse led by Professor William Ripple in 2017 (see Section 10). The respondents stated that there was ample scientific evidence to support the view that petroleum extraction was contributing to climate change.
- 4.26 Respondents believed that evidence from other countries who had greater experience with the extraction industry was key. The

organisation, Valero Energy Ltd stated that evidence in the USA showed a reduction in carbon emissions as a result of greater extraction levels. However, another respondent pointed to flaws within data in America, stating that emissions reductions were a result of “economic recession rather than coal-to-gas fuel switching”. Furthermore, another respondent stated that it had been banned in some states in America due to its impacts, with another respondent who highlighted that it had been banned completely in some European countries. Despite these examples, respondents highlighted the lack of Wales-level data, suggesting that this was an area that needed to be explored further.

- 4.27 Another gap in the evidence identified by respondents was that renewable energy was not considered. Renewable energy creation was seen as a more favourable sector to invest in and an industry to be encouraged by the Welsh Government.
- 4.28 Respondents stated that renewable energy was becoming more viable due to greater battery storage development. They also mentioned key areas to develop, including electrification of heating, geothermal energy, use of heat pumps and bioenergy. However, opposing views included that oil, gas and coal were still major sources of UK energy and that renewable energy technology needed to be developed further to become a main source of UK energy.
- 4.29 One respondent stated that renewables required a “back-up”, and therefore, gas-powered generating stations were a better alternative to coal, wood or biomass. The UKOOG also stated that “oil, gas and coal represent 80.1% of UK energy consumption, while wind, solar and hydro-electric power provide around 4% of UK energy”, therefore, it is not realistic that renewables can become a major source of energy in the near future. The UKOOG agreed that “natural gas will still be in demand over the coming decades in Wales and the UK”, as they stated that onshore petroleum extraction could be a more viable source of energy to meet the demand, to provide “environmental, economic and social benefit”.

- 4.30 The consensus among responses to this Consultation question was that climate change was a key threat facing society, where there would be “no second chances”.
- 4.31 Respondents also referred more widely to the impacts of onshore petroleum extraction. A comment used frequently within responses was that “fighting climate change is the greatest challenge we face, and the Welsh Government should do anything they can to reduce the country’s emissions of both CO₂ and methane – starting by implementing this policy which is being consulted on.”
- 4.32 Respondents believed this to be a pivotal issue for Wales, who should be “leading the way” in climate change mitigation methods and adhering to the commitment made to future generations under the Wellbeing of Future Generations (Wales) Act. Specific climate change issues highlighted included current rising temperatures, irregular weather patterns, natural disasters (including forest fires, melting ice sheets and flooding), loss of species and habitats, and survival of pathogens in warmer winters.
- 4.33 A single respondent stated that total greenhouse gas emissions from current estimated global fossil fuel reserves would be around “three times higher” than the current 1,100 gigaton limit (between 2011 and 2050) if global warming is to be kept below 2°C. The respondent stated that climate change was such a threat that the precautionary principle should be taken in regard to petroleum extraction, in case its impacts were potentially devastating. However, two responses saw climate change as an excuse, believing that it was not entirely man-made, and it was cyclical. A small number of responses also referred to evidence suggesting that there were positive impacts of CBM extraction sites on climate change, such as emissions limitation and greater awareness of emission saving techniques through regulation.
- 4.34 The UKOOG stated that "From 1990, the UK has reduced its emissions by 42%, more than any other major industrialised nation. During such time, UK economy wide natural gas consumption

increased by 50%." This would indicate that natural gas extraction does not contribute to emissions levels.

- 4.35 Other impacts of onshore petroleum extraction highlighted by respondents included waste, fossil fuels, pollution / air quality and water usage / pollution.

Other comments

- 4.36 The responses also stated that the evidence favoured petroleum extraction companies, focussing on the benefits of petroleum extraction for business. A comment was also made about the need for better education.

5. Socio-environmental Evidence

- 5.1 The second consultation question asked respondents if they had a view on the socio-environmental evidence that was provided. This evidence summarised the potential for (and the impacts) of petroleum extraction in Wales. The evidence looked at various indicators for potential Petroleum Extraction Development Licenses (PEDL) across Wales, including environmental, public health, socio-economic and techno-economic indicators, to map the feasibility of petroleum extraction sites across Wales.
- 5.2 Table 1.1 shows that of the 316 substantive responses to this question, 52 stated that they did not have a view on the socio-environmental evidence, and 264 stated that they did.

Summary

The majority of substantive consultation responses to Question 2 stated that they were concerned about the socio-environmental impacts of onshore petroleum extraction in Wales. The dominant view was that the policy position to disallow future PEDLs was supported as the socio-environmental impacts were numerous and predominantly negative. Respondents stated that petroleum extraction sites would fracture and divide local communities, with irrecoverable impacts on landscapes and ultimately quality of life.

Environmental concerns extended these local community impacts with key concerns being air pollution, water pollution and water usage. Though a few respondents stated that such impacts could be mitigated through regulation and permits, the majority of respondents believed these risks to be too significant to allow further petroleum extraction in Wales.

Socio-environmental evidence

- 5.3 Few consultation respondents referred directly to the socio-environmental evidence provided for the consultation. However, many related to the evidence outlined within the Consultation Document.
- 5.4 Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited's combined response referred to paragraph 5.21 which mentioned the "limited scale of petroleum extraction developments in Wales"⁵, reflecting that the industry needs to be allowed to progress. Valero Energy Ltd agreed with this and made a statement that the evidence supplied in paragraphs 5.21-5.38 "does not contain any irrefutable argument against the pursuit of unconventional oil and gas on environmental grounds".
- 5.5 Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited's combined response also referred to paragraph 5.25 of the Consultation Document where assumptions in studies were "admitted". The organisation believed that, therefore, these studies are unreliable and should not inform Welsh Government policy.
- 5.6 A respondent also referred to paragraph 5.34, where the Consultation Document outlined that emissions could be low if the operations were "properly run and regulated", however, the respondent stated that this would assume that 100 per cent efficient regulation could exist. Another referred to this paragraph, believing UK regulation and monitoring to be poor.
- 5.7 Furthermore, a respondent stated that regulation must be supported with "comprehensive monitoring, policing and deterrent regimes in place". They stated that these regimes are expensive and impractical, therefore, delegitimising claims within the evidence that regulation has the potential to minimise extraction sites negative impact on the environment. In contrast, Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited's combined response stated

⁵ Consultation Document, Page 24.

that regulation could be relied upon, with Natural Resources Wales (NRW) and Health and Safety Executive (HSE) enforcing environmental protection measures through permits that operators must comply with and on-site inspections.

- 5.8 Finally, a respondent referred to paragraph 5.37, where it is stated that “the most suitable areas can be found in the South Wales valleys, central Wrexham, and the Denbighshire coast”⁶. The respondent reflected that these were some of the “poorest parts of Wales” and would be impacted greatly, suggesting higher levels of inequality as a result.

Wider evidence discussions

- 5.9 Wider references to the evidence were made, with many interpreting that greater research was needed. There was also a view amongst some respondents that the evidence favoured onshore petroleum extraction companies.
- 5.10 Discussions about the evidence provided within the consultation responses included the view that greater research was needed. Respondents stated that there was not enough conclusive evidence provided, it was poorly researched, and some conclusions made were “supposition”.
- 5.11 Specific areas where it was deemed more evidence was required included methane leakage impacts. This links to responses to Question 1, where respondents stated that fugitive emissions represented a key gap in the evidence provided. It was also stated by respondents that evidence was needed from other countries where petroleum extraction (especially CBM extraction) was more common. Respondents believed that this evidence from other countries reflected overwhelmingly negative social and environmental impacts.
- 5.12 Additional sources of evidence were provided by the respondents in response to Question 2, including evidence from the Compendium of

⁶ Consultation Document, Page 27

Scientific, Medical and Media findings which showed the risks and harms of hydraulic fracturing, Defra research which “laid open the deep uncertainties of the environmental and social impacts” and a Tom Burke study which reflected significant negative impacts of hydraulic fracturing on drinking water resources. These sources of evidence are provided within the additional evidence section (Section 10).

Social

- 5.13 Here the respondents’ discussions in relation to social impacts of petroleum extraction are discussed. The overwhelming majority of respondents referred to negative social implications, which included a lack of social cohesion and fractured communities, negative health impacts and a decreased quality of life. These are discussed in more detail below.
- 5.14 Respondents stated that petroleum extraction would divide communities. One respondent stated that “the first victim of fracking is social cohesion”, another agreeing that there is currently fierce opposition to hydraulic fracturing amongst communities in Wales. One respondent referenced evidence that crime rates increased in areas of hydraulic fracturing sites. Respondents also referred to the negative experience at many other sites. This was “disastrous” for communities living near sites in Australia, the US and North England which, a respondent stated, have been “torn apart”. Another respondent referred to the inequity of these negative impacts, through their statement that “climate change impacts the poorest and most marginalised people first”. Interestingly, a respondent referred to a study of an exploratory hydraulic fracturing in Lancashire where there were “profound effects such as feelings of outrage, powerlessness, disillusionment with politics, feelings of intimidation and fear”.
- 5.15 Health impacts were also mentioned in response to Question 2. These consisted of negative health implications for local communities such as bad air quality and negative health and well-being

implications for those who have strong connections to the landscape. It was stated by a respondent that the negative health implications are in conflict with the principles of the Wellbeing of Future Generations (Wales) Act. Both the Wellbeing goals and health impacts will be discussed in the following section of this document (Section 6).

- 5.16 Quality of life impacts stated by the respondents linked closely to environmental impacts. These included noise and light pollution, increased traffic, loss of natural landscapes and drought. Respondents believed that landscapes would be irrevocably changed by petroleum extraction wells, which would have wider social impacts on those who regarded the landscapes as their homes.
- 5.17 Respondents also referred to the transitory nature of petroleum extraction sites, as they stated that they represented a “boom and bust cycle” that was highly damaging to the communities located near sites. This cycle implied a sudden influx of workforces and traffic to nominally small, rural communities with little infrastructure, that would just as suddenly vacate, with a negative impact on such communities.
- 5.18 Despite the negative impacts explored above, the UKOOG stated that communities can be impacted positively by petroleum extraction sites. They stated that they communicate closely with the public, believing that social license is key, having their own community benefits package in order to create a positive social impact near their petroleum extraction sites.

Environmental

- 5.19 Again, the dominant view was negative amongst respondents who referred to environmental impacts of petroleum extraction. This included damage to natural landscapes, soil and air pollution, earthquakes, biodiversity loss, changing weather patterns and water pollution / usage.
- 5.20 Respondents stated that petroleum extraction would damage the natural landscape and countryside in Wales. This was seen as an important resource for Wales and a source of income through tourism.

One respondent stated that the industry would convert Wales' "wonderful countryside into an industrial wasteland", with another who believed Wales' natural topography would be replaced with "slag heaps, drowned valleys and decimated landscapes". Other respondents also raised concerns about their trust of operators and their ability to rectify their environmental impact. For this reason, respondents concluded that there was a need to protect Wales against more sites as a precautionary measure.

- 5.21 Respondents also raised concerns that soil could be polluted through petroleum extraction sites. This could have negative impacts on the farming industry, including agricultural land used for sustainable farming. A respondent referred to evidence from Africa, where farmers were unable to grow crops due to soil contamination, leading to loss of livelihoods, displacement and mass migration.
- 5.22 Air pollution was a key area where respondents believed there to be significant negative impacts. One respondent referred to sites emitting a "cocktail of chemicals into the air including NO_x, Carbon Monoxide, Hydrogen Sulphide, diesel fumes, soot and dust, including known carcinogens". These pollutants were seen as having a key impact on society and local communities in terms of health, sometimes causing death, issues with capacity to think and impacts on quality of life. As a predominantly rural country, it was felt that these impacts were likely to be felt more significantly in Wales.
- 5.23 Earthquakes were highlighted by respondents as another environmental risk associated with hydraulic fracturing efforts. Respondents believed that this issue was exacerbated in mining towns where the risks of earthquakes were even greater. For this reason, respondents stated that Wales was not geologically viable for greater petroleum extraction exploration. Key examples highlighted by respondents included Blackpool, where earthquakes were reported at levels over 3.0 on the Richter scale and were felt in Scarborough. Furthermore, a respondent also stated that "Oklahoma, not a

traditional earthquake spot, is now the earthquake capital of the United States”.

- 5.24 In addition, biodiversity and habitat loss were highlighted as issues amongst responses. Respondents were concerned that local wildlife would suffer, causing it to migrate to other areas.
- 5.25 Similarly, changing weather patterns and climate impacts were considered as key environmental impacts to consider. Respondents voiced concern that these changes would increase the amount of natural disasters including flooding, which would have knock on effects for soil contamination. The expense of such natural disasters, which are likely to become increasingly frequent may become “costly or even impossible”. In contrast the UKOOG stated the weather implications and risks of hydraulic fracturing were low, with no major impacts on temperature and any impacts reversible.
- 5.26 High usage of water was highlighted by respondents, as was the pollution of water due to petroleum extraction sites. Firstly, extensive use and depletion of water resources was highlighted as a significant impact. One respondent stated that a conservative estimate of a single well’s water usage was 1 to 5 million gallons of water, with another respondent who highlighted the example of sites in Texas where 8 million gallons per well are used. Such depletion of resources could threaten drought and desertification.
- 5.27 Secondly, respondents raised issues about the contamination of both surface and groundwater, which is “used to supply a third of drinking water” in England. Respondents highlighted the example of the US where “hydraulic fracturing has caused contamination to drinking water resources across the country”. The UKOOG argued against this, as they stated that there is no evidence of groundwater pollution, and monitoring of this is undertaken as part of an environmental permit that sites must adhere to. Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited’s combined response similarly stated that Natural Resources Wales (NRW)

protects the environment through such permits. However, many respondents stated that regulation and monitoring of these problems were ineffective and could not be relied upon to manage environmental impacts.

- 5.28 Respondents highlighted further environmental evidence that they believed should be considered. This included evidence from other countries, the State of Nature report which reflected “dangerous reductions in our native wildlife” and the Environment America Research and Policy Centre Report.

Economic

- 5.29 In relation to this Consultation Question respondents also referred to the economic implications of petroleum extraction as this was seen to have a social impact. Predominantly, respondents believed that the industry would have little or no positive impacts on local economies, being ‘transitory’ in nature. Employment, a supposed benefit of petroleum extraction to local communities was criticised by respondents as flawed, with few, specialist jobs provided that required trained individuals from outside of the local area. The economic implications have been explored within the summary of interim responses in the section below (Section 9), which provides an overview of responses to the economic evidence.

6. Health Evidence

- 6.1 Question 3 of the Consultation asked, “Do you have a view on the Health evidence?”. The Health evidence provided for Question 3 was created by Public Health Wales and presented an initial view on the available evidence on the extraction of unconventional oil and gas and CBM.
- 6.2 Of the 395 substantive respondents who answered this consultation question, 282 stated that they did have a view on the evidence provided, and 39 stated that they did not. The further comments made are summarised below.

Summary

The majority of substantive consultation responses to Question 3 stated that they agreed with the implications to health outlined in the evidence presented in the consultation document. Respondents raised concerns about the short- and long-term effects of petroleum extraction on physical and mental health and wellbeing, including the additional burden this may have on the NHS. The respondents provided a large amount of additional evidence which supported their concerns from America, Canada and Australia. A small number of respondents disagreed with the potential health implications raised by the health evidence and other respondents.

Health evidence

- 6.3 Of all responses, only nine related directly to the health evidence provided. Four of these picked out information from the PHW report to state that the impact of petroleum extraction on public health could have negative health implications, as they stated the risk that it posed for current and future generations was too great. Three responses who referred directly to the PHW report highlighted that regulation could overcome any negative health implications and believed that

greater evidence was needed before petroleum extraction could be discounted. This included a response from the company, Valero Energy Ltd, who stated “it is sensible and right to base public policy on sound scientific data.” The remaining two responses from Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited and the UKOOG are discussed in detail in Section 6.16 and 6.20.

- 6.4 Wider discussions about the evidence provided included a view that evidence of mental health implications was needed to fully inform the consultation responses. Furthermore, there was a perception that there was not enough definitive scientific evidence to support petroleum extraction, however there is a reasonable risk which needs to be considered. A further view was that the PHW report was too optimistic in its belief that the risk, though highlighted in the report, could be mitigated with technology and regulation.
- 6.5 A number of responses highlighted apprehension over the use of the health evidence. Respondents believed there was a large amount of more up to date, peer reviewed health evidence available than what was presented in the PHW report. Respondents were concerned about industry and the government ignoring or covering up health evidence as they had done in the past on the harmful effects of smoking and asbestos. One respondent was particularly concerned that this evidence could be buried, and another thought it could be falsified.

Wider anti-petroleum extraction responses

- 6.6 Of the other responses received, the majority believed public health implications to be a reason to prohibit petroleum extraction in Wales. The reasons provided included the ineffectiveness of regulation, meaning that regulation of hydraulic fracturing sites could not guarantee limiting negative health impacts. There was concern about regulation and the ability of the Welsh Government to effectively regulate and monitor the industry. Respondents felt that to rely on

robust regulation was not acceptable due to a failure to adhere to regulation by similar industries in the past. Furthermore, there is not the resource required to monitor all aspects of petroleum extraction and self-monitoring was seen as unreliable. One respondent's view was that even if clean operation and effective regulation could be achieved, it was felt there should be consideration to the potential issues in tort law⁷ by individuals whose health and family life could be affected.

6.7 Other concerns raised included;

- air pollution
- groundwater pollution
- harmful chemical pollutants
- wider impacts on food supplies.

6.8 It was stated that pollution (particularly groundwater pollution) would impact horticulture and agriculture industries and, therefore, impact the supply of food. Diseases associated with air pollution were referenced as a concern, including asthmas and silicosis caused by inhaling the sand used during drilling. In addition to direct pollution from the petroleum extraction process, respondents considered the increased levels of transport, noise and light. The majority of respondents were of the opinion that this would cause an increase in respiratory disease and a decrease in wellbeing. One respondent stated that the UK had a growing public health crisis in terms of air quality and pollution. They were of the opinion that the UK currently operates at a higher limit than that set by Europe and the World Health Organisation and that the impact that petroleum extraction would have on this needed to be considered.

6.9 Specific health implications mentioned throughout numerous responses were;

⁷ The right to compensation for injury to an individual's person, property or reputation including people's rights to health and safety, a clean environment and their economic interests.

- lung disease
- asthma
- damage to brain function
- health issues associated with extreme temperatures (for the old and young).

6.10 These were frequently evidenced through research papers and documentation from overseas. Respondents mentioned evidence from countries, including America, Canada and Australia. Evidence from these countries demonstrated cases of negative health consequences from petroleum extraction. The evidence presented in these responses highlighted the risk of:

- premature births
- low birth weight
- skin conditions
- cancers
- heart problems.

6.11 An individual who responded to the general policy question, Question 8, outlined the link between the activities in America, Canada and Australia and potential UK practice. They stated that the parent companies of operations in the UK are the multi-national companies operating within the regulatory frameworks in America, Canada and Australia and therefore similar company practice could be applied in the UK. The effects of this practice have been linked to negative health and pollution impacts in these countries and should be taken into account, as there is potential for this practice to affect the UK in a similar manner. They felt that poor monitoring and enforcement through insufficient increases in public resource in the UK could further exacerbate the issue.

A number of respondents referenced the New York State evidence. The report referenced by the respondents was written by New York

Health professionals in March 2018 is in its fifth iteration⁸ and is a compendium of evidence that reaches similar conclusions to that of the PHW report. The respondents agreed with the compendium and highlighted a statement in the report made by the Concerned Health Professionals of New York and the Nobel Peace Prize-winning group, Physicians for Social Responsibility; "Our examination...uncovered no evidence that fracking can be practiced in a manner that does not threaten human health."

Implications on the NHS

- 6.12 Two responses highlighted further potential health implications, stating that a lack of NHS funding and austerity made petroleum extraction even harder to justify. The NHS did not have the resources to manage such adverse health implications on a larger scale. One of those respondents also mentioned the mining industry, which they reported became unviable due to the high costs of health and safety and treating mining related health problems. They were concerned that the health issues associated with petroleum extraction would have a similar burden on the NHS, which cannot cope with its current care requirements. An additional respondent raised the point that the full burden on the health care in America may not be known. As America does not have a national health service, many victims may settle with the companies undertaking extraction in exchange for silence, whereas in the UK the NHS would automatically have to cover the costs.

Mental health and wellbeing

- 6.13 In addition to the physical health implications discussed, many respondents believed petroleum extraction could impact mental health and wellbeing. The impact on mental health and wellbeing was believed to be associated with the stress and anxiety of living near the operations and the destruction of green spaces decreasing the quality

⁸ http://concernedhealthny.org/wp-content/uploads/2018/03/Fracking_Science_Compendium_5FINAL.pdf

of life of the residents. Though one respondent did feel this was hard to quantify. Another respondent questioned whether the potential risk to local communities was worth the risk, whilst another referenced previous impacts of industry to areas such as Port Talbot. One respondent stated "[I] think it's time we stopped chasing the pot of gold at [the expense of] our citizens' health and well-being".

- 6.14 Two respondents linked petroleum extraction to the Wellbeing of Future Generations (Wales) Act. They were of the opinion that the WFGA requires the Welsh Government to look at health and wellbeing holistically to reduce our dependence on fossil fuels.

Additional health evidence presented

- 6.15 A large number of responses included references to the 2016 Medact review⁹ and Johns Hopkins¹⁰ papers. A large number of these responses are based on a standard text template which has been used as the basis for numerous individual responses. There are however, references to this evidence which are not adapted from the standard text. Respondents using this standard text also included research published in Reviews on Environmental Health. The responses agreed with the conclusions presented by Medact and Johns Hopkins about the potential negative impact on air and water quality, health, climate change, social well-being, economics, noise and light pollution and seismic events.

Pro-petroleum extraction responses

- 6.16 Out of the 207 open text responses to the health question, five presented the pro-petroleum extraction position, agreeing with the PHW report position that regulation can mitigate negative health implications. Two of these stated that no credible (unnamed response) or irrefutable (Valero Energy Ltd) evidence had been put forward to prove any of the "wild health scare claims that are being

⁹ <https://www.medact.org/2015/resources/reports/health-and-fracking/>

¹⁰ <https://hub.jhu.edu/2016/08/25/fracking-health-migraine-sinus-fatigue/>

bandied about.” Valero Energy Ltd was confident that other industries are regulated effectively, and, in this case, regulation can mitigate pollution and groundwater contamination concerns. The remaining two responses were from the UKOOG and the combined response from Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited.

- 6.17 The combined response from Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited addressed the Consultation Document in great detail. The response covered the nature of the extraction methods, that stated they are not relatively new as the documentation says and that the coal mining that took place in Wales was far more invasive than the drilling techniques used in the conventional and/or unconventional gas industry today. The respondents questioned the reliability and accuracy of the PHW report, as the study states there is no evidence available on a Welsh site by site basis. They were of the opinion that future policy cannot be based on this little evidence or evidence from different nations due to the more stringent health and safety and environmental regulations in the UK. The respondent stated, “Reflections should be made in Welsh policy once the industry has progressed and Public Health Wales can work with licence holders/operators in Wales to produce an accurate, Wales-specific report.”
- 6.18 Their call for additional evidence through progressing the industry in Wales was repeated through the response. The response called for a more detailed Wales-specific review to be carried out a further two times, the results of which could influence future policy and regulations.
- 6.19 In reference to content on regulation from the PHW report, the respondents stated operators have no option but to “properly run and [regulate]” operations. NRW and the HSE carry out site inspections to ensure operators are compliant with their awarded environmental permit and planning permission and that they manage all potential hazards.

- 6.20 The response from the UKOOG outlines similar issues to that of the combined response from Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited. The UKOOG stated that;
- onshore oil and gas development is protective of public health.
 - unconventional techniques are not new to the UK.
 - applying evidence from outside the UK to domestic policy making should be done with caution.
 - UK regulation requires monitoring of emissions to air as part of the environment permit, and groundwater must be monitored as part of the requirements of the infrastructure act.
 - they would be interested to understand the 'gaps' in the data, especially in the context of the UK's regulatory environment.
- 6.21 The UKOOG conclude their response by saying they were in support of the collection of data through rigorous scientific approaches, as were the majority of other respondents. Unlike the majority of respondents, however, they were confident that the data being collected at present from operational sites will confirm that those living in the locality of onshore oil and gas development need not be concerned.

Wider comments

- 6.22 Further comments included discussion on what could be done to improve the future of the energy sector and public health. Investment into renewables to ensure health and safety and reduce pollution was recommended. Furthermore, one respondent felt that proactive management of public health should be adopted.

7. Transport and Planning Evidence

- 7.1 Question 4 of the Consultation asked, “Do you have a view on the Transport and Planning evidence?”. The report, Unconventional Oil and Gas: Community Impacts from Transportation Activities in Wales provided an updated summary of the Scottish Government study, which assessed the impacts of UOG traffic on local communities within Wales.
- 7.2 252 substantive respondents reported they had a view and 60 did not. The views of the respondents regarding the report evidence and perceived issues are summarised below.

Summary

The majority of substantive consultation responses to Question 4 agreed with the potential implications outlined in the evidence. Respondents were of the opinion that petroleum extraction would have negative implications on the areas local to the sites including release of hazardous material on transportation, noise and air pollution, increase in road traffic accidents and impact on nature conservation. A small number of respondents disagreed with the potential transport and planning implications raised within the evidence and stated that operators have to comply with environmental and planning permits granted by NRW and the local authority.

Transport and planning evidence

- 7.3 Only five respondents directly discussed the transport and planning evidence, the Community Impacts from Transportation Activities in Wales report. One stated, “the evidence demonstrates negative impacts from allowing the development of fossil fuel extraction in Wales”. Another respondent identified the negative impacts raised in the report, including accidental release of hazardous material during

transportation, air pollution, noise pollution and impacts on nature conservation. They believed that due to these impacts, and other impacts found elsewhere, that the industry should not be welcomed in Wales. The UKOOG stated however that; “The UKOOG fails to see how nature conservation is linked to traffic movements associated with onshore oil and gas developments.”

7.4 Valero Energy Ltd and the UKOOG acknowledged the concerns raised about traffic and transportation of hazardous materials but believed with the right control measures put in place the risks could be mitigated. “Valero therefore sees no reasonable grounds for Welsh Ministers to adopt a policy of not undertaking any new petroleum licensing in Wales, or not to support applications for hydraulic fracturing petroleum licence consents on the basis of transport and planning concerns.” The UKOOG questioned the Consultation Document where it stated that in line with draft planning policy Wales: Edition 10 ‘proposed treatment of the extraction of onshore oil and gas within the planning energy hierarchy to reflect their position as the least preferred source of fuel for power generation’.

7.5 Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited stated that the evidence is generic and applicable to every vehicle movement across every sector, including the general population’s use of the roads for commuting and/or leisure purposes. Similar to the response from the UKOOG, they state that operators are required to produce a Traffic Management Plan as part of their planning application to the local authority and their environmental permit application to NRW. These Traffic Management Plans stipulate the ways in which the operator will mitigate the effects of transportation and are approved as part of the permissions. The approval of these plans demonstrates that authorities are satisfied with the ways in which the operator proposes to safeguard road infrastructure and users. The organisation stated that this shows that oil and gas operators will be putting positive measures in place, which is not a requirement across all Welsh sectors.

- 7.6 Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited stated that the evidence provided was not sound enough to base Welsh policy on. The transport evidence was based on Scottish and United States information, the applicability of which, while perhaps more accurate than health, environmental and economic factors, was not certain. They called for a further Welsh-based study alongside the industry, so that actual impacts and benefits were known. They were however, pleased to see that the report concluded that, “any significant impacts would be avoided through the application of the control measures set out above.”

Potential implications

- 7.7 In summary, other responses discussed the negative implications for roads and transport infrastructure in Wales. Specifically, this included the increased volume on roads with heavy machinery and hazardous waste material, safety of roads, and the burden on Welsh residents from increased traffic noise. Many were concerned that there would be slow moving traffic, lorries would not stick to designated routes, road traffic accidents would increase, and that tourism and farming would be negatively affected. A respondent noted “The tax payer should not be burdened with the financial risks and the communities shouldn't be burdened with the social ones.”

Transport infrastructure

- 7.8 The majority of responses included concern about increased road pressure due to heavy machinery needed to set up the operation and to daily transport water to and from the site, and the current transport infrastructure not being able to cope. Furthermore, respondents felt that the roads needed to be better maintained at present and that there is a lack of funding to do this. There was heightened concern regarding the scale of such operations. One respondent explained that a current hydraulic fracturing site in the UK has altered its transport management plan, as it operated outside of its original conditions of delivering within working hours. Though this was

partially due to protests, the respondent felt this needed to be considered, as high levels of public anxiety may occur at petroleum extraction sites in Wales.

Noise and air pollution

- 7.9 Noise and air pollution were frequently discussed by respondents, who were of the opinion that the disposal of waste water (from de-watering) was a significant problem and that the heavy traffic would increase air pollution. One respondent acknowledged the “disposal of waste water (flow back) from fracking and CBM will be a problem as re-injection causes earthquakes” and raised concerns about the appropriate treatment and disposal of waste water. A further respondent stated there was no adequate cleaning and disposal technology or processes available, leading to pressure to dump waste water in waterways.
- 7.10 Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited countered the statement regarding increased de-watering for Coal Bed Methane as opposed to hydraulic fracturing. They stated that use of new technology could dramatically reduce the number of traffic movements. Technology that has been developed in Wales could be used to treat the water on site to such a quality that would allow the discharge of this clean water, under licence from NRW, into a local water course. This would drastically reduce the volume of fluids and therefore the number of traffic movements leaving a site. The UKOOG expanded on this by outlining that once the resource is proven, there would be scope for the application of temporary pipeline infrastructure and reuse of flowback water onsite.
- 7.11 Many responses to the consultation were concerned that areas which were valuable for tourism and mental and physical wellbeing would be destroyed due to industrialisation of rural areas and habitat loss through removal of hedges.
- 7.12 There was however, one respondent who mentioned that the construction of any extraction sites would be no different to the

construction of a wind farm, however renewable industries do not get accused of poisoning children or just caring about profit.

Planning

- 7.13 A few respondents were apprehensive of the planning applications. One respondent thought planning should not give application approval even for exploratory wells; especially with the need to consider the proximity of a well to schools and houses. In addition, these consultation responses recommended a rigorous organisation to oversee that companies are keeping to their agreements within planning, so shortcuts are not taken, and finances are scrutinised properly. A number of respondents referenced the planning decisions made in Ryedale and Kirby Misperton.
- 7.14 A response from Friends of the Earth Cymru and Landmark Chambers, London recommended that the Infrastructure Act 2015, Section 43 that was passed to the Welsh Government in 2017 be amended. They believed the Act should make horizontal drilling for the purposes of hydraulic fracturing or CBM beneath private property, even below 300m, trespassing.
- 7.15 Further responses noted contradictions with the Welsh Government's transport decarbonisation objectives and strategy and called to tighten regulation. Another respondent highlighted concern that operators would soon be able to explore potential sites without planning permission.
- 7.16 The UKOOG also raised their concerns regarding the planning system in the UK. They stated that since 2010, 75% of UK onshore oil and gas applications were recommended for approval by the planning officer, however 75% of these applications were rejected at a committee level. Similarly, in 2012, planning applications took approximately 3-4 months to be conducted, however by 2017 this was taking in excess of 13 months. Currently, the UK government is consulting on the potential for non-hydraulic fracturing shale gas wells to be included as part of permitted development and is investigating

whether shale gas production sites should be included as part of the nationally significant infrastructure project scheme.

Agreement with the evidence of low transport and planning impact

- 7.17 In addition to the Valero Energy Ltd response outlined, there are two other responses that are in favour of petroleum extraction in Wales, these are Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited combined response and UKOOG.

Wider comments

- 7.18 There were a number of wider comments that could be seen as out of scope for the Consultation which were focused on increased investment and focus on the Welsh railways, electric vehicles, increased park and ride facilities and other sustainable transport and planning systems. One respondent stated “We must develop transport and planning systems that are truly sustainable. This will mean decoupling current policies and practices from fossil fuel intensive methodologies and approaches.”
- 7.19 The UKOOG discussed increasing use of electric vehicles. They stated there would have to be very substantial upgrading of the electricity grid in South Wales which would be extremely costly and time consuming as well as disruptive. As an alternative, they have offered the gas pipeline, an existing infrastructure in Wales, to provide the vehicle fuel, this should be utilised using CBM to fuel strategically placed fuel cells that have nil emissions and are low noise to charge electric vehicles thereby accelerating the change to electric vehicles in Wales.
- 7.20 Coastal Oil and Gas Ltd, UK Methane Limited, and Adamo Energy (UK) Limited have suggested that domestic gas production in Wales offers the change to produce a lower carbon road vehicle fuel in the form of LNG. It has been reported that a truck powered by dual fuel LNG/diesel engine can emit up to 75 per cent lower NOx emissions and about 13 per cent lower CO₂ emissions compared to diesel

powered trucks. They have stated that emissions can be further driven down by the addition of hydrogen.

8. Decommissioning Evidence

- 8.1 Question 5 of the Consultation asked, “Do you have a view on the Decommissioning evidence?” This question asked the consultation respondents if they had a view on the evidence provided for decommissioning, site restoration and aftercare. This evidence focussed on the implications of a petroleum extraction site that was closed down or no longer in use.
- 8.2 A total of 201 substantive respondents reported they had a view and 103 stated that they did not have a view on the decommissioning evidence provided. The further comments made are summarised below.

Summary

The majority of substantive consultation responses to Question 5 stated there will be no need for decommissioning, site restoration and aftercare, if petroleum extraction is not permitted within Wales. Respondents raised concerns about the long-term regulation and monitoring of wells, especially due to concerns of methane leaks and the long-term environmental damage. In addition, respondents raised the lack of financial provision set aside for long term monitoring of decommissioned wells. However, a small number of responses stated operators have to comply with international standards and industry best practice as part of their environmental permit from NRW.

Decommissioning, site restoration and aftercare evidence

- 8.3 Section 5.62 of the Consultation Document explored the report, Welsh Government Oil and Gas Evidence Programme: Decommissioning, Site Restoration and Aftercare¹¹, that stated “decommissioned oil and

¹¹ AECOM, 2017. <https://beta.gov.wales/sites/default/files/consultations/2018-06/180703-welsh-government-oil-and-gas-evidence-programme-decommissioning-site-restoration-and-aftercare.pdf>

gas wells are unlikely to leak gases (including methane) or other fluids”. UKOOG and Valero Energy Ltd consultation responses agreed with this assessment. The UKOOG consultation response referred to a study from Durham University that concluded, on average, a decommissioned UK well would emit around 15 kg of methane per year, the equivalent of around a 1/6 of a dairy cow. Similarly, Valero Energy Ltd believed that the evidence provided was insufficient to suggest that petroleum extraction should not be explored on the grounds of decommissioning, especially as Wales has an existing body, Natural Resources Wales, to integrate pollution control, to mitigate potential risks to groundwater integrity and any other ecological concerns.

- 8.4 Six other consultation responses explicitly referred to the evidence discussed in Section 5.62 of the Consultation Document. Two responses stated that Section 5.62 put an “un-justifiable faith in the reach and efficacy of regulation” and the Oil and Gas Authority’s ‘Decommissioning Strategy’ focused mainly on offshore wells and the industry in the UK is unfamiliar with large-scale decommissioning projects. Two responses stated evidence of decommissioned wells in the UK was offered by Preese Hall, which is still not restored.
- 8.5 The majority of consultation responses did not explicitly refer to the decommissioning evidence, but they explored concern about leaking from wells. One of these responses was from Glyndwr University, which stated “well sites can leak methane for many years and the regulatory system is not capable of the level of long-term monitoring needed to ensure leaks are blocked in a timely fashion.” There was concern whether sites can ever be sealed, as these materials will not last forever, and there is limited evidence to show that wells can be safely permanently capped. One respondent stated, “most importantly of all, the wells that are drilled and eventually closed off after drilling will, over time, inevitably crack and be damaged by geological movements resulting in the release of toxic materials, gas and liquids into the ground, surface soils and into the underground aquifers.”

Another response raised concerns about deep aquifers that link to depths of 2000m.

Decommissioning, site restoration and aftercare regulations

- 8.6 A central theme explored within consultation responses to Question 5 was that if petroleum extraction in Wales was prohibited, there would be no need for decommissioning, site restoration and aftercare.
- 8.7 The Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited joint consultation response stated operators have to comply with international standards and industry best practice as part of their environmental permit from NRW and planning permission conditions from the local authority, the HSE, the OGA and an Independent Well Examiner. In addition, this response pointed out that operators adhere to the Borehole Sites and Operations Regulations 1995, as part of this must detail the proposed sealing or treatment of abandoned wells. NRW monitors sites for as long as is considered necessary and will not allow the surrender of sites until it is satisfied that there is no unacceptable risk to the environment.
- 8.8 Similarly, the UKOOG consultation response stated “UKOOG operators, as part of the new infrastructure project authority assessment, must provide financial resilience documentation to demonstrate to regulators that they have the capacity to decommission sites if necessary.” The UKOOG consultation response stated the need for a framework for regulation and aftercare, however, the UK regulatory system is sound for the management of onshore oil and gas wells.
- 8.9 The majority of other consultation responses raised concerns about the regulation covering the long-term monitoring of wells after decommissioning, especially for future generations. Unconventional and CBM wells require a programme of long-term periodic monitoring. One respondent stated unconventional wells leak more than conventional, so the volume of wells required for unconventional extraction makes this an issue for decommissioning. In addition,

responses suggested that sites are often not mapped out, so site locations are often unknown, preventing long-term monitoring being put in place. There was therefore a risk that pollution and leaks are not addressed in a secure and timely way.

Responsibility of sites

8.10 The majority of consultation responses raised concerns about the operator's responsibility to see through the decommissioning, site restoration and aftercare. A central theme raised by respondents was that of responsibility for the decommissioning of sites, especially if businesses no longer have the financial capability. There was a concern that this would fall to the landowner, Welsh Government, local authorities or the people living in the local area, when the business will have profited from the site. Quite a few responses suggested a number of measures to ensure companies would guarantee to decommission sites properly, these included:

- financial provision for long-term future problems that might arise from the sites
- responsibility for and future funding have to be determined and legally binding
- 'clean-up fund' to always be available to ensure the environment is put back, as per prior to the drilling
- insurance for decommissioning
- a bond placed, as per some wind turbine operators to pay for the decommissioning.

8.11 A small number of consultation responses mentioned a previous history of other industries not appropriately decommissioning and restoring sites, such as the North Sea oil rigs and the coal pits in Wales.

Environmental impact

8.12 Respondents explored the environmental impact of petroleum extraction, and the need to return the site back its previous function, including for agriculture and food production. Responses explored the

need for an environmental plan, to prevent as much environmental damage as possible by the time the site is decommissioned.

Importantly, the consultation responses questioned the development of new industries in Wales that are known to produce pollution, with potential long-term environmental impacts that go against the Paris Agreement.

Other responses

- 8.13 Other responses explored that there is no evidence to suggest decommissioned sites are safe, especially as it is a high-risk industry with a bad safety record.
- 8.14 A few respondents suggested there was an impact from nuclear waste which was not previously disposed of properly, so there is a need to ensure measures are put in place for the appropriate disposal of waste.

9. Economic Evidence

- 9.1 Question 6 of the Consultation asked, “Do you have a view on the Economic evidence?”. This question asked the consultation respondents if they had a view on the economic evidence provided, predominantly the 2015 report Socio-economic Impact of Unconventional Gas in Wales, and the 2015-2017 Socio-economic Impact of unconventional gas in Wales.
- 9.2 A total of 247 substantive respondents responded that they had a view and 61 responded they did not. The further comments made are summarised below.

Summary

The majority of substantive consultation responses to Question 6 agreed with the economic evidence that “unconventional gas in Wales is unlikely to be of the scale and nature to create any longer term transformative economic effects for the region”. Respondents explored the long-term impact on the environment and the people of Wales, was not worth any potential short-term benefit for the oil and gas industry. Responses raised concerns about the economic impact on other Welsh industries that rely on the natural environment, such as agriculture and tourism. The economic benefit of employment was seen as quite limited from responses. However, the wider economic impacts were seen as not fully captured by organisational responses and the industry can positively contribute to a domestic energy industry.

Economic evidence

- 9.3 There is an overall agreement from consultation responses with the statement that “unconventional gas in Wales is unlikely to be of the scale and nature to create any longer term transformative economic effects for the region”. Therefore, as suggested by one respondent,

this was enough evidence to close the debate, as “it is not a viable nor acceptable prospect to have fracking in Wales”.

9.4 However, the UKOOG response stated this is not a reason not to support development, especially as the position has been arrived at before the exploration process is allowed to proceed. The UKOOG’s position was that the continued development of onshore oil and gas in the UK offers great economic benefits to the country and to businesses of all shapes and sizes. In addition, their response discussed the Welsh report that “concludes that the development of its recoverable coal bed methane resources (around 15bcm) and evidence submitted to the Welsh government arrived at an estimated shale gas reserve of 29 bcm². If these two reserves were to be extracted, they would meet the annual demand (at current levels of consumption) in Wales for over 12 years, or 50% of demand for over 25 years.”

9.5 However, Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited, combined response stated that ““Unconventional gas in Wales is unlikely to be of the scale and nature to create any longer term transformative economic effects for the region,” cannot be accurately determined until the industry has actually progressed and begins to deliver such benefits”. The organisations stressed the direct and many indirect economic effects. This was supported by Valero Energy Ltd, as their response stated that the evidence provided had taken a too-narrow view point that failed to look at the wider positive effects; especially considering Welsh reserves could play a part in the UK and EU market in unconventional gas, especially strong consideration was required to ensure energy security after the UK’s membership of the EU ends in 2019. The organisation discussed this would provide an “additional cushion against supply disruptions should gas supply be impacted by geopolitical instability”.

Impact on the Welsh economy

- 9.6 The majority of consultation responses discussed there were no significant economic benefits and therefore agreed with the evidence (2015 Cardiff University report as outlined in Section 5.70 of the Consultation Document - “Unconventional gas in Wales is unlikely to be of the scale and nature to create any longer term transformative economic effects for the region”).
- 9.7 Responses highlighted that many people (e.g. Lord Stern and ex-CEO of Cuadrilla Lord Browne) have discussed the economic case for shale gas and CBM has not been proven, especially as a domestic onshore gas industry would not result in lower energy prices for customers, as the gas would be exported to the highest bidder in the global market. Responses stated that INEOS have already said they would use the gas for their petrochemical industry. Petroleum extraction therefore would not bring energy independence or benefits for individuals within Wales. However, the UKOOG response reported that there is a need for indigenous energy development of all kinds (e.g. oil, gas, nuclear and renewables) to negate the high import dependency.

Impact on other Welsh industries

- 9.8 There will be limited long-term economic benefits of petroleum extraction, due to the impact on other Welsh industries as discussed by respondents to the consultation. Several responses stated that “shale gas may transform a pristine and quiet natural region, bringing increased industrialization. As a result, rural businesses that rely on clean air, land, water and/or a tranquil environment may suffer losses from this change, such as agriculture, tourism, organic farming, hunting, fishing and outdoor recreation.”, which was within a draft Government report on fracking and the rural economy in 2015.
- 9.9 Therefore, responses were concerned about the impact of hydraulic fracturing and CBM industries on the rural economy, due to the increased industrialisation on a natural region and have a wider impact on the communities in Wales. As one response stated, “the

essentially short-term and effectively exported economic benefits of unconventional extraction would not contribute to the achievement of Wales' well-being objectives and the costs in terms of pollution, risk to health and ecosystem disturbance would be imposed on local communities." Responses therefore raised concerns about the impact on the long-term wellbeing and health of individuals within Wales.

Welsh jobs

- 9.10 Responses to Question 6 of the consultation explored the limited economic impact from employment in the petroleum extraction industry. Respondents raised concerns about the type and longevity of employment that would be created from this industry, perceiving it to be short term and unsafe employment, especially as high skilled employees will be brought into local areas. It was therefore not providing long-term meaningful employment for Wales. Some respondents suggested that the rate of employment would be higher for renewable energy sector jobs.

Environmental impact

- 9.11 Consultation respondents explored the need to consider the economic costs and impact on the environment of petroleum extraction in Wales and to therefore apply financial weights to the environmental long-term impacts, especially on other key industries in Wales, such as tourism and farming. Respondents pointed out the impact of unconventional extraction that was already seen on rural businesses in Yorkshire and Lancashire that rely on a clean, quiet environment.
- 9.12 Respondents explored the potential destruction of natural habitat and resources that are irreplaceable, such as ancient trees and woodlands. One respondent stated, "as Wales greatest strength resides in its pristine environment, its government's first obligation should be to protect it". Responses therefore made the case that any short-term economic benefits were not worth the potential long-term impacts to the ecology, environment, groundwater and waterways of

Wales. One response discussed the industry will accelerate the contribution towards global warming.

Investment in renewables

- 9.13 Respondents stated the petroleum extraction industry does not offer the sustainable long-term benefits that renewable energy technologies will provide Wales. The majority view was that investment and support should be provided to these industries, rather than petroleum extraction, as safer ways to produce clean energy that would minimise the damage to the planet. There were positive benefits of jobs and skills within renewable technologies as these included more skilled, cleaner and long-term jobs for the people of Wales.
- 9.14 One response stated that the global market was moving investment away from fossil fuels into renewable technology, so Wales should align with this global trend. Especially to provide support and subsidies for renewable energy generation to ensure it is a viable alternative to fossil fuels.

Local communities

- 9.15 The economic impact on local communities in Wales was raised as a concern by respondents to the consultation in relation to Question 6. Respondents discussed that the financial benefits of the industry were not realised within the local communities in Wales. However, the negative detrimental environmental impact would accrue to the areas where people live. Responses explored this will impact on house prices and insurance costs for people living within the areas where petroleum extraction is carried out. However, the UKOOG response noted the community benefits package of onshore oil and gas development in Wales, as part of the UKOOG community engagement charter. That would provide £100,000 to local communities for each hydraulically fractured exploration well site, and the potential for 1 per cent of revenue to be paid to communities, if hydrocarbons are discovered and produced. In addition, the response

stated that Cuadrilla resources have injected £10 million in the local supply chain and released community benefit packages under the UKOOG charter.

Other

9.16 Other economic impacts were discussed by respondents, these included:

- economic cost of local police forces required to support and protect sites
- the risk of a major accident and the financial implications could negate any financial benefits
- Wales needs to develop energy infrastructure which is decentralised.

10. Wider Evidence for Consideration

10.1 Respondents were asked to provide any additional evidence to support their views of the Consultation. A large number of responses have provided further evidence. The evidence provided is outlined below, for further consideration by Welsh Government.

Question 1

- Environment (Wales) Act 2016 and Natural Resources Policy
- <http://www.lse.ac.uk/GranthamInstitute/news/clean-growth-strategy-miss-carbon-budgets/http://www.ucl.ac.uk/news/news-articles/0115/070115-fossil-fuels>
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- <https://www.bbc.co.uk/news/science-environment-45629395>
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<https://www.nature.com/articles/s41561-018-0073-0>
- The National Assembly for Wales Research paper; Unconventional Gas: Shale gas and coal bed methane March 2015 <http://www.assembly.wales/Research%20Documents/15-013%20-%20Gas/15-013.pdf>
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<http://priceofoil.org/2016/09/22/the-skys-limit-report>
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- <https://friendsoftheearth.uk/sites/default/files/downloads/no-need-step-gas-76983.pdf>

Question 2

- <https://www.keele.ac.uk/media/keeleuniversity/facnatsci/schggg/news/2018/Fracking%20and%20Mining-%20Styles%202018.pdf>
- <https://beta.gov.wales/sites/default/files/consultations/2018-06/180703-socio-economic-impact-of-unconventional-gas-in-wales-cardiff-business-school.pdf>
- https://www.epa.gov/sites/production/files/2016-12/documents/hfdwa_executive_summary.pdf
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- https://uk-air.defra.gov.uk/library/reports.php?report_id=967
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Question 3

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- <https://www.jhsph.edu/news/news-releases/2016/study-fracking-industry-wells-associated-with-increased-risk-of-asthma-attacks.html>
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- <https://www.frackfreeunited.co.uk/fracking-impacts-what-you-need-to-know/health-impacts/>
- https://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5393361/>
- <https://www.youtube.com/watch?v=9KsWBeGtntA>
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- "The Real Cost of Fracking," Michelle Bamberger 2014 [Book]

Question 4

- <https://www.theguardian.com/environment/2018/feb/21/climate-change-will-push-european-cities-towards-breaking-point>
- <https://www.sciencedirect.com/science/article/pii/S0160412016300277>
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Question 5

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- <http://www.refine.org.uk/media/sites/researchwebsites/1refine/papers/Davies%20et%20al.,%20Well%20integrity,%202014.pdf>
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Question 6

- <https://beta.gov.wales/sites/default/files/consultations/2018-06/180703-final-report-socio-economic-impact-of-unconventional-gas-in-wales.pdf>, pp.86-87
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Question 7

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Annex A. Friends of the Earth Cymru Campaign Response

It's great to see that the Welsh government is committed to stopping fracking in Wales.

I completely agree with the draft policy set out in the consultation, 'Petroleum Extraction in Wales' (July 2018).

In my opinion there should be no new petroleum licensing in Wales, and applications for hydraulic fracturing petroleum license consents should not be supported.

I also agree that the Welsh government should NOT support 'new petroleum licenses in Wales or applications for hydraulic fracturing petroleum licence consents'. Additionally, Coal Bed Methane and Underground Coal Gasification being subject to the same rules and restrictions as hydraulic fracturing in Wales with the same commitment not to grant any licenses for these two technologies.

If Wales is to meet climate change targets, the long-term aims should be to remove fossil fuels from our energy mix while minimising economic impact, provide clarity for investors and encourage them to invest in lower carbon alternatives.

Fracking does not have a place in Wales, which is why I support the above draft policy in the consultation, 'Petroleum Licences in Wales'.

Thank you for giving us the opportunity to share our views on this consultation.

Annex B. List of Organisations Responses

Listed below is a complete set of organisations or membership groups that have responded to the Petroleum Extraction Policy in Wales consultation that have consented to not be anonymous.

- Barry Town Council
- [Member of] Abergavenny & Crickhowell Friends of the Earth
- Caerphilly County Borough Council
- Cardiff University, School of Psychology
- Chair, Etholaeth Mynwy Plaid Cymru Monmouth Constituency
- Climate reality Project
- Coastal Oil and Gas Limited, UK Methane Limited and Adamo Energy (UK) Limited
- Coed Cadw – the Woodland Trust
- Energy Safety Research Institute at Swansea University
- Frack Free Ryedale
- Frack Free Ryedale and Scarborough
- Frack Free United
- Frack Free Wales
- Frack Free Warsop
- Frack Off Rossendale
- Frackfreewrexham
- Glyndwr University, Wrexham
- Hillary Rodham Clinton School of Law, Swansea University
- Keep Kirdford and Wisborough Green, KKWG
- Lisvane Community Council
- Llanharan Against Fracking
- Locum GP for Dyfi Valley Health
- Machynlleth Town Councillor
- National Park Wales - Pembrokeshire Coast National Park Authority
- Natural Resources Wales
- Pocklington and district anti-fracking group

- South Somerset Green Party
- UKOOG
- UK Youth Climate Coalition
- Unzmanston Boulston and Slebech Community Council
- Valero Energy Ltd