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Talking "Fracking": A Consultation on Unconventional Oil and Gas

Analysis of Responses

October 2017



BUSINESS AND ENERGY



Talking 'Fracking': A consultation on unconventional oil and gas. Analysis of responses

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Glossary of technical terms

The following terms were used in the consultation paper and are also used in this report.

Coal bed methane	An unconventional source of gas because the gas is absorbed in the coal rather than being held in pore spaces.
Conventional oil and gas	Oil and gas that is recovered by drilling a well in porous rock, with the oil or gas flowing out under its own pressure.
Fracking	The common name for hydraulic fracturing – a drilling technique used to exact oil and gas contained in shale rock.
Fugitive emission	The escape of gasses or vapours from industrial equipment due to leaks or other unintended causes, during industrial activities.
Greenhouse gas	Any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere.
Hydraulic fracturing	A drilling technique, commonly referred to as ‘fracking’, which involves fracturing rock to release the oil and gas contained in the rocks.
Liquefied natural gas (LNG)	Gas, chiefly methane, liquefied for transportation.
Moratorium	A temporary prohibition of an activity.
Natural gas	A source of energy, typically composed of a mixture of hydrocarbons such as methane, hydrogen, carbon monoxide, carbon dioxide and nitrogen.
Seismic activity	Vibration of the ground or earthquakes due to natural or man-made causes.
Shale gas	A form of natural gas trapped within shale rock.
Shale rock	An impermeable rock from which natural oil and gas can be extracted.
Unconventional oil and gas	Oil and gas deposits contained in impermeable rocks, such as shale or coal. In such cases, the oil or gas cannot easily flow through the reservoir. Therefore to extract the oil and gas from the rock, techniques such as hydraulic fracturing must be used.
Well	A hole drilled into the earth by a drilling rig to explore for, or extract oil and / or natural gas.

Abbreviations

The following abbreviations are used in this report.

GDP	Gross Domestic Product
HSE	Health and Safety Executive
SEPA	Scottish Environmental Protection Agency
SNH	Scottish Natural Heritage

Note about terminology used in the analysis

The following terms are used in this report specifically in relation to the responses received in the consultation and in relation to the analysis of those responses.

Campaign response	A response submitted through a co-ordinated campaign, often using standard text provided by the campaign organiser. Campaign responses are of two types – standard and non-standard (see below for definitions).
Standard campaign response	A response to the consultation in which the respondent simply added their name to the standard text provided by a campaign organiser without making any changes to it.
Non-standard campaign response	A response to the consultation in which the respondent edited the standard text provided by a campaign organiser or added their own comments to it before submitting it (usually via the campaign organiser’s website).
Substantive response	A response drafted by a respondent using their own words (and not submitted through a co-ordinated campaign), or a non-standard campaign response. The use of the term ‘substantive’ here is not intended to imply that such responses were lengthier or more substantial than, for example, standard campaign responses – simply that the responses were original or, in the case of non-standard campaign responses, were personalised.
Petition	A response to the consultation comprising an introductory statement (the petition statement) followed by a list of signatories and their contact details.
Predominant views	The views expressed most frequently and by the widest range of respondents. (See Chapter 3 for further details.)
Alternative views	The views expressed by a small number of respondents within limited subgroups. (See Chapter 3 for further details.)

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Executive Summary

1. There are potentially significant reserves of shale gas and oil and coal bed methane in Scotland, particularly in the central belt. However, accessing these resources would require the use of technologies such as hydraulic fracturing (commonly referred to as 'fracking') and dewatering. Questions and concerns have been voiced by some about the possible environmental, health, social and economic implications of developing an unconventional oil and gas industry, and about whether the development of such an industry would be compatible with Scotland's ambitious climate change targets. However, others have pointed to the potential benefits of unconventional oil and gas – for the Scottish economy (and therefore for investment in a wide range of environmental and social benefits) and for energy security.

2. To date, the Scottish Government has taken what it describes as 'a cautious and evidence-led approach' to exploring the opportunities, benefits, risks and challenges as it considers the future of a possible unconventional oil and gas industry in Scotland. This approach has involved a moratorium on unconventional oil and gas development in Scotland since January 2015, the establishment of an Independent Expert Scientific Panel to examine the issue, and the commissioning of a number of research studies to investigate the evidence on potential impacts.

3. As part of the process of encouraging discussion and public participation in decision making, the Government also undertook a public consultation, *Talking 'Fracking': A Consultation on Unconventional Oil and Gas*, which ran from 31 January to 31 May 2017. The consultation paper presented a summary of findings from the commissioned studies, and contained ten open questions inviting views about the potential social, economic and environmental impacts of unconventional oil and gas.

About the consultation responses

4. The consultation received **60,535 responses** which were included in the analysis. These comprised:

- 21,077 standard campaign responses (35%) – i.e. responses based on a standard text provided by the campaign organiser
- 31,033 petition signatories (51%) – comprising an initial petition statement, followed by a list of signatories
- 8,425 substantive responses (14%) – i.e. responses drafted by respondents using their own words, or non-standard campaign responses (standard campaign responses which have been edited or personalised through the addition of extra text).

Respondent types (substantive responses only)

5. Substantive responses were submitted by 8,239 individuals and 186 organisations / groups. Among the latter, one-third were from community councils and other community groups. Organisational responses were also received from third sector or non-governmental organisations; private sector / industry bodies; public sector organisations; a range of professional bodies, membership organisations and trade unions; faith groups; and academic or research organisations. Among the respondents who submitted substantive responses **and** who provided postal addresses, 88% were from Scotland. In addition, of the respondents

with Scottish addresses who provided a postcode, two-thirds (66%) lived in areas identified as potentially having significant reserves of shale oil / gas or coal bed methane.

Overview of responses

6. As noted above, 86% of the responses to this consultation took the form of standard campaign responses or petitions. In all of these, the respondents explicitly called for fracking to be permanently banned in Scotland.

7. The remaining 14% (8,425) of responses were substantive responses. Within this group, with few exceptions, respondents made their views clear about fracking and / or the development of an unconventional oil and gas industry in Scotland, and the overwhelming majority expressed views that were opposed.

8. Among organisations, there was near unanimous opposition to fracking among community councils and other community groups, third sector and non-governmental organisations, faith groups, political parties and other activist groups. In addition, a majority of private sector organisations (including all those in the food and drink sector), some public sector organisations (including some local authorities), and a majority of academic / research organisations expressed strong reservations or serious concerns about the development of an unconventional oil and gas industry in Scotland, even if they did not call for an outright ban on fracking.

9. Fewer than 5% of those who submitted substantive responses (and fewer than 1% of respondents overall) expressed a different view on this issue. In the main, these other views came from:

- Organisational respondents in specific sectors – mainly the oil and gas and petrochemical industries, and related professional, membership or trade organisations – and a small number of individual respondents, all of whom were largely supportive of the development of an unconventional oil and gas industry in Scotland
- Organisational respondents from public sector organisations and regulatory bodies, who either did not express a view, or thought that it was not possible to come to a view based on the available evidence. This latter group also included a small number of individual respondents.

Views opposed to fracking and / or an unconventional oil and gas industry

10. As has been set out above, the overwhelming majority of respondents were opposed to fracking or the development of an unconventional oil and gas industry in Scotland. Across all consultation questions, these respondents:

- Repeatedly emphasised the potential for significant and long-lasting negative impacts on communities, health, environment and climate
- Expressed scepticism about the ability of regulation to mitigate negative impacts
- Were unconvinced about the value of any economic benefit and the contribution of unconventional oil and gas to Scotland's energy mix, believing that any benefits would be relatively short-lived and far outweighed by the risks presented by the industry.

Views in favour of the development of an unconventional oil and gas industry

11. As noted above (paragraph 9), a small number of respondents expressed positive views about the development of an unconventional oil and gas industry in Scotland. Across all consultation questions, these respondents:

- Emphasised the benefits for the economy, for communities, for the climate, and for Scotland's energy supply
- Thought that the positive impacts outweighed the risks and that, in any case, the risks associated with unconventional oil and gas extraction were no greater than the risks associated with any other industry
- Argued that the development of a strong and robust regulatory framework could mitigate any adverse impacts.

Views neither for nor against unconventional oil and gas

12. Among the small number of respondents who did not express a specific view either for or against the development of an unconventional oil and gas industry, there were three groups: (i) some thought that it was not possible to make an informed decision on whether to develop an unconventional oil and gas industry given the gaps in the current evidence base; (ii) others discussed both the positive and negative impacts of the industry without making clear what their own view was; and (iii) a third group did not state a view, but instead discussed the implications for the remit of their own organisation if an unconventional oil and gas industry were developed.

Views on the overall benefits and risks of unconventional oil and gas

13. In terms of the overall benefits of an unconventional oil and gas industry in Scotland, the predominant view, held by the vast majority of respondents, was that there would be no benefit or no NET benefit to the people of Scotland. The alternative view, expressed by a small number of respondents, was that there would be benefits; those identified most often related to the economy and more specifically to increased employment with consequential benefits in terms of wealth, prosperity and investment.

14. In terms of the overall risks or challenges, the predominant view was that the development of an unconventional oil and gas industry in Scotland would carry substantial risks – to health and wellbeing, to communities, to the environment, and to the economy. These risks were generally seen to be long-term and irreversible, and in most cases respondents did not think that any type of regulatory framework would be able to adequately manage the risks or prevent accidents and incidents. This group also highlighted the possible risk of a loss of faith in government and the political process if a decision was taken to establish an unconventional oil and gas industry in Scotland.

15. The alternative view, expressed by a small number of respondents was that all industrial activities have risks – particularly if they are located in areas of high population density. However, the risks of an unconventional oil and gas industry were seen to be minimal and manageable, and Scotland's regulatory regime was considered to be well equipped to deal with these. Respondents with these views thought that Scotland should not miss the opportunity presented by the industry. However, they thought that addressing perceived misinformation and building public confidence in the industry would be major challenges.

1. Introduction and background

Policy context

1.1 Unconventional oil and gas extraction is a complex and contentious issue. There are potentially significant reserves of shale gas and oil and coal bed methane in Scotland, particularly in the central belt. However, accessing these resources would require the use of technologies such as hydraulic fracturing (commonly referred to as ‘fracking’) and dewatering. Questions and concerns have been voiced by some people about the possible environmental, health and economic implications of developing an unconventional oil and gas industry, and about whether the development of such an industry would be compatible with Scotland’s ambitious climate change targets. However, others have pointed to the potential benefits of unconventional oil and gas – for the Scottish economy and for energy security.

1.2 To date, the Scottish Government has taken what it describes as ‘a cautious and evidence-led approach’ to exploring the opportunities, benefits, risks and challenges as it considers the future of an unconventional oil and gas industry in Scotland.¹ This approach has involved a moratorium on unconventional oil and gas development in Scotland since January 2015, the establishment of an Independent Expert Scientific Panel to examine the issue, and the commissioning of a number of research studies to investigate the evidence on potential impacts.

1.3 In relation to this topic, the Government has stated its commitment to evidence-led policy making, impartial information, open and informed dialogue, fair and balanced debate, transparency and encouraging wide participation. As part of the process of encouraging discussion and public participation in decision making, the Government undertook a public consultation, *Talking ‘Fracking’: A Consultation on Unconventional Oil and Gas*, to gather the views of the people of Scotland on this topic. The consultation ran for a four-month period from 31 January to 31 May 2017.

1.4 The Scottish Government aims to put recommendations to Parliament on the future of unconventional oil and gas in Scotland and to reach a final decision on the issue by the end of 2017. The findings from the consultation will form an important part of the evidence considered by the Government in reaching its view.

The Talking ‘Fracking’ consultation

1.5 The consultation paper provided a description of: (i) how unconventional oil and gas extraction is carried out; (ii) the current regulatory framework; and (iii) the anticipated uses for the products of an unconventional oil and gas industry in Scotland. The paper also presented and discussed the research commissioned by the Government to support decision making and included the Scottish Government’s own observations about the broader evidence base.

1.6 In line with its stated commitment to encouraging public participation in the debate on unconventional oil and gas, the Scottish Government took a number of steps to make information about the consultation widely available. This included setting up a dedicated website, *Talking Fracking*, to provide further information about unconventional oil and gas in an easily accessible format. The website included a link to the Scottish Government’s consultation hub where the consultation paper and online response form could be accessed.

¹ <http://www.gov.scot/Topics/Business-Industry/Energy/onshoreoilandgas>

1.7 A discussion pack was also created to help support group discussions in local communities and this was available for download from the *Talking Fracking* website. The discussion pack contained a set of slides presenting information about unconventional oil and gas and the findings from the independent research commissioned by the Scottish Government (including notes for the presenter); hand-outs providing additional information to support the discussion; and guidance on planning, managing and recording the discussions.

1.8 Finally, an easy-read version of the consultation paper was also made available.

1.9 The consultation itself contained ten open questions inviting views on a range of social, economic and environmental considerations. The questions were as follows:

- **Question 1:** What are your views on the potential social, community and health impacts of an unconventional oil and gas industry in Scotland?
- **Question 2:** What are your views on the community benefit schemes that could apply, were an unconventional oil and gas industry to be developed in Scotland?
- **Question 3:** What are your views on the potential impact of unconventional oil and gas industry on Scotland's economy and manufacturing sector?
- **Question 4:** What are your views on the potential role of unconventional oil and gas in Scotland's energy mix?
- **Question 5:** What are your views on the potential environmental impacts of an unconventional oil and gas industry in Scotland?
- **Question 6:** What are your views on the potential climate change impacts of unconventional oil and gas industry in Scotland?
- **Question 7:** What are your views on the regulatory framework that would apply to an unconventional oil and gas industry in Scotland?
- **Question 8:** Overall, and in light of the available evidence, what do you think would be the main benefits, if any, of an unconventional oil and gas industry in Scotland?
- **Question 9:** Overall, and in light of the available evidence, what do you think would be the main risks or challenges, if any, of an unconventional oil and gas industry in Scotland?
- **Question 10:** If you have any other comments on the issues discussed in this consultation, please provide them here.

1.10 There were no closed (tick-box) questions in the consultation.

1.11 The group discussion pack (described in paragraph 1.7 above) contained a shortened version of the consultation questionnaire, focusing on Questions 8, 9 and 10. Responses to this questionnaire could be submitted online, by email or by post.

About the analysis

1.12 As will be seen in Chapter 2, this consultation attracted a very large number of responses. It is important to bear in mind, however, that by their very nature, public consultations are not necessarily representative of the views of the wider population. Anyone can submit their views, and individuals (and organisations) who have a keen interest in a

topic – and the capacity to respond – are more likely to participate in a consultation than those who do not. This self-selection means that the views of consultation participants cannot be generalised to the wider population.

1.13 For this reason, the approach to consultation analysis tends to be qualitative in nature. Its main purpose is not to identify how **many** people held particular views, but rather to understand the full range of views expressed.

1.14 This particular consultation had only open questions – i.e. there were no tick-boxes – so the analysis of the responses is almost entirely qualitative. However, basic frequency analysis has been carried out to report the numbers and types of responses received, and to describe the characteristics of the people, organisations and groups who gave their views. These descriptive statistics are presented in Chapter 2 of this report. In addition, Chapter 3 gives an overview of the responses and includes information about the balance of opinion among respondents. This contextual information helps ensure that the main findings of the consultation (set out in Chapters 4–13) can be correctly interpreted and understood.

1.15 However, the main aim of the analysis was to identify and explore areas of agreement and disagreement between different groups of respondents, and to understand the reasons people gave for their views. Thus, in this report, the amount of space given to discussion of the various views expressed is not an indication of the prevalence of those views. At the same time, though, it will be made clear which views were predominant and which were less commonly held.

1.16 Respondents' views on particular issues were often closely interlinked with their views on other issues. For example, concerns about water supplies and land degradation were discussed as community impacts (Question 1) and environmental impacts (Question 5), and house prices, jobs and wages were discussed as community impacts (Question 1) and economic impacts (Question 3). In reporting the findings of the analysis, these linkages are acknowledged, but as much as possible the report attempts to avoid repetition by discussing respondents' views on particular issues only once.

1.17 Finally, it should be noted that many of the responses to this consultation (especially – but not limited to – submissions from organisations) contained a large amount of technical information and lists of references to other published and unpublished material. It is not possible in a report such as this to fully reflect the level of detail included in these responses.²

1.18 Furthermore, evidence which was cited on each side of the debate about the unconventional oil and gas industry was often contested by other respondents. Respondents frequently challenged the evidence brought forward to support views contrary to their own, or suggested that the evidence base was not adequate to support the conclusions drawn by those who disagreed with their position. It is not the role of this report to adjudicate on these differences; rather such comments have simply been noted where appropriate.

² Note however, that as part of the analysis, all references to other independently published research have been collected together separately and given to the Scottish Government.

2. About the respondents and responses

2.1 This chapter presents information about the respondents and types of responses received by the consultation. It also describes the way in which responses were received, and provides a brief description of the various campaigns which encouraged and helped to facilitate the submission of responses from their members / supporters.

How responses were received

2.2 Responses to this consultation were received in a wide range of formats.

Online submission

2.3 Respondents could submit an online response by completing the response form hosted on the Scottish Government's consultation hub. A link to the online form was also provided on the Scottish Government's dedicated *Talking Fracking* website.

Submission by email or post

2.4 Respondents could submit their responses directly to the Scottish Government's Onshore Oil and Gas Team at Victoria Quay by email or post.³

Submission through organised campaigns

2.5 A number of campaign groups co-ordinated responses among their members and supporters. These 'campaign responses' were based on a standard text provided by the campaign organiser and, in most cases, they were submitted to the Scottish Government through a form on the campaign organiser's website. Completion of the online form resulted in a respondent's comments being sent by email to the Scottish Government. Respondents could simply add their name and contact details to the standard response, and then send their message. Such responses are referred to in this report as '**standard campaign responses**'. Alternatively, respondents could edit the standard campaign response or add their own comments. These personalised responses, submitted via a campaign, are referred to in this report as '**non-standard campaign responses**'.

2.6 There were a few variations on this arrangement, with campaign organisers giving their supporters different options for submitting their responses. For example, three groups provided their supporters with pre-printed postcards or prepared letters. (For two of the groups, this was in addition to an online campaign as described above.) Respondents sent their signed postcards back to the campaign organisers (sometimes with additional comments added), and the campaign organisers presented them to the Minister for Business, Innovation and Energy. Prepared letters were signed and sent directly to the Scottish Government. One campaign organiser drafted a model response, with answers to each of the ten consultation questions, and supporters could simply copy this into the online response form on the Scottish Government's consultation hub. It was also possible to edit the model response before submitting it. Unlike other campaign organisers, one of the campaigns did not provide a standard campaign text to their members / supporters. Instead they provided brief background information and three prompt questions to assist people in drafting their own responses.

³ Note that one of the responses received by post included a model with instructions for assembly.

2.7 Table 2.1 below contains a list of campaign organisers; the way in which responses were submitted to the Scottish Government; and the consultation questions addressed by their standard campaign texts.⁴ While the standard campaign texts varied in their coverage of the specific issues and topics discussed in the consultation paper, all the campaigns also called for a ban on fracking in Scotland. Further details about each campaign, including copies of the standard campaign texts, are provided in Annex 1 of this report.

Table 2.1: Overview of campaigns

Campaign organiser	Submission method / format	Consultation questions addressed by standard campaign text
Avaaz	Via Avaaz website	Questions 1, 3, 6, 10
Broad Alliance	Model response sent via Scottish Government consultation hub or post	Questions 1–10
Broad Alliance	Postcards	Questions 1–10
Friends of the Earth Scotland	Via Friends of the Earth website	Questions 1, 3, 4, 5, 6, 9, 10
Friends of the Earth Scotland	Postcards	Question 9, 10
Greenpeace	Via Greenpeace website	Questions 1, 4, 5, 6, 10
Scottish Greens	Via Scottish Greens website	Questions 1, 6, 9, 10
South Lanarkshire Against Unconventional Gas (SLAUG)	Prepared sample letter, submitted by post	Questions 1, 3, 5, 6, 7, 9, 10

Petitions

2.8 This consultation also received five separate petitions. Petitions comprised an initial petition statement, followed by a list of signatories and their contact details. Some petition organisers also provided further background information for signatories. In all cases, petitions called for the Scottish Government to permanently ban fracking in Scotland. Petitions were submitted to the Scottish Government both in electronic and paper format. In some cases, petition signatories were also able to write brief comments alongside their signature.

2.9 Table 2.2 below contains a list of the petition organisers; details of how the petition was submitted; and the consultation questions addressed by the petition statement. Petitions which simply called for a ban on fracking have been analysed with comments submitted by other respondents in relation to Question 10. Further details about each of the petitions are given in Annex 2.

Table 2.2: Overview of petitions

Petition organiser	Submission method	Consultation questions addressed by petition statement
38 Degrees	Online petition (with option to include comments)	Question 10
Torrance resident, Ruth Dunster	Online petition through change.org (with option to include comments)	Questions 9 and 10
Children's petition (Friends of the Earth, West Fife)	Paper petition signed by children at Dunfermline Fresh Air Festival	Question 10
Our Forth	Paper petition	Questions 7 and 10
Scotland Against Fracking	Paper petition	Question 10

⁴ Note that standard campaign texts did not usually specify which consultation questions they were addressing. Decisions to interpret certain campaign statements as relating to particular consultation questions were taken by the analytical team during the analysis process.

Number of responses included in the analysis

2.10 Altogether, the consultation received 61,328 submissions. Following the removal of blank, invalid or duplicate responses, or multiple responses from a single individual, 60,535 responses remained (see Annex 3 for a detailed description of the data validation process). Thus, the analysis was based on these **60,535 responses**. (See Table 2.3.) These comprised:

- 8,425 substantive responses (14%) – responses drafted by respondents using their own words, and non-standard campaign responses
- 21,077 standard campaign responses (35%)
- 31,033 petition signatories (including 8,375 comments) (51%)

Table 2.3: Number of responses included in the analysis

Submission route	Response type	Standard campaign responses and other identical responses	Substantive responses (including non-standard campaign responses)	Total responses (n)
Campaign responses				
	Avaaz	100	458	558
	Broad Alliance (postcards)	946	366	1,312
	Friends of the Earth Scotland (online)	15,088	1,178	16,266
	Friends of the Earth Scotland (postcards)	4,574	8	4,582
	Greenpeace	251	2,555	2,806
	Scottish Greens	–	836	836
	South Lanarkshire Against Unconventional Gas (SLAUG)	118	1	119
	Multiple campaigns (combined multiple different responses)*	–	195	195
	Sub-total, campaign responses	21,077	5,597	26,674
	% of total 60,535	35%	9%	44%
Petition signatories				
	38 Degrees (includes 7,303 comments)	21,326	–	21,326
	Change.org (R Dunster) (includes 1,072 comments)	5,174	–	5,174
	Children's petition	43	–	43
	Our Forth	185	–	185
	Scotland Against Fracking	4,305	–	4,305
	Sub-total, petition signatories	31,033	–	31,033
	% of total 60,535	51%	0%	51%
Received through other routes				
	Email / post	–	114	114
	Scottish Government consultation hub**	–	2,714	2,714
	Sub-total, received through other routes	–	2,828	2,828
	% of total 60,535	0%	5%	5%
	Total responses	52,110	8,425	60,535
	% of total 60,535	86%	14%	100%

* 195 respondents submitted two or more non-standard responses through different campaigns. These responses have been combined to form 195 amalgamated responses as described in Annex 3.

** Includes 52 Broad Alliance campaign responses and 14 discussion group responses.

2.11 Throughout the remainder of this report, the term ‘responses’ will be used to refer to all the responses included in the analysis. However, the following section of this chapter provides a more detailed description of the 8,425 respondents who submitted substantive responses.

About the respondents (substantive responses only)

Types of respondent

2.12 Substantive responses were submitted by 8,239 individuals and 186 organisations or groups. (See Table 2.4.)

Table 2.4: Types of respondent (substantive responses only)

Type of respondent	Number of respondents	% of total (base=8,425)
Individuals	8,239	98%
Organisations or groups*	186	2%
Total	8,425	100%

* This includes 14 discussion groups who submitted their views using the discussion group response form provided on the *Talking Fracking* website.

2.13 The largest groups of organisational respondents were community councils and other community groups. Together, these comprised one third (33%) of all the organisational respondents. Other organisational responses were from third sector or non-governmental organisations; private sector / industry bodies; public sector organisations; a range of professional bodies, membership organisations and trade unions; faith groups; and academic or research organisations. (See Table 2.5 below.) A complete list of organisational respondents is provided in Annex 4.⁵

Table 2.5: Organisation / group types (substantive responses only)

Organisation / group type	Number of respondents	% of total (base=186)
Community councils*	39	21%
Other community groups	24	13%
Third sector / non-governmental organisations**	33	18%
Private sector / industry	22	12%
Public bodies / public sector organisations	16	9%
Professional bodies / membership organisations / trade unions	13	7%
Faith groups	10	5%
Academic / research organisations	7	4%
Other organisational or group respondents***	22	12%
Total	186	100%

* Includes 13 community councils who submitted discussion group responses.

** Includes one third sector organisation who submitted a discussion group response.

*** Other organisational or group respondents included political parties (or local branches of political parties), activist groups, and Facebook groups.

⁵ A small number of standard campaign responses (mainly those submitted through the Friends of the Earth and Greenpeace campaigns) were from organisational respondents. These organisations are not included in the figures shown in Table 2.5, nor are they listed in Annex 4 of this report.

Geographic location of respondents

2.14 Not all respondents provided a postal address (some gave only an email address), and so it was not possible to identify the country of residence for everyone. However, among those respondents (both individuals and organisations) who gave a postal address, 88% were from Scotland, 11% were from other parts of the UK, and 1% were from the rest of the world. (See Table 2.6.)

Table 2.6: Respondent country of origin (substantive responses only)

Country	Number of respondents*	% of total (base=7,509)
Scotland	6,629	88%
Rest of the UK (England, Wales, Northern Ireland, Channel Islands)	814	11%
Rest of the world	66	1%
Total	7,509	100%

* These figures refer to the number of respondents (both individuals and organisations) who provided sufficient address information to enable a country of origin to be identified.

2.15 Among respondents living (or based) in Scotland, not everyone provided a postcode. However, among those who did, two-thirds (66%) lived in one of 13 local authority areas identified as potentially having significant shale oil and gas reserves or coal bed methane. These local authorities are: City of Edinburgh; Clackmannanshire, Dumfries and Galloway, East Dunbartonshire, East Lothian, Falkirk, Fife, Glasgow, Midlothian, North Lanarkshire, South Lanarkshire, Stirling and West Lothian.⁶ (See Table 2.7 below.)

Responses to individual questions

2.16 As noted in paragraph 2.10 above, there were 60,533 responses to the consultation. However, not all respondents answered all the consultation questions. At the same time, not all of the comments made at each question were necessarily directly relevant to the question being posed – some related to other consultation questions, or to other issues not covered by any of the questions in the consultation document. For example, the 14 discussion group responses addressed only Questions 8, 9 and 10. However, much of the material included in these responses was relevant to Questions 1–7 and is included in the analysis of those questions.

2.17 Details of the number of respondents who made comments at each question are shown in Annex 5. This analysis shows that Questions 2, 7 and 8 were addressed by a considerably smaller number of respondents than other questions. However, given the point above, the figures shown in Table A5.1 should be considered as indicative only and should not be seen as ‘response rates’ for the questions.

⁶ This list is derived from a map of shale and coal bed methane deposits in Scotland, reproduced in the consultation paper. Note that, based on mid-year population estimates for 2016, 57% of the Scottish population live in these 13 local authority areas. See: <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2016>.

Table 2.7: Respondents from Scotland living in local authorities with potentially significant shale oil and gas reserves or coal bed methane (substantive responses only)

Local authority	Number of respondents*	% (base=6,604)
City of Edinburgh	1,064	16%
Clackmannanshire	88	1%
Dumfries and Galloway	191	3%
East Dunbartonshire	164	2%
East Lothian	214	3%
Falkirk	393	6%
Fife	438	7%
Glasgow	805	12%
Midlothian	94	1%
North Lanarkshire	233	4%
South Lanarkshire	257	4%
Stirling	200	3%
West Lothian	202	3%
Total respondents living in local authorities with potentially significant shale oil and gas / CBM reserves	4,343	66%
Respondents from Scotland who do not live in local authorities with significant shale oil and gas / CMB reserves	2,261	34%
Total respondents*	6,604	100%

Percentages do not total 100% due to rounding.

* These figures refer to the number of respondents living (or based) in Scotland who provided a postcode with their contact details.

A note about terminology

Note that this consultation sought views on unconventional oil and gas, including technologies such as hydraulic fracturing – commonly referred to as ‘fracking’ (see Glossary) – and dewatering in relation to the extraction of coal bed methane. However, respondents generally only used the term ‘fracking’ in their responses, and it was not possible to determine whether they were using it to describe all types of unconventional oil and gas operations, or to describe hydraulic fracturing specifically. Throughout this report, the term ‘fracking’ will be used interchangeably with the term ‘hydraulic fracturing’.

3. Overview of responses

3.1 Chapter 2 provided a description of the respondents and types of responses received in the consultation. This chapter provides a high-level overview of the content of responses, before going on, in Chapters 4 to 13, to consider the detailed comments that respondents made in relation to each of the consultation questions.

3.2 As discussed in Chapter 1, the analysis in Chapters 4 to 13 is primarily qualitative in nature – focusing on the issues respondents raised and the reasons they gave for holding particular views. This chapter provides a broader context for understanding respondents' views and discusses the overall balance of opinion among respondents in relation to the development of an unconventional oil and gas industry. However, it is important to reiterate that, as with all consultations, regardless of the balance of opinion, it cannot be assumed that the views expressed in this consultation are representative of those of the general population.

Views on fracking and an unconventional oil and gas industry

3.3 As seen in Chapter 2 (paragraph 2.10), out of the 60,000+ responses received in this consultation, 86% took the form of standard campaign responses or petitions. In all of these, the respondents explicitly called for fracking to be permanently banned in Scotland.

3.4 The remaining 14% (n=8,425) of responses to the consultation were substantive responses. Within this group, with few exceptions, respondents made their views clear about fracking and / or the development of an unconventional oil and gas industry in Scotland, and the overwhelming majority expressed views that were clearly opposed.

3.5 Among organisations, there was near unanimous opposition to fracking among community councils and other community groups, third sector and non-governmental organisations, faith groups, political parties and other activist groups. In addition, a majority of private sector organisations (including all those in the food and drink sector), some public sector organisations (including some local authorities), and a majority of academic / research organisations expressed strong reservations or serious concerns about the development of an unconventional oil and gas industry in Scotland, even if they did not always call for an outright ban on fracking.

3.6 Fewer than 5% of those who submitted substantive responses (and fewer than 1% of respondents overall) expressed a different view on this issue. In the main, these other views came from:

- Organisational respondents in specific sectors – mainly the oil and gas and petrochemical industries, and related professional, membership or trade organisations – and a small number of individual respondents, all of whom were largely supportive of the development of an unconventional oil and gas industry in Scotland. (Note, however, that most professional, membership or trade organisations did **not** express views in support of unconventional oil and gas.)
- Organisational respondents from public sector organisations and regulatory bodies, who either did not express a view, or thought that it was not possible to come to a view based on the available evidence. This group also included a small number of individual respondents.

Views opposed to fracking and / or an unconventional oil and gas industry

3.7 Respondents who were opposed to unconventional oil and gas extraction in Scotland:

- Repeatedly emphasised the potential for significant and long-lasting negative impacts on communities, health, environment and climate
- Expressed scepticism about the ability of regulation to mitigate negative impacts
- Were unconvinced about the value of any economic benefit and the contribution of unconventional oil and gas to Scotland's energy mix, believing that any benefits would be relatively short-lived and far outweighed by the risks.

3.8 Throughout this report, such views are referred to as **predominant views** as they were the views of the overwhelming majority of both individual and organisational respondents.

Views in favour of the development of an unconventional oil and gas industry

3.9 Respondents who expressed positive views about the development of an unconventional oil and gas industry in Scotland generally:

- Emphasised the benefits for the economy, for communities, for the climate, and for Scotland's energy supply
- Thought that the positive impacts outweighed the risks and that, in any case, the risks associated with unconventional oil and gas extraction were no greater than the risks associated with any other industry
- Argued that the development of a strong and robust regulatory framework could mitigate any adverse impacts.

3.10 Such views were much less common and are referred to throughout this report as **alternative** views.

Views neither for nor against unconventional oil and gas

3.11 Among the respondents who did not express a specific view either for or against the development of an unconventional oil and gas industry, there were three groups: (i) some thought that it was not possible to make an informed decision on whether to develop an unconventional oil and gas industry given the gaps in the current evidence base; (ii) others discussed both the positive and negative impacts of the industry without making clear what their own view was; and (iii) a third group did not state a view, but instead discussed the implications for the remit of their own organisation if an unconventional oil and gas industry were developed.

3.12 Such views are also referred to in this report as **alternative** views as they were expressed by a relatively small number of respondents.

Pattern of views across consultation questions

3.13 In the chapters that follow, the patterns of response and views described above were similar across all questions. Any exceptions to this patterning are highlighted.

4. Social, community and health impacts (Q1)

4.1 This chapter discusses the views of respondents on the potential social, community and health impacts of an unconventional oil and gas industry in Scotland.

4.2 The first section of Part 2 of the consultation paper considered evidence related to ‘community considerations’ – that is, how the development of an unconventional oil and gas industry might affect communities in Scotland. This section acknowledged that the location of shale gas and oil deposits in Scotland in the highly populated central belt meant that, if oil and gas extraction did take place, it would be in close proximity to existing communities. It also acknowledged public concerns about the impact of hydraulic fracturing (fracking)⁷, and stated the Scottish Government’s commitment to listening to the views of communities and involving people in decisions on this issue. The Scottish Government commissioned two research studies focused on specific types of community impact – these comprised a peer-reviewed health impact assessment carried out by Health Protection Scotland⁸ and a study to explore the implications of an increased volume of traffic on roads surrounding drilling sites.⁹ The findings of these studies were summarised in the consultation paper.

4.3 Question 1 in the consultation asked respondents for their views on the potential social, community and health impacts of an unconventional oil and gas industry.¹⁰

Question 1: What are your views on the potential social, community and health impacts of an unconventional oil and gas industry in Scotland?

4.4 Altogether, 22,918 respondents commented on Question 1. This comprised 123 organisations, 14 discussion groups, 6,278 individuals and 16,503 standard campaign respondents.

Overview of responses to Question 1

The **predominant** view among respondents was that an unconventional oil and gas industry would have significant long-term negative impacts for communities and that any benefits (generally seen in terms of job-related or economic benefits) would be short-term, and far outweighed by the risks to health, quality of life, local amenity, and community resilience and cohesion.

The **alternative views** were that there would be no impacts, no negative impacts, or only positive impacts. Respondents identifying positive impacts for communities tended to emphasise the potential *economic* benefits that might accrue from an unconventional oil and gas industry which, in turn, would contribute to enhanced community prosperity and improvements in health and social outcomes. This group of respondents generally saw the risks of fracking as minimal, wholly manageable, or no different to those of other industries.

⁷ In this chapter and the remaining chapters of this report, the term ‘fracking’ is used interchangeably with the term ‘hydraulic fracturing’. In their responses, respondents almost always used the term ‘fracking’ instead of ‘hydraulic fracturing’.

⁸ Health Protection Scotland (2016) *A health impact assessment of unconventional oil and gas in Scotland*.

⁹ Ricardo Energy and Environment (2016) *Understanding and mitigating community level impacts from transportation*.

¹⁰ Note that there was no separate question on the transport implications an unconventional oil and gas industry but respondents often discussed issues of transport and traffic in their responses to Question 1.

4.5 Respondents discussed the social, community and health impacts of an unconventional oil and gas industry in Scotland in terms of: health and wellbeing; the local economy; traffic, noise and light; housing; quality of life and local amenity; and community resilience and cohesion. Each of these is looked at in turn below.

4.6 The following should be noted about the analysis presented in this chapter:

- An important point for those concerned about community impacts was the fact that, in Scotland, any fracking would take place in the heavily populated central belt in close proximity to existing towns and villages. Respondents often also referred to the potential impact on their own community.
- A significant proportion of respondents provided short answers to Question 1, simply stating that the health, social and community impacts of fracking would be negative, but did not expand on the reasons for their views or provide details of the types of impacts they envisaged.

Health and wellbeing

4.7 For many respondents, particularly individuals, community groups, community councils and third sector organisations, concerns about the impact on human (and animal) health were central to their opposition to the unconventional oil and gas industry. These concerns focused mainly on (i) contamination of drinking water supplies, and the water table; (ii) exposure to air-borne toxins, dust (including silica) or fumes associated with the chemicals used during hydraulic fracturing, and / or released as a by-product; and (iii) the risk of incidents and accidents associated with unconventional oil and gas at all stages of operations (construction, operation and waste disposal, and decommissioning) such as chemical spills, leaks, blowouts, well and equipment failure. (See also Chapter 8 for further discussion of these concerns from an environmental perspective.)

4.8 Respondents noted a wide range of specific health problems which they reported as having been linked to unconventional oil and gas operations in other parts of the world. These included: cancers; respiratory and cardio-vascular disease; impacts on reproductive health and foetal development; impacts on the nervous system; skin problems; nausea and vomiting; abdominal pain; headaches; dizziness; eye and throat irritation; and nose bleeds.

4.9 Respondents also noted concerns about mental health, wellbeing and wider public health issues. Common among these concerns were increased stress and anxiety caused by living near an industrial site, disturbed sleep patterns as a result of noise and light pollution, and the potential impact on the availability and use of outdoor spaces (for children's play, walking, dog walking, gardening, etc.). Given the perceived short-term nature of unconventional oil and gas projects, respondents also mentioned the risk of public health problems associated with the departure of major local employers.

4.10 Respondents often highlighted how the health of particularly vulnerable groups – children, infants and unborn babies, the elderly, and those with pre-existing health conditions such as asthma – might be affected. They also referred to those employed in the industry who would be exposed to health and safety risks in the course of their work.

4.11 Many of the health problems highlighted were linked to pollution (air, soil and water) and the wider environmental impact of fracking which is discussed further in Chapter 8.

4.12 A much less common view was that the health risks would be minimal or non-existent, or that any risks could be managed, and were no greater than the risks associated with other industries. Some also argued that the health risks had been exaggerated by those campaigning against fracking. Further, some respondents saw the unconventional oil and gas industry as potentially having positive health impacts. These respondents drew attention to the benefits associated with increased employment and prosperity at an individual and community level. They also highlighted what they perceived as the good health and safety record of the (offshore) oil and gas industry, with some highlighting the absence of health problems associated with offshore drilling or suggesting that work within an onshore oil industry would offer improved working conditions for employees.

Comments on the evidence on health impacts

4.13 Respondents referred to a range of evidence in support of their position on the health impacts of unconventional oil and gas extraction, with many drawing on the Health Protection Scotland health impact assessment report commissioned by the Scottish Government. However, the way respondents interpreted this evidence was very different. Some respondents referred to the fact that the report said the evidence in this area was currently 'inadequate', and saw this uncertainty as a reason not to proceed. Such respondents also often referred to other studies from around the world (e.g. United States, Canada and Australia), arguing that there was more than adequate evidence to support their case.¹¹

4.14 Other respondents, however, argued that the health impact assessment had found no conclusive evidence of negative health impacts, and that fracking was already being undertaken safely around the world. This group also queried the relevance of some of the arguments put forward to the Scottish context, noting, for example, that most of Scotland's drinking water came from surface water rather than groundwater and was thus less susceptible to contamination than was the case in some areas where fracking had taken place. As such, they thought that arguments against unconventional oil and gas were unfounded based on the evidence on health impacts.

Jobs and the local economy

4.15 Although respondents generally agreed that unconventional oil and gas would bring some benefits for the local economy in terms of job creation and local spending, the dominant view was that these benefits would be relatively limited in scope and not sustained in the longer term. There was significant concern about how communities might be affected by the 'boom and bust' nature of the industry – e.g. how communities would cope with the pressures of an incoming transient workforce and the problems created by the loss of a local industry when operations came to an end.

4.16 Occasionally, respondents said that the prospect of new jobs, the development of a skilled workforce, and increased spending could be a stimulus for economic growth and diversification, and a catalyst for longer term community regeneration and revitalisation at a local level.

4.17 Wider views on the impact on the Scottish economy are covered in Chapter 6.

¹¹ Some respondents made reference to a specific US publication: *Concerned Health Professionals of New York, (updated 2016) Compendium of Scientific, Medical and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction)*. See <http://concernedhealthny.org/compendium/>.

Traffic, noise and light pollution

4.18 There was a general consensus among respondents that unconventional oil and gas operations would bring increased traffic – HGV traffic in particular – to local areas, as well as additional noise and light pollution. The predominant view was that each of these would have a significant negative impact on communities close to drilling sites, particularly since (as some respondents thought) multiple wells were likely to be located in relatively small areas.

4.19 In relation to traffic, some respondents expressed concern about the potential for increased pollution, the risk of accidents, traffic congestion, implications for road safety ‘active travel’, and the inconvenience caused to local residents. The potential for damage to the road network was also noted, especially as the additional traffic would often be on minor roads in relatively quiet or rural areas. This group thought that the research commissioned by the Scottish Government on this topic had underestimated the potential traffic impacts. The alternative view, expressed much less often, was that the traffic impact would be largely short-term (i.e. mainly confined to the construction phase), and would be no worse than the traffic associated with other industrial projects. It was also suggested that transport and traffic issues could be dealt with as part of the planning process, via traffic routing requirements, and / or through the creation of new or upgraded roads.

4.20 Regarding noise and light pollution, those who raised these issues saw them as the inevitable by-products of industrial processes. These respondents argued that noise and excessive light, particularly at night, could potentially have significant impacts on the personal wellbeing of residents in nearby communities (e.g. in causing stress and leading to disturbed sleep patterns), or would otherwise adversely affect the quality of life of local residents; the potential impact on schooling was also noted by some. Respondents noted the 24-hour nature of unconventional oil and gas operations. By contrast, other respondents saw these as less serious issues. This latter group highlighted the likely short-term nature of such impacts, and also thought there was scope to minimise their impact on communities through landscaping, screening and scheduling restrictions.

Housing and property

4.21 Respondents identified a number of potential negative impacts on housing and property in areas close to wells and drilling sites. Respondents were mainly concerned that people’s homes would fall in value or become unsellable, or that fracking operations would cause damage to properties (businesses and public buildings as well as homes), and that there would be no compensation for this. Respondents thought that the risk of seismic activity would cause problems in securing mortgages and home insurance. Some also thought that incoming workers would lead to an increased demand for rented accommodation and increased rents which would risk pricing current local residents out of the market.

4.22 Respondents additionally raised issues about land and property rights (e.g. the ownership of mineral rights below ground, and the rights of companies to drill horizontally below properties) and called for clarity on this.

Quality of life and local amenity

4.23 Respondents often talked in general terms about the potential for negative impacts on quality of life and local amenity caused by: (i) the loss of green space and natural habitats, and the impact on plants and wildlife; (ii) the visual impact of drilling sites and associated

infrastructure; and (iii) smells associated with unconventional oil and gas processes. All of these were seen as possible damaging effects of the industry which would make communities less attractive places to live.

4.24 Others, however, argued that such impacts would be minimal and or less significant than those associated with other industries (for example, it was particularly argued that unconventional oil and gas operations would be less visually intrusive than wind farms), and that economic benefits had the potential to enhance the quality of life for those living near drilling sites.

Community resilience and cohesion

4.25 Respondents discussed a number of potential impacts which can all be seen as being related to community resilience and cohesion, as follows:

- **Character and nature of communities:** Respondents argued that unconventional oil and gas operations would be disruptive to everyday life, and change the way of life in affected communities. As previously discussed, concerns about the social impacts on communities of a transient workforce with no long-term commitment to the local area were highlighted in relation to this issue. Some also raised the possibility of an increase in crime and anti-social behaviour.
- **Demographic change:** There was concern that the population size and demography in areas near wells and drilling operations would be affected by better off people moving away, and fewer people choosing to move to these areas. This could, in turn, lead to a break up of social networks, a reduction in socio-economic diversity and an increased prevalence of public health problems. Respondents argued that the negative effects of the industry would ultimately end up being borne disproportionately by poorer people often in already disadvantaged areas. An alternative view was that the establishment of an industry could help support population retention in rural and disadvantaged areas.
- **Disagreement and conflict:** Respondents highlighted the risk of increasing conflict within communities between those who supported the development of an unconventional oil and gas industry and those who opposed it; and those benefiting from it and those who did not. Some expressed particular concern that the use of incentives (for landowners or other individuals) would divide and disempower communities.
- **Trust and legitimacy:** There was a view that imposing an industry with perceived serious health and environmental risks on communities without their consent represented a 'democratic deficit', and would result in a loss of trust between people and government and an increase in social dislocation and disengagement.

5. Community benefit schemes (Q2)

5.1 This chapter discusses the views of respondents on the types of community benefit schemes which could apply if an unconventional oil and gas industry were to be established in Scotland. Community benefit schemes are intended to help communities who host industrial activity to share in the economic benefits of those developments.

5.2 The consultation paper included information about different types of schemes which could be established, and gave examples of schemes already in operation in Scotland (for example, with regard to wind farms and landfill sites). It also discussed the charter for community benefits, published by UK Onshore Oil and Gas (UKOOG, the industry trade body), which voluntarily commits operators to giving communities certain one-off payments for each exploratory well site, as well as ongoing payments of (no less than) 1% of revenues during production. Finally, it was noted that the UK Government had publicly committed to putting 10% of all shale gas tax revenues into a Shale Wealth Fund, which would be invested in the North of England and other shale producing areas in England over the next 25 years.

5.3 The consultation paper sought views on such schemes, as follows:

Question 2: What are your views on the community benefit schemes that could apply, were an unconventional oil and gas industry to be developed in Scotland?

5.4 Altogether, 3,643 respondents addressed Question 2. This comprised 114 organisations, 10 discussion groups, 2,573 individuals and 946 standard campaign respondents.

Overview of responses to Question 2

The responses to this question did not mirror the pattern of responses to many of the other consultation questions – as described in Chapter 3.

There was a range of views offered with regard to community benefit schemes. Most commonly, respondents were opposed to such schemes in the context of unconventional oil and gas developments, seeing them as inappropriate given the perceived long-term negative impacts of the industry. In addition respondents were sceptical about how valuable such schemes would be to communities or how they would operate.

By contrast, and less often, some respondents expressed support for such schemes. This group believed it was right that communities in close proximity to drilling sites should be compensated for negative impacts and should benefit by sharing in the profits made by commercial companies. Respondents offering such views included those in support of developing an unconventional oil and gas industry in Scotland, but also those opposed to the industry who nevertheless thought that it was right that communities benefitted should an industry be allowed to go ahead.

5.5 Each of the sections below presents respondents' comments on community benefit schemes. These tended to focus either on broad opposition to, or support for, the principle of such schemes being linked to unconventional oil and gas projects. Respondents also

commented on the design and running of such schemes, and possible other mechanisms for ensuring that communities benefitted. A final section covers a range of additional points.¹²

Criticisms of and reservations about community benefit schemes

5.6 Those respondents who were critical of community benefit schemes in the context of the unconventional oil and gas industry thought that:

- Such schemes amount to ‘bribery’ or are ‘sweeteners’ intended to overcome local opposition and persuade people to accept unpopular projects into their communities. It was noted that people may be swayed by community benefit schemes without fully understanding the impacts of the proposed projects.
- Such schemes would be unnecessary if the unconventional oil and gas industry were, in fact, beneficial for communities. That such schemes were being considered was seen to be a tacit acknowledgement of the industry’s harmful effects.
- Such schemes would lead to community divisions with some individuals / communities supporting and benefiting from the schemes and others not.
- While it may be appropriate to ‘compensate’ local communities for the loss of amenity and inconvenience caused by unconventional oil and gas operations, community benefit schemes cannot mitigate or compensate for health impacts, long-term irreversible environmental impacts or disruption to the social fabric of communities. Respondents also argued that the impacts would be felt beyond the area immediately adjacent to well sites. As such, they did not think that community benefit schemes with a local focus should be seen as relevant; they thought that the future of unconventional oil and gas should be considered at a more strategic national level, with account taken of the risks to and benefits for the whole of Scotland.

5.7 Additionally, respondents were often sceptical about the likely value of such schemes to communities. They argued that companies would always prioritise returns to shareholders and that the schemes proposed by energy companies and discussed in the consultation paper were voluntary in nature and were wholly or partly based on a percentage of profits. Thus, payments were not guaranteed, and respondents expressed doubts as to whether companies would deliver on their promises. In particular, it was suggested that there was a lack of transparency about company finances, and schemes were potentially vulnerable to accounting practices which allowed companies to minimise their declared profits; it was also suggested that communities could also lose out if companies went out of business. In addition, there was a further concern that schemes would be short term and linked to the duration of individual projects, while the impacts of industry operations would extend beyond that. Some respondents also noted that while the UK government-backed UKOOG charter scheme included a payment for exploratory drilling, not all companies had signed up to this. Thus, communities could suffer negative impacts but not receive any community benefit payment if a commercially viable source of gas was not found.

5.8 It was also suggested that any payments distributed via a community scheme would not amount to much on a per household basis, would not go far in mitigating impacts, and

¹² Some respondents offered comments at Question 2 relating to their views on the general community impacts of an unconventional oil and gas industry. Within this group, some simply said ‘There will be no benefits to the community’.

would represent only a small proportion of company profits. Further, the percentage basis proposed for schemes (1% of revenues according to the UKOOG charter), combined with the lack of certainty about how valuable the unconventional oil and gas industry would turn out to be, meant that the real value of these schemes could not be known at this stage.

5.9 Such views were shared by respondents opposed to community benefit schemes and also by some of those who supported them in principle, but wanted to make sure that any schemes established were as beneficial as possible to local communities.

5.10 Respondents often distinguished between their views on community benefit schemes in general, and schemes which might be linked specifically to unconventional oil and gas operations. The former were largely viewed as an appropriate and positive way of recognising the localised impact that projects such as windfarms, seen as benefiting the country as a whole, had on host communities (although there was also some criticism of how such schemes have operated). Regarding the latter, however, respondents did not think it appropriate to link community benefit schemes to an industry that was perceived as causing long-term damage to public health and to the environment. A related view was that the decision about whether or not to allow unconventional oil and gas operations to proceed had implications beyond the level of individual communities and should not be able to be influenced by the offering of financial inducements and short-term gains to local communities.

5.11 Occasionally, respondents expressed opposition to community benefit schemes, stating that they were: (i) unnecessary since communities would benefit from the unconventional oil and gas project itself; (ii) unhelpful as they encouraged a 'dependency' culture; or (iii) unfair in rewarding communities that happened to be located close to potential sites. Respondents offering such views were mainly individuals who generally supportive of the unconventional oil and gas industry.

Support for community benefit schemes

5.12 Respondents who were positive about the possibility of community benefit schemes offered the following main reasons for their views:

- It was right that communities should receive some form of 'compensation' for negative impacts experienced as a result of industrial developments, and that the companies profiting from such developments should be expected to share their profits with the communities experiencing those negative impacts.
- Such schemes operated successfully in connection with other industries and brought important benefits to communities, and there was no reason not to extend them to any unconventional oil and gas industry established in Scotland.
- Such schemes had the potential to be transformational for disadvantaged communities.

5.13 Respondents expressing these views were generally supportive of the unconventional oil and gas industry. This group included industry representatives and other related organisations who often provided details of their existing commitments and proposals in this area. However, this group also included some respondents who were generally opposed to the establishment of an unconventional oil and gas industry but believed that community

benefit schemes should be introduced **if** unconventional oil and gas extraction went ahead in Scotland and / or if it was assessed to be safe.

Design and operation of schemes

5.14 Some respondents offered suggestions as to how such schemes might be designed and operated. There were both positive and negative views about the voluntary UKOOG charter approach and the schemes currently in operation covering landfill / windfarm projects as possible models for unconventional oil and gas schemes. In addition, there were varied suggestions for how schemes might be structured and which bodies might be involved in their oversight and operation (e.g. local community trusts, local authorities, organisations currently involved in administering other community benefit schemes). Respondents were keen for lessons to be learned from different models of community benefit schemes in operation in the UK and around the world.

5.15 Comments from respondents who discussed more specific aspects of the design and operation of potential schemes focused on the following:

- Underpinning principles and features: There was general agreement that community benefit schemes should be transparent and accountable, should adhere to best practice, and be subject to independent regulation and auditing. Respondents also emphasised the importance of community engagement and participation (which can in itself have wider, longer-term benefits) and the need to provide appropriate support for this, and partnership working involving all stakeholders.
- Financial arrangements: At a general level, respondents stressed the need for schemes to be 'fair and proportionate' and to reflect the wealth gained from unconventional oil and gas projects. There was one caveat noted by a few respondents – that scheme obligations should not be set at a level that undermined the commercial viability of the industry. While some were happy with the idea of percentage-based schemes, others favoured schemes which would make reliable regular payments throughout the life of a project (from exploration to decommissioning and beyond) – this was seen as important for planning purposes, for minimising time lags in terms of residents seeing tangible benefits, and for ensuring a recognition of impacts which appeared even after projects had concluded.
- Scope of schemes: The need for a satisfactory definition of 'community' / 'wider community' was raised repeatedly as an issue which needed to be addressed. Additionally, respondents suggested the need for flexibility to allow for strategic, cross-community projects to be funded, and to take account of multiple projects in relatively small areas.

5.16 Respondents also offered a range of specific suggestions on what should be funded from such schemes. These included, for example: community facilities, environmental projects, local infrastructure improvement and / or maintenance, and projects linked to renewable energy or improving energy efficiency in the homes of local residents. However, some respondents talked more generally about the importance of focusing on sustainable projects with long-term value for whole communities.

Alternative / additional proposals

5.17 Some respondents expressed a preference for alternative or additional mechanisms for allowing communities at national or local levels to benefit from unconventional oil and gas projects. By and large, these suggestions were based on statutory arrangements and the removal of corporate control or influence. They included variations on different tax-based schemes to benefit the whole of Scotland; the creation of a Scotland-wide 'wealth fund' with contributions made through ring-fenced taxation; and systems which provided additional funding to relevant local authorities. Other alternative suggestions were local communities being given a stake in the ownership of unconventional oil and gas developments; community wealth funds; and the establishment of community trusts to receive and control money from the industry.

5.18 Some respondents thought that the current planning processes and regulations also provided options for funding mitigation arrangements and securing community benefits.

Other points made

5.19 The following additional points were also occasionally made:

- It was important to be clear about the distinction between payments made to property owners to enable unconventional oil and gas operations to take place on their land, compensation payable to individuals for harm caused / losses suffered, and schemes that fund projects intended to benefit a whole community. Respondents argued that all of these should be adequately and fairly provided for.
- Research to date has indicated a mixed picture in relation to the effectiveness and operation of community benefit schemes, and the perceptions of the benefits received by communities. The evidence also shows that there is a wide variety of models for community benefit schemes, and that the extent to which people's attitudes and views towards prospective industrial projects are affected by the availability of such schemes is variable.
- Unconventional oil and gas extraction would lead to significant and widespread costs, both on-going and long-term, linked to infrastructure provision and repair, increased demands on health and other public services, environmental mitigation and restoration over potentially large geographic areas, clean-up costs related to incidents and decommissioning, etc. There were calls for companies to be required to contribute to or cover such costs.
- Regardless of the community benefit schemes proposed, it was important that local communities benefitted from unconventional oil and gas developments in terms of jobs, training, and economic investment.

5.20 Finally, a range of respondents, including those representing public bodies and professional bodies, stressed that the possibility of community benefit schemes should not be considered as a factor in the determination of planning applications.

6. Impacts on Scotland's economy and manufacturing sector (Q3)

6.1 This chapter presents an analysis of respondents' views on the potential impacts of unconventional oil and gas on Scotland's economy and manufacturing sectors.

6.2 The consultation paper set out the current context in relation to Scotland's Economic Strategy and draft Energy Strategy.¹³ It also presented the main findings of the economic impact assessment commissioned by the Scottish Government. This examined the impact that an unconventional oil and gas industry could have on jobs and the wider Scottish economy under a range of potential production scenarios (described as central, low and high). It was also noted that unconventional oil and gas has had a major impact on manufacturing and energy supplies in North America. Respondents were asked to consider these findings and give their own views on the potential impact of unconventional oil and gas on Scotland's economy and manufacturing sector.

Question 3: What are your views on the potential impact of unconventional oil and gas industry on Scotland's economy and manufacturing sector?

6.3 Altogether, 19,112 respondents addressed this question. This comprised 116 organisations, 14 discussion groups, 2,730 individuals and 16,252 standard campaign respondents.

Overview of responses to Question 3

The **predominant view** was that the development of an unconventional oil and gas industry may result in a modest increase in jobs and some economic benefits to the oil and gas sector and chemical manufacturing sector in Scotland. However, these benefits are likely to be short-lived and are far outweighed by adverse economic and social impacts in other areas. Specifically, concerns were voiced about the potential for negative impacts on other key sectors of the Scottish economy – food and drink (including agriculture and fishing), tourism and housing – and the possibility of reputational damage to what was referred to as 'Brand Scotland'.

The **alternative view** was that the potential for positive impacts was enormous and the economic benefits were understated by the findings of the Scottish Government-commissioned economic impact assessment.

6.4 This chapter first discusses respondents' views on the findings of the Scottish Government-commissioned economic impact assessment which were presented in the consultation paper. It then considers respondents' views about the nature of any potential economic impacts, which were seen mainly in terms of: jobs and wages; impacts on the chemical manufacturing sector; impacts on other sectors of the Scottish economy; energy security; trade balance; and tax receipts.

¹³ Note that the draft Energy Strategy was also the subject of public consultation concurrently with the *Talking 'Fracking'* consultation. This is discussed further in Chapter 7.

Comments on the findings of the economic impact assessment

6.5 Respondents often referred in their comments to the findings of the economic impact assessment discussed on pages 40–44 of the consultation paper. They critiqued different aspects of the research and, depending on their perspective, suggested that the findings either overstated or understated the potential economic benefits.

6.6 Those who thought the economic benefits were **overstated** argued that:

- The research takes a narrow approach to assessing economic impacts and does not consider or give adequate attention to: (i) costs to other sectors which might experience negative impacts; (ii) health, social and environmental costs; and (iii) potential costs to the public purse of having to develop and enforce a robust regulatory regime.
- The economic scenarios set out in the research rely on data from productive shale fields in the United States. Some thought it was inappropriate to extrapolate this data to a Scottish context, given the different demographic context (i.e. with a large population residing in close proximity to potential well sites), and the ‘more complex geological formations’ in Scotland. Moreover, it was thought that the (smaller) scale of production and stricter regulatory regimes in Scotland would lead to higher costs than those in the United States.

6.7 Those who thought the economic benefits were **understated** argued that:

- Since the report was published, gas prices have risen and future price forecasts are now higher than those used in the analysis.
- Estimated gas production under the most optimistic scenario was seen to be inconsistent with data from the British Geological Survey – and was considered to be low in comparison to other countries.
- The report contains little detail about possible benefits to supply chains. It was noted that supply chain impacts and associated job creation would be seen not only within the oil and gas and petrochemical sectors in Scotland, but also by a wide range of companies (including small businesses) supporting those industries.

The nature of impacts on the economy and manufacturing sectors

6.8 As well as highlighting a range of specific (positive and negative) economic impacts (discussed below), respondents also often expressed more general views about the potential impacts on the economy. These ranged from ‘potentially overwhelmingly positive’, through to ‘modest but not huge’, to ‘disappointingly low’ or even ‘detrimental’.

Jobs and wages

6.9 One of the main economic impacts that respondents identified was in relation to jobs and wages. However, the predominant view, expressed by those who were generally opposed to the development of an unconventional oil and gas industry, was that any benefit to the Scottish economy in terms of job creation was questionable. Respondents who held this view thought that:

- Many of the jobs created would be short-term – associated with the construction and development of well pads
- Skilled jobs would be few in number and likely to be filled by staff brought in from elsewhere or ‘specialist contractors flown in from overseas’ who have the necessary expertise and experience
- Additional supply chain benefits (for example, related to the manufacture of specialist equipment) would be unlikely to be felt in Scotland as equipment related to exploration and drilling would be purchased more cheaply from overseas suppliers
- Most local jobs arising from the development of an unconventional oil and gas industry were likely to be limited to low-paid, low-skill, temporary work or related to accommodation provision for temporary workers
- Having a more accessible (i.e. ‘cheaper to extract’) onshore supply of oil and gas could cause further decline in the existing offshore industry.

6.10 In general, respondents with these views concluded that unconventional oil and gas was unlikely to provide meaningful, desirable or stable local employment. Instead, respondents frequently suggested that renewable energy and energy efficiency schemes have the potential to provide greater benefit to the Scottish economy in terms of job creation and sustainability.

6.11 By contrast, the alternative view put forward by those in favour of establishing an unconventional oil and gas industry, was that its development could potentially:

- Secure existing highly skilled, high-value jobs and create many new jobs in the chemical manufacturing industry in Scotland – respondents referred to the possible creation of thousands, tens of thousands and even hundreds of thousands of jobs
- Create a wide range of new supply chain jobs – i.e. technical services, equipment hire and maintenance, monitoring and inspection, fluid management, waste services, etc.
- Help with the redeployment of skilled and experienced workers made redundant by the Scottish offshore oil and gas industry
- Attract investment, and lead to increased wages and higher standards of living in the central belt
- Provide opportunities for training, apprenticeships and well-paid employment for young people.

Impact on the manufacturing sector

6.12 There was a general view among respondents – both those opposed to establishing an unconventional oil and gas industry in Scotland, and those in favour – that one of the main beneficiaries would be the chemical manufacturing industry at Grangemouth. However, the predominant view, expressed by those opposed, was that any benefit to this sector would be short-lived and far outweighed by the risks of adverse impacts on other key Scottish industries (discussed further below). The respondents who held this view made a variety of related points, including that:

- Given the current low cost of importing shale gas from the United States, there is little economic pressure on Scottish industries to find alternative sources of gas.

Moreover, given the (estimated) smaller scale of production in Scotland as compared with the United States, there is every possibility that the cost of domestically produced gas would be no less expensive than imported gas, thus making investment in the unconventional oil and gas industry a 'waste of money'.

- The oil and gas produced would undoubtedly be sold to the highest bidder, and there was therefore no guarantee that the Scottish manufacturing sector would benefit directly from having a locally produced supply of shale gas and oil.
- Regardless of its price, a domestic supply of shale gas and oil is unlikely to displace imported gas and oil entirely.
- Scotland's efforts and investment would be better focused on reducing reliance on fossil fuels and developing a more sustainable post-carbon economy.

6.13 The alternative view, mainly expressed by those in favour of establishing an unconventional oil and gas industry, was that, potentially, a source of domestically produced shale gas and oil would provide a secure supply of feedstock for the chemical manufacturing industry in Scotland, thus doing away with the need to import gas and oil from the United States. This would lower production costs for an important sector of the Scottish economy, and make this sector more competitive in international markets.

Impacts on other sectors of the Scottish economy

6.14 Respondents who were sceptical about the potential for unconventional oil and gas to create local jobs argued instead that it could, in fact, result in significant job losses in other key sectors of the Scottish economy. Those seen to be most at risk were in the food and drink industry (including agriculture, fishing, whisky, beer and bottled water) and tourism.

6.15 There were repeated concerns about the potential for contamination (or even the **perception** of contamination) of land and / or water to undermine consumer confidence in Scottish food and drink. Respondents pointed to Scotland's international reputation for high-quality food, fertile land, clean air, and unspoilt landscapes and argued that this 'Brand Scotland' could be seriously damaged by an unconventional oil and gas industry.

6.16 There was a further concern about the possibility of personal loss to farmers as a result of high value farm land being broken up to accommodate drilling sites, and (potentially) the inability to obtain insurance to cover losses related to the long-term contamination of land and / or sickness or death of livestock caused by the effects of fracking.

6.17 Respondents also frequently raised concerns about the possibility of negative impacts on the housing sector, particularly in terms of falling house prices and the inability to sell houses. These concerns were based on reports about the negative impacts already beginning to be seen in the property market in communities in the north of England which have been identified as potential drilling sites. Concerns were also expressed about the possibility of being unable to obtain a mortgage or home insurance for a property located in areas around drilling sites. Respondents commented that once oil and gas wells are in place, they cannot be fully removed, only 'capped'. Thus, the negative effect on the housing market could last for a considerable length of time. Less commonly, respondents thought that negative impacts in the housing market might also arise as a result of local homes being bought up by individuals employed in the oil and gas industry, thus resulting in inflated house prices and the existing local population being priced out of the market. Respondents were

also concerned about the loss of land for housing, both in the short term, and in the long term where land had been contaminated.

6.18 Only very occasionally did any respondents suggest that an unconventional oil and gas industry could have a **positive** impact on other sectors of the Scottish economy. For example, there was some comment that it could benefit tourism since fewer wind farms would need to be built in beauty spots.

Energy security and costs

6.19 Although the consultation paper had stated that Scottish shale gas was not likely to be used to supply energy or lead to lower fuel prices for **domestic customers**, some respondents nevertheless commented that they thought domestically produced gas could benefit the Scottish economy by filling an energy gap resulting from: (i) the decline of the offshore oil industry, and (ii) the planned decommissioning of nuclear power stations.

6.20 However, it was more common for respondents to dismiss the potential benefits of unconventional oil and gas for Scotland's energy supply. These respondents argued that Scotland's energy future lies with renewables and carbon neutral alternatives such as bio-fuels. These issues are discussed in further detail in the next chapter.

Balance of trade (imports vs exports)

6.21 While some respondents saw the potential for Scotland to become a significant exporter of unconventional oil and gas as a result of the development of an industry in Scotland, respondents were more likely to argue that global oil prices were volatile and determined by political forces beyond Scotland's control. Furthermore, it was unlikely that Scotland could compete in the international oil and gas market with countries such as Poland, the USA or Russia. The point was made repeatedly that if current low oil and gas prices persisted, then an unconventional oil and gas industry in Scotland would not be viable.

Tax receipts

6.22 The potential for increased tax receipts was a positive impact identified by some respondents. This group argued that the production of Scottish shale gas would result in increased taxes paid to central government and local authorities through corporation tax, business rates, VAT, and a general strengthening of the income tax base in Scotland. There was also a view that the growth in the economy achieved through an unconventional oil and gas industry would result in more money being available for the NHS, education and public services more generally.

6.23 More often, however, respondents claimed that any profits from unconventional oil and gas production would go to 'offshore tax havens', or that most of the tax received would go to the UK Government, leaving Scotland with little benefit. There were also repeated concerns that the cost of decommissioning redundant wells would end up being borne by the Scottish Government and therefore the taxpayer. Respondents also argued that unconventional oil and gas was likely to present significant costs to the public sector, as a result of adverse health (and mental health) impacts, road and infrastructure repairs, industry subsidies, monitoring regimes, and incidents and accidents.

Other relevant issues raised by respondents

6.24 Finally, respondents raised other relevant issues which were of a different nature to the impacts described above:

- Some respondents argued that the development of an unconventional oil and gas industry was inconsistent with a range of other economic policies and strategies in Scotland, including the Scottish Government's draft Climate Change Plan, draft Energy Strategy, Good Food Nation strategy and Zero Waste Strategy (i.e. the development of a circular economy). It was also thought to undermine the local tourism strategies of towns and cities in the central belt (Falkirk and Stirling were particularly mentioned).
- Respondents frequently stated that Scotland's economy and manufacturing sectors would be better served in the medium to long term by focusing on research and development for cleaner energy projects, and reducing the demand for oil and gas. It was noted that many other countries around the world were already moving in this direction.
- Some respondents called on the Scottish Government to find ways of supporting the chemical manufacturing industry at Grangemouth in ways that do not jeopardise the environment or the communities and regional economies in the central belt.
- A few respondents suggested that there were risks in **not** establishing an unconventional oil and gas industry in Scotland. These risks could include job losses in Scottish manufacturing and loss of confidence and investment in the established oil and gas industries.

7. Role in Scotland's energy mix (Q4)

7.1 This chapter presents an analysis of respondents' views on the role of unconventional oil and gas in Scotland's energy mix.

7.2 The consultation paper noted that, in January 2017, the Scottish Government published a draft Energy Strategy for consultation. This set out a long-term vision of: (i) a modern, integrated, clean energy system, delivering reliable energy supplies at an affordable price, in a market that treats all consumers fairly; and (ii) a strong, low carbon economy which shares the benefits across Scotland's communities, reducing social inequalities and creating a vibrant climate for innovation, investment and high-value jobs.

7.3 The draft Energy Strategy discussed the challenges of meeting Scotland's future heat, power and transport needs, and considered the overall role of hydrocarbons in Scotland's future energy mix. It noted that heating accounts for 53% of the energy consumed by Scotland's homes and businesses, and that 79% of Scottish homes currently use mains gas as their primary heating fuel, with demand for natural gas predicted to increase until 2040. Given this context, the consultation asked respondents for their views about the place of unconventional oil and gas in Scotland's energy mix.

Question 4: What are your views on the potential role of unconventional oil and gas in Scotland's energy mix?

7.4 Altogether, 22,069 respondents addressed this question. This comprised 115 organisations, 11 discussion groups, 5,658 individuals and 16,285 standard campaign respondents.

Overview of responses to Question 4

The **predominant view** was that unconventional oil and gas should have no role in Scotland's energy mix. It was seen to be unnecessary, expensive, and inconsistent with the Scottish Government's ambitious greenhouse gas emissions targets. Respondents instead wanted Scotland to concentrate efforts on developing more sustainable energy systems involving renewables and biofuels.

There were **two alternative views**. The **first**, expressed mainly by organisations in the oil and gas industry and a range of individual respondents, was that natural gas will continue to be an important source of energy for Scotland – particularly in relation to heating for homes and businesses. With North Sea oil declining and the planned decommissioning of Scotland's nuclear power stations, a domestic source of unconventional oil and gas would provide Scotland with a diverse energy mix, and enable greater self-sufficiency during the transition to a low carbon future. However, there were differences between respondents in whether they saw a small short-term role for unconventional oil and gas, or whether they saw a more significant medium- to long-term role.

The **second** alternative view, expressed by a range of organisations and individuals, was that there are insufficient quantities of unconventional oil and gas available in Scotland for it to be of any significant importance in Scotland's energy mix. Unconventional oil and gas should (or would) be used primarily as feedstock for industrial processes, not for energy.

7.5 Each of these views is discussed further below. In general terms, the views of different respondents about the potential role of unconventional oil and gas in Scotland's energy mix ranged from 'unnecessary' and 'unethical' through to 'limited for a period of time' to 'essential' or 'critical'.

Unconventional oil and gas has no role in Scotland's energy mix

7.6 Respondents who thought there was no role for unconventional oil and gas in Scotland's energy mix often set their comments within the context of Scotland's draft Energy Strategy and draft Climate Change Plan. The two main points made by this group were: (i) that the development of a new unconventional oil and gas industry in Scotland would jeopardise Scotland's efforts to meet its climate change commitments, and (ii) that it was incompatible with the vision set out in the draft Energy Strategy.

7.7 The group also pointed to findings from the Scottish Government-commissioned economic impact assessment which indicated that: (i) production of unconventional oil and gas would only fully begin in 2026, with peak production not anticipated until around 2044 – just six years before Scotland's energy systems are meant to be fully decarbonised (in 2050), and (ii) under the central scenario (set out in the report), the estimated total production over the lifetime of the industry would be equivalent to 'a mere 5.5 years' worth of gas' based on current Scottish gas consumption levels. Furthermore, it was anticipated that this gas would not be used for domestic heating purposes. Based on these findings, respondents argued that the development of an unconventional oil and gas industry in Scotland would significantly delay the transition to decarbonisation for very little benefit.

7.8 Respondents in this group also repeatedly voiced concerns about the possibility that any investment in a new onshore oil and gas industry would displace investment into the development of cleaner forms of energy and initiatives to promote energy efficiency – thus setting back Scotland's renewable energy agenda. They suggested that there was evidence this was already happening in England with the UK Government's support for nuclear power and shale gas exploration coinciding with a reduction in investment in renewables.

7.9 Some respondents also challenged claims that unconventional oil and gas has a smaller 'carbon footprint' than other fossil fuels such as coal and imported liquefied natural gas. This group argued that there was widespread disagreement about this issue. These issues are discussed in further detail in Chapter 9.

7.10 Respondents in this group tended to call for the development of 'greener', 'clean energy' alternatives to oil and gas. Some encouraged the Scottish Government to continue to provide international leadership with its clear focus on renewables (wind, hydro, wave and solar power). Others suggested a wider range of alternatives and also specifically addressed the issues of Scotland's heating and transport needs. These respondents called for further investment into a diverse range of renewable and sustainable energy technologies and other initiatives, including:

- Developing alternative energy sources and delivering renewable energy to homes and businesses more efficiently (e.g. biomethane / biogas; ground and air source heat pumps; district heating initiatives¹⁴; improving battery storage for electricity

¹⁴ District heating is the supply of heat and / or hot water from one source to a district or a group of buildings / homes, rather than each building / home having its own supply.

generated by renewables; solar water heating; installing solar panels / tiles on all new-build houses)

- Taking steps to reduce energy demand (e.g. improving insulation in homes and businesses; replacing old double glazing; revising building standards to ensure that all new homes and offices are carbon neutral)
- Improving national energy infrastructure (e.g. developing better connectivity with the UK and Europe to manage variability in renewable supplies)
- Developing sustainable transportation initiatives (e.g. supporting the transition to electric cars; improving public transport infrastructure; electrifying and expanding rail transport; requiring building projects to employ local people to reduce road travel)
- Other initiatives aimed at reducing greenhouse gas emissions or increasing sustainability (e.g. carbon capture and storage systems; regenerative agriculture; new manufacturing techniques and technology such as the development of synthetic ethane for plastics).

Unconventional oil and gas as a ‘transition fuel’

7.11 Respondents who thought that unconventional oil and gas should have a role in Scotland’s energy mix generally spoke about it as a ‘transition fuel’, and one with a lower carbon footprint than other fossil fuels. Respondents expressing this view included organisations from the oil and gas sector, and a range of individual respondents. Within this group, however, there were differences between respondents with respect to how long they thought the ‘transition’ period should – or was likely to – last, and whether they saw the role of unconventional oil and gas in Scotland’s energy mix as large or small.

7.12 Irrespective of their views on these issues, these respondents generally acknowledged that the long-term direction and priority for Scotland was to reduce its reliance on fossil fuels in line with its climate change commitments. However, this group tended to emphasise the strategic importance of having a reliable energy supply in the short to medium term and achieving greater self-reliance during the transition period. They believed that unconventional oil and gas had a role in giving Scotland a more secure, diverse energy mix during the transition.

7.13 Respondents who argued that unconventional oil and gas had a potentially significant and / or longer-term role to play in Scotland’s energy mix pointed to a range of government statistics and forecasts from national energy suppliers, and suggested that it was ‘unrealistic’ to think that natural gas would not play a significant role in Scotland’s energy mix for some time to come (i.e. at least several decades). They also noted that:

- More than three-quarters of Scottish households use gas as their primary source of heating
- In winter, peak demand (in gigawatts) for gas is substantially higher than electricity demand
- Electricity is significantly more expensive per kilowatt hour than gas, and there is a strong correlation between fuel poverty in Scotland and having no mains gas or having heating provided by electricity only.

7.14 These respondents also pointed out that North Sea oil production is declining and Scotland's current energy requirements cannot be met using renewable sources alone, which mainly produce electricity. They noted that changing the way in which heating, in particular, is delivered to homes and businesses around Scotland will pose major economic and practical challenges over the next few decades, and that the scale of this challenge is such that all options should be considered and 'none should be ruled out on ideological grounds'.

7.15 Doing away with gas entirely and moving to electricity-based heating systems would require a substantial increase in electricity production, particularly during winter months. There would also be major capital costs for government, businesses and homeowners in making these changes as gas appliances in homes and businesses would have to be replaced, and local electricity grid networks would need to be significantly strengthened.

7.16 Respondents in this group also noted that natural gas currently has an important role in generating electricity, and with the planned decommissioning of nuclear power stations in Scotland, gas will continue to provide a back-up supply of power to cover for the variability in wind and solar generated electricity. Others expressed concern about what they perceived to be an 'over-reliance' on renewables, which they believed resulted in the need to import energy from England and other countries to cover times of peak demand.

7.17 These respondents argued that it was better for Scotland to have access to a diverse range of energy sources, rather than becoming reliant on any one source or having to purchase energy from elsewhere. They also thought that it was a 'false dichotomy' to suggest that a government could only invest **either** in renewables **or** in gas production; and that there was no reason why Scotland could not, and should not, do both.

Insufficient quantities of unconventional oil and gas

7.18 Finally, a range of both individual and organisational respondents thought that, based on current estimates of the quantity of unconventional oil and gas resources in Scotland, it was likely that any production would be relatively short term (i.e. compared with countries that have substantial reserves such as the United States). Thus, it was unlikely that any Scottish unconventional oil and gas industry would outlast the current projected demand for natural gas in Scotland. This group thought that unconventional oil and gas would have little role in Scotland's energy mix, and would instead (as stated in the consultation paper) have more value as a feedstock for Scotland's petrochemical industry.

Other relevant views

7.19 It should be noted that there were slight variations on some of the main views discussed above. For example, some respondents thought it was unnecessary for Scotland to develop a new onshore oil and gas industry **at this stage**. This group argued that oil and gas should continue to be extracted from the North Sea for as long as possible. In the meantime, Scotland should focus on developing green energy technologies and expertise, keeping any onshore reserves for a later date when and if there may be a greater need for them. This group suggested that a delay in establishing an onshore industry would also allow time for the impacts of hydraulic fracturing (in other countries) to be more fully understood.

7.20 A small number of respondents expressed a view that, without further information about the quantity and chemical make-up of Scotland's onshore shale oil and gas reserves, it was unclear whether these reserves would be used primarily for industrial feedstock, or

whether they could have a larger role in Scotland's future energy mix. Respondents with this view pointed out that only through further exploration could these questions be answered. Some of the respondents in this group suggested that exploration should be undertaken, but without any commitment being made to large-scale or longer-term drilling.

7.21 Relatively small numbers of (mainly individual) respondents expressed a diverse range of views on other matters related to the role of unconventional oil and gas in Scotland's energy mix, but not directly related to any of the main views discussed above. For example:

- There was an acknowledgement that fossil fuels play an important role in the pharmaceutical industry and healthcare and a view that they should be conserved for these purposes, rather than used for energy.
- At one extreme, there were calls for legislation to be enacted to prohibit fossil fuel extraction altogether. At the other extreme, there were suggestions that Scotland should aim to make as much money from an unconventional oil and gas industry as possible.
- There were concerns about Scotland's energy supply being controlled by small numbers of multi-national corporations whose aims are primarily to make a profit. Some respondents advocated nationalising the oil and gas sector.
- Following on from the latter point, respondents on both sides of the debate sometimes discussed the moral and ethical aspects of where Scotland gets its energy. The more common view was that it would be 'unethical' to extract more fossil fuels in Scotland (thus contributing to climate change) when the country had such abundant sources of renewable energy. However, others argued that it was 'unsustainable', 'unethical' and 'counter-productive' (in terms of reducing climate impacts) for Scotland to import gas and oil from countries with unstable regimes or from countries half-way around the world which have less robust regulatory environments.

8. Potential environmental impacts (Q5)

8.1 This chapter discusses respondents' views relating to the potential environmental impacts of unconventional oil and gas, including seismicity.

8.2 The final section of Part 2 of the consultation paper (pages 46–53) focused on environmental considerations. Specifically, this section summarised and discussed the studies which the Scottish Government had commissioned in 2016 to examine climate change, decommissioning and the risks of induced seismicity. The section also discussed regulation and how it could be strengthened.

8.3 It should be noted that no environmental impact assessment was commissioned by the Scottish Government to examine (specifically) the potential environmental impacts of an unconventional oil and gas industry in Scotland. However, as highlighted in the consultation, the Independent Expert Scientific Panel considered the evidence on environmental impacts. In the section of the consultation paper on 'Scottish Government observations on the evidence' (page 53), it was noted that:

'In respect to environmental regulation, the research project findings are broadly consistent with the findings of the Independent Expert Scientific Panel, which concluded that "The regulatory framework is largely in place to control the potential environmental impacts of the production of unconventional oil and gas in Scotland, although there may be gaps to address".'

8.4 Thus, the Scottish Government did not comment on the wide range of potential environmental impacts per se, simply on the extent to which regulation was in place to control or mitigate any potential impacts.

8.5 The section on 'Scottish Government observations on the evidence' also highlighted that (i) the seismicity study had concluded that the risk of felt earthquakes from unconventional oil and gas developments is low and that (ii) the Scottish Government would undertake all necessary relevant statutory assessments in coming to a final position on unconventional oil and gas, including undertaking a strategic environmental assessment, which would be required regardless of the form of a final decision.

8.6 Question 5 invited comments about the potential environmental impacts of an unconventional oil and gas industry in Scotland.

Question 5: What are your views on the potential environmental impacts of an unconventional oil and gas industry in Scotland?

8.7 Altogether, 21,939 respondents addressed this question. This comprised 120 organisations, 14 discussion groups, 5,402 individuals and 16,403 standard campaign respondents.

Overview of responses to Question 5

Almost all respondents agreed that there was the potential for negative environmental impacts to result from an unconventional oil and gas industry in Scotland; just a handful said there would be 'no environmental impacts'.

The **predominant view** was that the potential negative environmental impacts far outweighed any benefits that might accrue from developing an unconventional oil and gas industry. Respondents thought that there were substantial risks involved and they thought the environmental impacts, especially the potential contamination and pollution of water, soil and air, would be extremely serious. Respondents did not think that the current – or any future – regulatory framework could address the potential environmental impacts, and they therefore wished to see an outright ban on fracking in Scotland.

There were **two alternative views** offered. **First**, respondents who were in favour or broadly supportive of the development of an unconventional oil and gas industry suggested that any potential negative environmental impacts could be controlled, mitigated and minimised through a robust regulatory framework. **Second**, respondents who were not wholly against unconventional oil and gas or who thought the evidence was insufficient to proceed at present thought that some exploratory drilling and limited pilots should be undertaken, with proper monitoring and assessment in place; this would help to address perceived gaps in the current evidence base on the environmental impacts and would help guide decision making in the future.

8.8 In their comments on this issue, respondents not only discussed the potential environmental impacts of unconventional oil and gas extraction, but also the scale and consequences of these impacts, and the implications for decommissioning. There were also comments on the nature of the current evidence available to guide decision making in this area as well comments specifically on the research on seismicity commissioned by the Scottish Government. Each of these topics is considered below.

Potential environmental impacts

8.9 There was widespread agreement that the development of an unconventional oil and gas industry could result in a wide range of negative environmental impacts. Respondents repeatedly used terms such as 'catastrophic', 'disastrous' and 'devastating' to describe the potential environmental effects. The impacts mentioned most frequently were in relation to: groundwater (and drinking water) contamination; air pollution; soil pollution; CO₂ and methane emissions; impacts on the underlying geological structure; impacts on wildlife and habitats; impacts on agriculture; impacts on the visual landscape; and impacts associated with noise, traffic and light pollution.¹⁵ These potential impacts are described in further detail below.

8.10 Respondents commented that pollution and contamination of groundwater (and drinking water) could arise from: accidental surface spills and underground leaks of toxic fluids (including methane) and other chemicals; leaks in (or from) well casings; and leaks from pathways created as a result of hydraulic fracturing. Moreover, contaminated

¹⁵ Note that some of these impacts can also be thought of as 'community impacts' and have been described in Chapter 4.

wastewater from the hydraulic fracturing process could also result in soil pollution, which could in turn contaminate food crops grown in the soil. Emissions of CO₂ and methane would also result in pollution, and would contribute to climate change. This latter point is discussed further in Chapter 9.

8.11 In addition, respondents identified a range of potential impacts relating to the underlying geological structure of the earth. They discussed increased seismic activity, earthquakes, cracks, fractures, and subsidence. Respondents also pointed to potential negative impacts on Scotland's hydrogeology, particularly in the context of the likely location of any drilling sites in densely populated areas.¹⁶

8.12 Respondents also highlighted the possibility of impacts on wildlife and habitats – which could in turn have adverse effects on biodiversity, flora, fauna, aquatic life, and areas of special ecological importance. Such impacts were seen to be a likely consequence of competing land use requirements in densely populated areas, with some respondents also noting that unconventional oil and gas extraction would potentially take agricultural land out of production.

8.13 Respondents argued that the development of an unconventional oil and gas industry would also have a variety of negative impacts on the visual landscape – for example, through the industrialisation of the countryside, through the destruction of the natural beauty of the countryside, and through the creation of holding pools for wastewater prior to its removal.

8.14 Finally, repeated reference was also made to other environmental impacts such as increased noise, increased traffic (and associated pollution) and increased light pollution – all of which have already been discussed in detail in Chapter 4.

8.15 In general, respondents did not see the impacts discussed above as occurring in isolation. On the contrary, they saw them as highly inter-related. For example, groundwater pollution would also put soil quality at risk; increased traffic would not only cause an increase in air pollution, but it would also adversely affect wildlife and habitats, and the visual landscape.

8.16 Occasionally, respondents identified potentially positive environmental impacts from the development of an oil and gas industry. These were largely seen to be generated through increased job opportunities which had the potential to provide opportunities (due to additional wealth creation) for positive environmental developments.

Scale and consequences of potential environmental impacts

8.17 Respondents differed in their views on the scale and consequences of these potential environmental impacts. There were broadly three groups as follows:

- Those who thought the potential environmental impacts were likely to be highly damaging; could not be managed, mitigated or controlled through regulation; were not 'worth the risk'; and who therefore were opposed to any development of an unconventional oil and gas industry. This was the predominant view.

¹⁶ Hydrogeology is the area of geology that deals with the distribution and movement of groundwater in the soil and rocks of the Earth's crust (commonly in aquifers).

- Those who thought the potential environmental impacts (and the attendant risks) could be managed, mitigated and controlled through the rigorous application of an (updated and strengthened) regulatory framework; and / or who thought the risks of an unconventional oil and gas industry were minimal / no more than other industries; and / or who thought there was potential for environmental benefits.
- Those who were ambivalent, undecided or unable on the basis of the evidence provided to give a view about the scale and consequences of the potential environmental impacts.

8.18 Respondents who thought the scale and consequences of the potential environmental impacts were likely to be highly damaging (often described as ‘catastrophic’ or ‘devastating’) often made one or more of the following points:

- Evidence which they considered to be important and credible from elsewhere (principally from the United States but also from other countries such as Australia and Canada) indicated that there are serious and damaging consequences to the environment from developing an unconventional oil and gas industry. In discussing the evidence, respondents most often highlighted: (i) the bans on hydraulic fracturing introduced in other countries and states as a consequence of chemical spills and land and water pollution (ii) the link between disposal of wastewater by reinjection into a hydraulically fractured well and the increased risk of earthquakes, and (iii) the reports of ‘flammable tap water’ from the United States.
- The environmental changes and impacts which would result from the development of an unconventional oil and gas industry were perceived to be far-reaching and irreversible, thus compromising the safety and wellbeing of future generations, as well as the viability of the planet itself.
- The environmental impacts were thought to be unpredictable and uncontrollable and the risks unknown or not (yet) well understood. Respondents therefore thought it was not possible to manage or mitigate them, even with a strengthened regulatory framework.

8.19 By contrast, those who generally supported the development of an unconventional oil and gas industry, or who felt the impacts were minimal or no worse than other energy industries, or who thought there was potential for environmentally positive impacts argued that:

- The UK has a far stronger and more robust approach to regulation than other countries (including the United States) and there is an opportunity to learn from experience elsewhere. Moreover, there is already evidence available about the extent of the potential environmental impacts and this can be used to good effect in strengthening the regulatory framework and addressing current gaps in regulation (as set out in the consultation paper). (See also Chapter 10.)
- All (energy) industries have environmental impacts. Those identified in relation to unconventional oil and gas are no worse than those of other energy projects. There were repeated references, in particular, to the negative visual impact on the landscape of windfarms.

- Unconventional oil and gas is the best energy option available to Scotland at the present time and could help provide a transition to a fossil fuel free future. It would save money in the medium term – by displacing other more expensive imports of gas – and give Scotland greater control over its production standards.
- Many of the negative environmental impacts, especially those related to the development phase – for example, noise or traffic pollution – would be only temporary. The longer term benefits outweigh these short-term impacts.

8.20 Respondents who were unsure or ambivalent about the potential environmental impacts wanted to see firmer evidence before reaching a conclusion about whether or not an unconventional oil and gas industry should be developed. Some of the respondents in this group which included public sector bodies suggested that some small scale pilots might be undertaken in the first instance, with proper baseline assessments and monitoring arrangements, before a firm decision regarding the future of unconventional oil and gas in Scotland was made.

Evidence to guide decision making

8.21 The lack of an environmental impact assessment to underpin the consultation paper was highlighted by some respondents as a serious omission. Those who raised this issue questioned why research on the risks of induced seismicity had been commissioned, but not research on wider environmental impacts. It was also noted that the section of the consultation paper referring to ‘environmental considerations’ focused mainly on climate change and the regulatory framework. (Respondents who raised this were generally individuals and organisations who did not favour the development of an unconventional oil and gas industry.) It was thought that without such an assessment there was no firm basis on which to make a judgement about the scale and nature of any potential environmental impacts and therefore about whether any potential benefits were ‘worth’ the potential risks.

8.22 However, other respondents, especially those organisations involved in regulation, or those representing the energy industry or related professional / trade organisations, thought there was sufficient evidence available to guide the development of an unconventional oil and gas industry, to develop a strengthened regulatory framework, and to mitigate and manage any potential risks.

Induced seismicity

8.23 A small number of respondents discussed the evidence on induced seismicity, including the evidence contained in the Scottish Government commissioned report. There was a wide range of views in relation to the general topic and in relation to the commissioned research. The predominant view was that there was insufficient evidence to guide decision making. Points made included that: ‘it would be more appropriate to focus on the additional risk arising from adding fracking to the existing coal-mining related risk’; that ‘the long-term impacts are unknown’; and that ‘given the lack of historical data it is hard to identify which areas might be affected’. Less commonly, respondents said they were generally content that the impacts of induced seismicity were likely to be small or negligible.

8.24 Given the recent research which has linked increases in earthquakes to disposal of wastewater by injection into deep wells, respondents thought a formal prohibition of this practice was required.

Decommissioning and aftercare

8.25 The consultation paper contained a summary of the findings of research commissioned by Scottish Government to investigate ‘potential environmental risks, industry best practice, and the adequacy of regulatory controls over decommissioning, including for long-term monitoring’. This research concluded that ‘with appropriate regulatory oversight and monitoring, the framework is sufficient to manage risks of well leakage consistent with the aim of providing suitable protection for communities and the environment’.

8.26 A small number of respondents raised points in relation to decommissioning and aftercare, and how this might impact on the environment. There was scepticism on the part of those who were opposed to the development of an unconventional oil and gas industry that the regulatory framework could be enforced or could ensure safe decommissioning. There were also concerns that drilling sites and the surrounding areas would not be returned to their previous state, or made fully safe, and that environmental problems may continue to arise in the future. These respondents described the conclusions of the commissioned research (described above) as ‘wishful thinking’. They focused on the high costs of restoration, and said that, given the previous history of oil and gas companies in avoiding clean-up and restoration costs, the financial liability would ultimately be borne by the taxpayer. By contrast, those in favour of establishing an unconventional oil and gas industry in Scotland agreed that the regulatory framework, as long as it was properly resourced and companies adhered to it, would ensure decommissioning was undertaken safely.

9. Potential climate change impacts (Q6)

9.1 This chapter discusses respondents' views on the potential climate change impacts of unconventional oil and gas.

9.2 Pages 46–48 of the consultation paper covered issues relating to the potential climate change impacts of unconventional oil and gas. This section referred to Scotland's current climate change targets and provided a link to the Scottish Government's third Climate Change Plan, which was published in draft in January 2017.¹⁷

9.3 This section also discussed the analysis provided by the UK Committee on Climate Change. This Committee was asked to advise on 'the potential impact of unconventional oil and gas on Scottish and global greenhouse gas emissions'. In doing this, the Committee used the production scenarios developed in the Scottish Government-commissioned economic impact assessment. (See Chapter 6 for further discussion of the economic impact assessment.)

9.4 In their response to this request, the UK Committee on Climate Change set out 'three tests' as being prerequisites for Scotland being able to meet its climate change targets while developing an unconventional oil and gas industry. These were that:

- (i) Emissions are limited through tight regulation. Within this, much greater clarity is required over the respective roles of different actors in the regulatory system particularly around fugitive emissions.
- (ii) Fossil fuel consumption remains in line with the requirements of Scottish emissions targets. Scottish unabated fossil energy consumption must be reduced over time within levels previously advised by the Committee. This means that unconventional oil and gas production must displace imported gas rather than increase domestic consumption.
- (iii) Emissions from production of unconventional oil and gas are offset through reductions in emissions elsewhere in the Scottish economy.

9.5 Question 6 asked respondents for their views on the potential climate change impacts of an unconventional oil and gas industry in Scotland.

Question 6: What are your views on the potential climate change impacts of an unconventional oil and gas industry in Scotland?

9.6 Altogether, 20,382 respondents addressed this question. This comprised 119 organisations, 14 discussion groups, 3,746 individuals and 16,503 standard campaign respondents.

¹⁷ Note that given the current policy of a moratorium on unconventional oil and gas, the draft Climate Change Plan does not consider the potential role of, or emissions from, unconventional oil and gas.

Overview of responses to Question 6

Almost all respondents agreed that Scotland should tackle climate change, reduce its greenhouse gas emissions, and make the transition to a low carbon economy; just a handful of respondents thought that this was not an important policy objective.

The **predominant view** was that an unconventional oil and gas industry in Scotland would increase greenhouse gas emissions, have a negative impact on climate change, and thus also a negative impact on Scotland's ability to meet the climate change targets to which it was legally committed. These respondents did not view unconventional oil and gas as a 'cleaner' fuel that could help Scotland in its transition to a low carbon economy; and they were particularly concerned about the impact of fugitive emissions of methane gas.

By contrast, there were **a range of alternative views** including that the development of an unconventional oil and gas industry in Scotland would have no impact, a negligible impact or a small positive impact on climate change (and hence on climate change targets). Respondents with these views thought that unconventional oil and gas could provide an important 'transition' or 'bridging' fuel as Scotland moves to a low carbon economy; this group also thought that a robust regulatory framework would control and mitigate any risks relating to climate change generally and fugitive methane emissions in particular.

9.7 There were two opposing views about the climate change impacts of unconventional oil and gas: that it would have a negative impact, or that it would have a positive or neutral impact. The two groups of respondents holding these views both cited evidence from the consultation paper and from a range of other sources in support of their position. These views are discussed in detail below.

Negative impact on climate change

9.8 Many respondents who believed the development of an unconventional oil and gas industry would have negative impacts on climate change described climate change as 'the biggest issue of our time'. They emphasised the scientific consensus that existed around the causes of climate change, and also its effects (droughts, earthquakes, tsunamis, storms, etc.). Respondents also focused on the extent to which climate change affected everyone – both current and future generations. The specific susceptibility of vulnerable groups – the poor, children, the elderly – to the effects of climate change was highlighted.

9.9 These respondents also focused on the significant contribution that burning fossil fuels makes to greenhouse gas emissions – and therefore to climate change – and argued that fossil fuels should be 'left in the ground'.

9.10 These respondents referred repeatedly to a range of statements set out in the consultation paper as follows:

- 'An unconventional oil and gas industry is likely to lead to increased greenhouse gas emissions, which would make it more challenging to achieve Scottish climate change targets.' (page 6)

- ‘The high level of ambition embodied in Scottish annual emissions targets means that finding offsetting effort elsewhere in order to accommodate even moderate additional emissions from unconventional oil and gas production or other sources (e.g. aviation) would be challenging.’ (page 47: statement from the UK Committee on Climate Change)
- ‘The implications for greenhouse gas emissions of unconventional oil and gas exploitation are subject to considerable uncertainties, both regarding the size of any future industry and the emissions footprint of production.’ (page 47)
- ‘However, within the context of Scotland’s climate change legislation, an unconventional oil and gas industry would create challenges in meeting Scotland’s ambitious and world-leading climate change targets.’ (page 53).

9.11 Moreover, these respondents also believed that the ‘three tests’ set out by the Committee on Climate Change described above (paragraph 9.4) were not currently, and could not be, achieved. In particular, they wished to know which industries would provide the ‘offsetting effort’ described above. These respondents challenged the Scottish Government observation in the consultation paper that the impact on climate change would be ‘broadly neutral’ (page 53) given the lack of definitive evidence available.

9.12 The other themes raised by these respondents covered: achieving climate change targets; the regulatory framework; and unconventional oil and gas as a ‘transitional’ technology. Each of these is discussed in turn below.

Achieving climate change targets

9.13 Respondents in this group did not think that the climate change targets set out by the Scottish Government could be achieved if an unconventional oil and gas industry was developed. They saw these targets as very important, and pointed out that some of the targets stemming from the 2015 UN Paris Accord were legally binding; failure to achieve them was therefore viewed with grave concern.

9.14 Respondents thought that up until now, Scotland had a good record in achieving greenhouse gas emissions targets; indeed, they felt that Scotland was a role model and provided leadership for other countries in relation to climate change. Investing in unconventional oil and gas was thought to undermine this and to ‘give the wrong signal’ about Scotland’s commitment to reducing greenhouse gas emissions.

9.15 Some of these respondents explicitly mentioned that, in the ‘grand scheme of things’, Scotland’s contribution to global greenhouse gas emissions was very small indeed; even if Scotland decreased its emissions to zero, there would be a minimal impact on the global picture. However, notwithstanding this, respondents thought it was vital that Scotland takes its commitments to greenhouse gas reduction seriously and offers a world-leading example to other countries.

9.16 Overwhelmingly, these respondents thought that in order to achieve climate change targets Scotland’s focus should be on developing renewable technologies. In this context, the unconventional oil and gas industry was seen as a distraction. (See Chapter 7 for a discussion of renewable technologies and the role of unconventional oil and gas in Scotland’s energy mix.)

The regulatory framework

9.17 These respondents did not believe that the regulatory framework would be capable of monitoring, enforcing, or controlling greenhouse gas emissions. They did not think the skills or personnel were available to deliver on this and they asked who would bear the (substantial) costs of regulation. The potential impacts of Brexit on the regulatory framework, and whether this would result in a dilution of standards, was also raised.

9.18 Respondents queried whether detailed risk mitigation plans had been produced and more specifically, they focused on whether these were sufficient to control methane gas emissions during fracking operations (both vented emissions and unintentional leaks). Respondents repeatedly highlighted the large relative impact of methane gas compared to CO₂ on global warming and they did not believe regulation was, or could be, adequate to control this.¹⁸ (See Chapter 10 for further discussion of the regulatory framework.)

Unconventional oil and gas as a ‘transitional’ technology

9.19 Respondents did not agree with the argument that unconventional oil and gas could provide a ‘transitional’ technology to a low carbon future. They thought the timetable didn’t allow for this; fracking would not make a significant contribution to energy demands overall until ‘too late’ (the late 2030s) by which time, they thought, other technologies would be available. Moreover, the fact that the United States had experienced a drop in its greenhouse gas emissions following the development of the shale gas industry was not seen by these respondents to be relevant to Scotland, given the very different energy mix (including the use of coal) in the United States.

Positive or neutral impact on climate change

9.20 Respondents who thought that developing an unconventional oil and gas industry in Scotland would have a positive, neutral or negligible impact on climate change cited in their responses the statement in the consultation paper that: ‘An unconventional oil and gas sector in Scotland is likely to have a broadly neutral impact on global greenhouse emissions if it is tightly regulated.’¹⁹ Respondents in this group, who were generally in favour of developing the industry in Scotland, believed that the three tests by the UK Committee on Climate Change (see again paragraph 9.4) had already been achieved or could be achieved in the future.

9.21 These respondents often highlighted the small scale of Scotland’s contribution to overall global warming, and the (likely small) scale of any potential unconventional oil and gas industry that would be developed. They did not think Scotland’s approach in relation to reducing greenhouse gas emissions was of any significance at an international level.

9.22 This group of respondents focused their comments on the following topics, all of which were linked to the three tests described above: regulation of the unconventional oil and gas industry, displacement of imported gas and other sources, the role of shale gas in transitioning to a low carbon economy, and the use of shale gas within the Scottish economy. These are discussed below.

¹⁸ The consultation paper gives a multiplication factor of 25, based on estimates provided by the Intergovernmental Panel on Climate Change (page 46). Respondents gave other estimates, some much higher than this, of the multiplication factor.

¹⁹ ‘Scottish Government Observations on the Evidence’ (page 53).

Regulation of the unconventional oil and gas industry

9.23 These respondents highlighted the importance of appropriate regulation within the industry. Issues relating to regulation are discussed in greater detail in Chapter 10 but the main points raised here were that: (i) the (EU, UK and Scottish) regulations and standards applied in Scotland are much higher than those applied elsewhere (in particular in the United States); (ii) the regulations and standards should be further strengthened as identified in the consultation paper, the regulatory gaps should be addressed, and the industry should strive to continuously improve its regulatory framework; and (iii) there should be proper monitoring and controls in place to regulate and minimise fugitive methane emissions.²⁰

Displacement of imported gas

9.24 This group of respondents emphasised the importance of using domestically produced gas rather than imported gas. This was often mentioned in the context of displacing imported shale gas from the United States where the environmental protections and regulatory frameworks were thought to be weaker. Respondents often located this view within a moral / ethical context, emphasising that ‘we should not expect other countries to do our dirty work for us’ or to take risks that we do not wish to take ourselves. (Similar ethical issues were raised in relation to role of unconventional oil and gas in Scotland’s energy supply – see paragraph 7.21, point 4.)

Transition to a low carbon economy

9.25 These respondents thought that unconventional oil and gas provided an important and valuable ‘bridging’ fuel (or ‘transition’ fuel) as Scotland (and the UK more generally) transitions to a low carbon economy. Respondents argued that a low carbon economy would take many decades to achieve and that both conventional and unconventional oil and gas would be required for many years to come.

9.26 This group of respondents thus saw an unconventional oil and gas industry as a sensible solution for the short to medium term. They pointed repeatedly to the reduction in greenhouse gas emissions which had been achieved by the United States following its transition away from (conventional) coal and oil to shale gas. More broadly, respondents favoured using unconventional oil and gas to displace / replace any other energy sources that were known to have greater greenhouse gas emissions / greater ‘carbon footprint’ / greater lifecycle emissions associated with their extraction, production and use (e.g. coal, diesel).

Use of unconventional oil and gas

9.27 Respondents emphasised that whatever impact the extraction and production processes had, the overall impact of the development of an unconventional oil and gas industry on greenhouse gas emissions would depend on the use to which any extracted shale gas was put. The impacts would be different, depending on whether domestic shale gas was used: (i) to displace imported liquefied natural gas, (ii) to substitute for oil and diesel or, (iii) as petrochemical feedstock. In relation to the latter, it was argued that the impacts on greenhouse gas emissions would be minimal.

²⁰ Fugitive emissions refer to the unintended release of gases or vapors through the use of pressurized equipment in industrial processes.

10. The regulatory framework (Q7)

10.1 This chapter discusses respondents' views on the regulatory arrangements which might apply to an unconventional oil and gas industry in Scotland.

10.2 The final section of Part 2 of the consultation paper (pages 50–53) discussed the current regulatory framework in Scotland, which 'covers the vast majority of activities requiring control and monitoring as part of unconventional oil and gas developments'. The paper described the licensing system, the planning permissions process, and the requirement for an environmental impact assessment, as well as the roles of the main bodies involved in regulating the industry (HSE, SEPA, SNH, and local authorities). The paper also summarised the views of the Scottish Government's expert panel in relation to areas where the regulatory framework could be strengthened.

10.3 Question 7 in the consultation asked respondents for their views as follows:

Question 7: What are your views on the regulatory framework that would apply to an unconventional oil and gas industry in Scotland?

10.4 Altogether 3,913 respondents commented on Question 7. This comprised 120 organisations, 14 discussion groups, 2,533 individuals, 185 petition signatories, and 1,061 standard campaign respondents.

Overview of responses to Question 7

The pattern of views in the responses to this question was slightly different to the general pattern of responses set out in Chapter 3 of this report.

The **predominant view** among respondents, particularly those opposed to unconventional oil and gas, was that no acceptable regulatory framework could ever be developed for the industry. The (often unknown) risks were seen to be too great; no regulation, however strongly enforced, could offer adequate protection. A **related view** was that the power of the industry, and the prioritisation of profit over safety and standards, would result in inadequate regulations, poor compliance and ineffective enforcement.

Those respondents who discussed regulation in more detail thought a robust regulatory framework would be vital if unconventional oil and gas extraction was allowed to go ahead in Scotland. This was seen to be a relatively new industry and a well-defined and strictly enforced regulatory framework would be required to build public confidence and to manage the risks.

There was, though, a common view that the current framework would need to be augmented and strengthened. Capacity and capability would have to be built; the gaps in the framework would need to be addressed; and the responsibilities of each of the key players would have to be clarified. A small number of respondents, particularly those in favour of establishing an unconventional oil and gas industry, were confident these changes could be achieved; others, generally those opposed, were more sceptical.

10.5 The views of respondents are considered in the sections below, which focus on the following themes: general views on regulation of the industry; gaps in the framework; co-ordination and structuring of responsibilities across different regulatory bodies; capability and capacity for strong regulation; the costs of regulation; and public confidence. A final section covers other issues raised. It should be noted that many individuals used the question to restate their opposition to the unconventional oil and gas industry or said, simply, that ‘a regulatory framework wouldn't be required if fracking was banned’, ‘the framework should ban fracking’ or ‘the framework should be so strict it wouldn't be worth doing’. Others said they did not have the knowledge to comment, or simply said ‘don't know’.

General views on regulation of the industry

10.6 Most respondents who commented on this question offered only general views on the issue of regulation of the unconventional oil and gas industry.

10.7 The predominant view, expressed mainly by those opposed to the development of an unconventional oil and gas industry, was that the industry **could not** be effectively regulated because of the inherent risks and dangers. The (often unknown) risks of hydraulic fracturing were seen to be too great; no regulation, however strongly enforced, could offer adequate protection. A related view was that the unconventional oil and gas industry **would not** be effectively regulated given the perceived power of large corporations, the relative weakness of the regulatory system, and the consequences these would have for any framework, its application and enforcement. There was a belief that profit would be prioritised over standards and safety.

10.8 Among other respondents, however, there was general agreement that a robust regulatory framework would be vital if the decision was made to proceed with an unconventional oil and gas industry in Scotland. This was seen to be a relatively new industry and a well-defined, independent, transparent and strictly enforced regulatory framework would be required to build public confidence and manage risks. This view was common among those who supported the development of the industry; however, some of those opposed to the industry also stressed the importance of strong regulation should a decision be taken to allow it to go ahead in Scotland.

10.9 Occasionally, supporters of unconventional oil and gas commented that the regulatory framework should not be overly bureaucratic, and that it should protect the environment and communities while simultaneously enabling the development of a viable industry.

10.10 Respondents, including some from the oil and gas industry and other related organisations, expressed confidence in the current framework, which they thought was ‘complex but effective’, ‘fit for purpose’ and ‘tried and tested’. In particular, they endorsed current offshore (and onshore) regulatory regimes which they felt provided a good basis for future developments of the unconventional oil and gas industry and emphasised that the arrangements in the UK were much better than those elsewhere (especially in the United States).

10.11 However, others thought that the current regulatory framework would need to be strengthened, and augmented. Moreover, these respondents thought that capacity and capability in regulation would have to be built, and the roles and responsibilities of each of the key players would have to be clarified.

10.12 In contrast, those opposed to an unconventional oil and gas industry in Scotland were more sceptical. They highlighted what they saw as significant gaps and inadequacies in the current and proposed framework – some cited the ‘vast’ number of recommendations for improvement noted across the Scottish Government’s research as evidence that a suitable system was not in place – and were concerned that these could not or would not be effectively addressed. They highlighted a range of issues such as a lack of evidence, lack of resources and expertise, and perceived systemic shortcomings in the approach to regulation (including over-reliance on self-regulation and reporting) in explaining their concerns.

10.13 The more detailed comments offered by a small number of respondents regarding the regulation of an unconventional oil and gas industry in Scotland are presented below.

Gaps in the regulatory framework

10.14 The consultation paper identified a number of gaps with regard to how the current regulatory framework might be applied to the unconventional oil and gas industry and explained that regulations would need to be strengthened or augmented to address these. The specific areas highlighted in the consultation paper related to air quality (and in particular fugitive gas emissions), decommissioning and induced seismic events. The consultation paper also suggested there should be a requirement for a health impact assessment, an environmental impact assessment, and a traffic management plan to be undertaken as part of the planning process. In addition, improvements in the engagement with local communities, increased transparency especially in relation to operational standards and the use of chemicals, and improved baseline data for monitoring were all thought to be required.

10.15 Respondents endorsed all these suggestions for addressing gaps in the current framework, but also drew particular attention to issues relating to the siting and integrity of wells, the monitoring of methane gas emissions, and waste disposal. There was, though, scepticism among those opposed to the unconventional oil and gas industry that identified shortcomings could be adequately resolved.

10.16 Issues relating to decommissioning, site restoration and aftercare were a particular concern. There were examples given of cases in which contractors had defaulted on their obligations in the past (particularly in relation to open cast mining in some areas of Scotland) and it was thought important that the responsibility for decommissioning should be borne by the industry. There was support for a licensing system which would incorporate payment of a compulsory ‘bond’ to provide guaranteed funds to cover decommissioning costs.

10.17 Other issues highlighted as gaps to be addressed were: local authority policies for managing impacts on historical environment assets; stronger risk assessments in relation to environmental, geological and health concerns; and regulations to cover the environment for fish and fisheries. There was also a view that landowners needed protection from any possible liabilities arising from damage caused by hydraulic fracturing.

10.18 At a more general level, stronger enforcement powers were thought to be required; this was especially mentioned by those who were opposed to fracking who offered examples (mostly from England and Wales) of breaches of the regulation which had not been followed up by any punitive or remedial action. Respondents questioned whether the current regime had sufficient ‘teeth’, and called for strict enforcement and tough penalties for non-compliance.

Co-ordination and structuring of responsibilities

10.19 There was widespread recognition of the importance of having an integrated framework in which the roles, responsibilities, and communication channels of the various individual regulatory bodies was clearly defined. Those who were supportive of the development of an unconventional oil and gas industry highlighted that the industry was no different to others in having multiple players involved in regulation; those against had serious concerns about the impact of fragmentation, duplication and lack of strong communication links across the regulatory system.

10.20 There was a range of views on the necessity and desirability of having a new regulatory body, rather than an evolution of the current arrangements. If a new body was going to be formed, respondents suggested it would need to be independent, and to involve all relevant stakeholders.

10.21 There was also some debate about whether regulation of the industry should be UK-wide or specific to Scotland, and the extent to which Scotland's approach might diverge from that of the UK. Some – particularly those opposed to fracking – expressed concern at the UK's approach in allowing an unconventional oil and gas industry to proceed and wanted to see Scottish Government-led regulation. Others thought a UK-wide system made more sense for the industry or doubted Scotland's capacity to develop a separate system.

Capability and capacity for strong regulation

10.22 Those who were supportive of the development of an unconventional oil and gas industry highlighted the availability of existing skills and expertise within the offshore sector. They felt that this gave a good platform for developing capability and capacity for an onshore industry. Current regulatory arrangements were praised, with regulators and staff described as 'highly experienced' and 'able to cope with challenges'. Respondents thought there was an opportunity for Scotland to build on this and become a world leader in the field.

10.23 By contrast, those who were against the establishment of an unconventional oil and gas industry highlighted what they saw as serious deficits in the capability and capacity of the regulatory sector (HSE, SEPA, SNH and local authorities). There were concerns expressed about the inadequate resourcing of the current regulators, especially in the light of reduced budgets and staff cutbacks in recent years. Particular concerns were raised about the lack of relevant expertise in local authority planning departments with regard to underground developments, decommissioning and site restoration; and it was thought that the wide variety of technologies used within the unconventional oil and gas industry presented challenges for the processing of planning applications. This group also considered the reliance on self-reporting within SEPA's processes to be inadequate.

The costs of regulation

10.24 The costs of regulation were highlighted only by those who were opposed to the development of an unconventional oil and gas industry in Scotland. These respondents were concerned about the potential costs of developing and implementing an appropriate regulatory system and about who would bear those costs. They also thought the costs of regulation should be factored into the decision making about the viability of the industry. If proper regulation were to be very expensive, this would change the economic scenario modelling and might mean that the industry would not be considered to be viable.

10.25 Linked to this, respondents noted that funding for statutory regulatory bodies – and for enforcement activities – would be borne by the public purse, and that it would be difficult to find funds for (additional) regulation at a time of austerity and public sector cutbacks. However, there was also a view that public funding of regulatory bodies amounts to an industry ‘subsidy’, and that the costs of regulation should be met by the industry itself.

Public confidence in the regulatory framework

10.26 Respondents thought it was important that the public had confidence in the regulatory framework; they thought that transparency was required to build trust; and that there should be early consultation with affected communities on the various options as a way to secure their trust. Respondents supportive of an unconventional oil and gas industry were optimistic that these conditions could be met, and they believed that sharing emerging information from England would help to build that confidence.

10.27 More often, however, respondents indicated a serious lack of trust and confidence in the (current and potential future) regulatory framework. These respondents made a range of points indicating the reasons why they did not trust the regulatory process, with some saying that their views were based on personal experience (e.g. of working in the oil industry or the regulatory sector, or of living close to industrial developments). They argued that:

- Experience in the UK in a range of industrial settings showed significant failures in regulation²¹
- Experience in the offshore oil industry and in other major manufacturing sectors has demonstrated the shortcomings of the regulatory regime
- Reports of incidents, accidents and negative impacts from around the world demonstrated that companies do not adhere to best practice, and that regulatory and enforcement systems are not effective
- Regulatory systems are inevitably biased towards industry interests, given the power of big corporations – firms routinely bypass regulations which are in any case designed to operate in their favour, there is a lack of enforcement action in response to regulatory failures, and any fines are minimal compared to ‘cost savings’ of ‘cutting corners’ in relation to safety.

Other points

10.28 Respondents made a number of additional points as follows:

- Leaving the EU would have implications for regulation, much of which currently stemmed from EU directives, and there was concern about the potential dilution of regulatory requirements.
- There was no guarantee that any regulatory system established at this point would be maintained in the future.
- There was currently not enough knowledge or evidence about the potential impact of the unconventional oil and gas industry to allow an effective regulatory regime to be established.

²¹ In their comments, respondents identified numerous specific cases (often local) where they perceived that there had been failures in regulation.

11. Benefits of an unconventional oil and gas industry (Q8)

11.1 This chapter discusses respondents' overall views relating to the benefits of an unconventional oil and gas industry in Scotland. Question 8 invited comments as follows:

Question 8: Overall, and in the light of the available evidence, what do you think would be the main benefits, if any, of an unconventional oil and gas industry in Scotland?

11.2 Altogether, 3,670 respondents addressed this question. This comprised 122 organisations, 14 discussion groups, 2,588 individuals and 946 standard campaign respondents.

Overview of responses to Question 8

The **predominant view** among respondents was that there is no benefit or no NET benefit to the people of Scotland of developing an unconventional oil and gas industry. The only beneficiaries would be the small number of companies, shareholders and employees who would profit financially from such a development. Respondents thought that while there may be some limited benefits from developing the industry – particularly in terms of employment and jobs – these benefits would be small and short-term, and would not in any way outweigh the environmental and social damage that would result (in the longer term) from the development of such an industry; in other words respondents believed that 'the benefits do not outweigh the risks'.

The **alternative** view was that there were benefits to the development of an unconventional oil and gas industry in Scotland. The benefits identified most often related to the economy and more specifically to increased employment with consequential benefits in terms of wealth, prosperity and investment. Other benefits – identified less often – related to energy security and the diversification of energy sources, community benefits due to increased investment, and environmental benefits.

11.3 Among the respondents who commented at Question 8, the main benefits of an unconventional oil and gas industry were discussed in terms of: the economic benefits; energy mix and energy security benefits; environmental benefits; and community benefits. Each of these topics is considered below. Occasionally respondents also identified other benefits or raised related issues, and these are discussed at the end of this chapter.

11.4 The following should be noted about the analysis presented in this chapter:

- Many of the respondents commenting at Question 8 simply said there would be 'no benefits whatsoever', 'zero benefits', 'absolutely none', 'no overall benefits', 'there will be no benefits only drawbacks', that 'I can see no benefits', or that 'I don't believe there are any benefits' from the development of an unconventional oil and gas industry. In addition, respondents said an unconventional oil and gas industry was not necessary or needed. These respondents did not elaborate their views any

further in response to this question and so their perspectives are not otherwise reflected in the main analysis in this chapter.

- The views offered in response to this question often recapped the points that respondents had made earlier in their submissions; these views have been set out in detail in the earlier chapters of this report (Chapters 4 to 10) and are not repeated at length here.

Economic benefits

11.5 The main benefits of unconventional oil and gas were seen to be related to the economy, to wealth creation and, more specifically, to increased employment and more jobs within the manufacturing sector. However, the predominant view, expressed by those who were opposed to developing an industry in Scotland, was that these benefits were ‘small’, ‘limited’, ‘negligible’, or ‘short-term’, and would only be experienced by a small number of companies, shareholders and employees. Respondents offering such views thought that (i) there would be ‘no meaningful benefits’ to the wider population or to ‘ordinary people’ or communities, (ii) the economic benefits claimed by the industry were highly speculative and had been exaggerated and (iii) any economic benefits did not outweigh the risks – especially the environmental risks – of developing the industry.

11.6 Respondents who held these views highlighted that:

- The impact on the wider economy (including on GDP, tax receipts etc.) would be small and short-term; they thought the economic case for developing the industry was weak.
- The main economic benefits would be restricted to companies in the oil and gas sector and their shareholders; respondents viewed these beneficiaries in a negative light, describing their ‘profit motive’ or ‘wealth extraction’ as something which should not be encouraged or supported.
- The number of jobs that would be created would be small. Many of the jobs would be short term, and would go to ‘outside contractors’; moreover many of the jobs that would be created would be ‘low quality’ or ‘low skill’ jobs and they would be restricted to (a few) local areas.
- There could be ‘economic disbenefits’ which also needed to be considered, including (negative) impacts on house prices and damage to roads.
- The same amount of money invested in almost any other industry would create a greater ‘return on investment’ in terms of the number of jobs supported. In particular, it would be preferable to invest in renewable technologies. Linked to this was a view that investing in unconventional oil and gas would act as a disincentive to investment in other (energy) industries.

11.7 By contrast, the alternative view which was put forward by those supportive of unconventional oil and gas was that there would be significant economic benefit (described by some as ‘an unmissable opportunity’) of developing an industry in Scotland. These respondents highlighted that:

- The growth in the Scottish economy, and the related wealth creation and increased employment, would allow a wide range of social, environmental, and community

benefits to be pursued. These included: funding for research and development of renewable technologies; the reduction of fuel poverty; investing in methods for reducing energy demand; the potential to build expertise in a sector where Scotland could have an international and leadership role including the provision of services beyond Scotland; and the opportunity for Scotland to continue to build its tradition for engineering excellence.

- There would be many jobs created both directly (within the industry itself) and indirectly (through supply chains). Jobs in the unconventional oil and gas sector could help to manage the decline of employment / assist with redeployment in the conventional (offshore) oil and gas industry; many of the jobs created would be high quality, highly skilled jobs and the current capability within the conventional sector can be 'ported' into the unconventional sector. It was argued that if the investment was not made in Scotland, the jobs will 'go elsewhere' within the UK and Scotland would lose out.
- The petrochemical and related industries would benefit economically from the cost advantages of having a domestic supply of gas, and there was specific mention of securing jobs at Grangemouth. Furthermore, any surplus oil and gas can be exported or sold. The energy source is close to existing markets and the transportation infrastructure is in place; this will enable the industry to work more efficiently, to the benefit of the whole Scottish economy.
- Jobs will be created in deprived areas where they are much needed, and young people in particular will benefit from this development.

Energy mix and energy security benefits

11.8 Respondents held a range of views on the benefits of developing an unconventional oil and gas industry for Scotland's 'energy mix' and 'energy security'. Among those who raised this point, there was a general view that access to an additional source of energy for both domestic and industrial purposes was 'a good thing' and that reducing dependence on imported gas and being more 'self-sufficient' in relation to Scotland's energy requirements (and thereby improving energy security) was desirable.

11.9 However, respondents differed in their assessment of the scale of these benefits and of the extent to which these benefits outweighed the risks. Those opposed to establishing an unconventional oil and gas industry emphasised that:

- Any benefits to energy security would depend on whether the industry is economically viable and whether it was developed responsibly and safely. These respondents did not believe it was viable, or that it could be developed safely.
- The additional supply would be small and temporary, and too late to be considered as a 'transition fuel', according to the calculations provided in the consultation paper; there would be no (positive) impact on energy prices.
- It would be better to leave these resources in the ground 'for now', until there was a better understanding of the risks involved in their extraction.
- Although this is an additional source, and diversity of supply is important, this is a 'cheap and dirty fuel' and not one which can be viewed positively when weighed against the risks.

11.10 By contrast, respondents who were supportive of unconventional oil and gas highlighted that:

- It is important to make use of currently untapped resources (of oil and gas) which will continue to be relied on as an energy source for decades to come while cleaner technologies are developed and while the capacity of (current) renewable technologies are increased. This additional source would allow the ‘transition period’ to decarbonisation to be stretched and would offer a longer term sustainable source of hydrocarbons.
- The less exposure there is to foreign imports and the associated potential supply-side shocks, uncertainties and variable costs the better. In particular, increasing price stability (and mitigating the price risk) was seen to be vital. Furthermore, it was suggested that it would be possible by this means to displace imported liquefied natural gas by 2030.
- The additional supply from unconventional oil and gas will enable generating capacity associated with high greenhouse gas emissions to be decommissioned.

Community benefits

11.11 Respondents who were opposed to unconventional oil and gas did not refer to any community benefits which would arise as a consequence of the development of an industry. However, those in favour of developing an industry suggested that there was a range of community benefits which would flow from the decision to proceed.

11.12 Those who were supportive of unconventional oil and gas argued that community benefits would follow as a consequence of the economic benefits. In particular, these respondents thought that communities, particularly those in locations which might struggle to attract investment, would benefit from increased employment opportunities, and from the investment which would be channelled through community benefit schemes. It was suggested that community infrastructure would be improved and upgraded (e.g. public transport, sports facilities, pedestrian routes etc.), and that the health and wellbeing of communities would benefit from this additional investment. Finally, there was the potential for land to be improved post-decommissioning, which would benefit communities.

Environmental benefits

11.13 In most cases, respondents did not think there were any environmental benefits of developing an unconventional oil and gas industry; indeed they often highlighted in their responses the view that the unconventional oil and gas industry should be banned completely because of the associated risks and potential damage to the environment. By contrast, those who were in favour of establishing an industry in Scotland thought that there would be a decrease in greenhouse gas emissions (and therefore a positive impact on climate change) as unconventional oil and gas was substituted for fuels with a higher ‘lifecycle emissions’ profile both within the UK and elsewhere, and the number of ‘gas miles’ travelled was reduced.²²

²² The argument was that Scotland could substitute domestically sourced gas for imported LNG; the imported LNG could then be substituted for coal stocks elsewhere in the world (e.g. China)

11.14 Occasionally, respondents on both sides of the argument about unconventional oil and gas suggested that one environmental benefit of developing an industry would be to reduce the numbers of windfarms and offshore oilrigs around Scotland; these were described as visually unattractive and undesirable.

Other benefits

11.15 There was a range of other benefits suggested by those who favoured the development of an unconventional oil and gas industry. These included:

- Gas-powered electricity production is very responsive to demand, and is the first to increase when there is additional load in the system.
- For landowners, there is the potential for land to be leased, which could contribute positively to enhanced business resilience (through diversification).
- There is an opportunity to improve the regulatory framework and the associated public engagement procedures and to bring safety standards under domestic control.

Other relevant considerations

11.16 A number of other issues were raised by respondents including that:

- Considering the unconventional oil and gas sector in isolation from the rest of the 'energy system' was inappropriate. A more relevant question to ask – although much harder to answer – was 'What is the best way to provide a decent standard of living while minimising environmental impacts?'
- It was not clear to some respondents whether investment in the unconventional oil and gas industry would help or hinder investment in renewable technologies. (Note however, that respondents who commented at Question 4 – about the role of unconventional oil and gas in Scotland's energy mix – believed that it would hinder investment. See paragraph 7.8.)
- Scotland needed to demonstrate that it was 'open for business' and the development of an unconventional oil and gas industry would signal this.
- Development of the industry should not go ahead unless and until any benefits are fully under the control of the Scottish Government.
- There was not sufficient information available to judge what the main benefits of developing the industry would be.

12. Risks/challenges of an unconventional oil and gas industry (Q9)

12.1 This chapter discusses respondents' overall views relating to the risks or challenges of an unconventional oil and gas industry in Scotland. Question 9 invited comments as follows:

Question 9: Overall, and in the light of the available evidence, what do you think would be the main risks or challenges, if any, of an unconventional oil and gas industry in Scotland?

12.2 Altogether, 29,962 respondents addressed this question. This comprised 127 organisations; 14 discussion groups; 3,921 individuals; 20,726 standard campaign respondents and 5,174 petition signatories.

Overview of responses to Question 9

The **predominant** view was that the development of an unconventional oil and gas industry in Scotland would carry substantial risks – to health and wellbeing, to communities, to the environment, and to the economy. These risks were generally seen to be long-term and irreversible. Respondents with these views had no confidence in any regulatory framework, irrespective of how strict or robust it is, to adequately manage these risks or to prevent accidents and incidents.

The **alternative** view was that all industrial activities have risks – particularly if they are located in areas of high population density. However, the risks of an unconventional oil and gas industry were seen to be minimal and manageable, and Scotland's regulatory regime was considered to be well equipped to deal with these. Independent monitoring of the industry would ensure that operations are well managed at all stages, from planning and exploration, through to decommissioning and aftercare. Respondents with these views thought that the biggest challenge was to address public misinformation and build public confidence in the industry.

12.3 'Risks' and 'negative impacts' were mainly identified by those opposed to the development of an unconventional oil and gas industry in Scotland. Most often, respondents discussed the risks of an unconventional oil and gas industry in terms of the risks to: health and wellbeing, communities, the environment, and the economy. Responses to this question frequently took the form of lengthy bulleted lists which recapped points previously made by respondents elsewhere in their submissions. These views have been set out in detail in the earlier chapters of this report (Chapters 4 to 10) and so are summarised only very briefly here.

12.4 Some respondents also identified political risks and, occasionally, business-related risks. The former were raised by respondents of all types (individual, organisational) regardless of their views on unconventional oil and gas; the latter tended to be highlighted by those working in the oil and gas industry or other supporters of the industry.

12.5 Regarding challenges, those opposed to the development of an unconventional oil and gas industry identified a range of challenges **if** a decision is taken to lift the existing moratorium and allow the development of an unconventional oil and gas industry in Scotland. These challenges related mainly to the mitigation of risks and the development and enforcement of an effective regulatory framework. By contrast, respondents supporting the establishment of the industry often discussed different types of challenges – related to allaying community concerns and addressing misinformation, which they saw as necessary to enable the industry to proceed.

12.6 The following general points should be noted:

- As suggested in Chapter 11, most respondents saw **only** risks from the development of an unconventional oil and gas industry in Scotland and **no** benefits. The risks were considered to be ‘substantial’, ‘serious’, ‘long-term’, ‘irreversible’ and ‘global’ as well as local.
- Respondents often referred to ‘evidence’ in their comments. However, on the basis of the same evidence, some respondents drew the conclusion that the risks of an unconventional oil and gas industry were too great to proceed, others drew the conclusion that the risks were minimal and manageable, and a third group saw the risks as ‘unknown’ or ‘unknowable’.

Summary of main risks

12.7 The main risks identified by respondents in relation to the development of an unconventional oil and gas industry are summarised below. It is worth emphasising that these risks, and the potential negative impacts resulting from them, were seen to be inter-related. Thus, the same risk (e.g. water contamination) could have multiple negative impacts – on health, on the environment, on communities and on the economy.

Risks to health and wellbeing

12.8 Respondents pointed to the potential for negative impacts on physical health from contaminants (in air, water or land), pollutants and carcinogenic chemicals. These risks were seen to be greatest for the vulnerable (i.e. children, the elderly, those with existing health conditions) and those living near drilling sites. Some respondents also highlighted the potential for impacts on mental health and wellbeing (related to noise, odours, traffic and pollution).

12.9 Those opposed to the development of an unconventional oil and gas industry and those in favour both commented that there is a lack of evidence regarding health impacts. Most often, respondents saw this as a reason not to establish an industry in Scotland; the alternative view was the current evidence provides no reason **not** to proceed.

Risks to communities

12.10 Respondents saw the potential for negative impacts on the quality of life in communities (in relation to noise, pollution, traffic, etc. as noted above), and on housing and home ownership (being unable to sell a house, falling house prices, difficulties obtaining insurance or a mortgage). They also saw the potential for an unconventional oil and gas industry to cause division within communities if some were seen to benefit from the industry while others experienced only negative impacts. Related to this, community benefit schemes

linked to an unconventional oil and gas industry, in particular, were seen to be potentially divisive. However, there was also a view that if an industry were established, the community benefit scheme would be inadequate or fail to provide any real benefit to communities.

12.11 There was a view that the consultation paper had not given adequate attention to discussing the risks to quality of life issues, and the potential effects of an unconventional oil and gas industry on local social and cultural life. Some respondents commented that industrial activities can have a cumulative effect on communities, and many of the communities that may be affected by an unconventional oil and gas industry were already coping with the effects of large-scale industrial waste facilities, incinerators, and landfill sites nearby.

12.12 Discussion groups often highlighted local incidents and accidents from current and historic industrial activities which they said had not been well-managed by the respective industries or by the regulatory bodies established to oversee and monitor them.

Risks to the environment

12.13 Respondents discussed the risks of pollution (air, water and land); the risks of earthquakes; the negative visual impact of wells and drilling sites; and the risks to wildlife and habitats. In addition, there were frequent comments about the risks of fugitive methane emissions; the risks of maintaining a dependence on fossil fuels; the risks of removing the urgency to invest in cleaner, greener approaches to energy generation; and the consequences of all these things for climate change. Finally, respondents saw risks associated with the restoration of land (i.e. that it may take decades for land to be returned to its original state and / or that the cost of restoration will end up having to be funded by the public purse).

12.14 Some respondents discussed the geology of Scotland, the ways in which Scotland's geology differs from that in countries where hydraulic fracturing has previously been carried out, and the potential for earthquakes and subsidence.

Risks to the economy

12.15 Respondents opposed to unconventional oil and gas discussed the risks of job losses and reputational damage to tourism and the food and drink sector; the risks of further job losses in the offshore oil and gas industry; the risk of diverting investment away from developing a low carbon economy; and the risks of increased costs to taxpayers related to the regulation of the industry.

12.16 Those supporting the establishment of an unconventional oil and gas industry also identified economic risks – they saw the risks of **not** moving ahead in terms of Scotland's increased dependence on imported gas; job losses; and a loss of future investment.

Additional risks (not previously discussed)

Political / societal risks

12.17 Respondents on both sides of the debate identified a range of political risks related to the establishment of an unconventional oil and gas industry in Scotland. Those who were opposed to the industry tended to focus on the potential risks **if** a decision is taken to establish an industry. These included: (i) the risk of local communities losing faith in

government / politicians and the political process; (ii) the risk of public resistance, dissent, and legal challenges from communities; and more broadly, (iii) the risk to Scotland's reputation as a progressive nation and a world leader on climate change and in promoting renewables.

12.18 Those in support of the industry highlighted: (i) the risk that politicians and other stakeholders might make decisions about unconventional oil and gas based on political motives rather than an informed understanding of the evidence; and (ii) the risk of a lack of political leadership (potentially resulting in a missed opportunity for Scotland). Occasionally, among this group, there were suggestions that if a decision is taken to establish an unconventional oil and gas industry, there was a risk of government mismanagement of the industry and the consequent potential benefits.

Business risks

12.19 The potential for business risks were generally raised by respondents supportive of the development of an unconventional oil and gas industry. They saw risks in the possibility that the industry may be less viable / valuable than anticipated; that there may be legal challenges from communities; or that the industry may be dissuaded from investing in Scotland due to public opposition and a lack of political support.

12.20 Occasionally, those who were opposed to the industry also highlighted business-related risks, but these were of a different nature to those above. Some in this group saw a risk that the industry might grow beyond initial expectations 'once it had a foothold' in Scotland; others saw a risk that it would not 'deliver its promised benefits' (i.e. in terms of jobs, quality of jobs, community benefit schemes, decommissioning / restoration of land).

Challenges

12.21 In the main, respondents identified challenges that would arise **if** an unconventional oil and gas industry were established in Scotland. These challenges were seen to relate to:

- Developing and enforcing effective regulation
- Monitoring environmental effects throughout the whole lifespan of a well – and beyond, after the restoration of land
- Mitigating negative impacts (on the environment, on communities, on the economy, etc.)
- Meeting climate change commitments.

12.22 Those in favour of the development of an unconventional oil and gas industry highlighted different types of challenges. The most significant of these was in relation to building public confidence in the industry. Those who raised this issue emphasised the challenges of countering misinformation spread by the 'anti-fracking lobby', persuading the public that the industry is safe, and obtaining planning consent to proceed. It was suggested that one way of doing this would be to undertake initial exploratory work (or a pilot project) in one low risk area away from densely populated communities. This would allow a better assessment of the risks and the viability of the industry in Scotland.

Managing the risks and challenges

12.23 In discussing the risks and challenges of developing an unconventional oil and gas industry in Scotland, respondents also sometimes discussed their views on whether and how the perceived risks could be managed.

12.24 The predominant view was that the risks were simply too great, and therefore, no unconventional oil and gas industry should be established. A slight variation on this view was that no matter how small the risks, accidents and incidents will happen, and these are likely to have severe and long-lasting effects. A third, related view was that Scotland has no need for additional sources of gas (because there are still reserves in the North Sea, and because of Scotland's focus on moving to a low carbon economy); therefore whatever the risks are, they should not be taken.

12.25 Respondents who were opposed to the development of an unconventional oil and gas industry also repeatedly queried whether there was sufficient technical expertise, capacity and resources within local authorities and regulatory bodies. There were also concerns that even if a strict regulatory framework were developed, the likelihood was that standards and enforcement activities would become more relaxed over time. Overall, this group had little confidence in the ability of regulatory bodies to prevent accidents or incidents, or to robustly monitor activities in this area. (These issues have been discussed in detail in Chapter 10 of this report.)

12.26 The alternative view was that the unconventional oil and gas industry had no more risks than many other industries, and far fewer risks and challenges than the offshore oil and gas industry. Respondents in this group argued that the Scottish Government's own expert scientific panel had concluded that the challenges of establishing an onshore industry were not insurmountable, and they emphasised that any impacts to communities could be minimised through careful site selection. They also argued that Scotland's regulatory regime was well equipped to take on the task of monitoring and overseeing this new industry.

13. Other comments (Q10)

13.1 The final consultation question asked respondents for any other comments on issues discussed in the consultation paper:

Question 10: If you have any other comments on the issues discussed in this consultation, please provide them here.

13.2 Altogether, 55,688 respondents addressed this question. This comprised 142 organisations, 14 discussion groups, 3,422 individuals, 21,077 standard campaign respondents and 31,033 petition signatories.

13.3 This chapter presents a summary of the comments made at Question 10. It also: (i) considers respondents' comments made in response to preceding questions which did not directly address the questions as posed, and (ii) discusses themes which recurred in comments across all questions.

13.4 In many cases, respondents used Question 10 to restate their views on the potential social, economic and environmental impacts of an unconventional oil and gas industry if it were established in Scotland; such comments have been covered in the preceding chapters and are not discussed here again.

13.5 The three main themes identified at Question 10 related to: (i) the case respondents put forward for and against the development of an unconventional oil and gas industry; (ii) their views about the next steps in the process of making of a decision about the future of unconventional oil and gas in Scotland; and (iii) issues relating to the current evidence base. In addition, respondents also frequently used Question 10 to explain why the issue of fracking was of personal interest to them. These comments are considered first.

Context and personal perspectives of the respondents

13.6 When discussing their views about unconventional oil and gas, respondents often made their personal perspective on fracking clear, indicating, for example, that they were a parent, a grandparent, a resident of an area which had been earmarked (potentially) for fracking, a person with relevant academic or professional expertise, etc. Respondents living outside of Scotland often explained that their interest in the consultation was based on a personal connection to Scotland (as a past resident, a regular visitor, or because they had a family member living in Scotland).

13.7 There was particular concern expressed about the situation in England where hydraulic fracturing has been allowed to proceed despite widespread opposition from local residents and local authority refusal to grant planning consent. Respondents based in these areas often called on the Scottish Government to help support them in their opposition to fracking in their own communities, by 'taking the lead' in the UK, and there were frequent calls for a UK-wide ban.

13.8 Some respondents also commented that they saw fracking as an issue of international significance. Those opposed to fracking indicated that they were opposed to the practice not only in Scotland, but elsewhere as well. Occasionally, respondents from outside the UK

referred to their own (mainly negative) experiences of fracking or other large-scale industrial developments in their own countries.

13.9 Respondents also referred to a range of reports (academic and non-academic), media reports and films and often stated that their own views about fracking had been informed by what they saw as ‘the evidence’ contained therein.

The case for and against fracking

13.10 As noted above, respondents frequently used Question 10 as an opportunity to state, or restate, their views of fracking. (Note that the consultation did not contain a question which specifically asked about support or opposition to fracking.) As discussed in Chapter 3 of this report, the overwhelming majority of respondents explicitly stated that they were opposed to fracking and the development of an unconventional oil and gas industry in Scotland. It was common for respondents to say this in just a few words, for example: ‘ban fracking’, or ‘I don’t want fracking in Scotland’, without expanding further. Less often, respondents indicated support for fracking. Some in this group also offered very brief comments such as: ‘I am for fracking’, ‘I want fracking to happen in Scotland’, and ‘Get on with it’.

13.11 However, some respondents provided further information, and these comments are considered here.

The case against fracking

13.12 Those opposed to fracking often discussed their strength of feeling on this issue, and appealed to the Scottish Government to ‘do the right thing’ and ‘ban fracking once and for all’. Arguments were often presented in terms of a democratic imperative, with respondents urging the Government to ‘listen to the people of Scotland’, including those in communities likely to be affected who, it was said, were overwhelmingly opposed. Respondents emphasised the importance of this decision for Scotland and the people of Scotland, now and for future generations. Other points highlighted in the responses included the following:

- The nature of fracking is such that its negative impacts would be serious, long-term, and irreversible.
- There were many examples of detrimental environmental and health impacts elsewhere in the world, some of which had led to an explicit ban on fracking (e.g. France, Netherlands, New York, etc.).
- Scotland is a small country and the potential drilling sites are in highly populated areas which are already compromised by previous mining activity, so the implications of proceeding would be very different from those in America, Australia, Canada, etc., which were large countries with much lower population densities.
- The geology of Scotland is different to other countries where fracking has taken place. While some respondents suggested that Scotland’s geology made it unsuitable for fracking, others suggested that the negative impacts of fracking would be potentially much greater because of Scotland’s geology.
- Scotland’s future is with renewables, energy efficiency and a move away from carbon fuels; respondents were positive about Scotland’s action to date in these areas and called for the Government to further prioritise this work.

13.13 At a more general level, the Scottish Government was urged to look at what was happening elsewhere in the world, and / or to take a long-term view in making its decision.

The case for unconventional oil and gas

13.14 In contrast, those in favour of the development of an unconventional oil and gas industry in Scotland urged the Government to make a decision based on the evidence (which they thought supported the case), rather than what they described as ‘vocal campaigns’ and (uninformed) ‘public opinion’. This group thought that Scotland should take advantage of what they saw as an important opportunity in terms of industrial and technological gain and economic benefit. In making their case, these respondents emphasised that:

- Scotland has a strong tradition in engineering and innovation and has the expertise to make a success of unconventional oil and gas, and to take a leading role in the industry.
- Scotland risks falling behind other nations as they move ahead with investments and developments in this industry, and there are potentially economic costs to **not** proceeding which need to be considered.

13.15 These respondents called for the Government to be ‘brave’ and take a strong stance in allowing the development of an unconventional oil and gas industry for the benefit of all. There was also a view among this group that the use of the term ‘fracking’ in the consultation paper was unfortunate as this was perceived to be an emotive term with negative connotations; it was suggested that it would have been preferable to refer instead to ‘onshore gas extraction’ and to move the debate beyond discussions about the method of extraction and focus instead on the importance of having secure and diverse sources of energy as Scotland makes the transition to a low carbon economy.

Decision making – the next steps

13.16 Another significant theme in respondents’ comments at Question 10 related to their understanding of, or views about, what the next steps for the Scottish Government should be in making a decision about the future of unconventional oil and gas in Scotland.

13.17 Although, in the main, respondents simply argued for either a ban on fracking or for fracking to be allowed to proceed, there were also some variations on these ideas, with a small number of respondents suggesting that: (i) the moratorium should be extended, (ii) there should be a temporary ban, or (iii) Scotland should delay its decision while continuing to monitor emerging evidence and developments elsewhere. Respondents who were supportive of the development of an unconventional oil and gas industry often said they were keen to see a ‘quick and final decision’ on the issue.

13.18 There were also comments about the respective roles of the Scottish Government and UK Government in making the decision. Those opposed to the establishment of an unconventional oil and gas industry thought this decision should be taken by the Scottish Government (or Parliament). At the same time, some respondents thought that any attempt to **ban** fracking in Scotland might be outwith the powers of the Scottish Parliament and open to being overturned by the UK Government or to legal challenge from the oil and gas industry. Respondents who raised this issue suggested that extending the current moratorium might, therefore, be an equally effective solution. There were calls for clarity on this issue, and clarity on the technical difference between a ‘ban’ and a ‘moratorium’.

13.19 Those supportive of the development of an unconventional oil and gas industry in Scotland sometimes suggested that exploratory drilling might begin in a limited way, and this could be monitored and evaluated to assess the viability of the industry and its likely impacts. It was suggested that test sites located away from populated areas should be selected to allow their impact to be assessed in less risky circumstances, and that exploratory projects should work closely with local communities.

The role of different stakeholders in the decision making process

13.20 Respondents on all sides of the debate about unconventional oil and gas endorsed the importance of community engagement and community participation in the decision making process, and the importance of properly informed debate at national and local level. There was a range of comments about the influence of different lobby groups. Most often, those opposed to unconventional oil and gas expressed concerns about the potential for big business to use their power to influence the decision. Respondents who raised these concerns called for the decision to be taken in the interests of the people of Scotland rather than in the interests of energy companies and their shareholders. In contrast those supportive of an unconventional oil and gas industry argued that environmental groups promoting an anti-fracking agenda were dominating the debate at the expense of local communities. There was a view that more emphasis should be placed on getting the views of affected communities.

13.21 In a few cases, respondents called for a national referendum to be held on the issue, or for local referenda to be held in potentially affected areas. Others argued that the case for unconventional oil and gas needed to be judged on a case-by-case basis in local contexts.

The Scottish Government position

13.22 Respondents opposed to fracking frequently commended the Scottish Government for its stance to date on this issue – and on other issues relating to the environment and sustainability. In urging the Scottish Government to ban fracking, respondents argued that to do otherwise would be inconsistent with the Scottish Government's 'progressive' agenda and existing strategic commitments and priorities on climate change, on renewables, and on tackling social and health inequalities. They also thought that the decision on unconventional oil and gas could not be taken in isolation but should take account of other wider policy issues, including the Government's overall energy strategy.

13.23 Respondents also suggested that a decision to allow unconventional oil and gas extraction to go ahead would represent a significant 'u-turn' with regard to the Government's stated position.²³ Moreover, some respondents were concerned that the decision to consult on the issue already indicated that the Government may be shifting its position (or may be prepared to do so).

13.24 In endorsing the Scottish Government's current stance on environmental issues, respondents often suggested that Scotland was providing leadership in this area. As such, they thought the Scottish Government could build on this position, acting as an example to other

²³ There were repeated references to the First Minister's statement that: 'Unless it can be proven beyond doubt that there will be no risk to health, communities or the environment, there will be no fracking or unconventional oil and gas extraction in Scotland'.

countries around the world, including within the UK, if unconventional oil and gas extraction were banned in Scotland.

13.25 Respondents supportive of unconventional oil and gas took a different view. They argued that it was the role of government to take strategic and often difficult decisions on behalf of the whole population; to ensure that the country reaped the potential benefits of economic opportunities; to ensure effective regulation to mitigate risks; and to educate people about 'risk' and work to alleviate public concerns. Respondents urged the Scottish Government to be 'bold' and 'show vision' in allowing an unconventional oil and gas industry to proceed. Furthermore, respondents in this group argued that development of the industry in Scotland would support the Scottish Government's aim of growing the economy and be in line with its energy and industry strategies.

Evidence and information

13.26 Finally, the third major theme in respondents' comments at Question 10 (and across other questions) was in relation to the evidence and information available to inform the decision about a possible development of an unconventional oil and gas industry in Scotland.

13.27 Respondents frequently voiced support for the evidence-based approach taken by the Scottish Government to date, and they highlighted the importance of learning from experience elsewhere. Alongside that support, however, there was also concern about a lack of conclusive evidence on particular issues, and the extent of assumptions and 'unknowns'. There was also criticism from a range of perspectives that the evidence and the consultation paper either downplayed or exaggerated the risks of hydraulic fracturing, was not impartial, or was incomplete. Some respondents also called for clarity as to how the responses to the public consultation would be used in reaching a decision on the role of unconventional oil and gas in Scotland, and how different types of evidence would be weighed in that process.

13.28 Some respondents called for the Scottish Government to take a 'precautionary approach' towards unconventional oil and gas. However, there were varying interpretations of exactly what that might mean for policy in this area. Some respondents argued that the lack of conclusive evidence about the impacts of hydraulic fracturing – or the presence of any risk, however small – meant that fracking should be banned outright. Others thought that risks could be managed, and that fracking should proceed on a limited and cautious, and well-regulated basis while the industry bedded down and more evidence was gathered.

13.29 Respondents made a range of other more specific points, including that:

- There was insufficient evidence at the current time to reach a decision and more research was needed. (This was particularly raised by those who had ambivalent or mixed views about unconventional oil and gas.)
- There were specific gaps and inadequacies in the work commissioned by the Scottish Government. Gaps included the absence of an environmental impact assessment, a hydrology report, an equalities or communities impact assessment; research on wildlife impacts; and a representative survey of the general public in Scotland. Shortcomings included the limitations of the health impact assessment; the absence of long-term monitoring data; and the narrow focus of the economic report. Research on the wider implications of unconventional oil and gas for Scotland's infrastructure was also called for.

Annex 1: Campaign responses

This annex provides further information about the campaign responses received in the consultation. Copies of all the standard campaign texts are provided below.

It should be noted that:

- Each of the campaigns asked their supporters to provide variable levels of detail in relation to personal information (i.e. name and contact details). Some campaigns asked for full postal addresses, others asked for email addresses only.
 - All campaign responses received in the consultation were checked to identify whether they were 'standard' or 'non-standard'. Non-standard responses were copied into the analysis database and put through the validation process described in Annex 3 (see below). Standard responses were not validated in the same way; they were simply counted and the numbers reported. Thus, there has been no process of identifying and removing invalid responses or duplicates within the standard campaign responses.
 - Within each of the campaigns, there were a small number of non-standard responses in which the respondent had edited the standard response to express support for fracking. These have been reported as non-standard campaign responses under the campaign through which they were received (see again Annex 3). However, technically, they are not campaign responses; they are personal responses to the consultation which the respondent simply chose to submit through the means provided by the campaign organisers.
 - A small number of standard campaign responses (mainly those submitted through the Friends of the Earth and Greenpeace campaigns) were from organisational respondents. These organisations are not included in the figures shown in Table 2.5 in Chapter 2, nor are they listed in Annex 4 of this report.
-

Avaaz online campaign

The Avaaz campaign provided a list of bullet points to assist respondents in drafting a consultation response which could then be submitted via the Avaaz website. For the purpose of the analysis, the text was seen as relating to Questions 1, 3, 6 and 10 of the consultation questionnaire.

Send a message to ban fracking

The Scottish government has announced a **public consultation to help them make a final decision on a fracking ban.**

We have just days to flood them with our voices. If enough of us write to them we can show the government the world is looking to them for leadership, and we could win.

Send a message now by using the tool on the right and feed in directly to the public consultation! Here are some talking points to consider, but remember -- the more personal, the better.

- As a member of the Scottish public, I call on you to ban unconventional oil and gas from Scotland until we know it's 100% safe to our health.

- There is overwhelming evidence that proves fracking chemicals are cancerogenic, can be linked to reproductive health problems and lead to dangerous water pollution.
- Experts say economic benefits of fracking are exaggerated. Household energy bills won't be reduced and the estimated costs will be much higher than in US.
- More and more states and counties across US and Australia are banning fracking. I ask you to act responsibly for the future of our homeland!
- Burning fossil fuels is the key driver of global warming. Experts are warning: letting fracking industry in could mean that Scotland won't meet its legally binding climate targets. We can't afford to frack our planet.

Broad Alliance postcard campaign

The Broad Alliance – Communities against UOGE provided pre-printed postcards to be submitted as responses to the Scottish Government consultation. The postcards contained 9 points and a space for people to add their own personal comment. For the purpose of the analysis, the text was seen as relating to Questions 1-10 of the consultation questionnaire.

- (1) The social, community and health impacts of **unconventional oil and gas** extraction (UOGE) would be disastrous.
- (2) The payments companies promise may never materialize and won't cover damage to environment and infrastructure (roads, bridges, land, water).
- (3) UOGE is a threat to tourism, whisky and modern sustainable industries. Potential pollution of air, land and water puts the 'Scottish brand' at risk.
- (4) 5.5 years' worth of gas over 42 years (Economic Impact Study) means that UOGE would not really contribute to Scotland's energy supply.
- (5) The environment will suffer: loss of amenity, risk of toxic leaks, heavy traffic and pollution. Noise and light pollution from 24-hour working is bad for people and wildlife.
- (6) We must tackle climate change by replacing fossil fuels; US studies show fracked gas can be worse than coal for the climate. Your government's Climate Impact Study says a UOGE industry would make it harder to achieve climate targets.
- (7) The taxpayer would end up paying for monitoring, regulating and cleaning up, for no return. No regulation can make this high risk business safe.
- (8) UOGE's contribution to GDP (0.1% over 42 years) and jobs (1,400 over 42 years) is negligible (Economic Impact Study).
- (9) The main risk is to health, especially the health of children who are still developing. The challenge is for your government to have the courage and foresight to ban UOGE (fracking) here.
- (10) Other points I want to make:

Broad Alliance: model answers to consultation questions

The Broad Alliance provided written answers to the questions posed in the Scottish Government consultation, inviting people to use them as they are, or edit them to reflect their own views and priorities. For the purpose of the analysis, the text below was seen as relating to Questions 1-10 of the consultation questionnaire.

Q1: What are your views on the potential social, community and health impacts of an unconventional oil and gas industry in Scotland?

- The social, community and health impacts are entirely negative. Therefore my view is that there should be no unconventional oil and gas industry in Scotland.
- Social impacts would include destruction of trust between people and government, imposing a dirty industry with health and environment risks on communities, without their consent, to enable short-term profits for fracking companies.
- Community impacts would include loss of environmental assets, increased traffic disrupting community life and cohesion, falling house prices, difficulty attracting modern, clean industries that will supply jobs of the future.
- Health risks are clearly set out in the Public Health Scotland impact study and therefore the precautionary principle must apply. Since it was written, further significant peer-reviewed studies from the United States have highlighted that the health of people, including unborn children, suffers when they live close to fracking operations.

Q2: What are your views on the community benefit schemes that could apply, were an unconventional oil and gas industry to be developed in Scotland?

- It is a bribe to try to convince individuals and local authorities to accept fracking. There is no guarantee anything will be paid. Companies can declare losses to limit payments. The fracking companies will not pay for fixing damaged road surfaces, bridges and other infrastructure, or for cleaning up spills of fracking fluids on the public roads. As with the coal industry, and the first shale industry, the public purse will be left to clean up when the companies have left.

Q3: What are your views on the potential impact of unconventional oil and gas industry on Scotland's economy and manufacturing sector?

- I agree with KPMG, authors of the government's impact study, who confirmed that it would "not make a significant contribution to Scotland's economy". It will negatively impact manufacturing, distracting focus from support for industries that would contribute to a sustainable economic future. It will damage tourism and the Scotland "brand", especially for food and drink.

Q4: What are your views on the potential role of unconventional oil and gas in Scotland's energy mix?

- The KPMG impact study confirms that fracked gas will be mainly for INEOS to extract Ethanol to make plastics. It might contribute a maximum of 5.5 years of Scotland's need for fuel gas over 42 years. But INEOS is planning to use any fuel gas for its plant at Grangemouth. Therefore it will not be part of Scotland's domestic energy supply. So, as KPMG also confirms, it will not reduce consumer gas prices.

Q5: What are your views on the potential environmental impacts of an unconventional oil and gas industry in Scotland?

- This is a dirty, dangerous fossil fuel extraction industry. It would happen in Scotland's most populated area with the fracking companies allowed to decide how close to people's homes they put the wells. Local authorities trying to prevent it would have to challenge the fracking companies at expensive planning enquiries, and pay for their own environmental impact studies, diverting money from other services with no guarantee they would win their case. There will be leaks of fracking fluids, both from split fracking pipes and on site during production. This puts the water supply at risk. There will be further leaks when the flowback water is being transported on Scotland's roads to treatment plants. The evidence is that treatment of fracking fluid is only partially successful, especially in terms of radioactive materials. We should not put it in our rivers and seas. There will be methane leaks, which is bad for health, especially children's health. There will be long periods of 24-hour noise and vibration and all-night lighting which is damaging to people's mental health and wellbeing. There will be more heavy traffic, with the attendant pollution.

Q6: What are your views on the potential climate change impacts of unconventional oil and gas industry in Scotland?

- The Climate Change Committee impact study told the Scottish government that fracking is only acceptable if 3 tests are met:
 1. There are cuts in emissions in other industries, including agriculture, to make up for fracking. Why should other industries do this? Who will make them?
 2. Fracked gas is balanced against a reduction in imports. With INEOS committed to importing fracked gas from the United States, this cannot be achieved.
 3. There is intensive well-by-well monitoring. SEPA could not provide this level of monitoring, and the public should not have to pay for the introduction of a new regulatory regime.

In other words, the 3 climate tests cannot be met and therefore fracking should not be permitted.
- Global warming scenarios all point to the fact that the majority of fossil fuel reserves must remain unused if global temperature rises are to be kept to the Cop21 agreement of 2°C. Scotland must play its part by banning Unconventional Oil and Gas Extraction.

Q7: What are your views on the regulatory framework that would apply to an unconventional oil and gas industry in Scotland?

- There is currently no appropriate regulatory framework for unconventional gas; one would have to be created as the Government's own report makes clear. This would cost a significant amount of public money, at a time of cuts and austerity. The Scottish Environmental Protection Agency (SEPA) has confirmed that its regulation policy is as follows: "SEPA's enforcement philosophy is to use the minimum amount of formal regulation necessary to secure compliance. An exceedance of an environmental quality standard is not in itself indicative of non-compliant or illegal activity on the part of the operator and thus a breach would not necessarily precipitate significant enforcement action." This approach has already proved inadequate in a range of industries. In terms of fracking it would be disastrous.

Q8: Overall, and in light of the available evidence, what do you think would be the main benefits, if any, of an unconventional oil and gas industry in Scotland?

- There would be no benefits to Scottish communities or the Scottish economy as a whole.

Q9: Overall, and in light of the available evidence, what do you think would be the main risks or challenges, if any, of an unconventional oil and gas industry in Scotland?

- Danger to health especially the health of children and the unborn.
- Risk to mental health and well-being of communities near fracking wells.
- Creation of “sacrifice zones” where people will be unable to sell their homes and new development is halted both for housing and clean business.
- 24-hour noise pollution and heavy traffic carrying dangerous cargos on rural roads.
- Scotland unable to meet its climate targets
- Damage to tourism, food and drink industries
- Cost to taxpayer of intensive monitoring and regulation
- Negative impact on development of clean, sustainable jobs.

Q10: If you have any other comments on the issues discussed in this consultation, please provide them here.

1. The First Minister promised in the Scottish Parliament that unless it could be proved that fracking could be done without risk to health and the environment, it would not be permitted. The Scottish Government’s own impact studies highlight significant health, environmental and climate risks. On that basis, the government should keep its promise and ban fracking.
2. KPMG says there is no significant benefit to Scotland’s economy – why is unconventional gas even being considered?
3. How will the Scottish Government make other industries and agriculture cut their emissions to make up for the emissions from fracking, as proposed by the Climate Change Committee?
4. The public will end up paying for the clean up and abandoned wells if the market fails – this is already happening in the United States. There is speculation that future licences might include bonds to be held in trust to pay for any clean-up should the company go bankrupt or fail to fulfil its obligations – a kind of insurance policy. But it is not clear that the licences already granted by the UK government can be amended to include bonds.
5. This is a Scotland-wide consultation but the views of communities that will be most affected must have more weight in the decision-making process. It is already clear that there is no social licence for fracking in the currently licensed areas.

Friends of the Earth Scotland online campaign

Friends of the Earth provided a standard text which could form the basis of a response to the consultation which respondents had the option of personalizing. This could then be submitted to the Scottish Government consultation via the Friends of the Earth website. For the purpose of the analysis, the text below was seen as relating to Questions 1, 3, 4, 5, 6, 9 and 10 of the consultation questionnaire.

Fracking will hold back our efforts to fight climate change, poses serious public health risks and threatens communities across Scotland.

There is a significant body of evidence from around the world highlighting the serious risks of unconventional oil and gas extraction to the climate, our environment, health and communities. This is supported by key findings from the Scottish Government's own commissioned research.

In the context of the global climate crisis it is irresponsible for a country like Scotland, with a carbon intensive past and such abundant renewable resources, to open up a new frontier of fossil fuels. The UK Climate Change Committee's report you commissioned makes it clear that allowing the

unconventional oil and gas (UOG) industry to go ahead will make it much harder to meet our climate targets.

Health Protection Scotland's impact assessment has found evidence that a number of air and water-borne environmental hazards would be likely to occur as a result of UOG operations. It also confirmed that UOG workers' health could be at risk from the use of silica in fracking operations and that other hazards from the fracking industry could pose a risk to the health of nearby residents. Given significant evidence from around the world of serious public health risks posed by the industry, ranging from low birth weights to respiratory disease and cancers, the precautionary principle demands that unconventional gas extraction should not be allowed to go ahead.

Further, the research you commissioned on economic scenarios demonstrates that far from replicating the US shale boom, it is unclear if the industry is commercially viable at all in Scotland. Report authors KPMG warn that even if the industry were to get underway commercially, it would only be expected to contribute on average 0.1% GDP, and be unlikely to create plentiful skilled local jobs.

In the face of growing evidence of harmful impacts, the precautionary principle demands that fracking must not be allowed to go ahead.

I'm calling on the Scottish Government to act urgently to ban unconventional oil and gas. Please treat this as a response to the consultation 'Talking Fracking'.

Friends of the Earth Scotland postcard campaign

Friends of the Earth provided pre-printed postcards to be submitted as responses to the Scottish Government consultation. The postcards contained the statement shown below. For the purpose of the analysis, this was seen as relating to Questions 9 and 10 of the consultation questionnaire:

Fracking will hold back our efforts to reduce climate change, pose serious public health risks and threatens communities across Scotland.

A significant body of evidence from around the world highlights the serious risks of unconventional oil and gas extraction to the climate, our environment, health and communities. This is supported by key findings from the Scottish Government's own commissioned research. In the face of growing evidence of harmful impacts, fracking must not be allowed to go ahead.

I'm calling on the Scottish Government to act urgently to ban unconventional oil and gas. Please treat this as a response to the consultation 'Talking Fracking'.

Greenpeace online campaign

Greenpeace provided a list of bullet points to assist respondents in drafting a consultation response which could then be submitted via the Greenpeace website. The points were structured around three themes of environment, health and alternative energy sources. For the purpose of the analysis, this text was seen to relate to Questions 1, 4, 5, 6 and 10 of the consultation questionnaire.

'Talking points' provided:

My concerns about the environment

- Land near Falkirk, Stirling and Cumbernauld has been earmarked for fracking. The fossil fuel industry should not be allowed to drill close to residential areas like these.

- Fracked gas is a fossil fuel. Burning large quantities of it will release vast amounts of greenhouse gases and will accelerate climate change.
- A single fracking site can produce thousands of gallons of contaminated wastewater, which could cause harm if leaked into the environment (Source: [Fracking: The Evidence](#), Greenpeace report).

My concerns about health

- The UK government's own research found that people living close to fracking sites may be forced to breathe in "noxious odours from venting gases." (Source: [Shale Gas Rural Economy Impacts report](#))
- The same report found that people may also be forced to live with "light pollution that affects sleeping patterns."
- Research has shown that traffic associated with fracking can increase air pollution by up to 30% (Source: [Newcastle University](#))
- In the US, New York State and Maryland have banned fracking on public health and environmental grounds.

Scotland should invest in:

- Scotland has huge potential for renewable power and should choose to back clean technologies instead of burning fracked gas.
- First Minister Nicola Sturgeon has spoken out about the importance of tackling climate change. The Scottish government should now act on these words and commit to leaving shale gas in the ground.
- Fracking firms claim shale gas could be used to heat homes. A better idea would be for the Scottish government to make sure homes are insulated so less energy is lost. This could also help slash consumer energy bills.

Scottish Greens online campaign

The Scottish Green Party provided brief background information and three prompt questions to assist people in drafting a response to the consultation. This could then be submitted to the Scottish Government as an email message via the Scottish Greens website. The prompts related to Questions 1, 6, 9 and 10 of the consultation questionnaire and so for the purpose of analysis the responses are seen as relating to these questions.

Tell the Scottish Government to #KeepItInTheGround

In November 2016, the Government published independent research on the impacts of fracking on our health, economy and communities. There is clear evidence that extracting unconventional fossil fuels will **threaten our environments** and **endanger the health** of those living near to fracking sites. Extracting more fossil fuels will **make it harder to meet climate targets**.

The economic impacts are also uncertain. The reports suggest that far from creating a booming new industry, fracking will contribute only 0.1% to Scotland's GDP. Scottish Greens have shown that by harnessing our renewable energy potential we can create over 200,000 jobs in safe and clean ways for future generations.

The Government's independent research contains plenty of evidence for keeping unconventional fossil fuels in the ground. **But a permanent ban on fracking will only happen if we let Ministers know how important it is to halt this industry.**

Fracking should have no place in Scotland's future. **It's bad for the climate, bad for public health and won't boost our economy.**

Help us ban fracking once and for all. Respond to our consultation and let the Scottish Government know why they should #KeepItInTheGround.

What are your views on the social, community and health impacts of fracking?

- Fracking could affect me and my community by...

What are your views on the potential climate change impacts of fracking?

- Fracking is bad for climate change because...

What are the main risks or challenges of an unconventional oil and gas industry in Scotland?

- I think fracking should be banned because...

South Lanarkshire against Unconventional Gas (SLAUG) letter campaign

SLAUG provided a model letter which could be submitted as a consultation response by individuals along with a standard Respondent Information Form. This campaign was also promoted on the Broad Alliance website. For the purpose of the analysis, the points made in the letter were seen as relating to Questions 1, 3, 5, 6, 7, 9 and 10 of the consultation questionnaire.

I am writing to support the campaign against unconventional gas extraction in Scotland to protect our health, economy, landscape and environment. I want Scotland to be world leaders in renewable energy thereby reducing the impact of carbon emissions into our atmosphere causing climate change. I support the submission of the Broad Alliance representing community organisations and people across Scotland to the national consultation. To this end I would ask the Scottish Government to support the collective evidence of the Broad Alliance and that of partner organisations such as SLAUG to ensure a national ban be applied in Scotland. In addition I would like to submit concerns:

Health

- Airborne and water borne environmental hazards would be likely to occur as a result of unconventional oil and gas operations.
- Fracking and disposal of waste water into deep injection wells have been found to be associated with increased seismicity.
- Sufficient evidence of respirable crystalline silica (a component of hydraulic fracturing fluids) have occurred at levels that could pose a risk to the health of workers.
- Evidence that hazards, such as airborne polycyclic aromatic hydrocarbons and tropospheric ozone and waterborne total dissolved solids and metal ions have occurred at levels that could risk health of residents.
- Waterborne methane has occurred at levels that pose a potential explosive risk.
- We believe there are inadequacies in the current regulatory framework in Scotland to monitor such threats.

- The health evidence, despite some inadequacies, justifies adopting a precautionary approach. This should adopt best practice, regulatory frameworks and community engagement including a ban on all wells within a 2km radius of any households in Scotland.

Greenhouse gas emissions

- There are considerable uncertainties about the implications of unconventional oil and gas for greenhouse gas emissions.
- There should be a strong regulatory framework if exploitation of unconventional oil and gas goes ahead in Scotland to 'guarantee' the protection of communities and ensure personal accountability of breaches. The current regulatory framework for greenhouse gas emissions in Scotland is unclear about who is responsible for what. There may be gaps in current regulations over emissions to air, including fugitive methane.
- Exploiting unconventional oil and gas by fracking on a significant scale is not compatible with Scottish climate change targets unless three tests are met:
- Emissions from well development, production and decommissioning must be strictly limited, with tight regulation and close monitoring.
- Fossil fuel consumption must remain in line with the requirements of Scottish emissions targets. Without carbon capture and storage, the use of fossil fuels in power generation, transport and buildings must be eliminated by 2060.
- Additional production emissions from shale wells will need to offset through reductions elsewhere in the Scottish economy.

Economics

- Unconventional oil and gas would only represent 0.1% of the Scottish GDP (central estimate)
- By 2062, shale gas cumulative output is estimated at 947 billion cubic feet (central estimate) at current rates this represents 5.5 years of Scottish consumption. This assumes 20 pads, 15 wells per pad and production lifetime of each well of 15 years (central estimate). At peak, an estimated 80 full-time equivalent jobs per pad would be created or 1,400 jobs in total (central estimate) but at what cost to tourism, property valuations and renewable energy jobs?
- If oil and gas prices were to remain at historically low levels it would be unlikely that unconventional oil and gas resources in Scotland could be developed economically. An extended period of low prices would make development unattractive and economic benefits would not materialise.
- Development of unconventional oil and gas in Scotland would rely on an ability to obtain appropriate finance to support exploration and extraction. This would likely be detrimental to investments in renewable energy.

Transport

- Local communities will experience rises in traffic numbers, potentially for a number of years, with increases in noise, emissions, road damage and risks of accidents.
- Each shale gas well pad could require 13,000-93,000 vehicle movements over 20 years.
- Coal bed methane well pads would require about 93,000 vehicle movements over 12 years.
- Traffic movements could be 190 a week for two years during the development of a pad with 15 wells.

- Other impacts include road surface damage, increased risk of accidents and release of hazardous material, air pollution, noise, threat to nature conservation.
- All planning applications for unconventional oil and gas developments should require an Environmental Impact Assessment and Traffic Management Plan and be a minimum 2km from any residential household.
- Enforcement officers should be appointed to ensure mitigation measures are implemented and enforced.

Induced seismic activity

- A magnitude 4.4 earthquake (the largest linked to fracking at the time the report was compiled) would be felt by many people and may even cause some superficial damage if it happened in central Scotland.
- There is a small probability of induced earthquakes large enough to be felt but the longer term impact on the strata below ground is uncertain.
- Increases in earthquake activity in the US have been linked to waste water injection.
- Lack of historical data and low background activity makes it hard to identify areas which might have a greater risk of induced seismicity from unconventional oil and gas operations.

Decommissioning, site restoration and aftercare

- There is a regulatory gap and lack of any mechanism requiring long-term monitoring and responsibility for wells.
- Decommissioned wells may leak gases if poorly constructed and abandoned contrary to international standards and industry best practice.
- Poorly constructed wells may leak methane to air and allow subsurface leaks into groundwater as experienced at numerous sites where fracking has occurred worldwide.
- Although the risk may be low, where hydrocarbons are under pressure the risk is greater if well integrity fails.
- Leaks from decommissioned wells should be monitored for as long as the Scottish Environmental Protection Agency considers necessary.
- Leaks from above ground tanks and pipes could contaminate ground and surface water.
- Scotland's regulatory framework for decommissioning needs to ensure appropriate bonds and accountability. Devolution of licensing to the Scottish Government is an opportunity to strengthen powers requiring operators to provide financial guarantees to cover liabilities.
- An annual levy on consented wells or a mutual fund should be established to cover the costs of repairing leaking.

I am of the view that 'The Paris climate change agreement' makes it imperative that we move to a post carbon economy. We need a permanent ban on the exploitation of unconventional oil and gas by any means, including test drilling in Scotland as these activities are wholly at odds with Scotland's obligations under this international agreement. Under the obligations of the agreement Scotland requires to make significant carbon reductions and hold the increase in the global average temperature to well below 2°C. However if we continue to exploit new forms of carbon fuel and increase pollution during the extraction and combustion of fracking this decision will be in direct opposition to agreement.

Scotland needs a safe, sustainable future. Does Scotland need fracking? No. Will fracking improve the health of Scotland? No. Will fracking improve the climate of Scotland? No. Will fracking improve the landscape of Scotland? No. Does Scotland want fracking? No. Scotland needs the

Scottish Government to stand up not just for the people of Scotland but for the very earth that sustains us. Now is the time to take a bold, positive path towards a better Scotland, a positive Scotland and a sustainable Scotland for the betterment of all.

Annex 2: Petition texts

38 Degrees online petition

This online petition was posted on the 38 Degrees website offering people the opportunity to sign and / or add a comment in support of the following statement. For the purpose of the analysis, the petition statement is seen as relating to Question 10 in the consultation questionnaire.

To Paul Wheelhouse MSP, Energy Minister

Petition text

Permanently ban fracking in Scotland

Why is this important?

The Scottish Government's own reports show that fracking could:

- pose a risk to health
- contaminate water
- hit house prices
- increase traffic in nearby communities
- and make it harder to meet climate targets

The Scottish Government is considering the future of fracking in Scotland. It is vital they ban fracking to protect Scotland's people and environment from a dangerous form of energy extraction.

Change.org online petition

This petition was posted on Change.org by Torrance resident Ruth Dunster, inviting people to sign in support of the following statement. For the purpose of the analysis, the petition statement is seen as relating to Questions 9 and 10 in the consultation questionnaire.

Tell Scottish Cabinet Ministers to ban fracking in Scotland NOW.

Letter to

Cabinet Secretary for Economy, Jobs and Fair Work **Keith Brown MSP**

Minister for Business, Innovation and Energy **Paul Wheelhouse MSP**

Minister for Environment **Roseanna Cunningham MSP**

We, the undersigned, respectfully ask you to use your powers to ban fracking in Scotland. We are deeply alarmed about its consequences for Scotland.

If we don't get an outright ban on fracking in Scotland now, we may lose our chance to prevent it. Across Scotland people are waking up to what a devastating effect this would have on our land, our health, and our communities.

The following background information was provided:

I live in Torrance, a beautiful village in a scenic, unspoilt valley in Scotland. I found out last year that Ineos Upstream Ltd have plans for **a fracking operation here – and in a whole swathe of communities** in other areas across Scotland. Fracking is a process which forces water deep underground at very high pressure to force gas to the surface. It has an appalling and frightening track record around several countries, especially the USA and Australia.

The Scottish Government is already being lobbied by powerful companies like Ineos to move away from our renewable energy strategy and invest in this toxic and dangerous industry instead. Please tell the Ministers responsible for energy and environment policies that we want Scotland to invest in renewable energy technologies and refuse to grant fracking licenses to companies like Ineos Upstream.

Scotland is at the turning point. Either we invest in the sort of technologies out there for clean, cheap energy – like Norway's huge hydro power scheme which creates most of their energy – or we go down the toxic energy road of the fracking business lobby's plans.

Some key points you might want to know:

- The Scottish Government's moratorium **is just a temporary ban** while the government considers their options – and gets lobbied by fracking big business in the mean time
- Chemical spills and land and water pollution persuaded New York state, France and Bulgaria to ban the fracking industry outright. **The public health impact on communities seen in evidence like the USA documentary 'Groundswell Rising,' and Dr GERALYN McCARRON'S Australian medical study 'Symptomatology of a Gas Field,' completely dispel the myth that fracking is safe.** Have a look on Youtube for clips of the film, and google the report.
- Research near fracking plants has documented **regular earth tremors caused by fracking** – houses with cracks in their walls, property values falling, meaning nobody wants to live or invest there any more. It's already happened in Blackpool and in places like Oklahoma right across the USA and Canada, 'man made seismic activity' been getting worse and worse
- Recent documentaries like 'Gasland' filmed residents taking a match and setting fire to **methane gas coming out of their kitchen taps**
- **Scotland's economy doesn't need this to create jobs** – instead, if we make the right choices, we can invest in the exciting and very successful new renewable energy technologies being developed just now. And invest in already successful and growing Scottish industries – like video games, bioscience, and financial and banking services. And of course tourism and whisky. We can have a successful clean economy.
- Last but not least – **this is one huge step back to the fossil fuels we're trying to eradicate** to cut down our carbon emissions. It's not a 'cleaner,' 'transition' fuel – it has lower CO₂ levels than coal burning (though it is still sizeable) but the methane gas emitted is a much more serious greenhouse gas. Do we really want to speed up global warming which threatens our planet and our survival?
- For more information see frack-off.org.uk, Youtube clips of the documentaries Gasland, Groundswell Rising and Frackman, FB Scotland Against Fracking and numerous local anti-fracking FB groups, and the impartial research digest drillordrop.com.

Children's petition

This petition was organised by Friends of the Earth, West Fife branch. Signatures were gathered at the Dunfermline Fresh Air Festival held on 27 May 2017. For the purpose of the analysis, the petition statement is seen as relating to Question 10 in the consultation questionnaire.

Please Mr Wheelhouse, can you ban fracking coz my daddy says it's not nice and I want somewhere nice to play.

Our Forth petition

This (hard-copy) petition was organised by Portobello-based Our Forth, and was circulated in local communities inviting people to sign in support of the following statement. For the purpose of the analysis, the petition statement is seen as relating to Questions 7 and 10 in the consultation questionnaire.

No Unconventional Gas in our Forth

By signing this petition we, the undersigned, ask the Scottish Government for the following:

1. Underground Coal Gasification to be included in the Scottish Government's Moratorium on Unconventional Gas Extraction.
2. This moratorium to be turned into a complete ban on Unconventional Gas Extraction in Scotland.
3. We would also demand that a 2 kilometre buffer one between any unconventional gas developments and communities be set to take immediate, and permanent effect irrespective of any decision taken in future by the Scottish Government.

Scotland Against Fracking petition

This (hard-copy) petition was organised by Falkirk-based Scotland Against Fracking and circulated in local communities inviting people to sign in support of the following statement. For the purpose of the analysis, the petition statement is seen as relating to Question 10 in the consultation questionnaire.

For the attention of the democratically elected Government of Scotland

On behalf of the people, we the undersigned, as citizens of democratic Scotland demand that no hydraulic fracturing, coal bed methane or underground coal gasification be permitted anywhere within the country of Scotland. To proceed goes against the democratic will of the people and the government have either sought or been granted sufficient licence to allow unconventional gas extraction to go ahead.

Annex 3: Data validation

This annex provides details about the data validation process – i.e. the process of determining the total number of consultation responses.

Number of responses received

As noted in Chapter 2, the consultation received 61,328 submissions. Of these, 21,077 (34%) were standard campaign responses received through one of the organised campaigns, and a further 31,033 (51%) comprised signatures to a petition. The remaining 9,218 responses (15%) were either: (i) non-standard campaign responses, (ii) responses submitted directly to the Scottish Government by email or post, or (iii) responses submitted via the Scottish Government's online consultation hub. Together, these personalised non-standard campaign responses and individually drafted responses are referred to as 'substantive responses'. (See Table A3.1 on the following page.)

Validation of responses

All non-standard campaign responses and all responses received by email or post were entered into a database together with the responses submitted via the Scottish Government's consultation hub. This database therefore initially contained 9,218 responses.

The 21,077 standard campaign responses were not entered into the database. However, the analysis takes into account the statements submitted through all the campaigns in relation to each of the consultation questions, and the number of campaign responses received have been reported on a question-by-question basis.

Comments received with petitions (n=8,375) were also not entered into the database. However, a separate analysis was undertaken to identify the main themes in these comments, and the findings of this analysis have been reported together with the other views expressed in relation to relevant questions.

Of the 9,218 responses initially entered into the database, 793 were removed for a variety of reasons:

- 85 were found to be entirely blank.
- 131 were identified as invalid. To be classed as 'valid', responses had to have the respondent's name (both a first name or first initial **and** a surname) **and** their contact details (an email address, a postal address, or a complete postcode). Any responses not including **both** the respondent's name **and** their contact details were removed from the database as invalid.
- 79 were found to be identical duplicate responses sent by the same (79) individuals. Duplicate responses generally occur when a respondent submits their response electronically via the consultation hub and also sends a copy by email or post. In these cases, one of the responses is retained and the other is removed.
- 2 responses initially submitted to the consultation were later withdrawn by the respondent.
- 1 was identified as correspondence not intended as a response to the consultation.

Table A3.1: Number of responses received

Submission route	Response type	Standard campaign or other identical responses	Substantive responses (including non-standard campaign responses)	Total responses (n)
Campaign responses				
	Avaaz	100	596	696
	Broad Alliance (postcards)	946	384	1,330
	Friends of the Earth Scotland (online)	15,088	1,284	16,362
	Friends of the Earth Scotland (postcards)	4,574	9	4,583
	Greenpeace	251	2,815	3,060
	Scottish Greens	–	1,129	1,122
	South Lanarkshire Against Unconventional Gas (SLAUG)	118	1	119
	Sub-total, campaign responses	21,077	6,218	27,295
	% of total 61,328	34%	10%	45%
Petition signatories				
	38 Degrees (includes 7,303 comments)	21,326	–	21,326
	Change.org (R Dunster) (includes 1,072 comments)	5,174	–	5,174
	Children's petition	43	–	43
	Our Forth	185	–	185
	Scotland Against Fracking	4,305	–	4,305
	Sub-total, petition signatories	31,033	–	31,033
	% of total 61,328	51%	0%	51%
Received through other routes				
	Email / post	–	129	129
	Scottish Government consultation hub*	–	2,871	2,871
	Sub-total, received through other routes	–	3,000	3,000
	% of total 61,326	0%	5%	5%
	Total responses submitted	52,110	9,218	61,328
	% of total 61,328	85%	15%	100%

* Includes 52 Broad Alliance campaign responses and 14 group discussion responses. Note that percentages may not total 100% due to rounding.

Finally, it was found that 445 respondents had submitted two or more **different** responses to the consultation. (The maximum number of different responses submitted by a single individual was five.) Multiple different responses from the same individual were combined to form a single amalgamated response. This response, containing all the comments from all their responses, was retained in the database and included in the analysis; all the other responses from that individual were then removed. Thus, for the purposes of analysis, the respondent was counted only once. Through this process, a total of 495 responses were removed.

Following the removal of blank, invalid, duplicate and multiple responses, there were **8,425 substantive responses** from 8,425 respondents in the database. (Table A3.2 summarises the process of validating the responses.)

Table A3.2: Number of substantive responses included in the analysis

	Number of responses
Number of substantive responses received	9,218
Number of substantive responses removed	
Blank responses	-85
Invalid responses	-131
Duplicate responses	-79
Multiple different responses from a single individual	-495
Responses removed for other reasons	-3
Total responses	8,425

Thus, **the analysis was based on 60,535 responses**. As shown in Chapter 2 (Table 2.3) this comprised:

- 8,425 substantive responses (14%)
- 21,077 standard campaign responses (35%)
- 31,033 petition signatories (including 8,375 comments) (51%)

Annex 4: List of organisational respondents

Community councils (39)

- Airth Parish Community Council
- Auchinloch Community Council
- Avonbridge & Standburn Community Council
- Bishopbriggs Community Council
- Blackford Community Council
- Blackness Area Community Council
- Blairgowrie & Rattray Community Council
- Bo'ness Community Council
- Bonnybridge Community Council
- Causewayhead Community Council, Stirling
- Charlestown, Limekilns and Pattiesmuir Community Council
- City Centre & Harbour Community Council
- Cockenzie and Port Seton Community Council
- Craigton Community Council
- Cumbernauld Village Community Council
- Grangemouth including Skinflats Community Council
- Juniper Green Community Council
- Kincardine Community Council
- Kirkintilloch Community Council
- Kirkmabreck Community Council
- Larbert, Stenhousemuir & Torwood Community Council
- Livingston Village Community Council
- Mercat Cross and City Centre Community Council
- Moorfoot Community Council
- Murieston Community Council
- Peebles Community Council
- Plains Community Council
- Portobello Community Council
- Reddingmuirhead and Wallacestone Community Council
- Robroyston Community Council
- Shawlands & Strathbungo Community Council
- Shieldhill and California Community Council
- Shotts Community Council
- Torrance Community Council
- Townhill Community Council
- West Calder & Harburn Community Council
- West Fife Villages Community Council Forum
- Westfield Community Council

Other community groups (24)

- Associates of Milton Community Garden

- Athens County (OH, USA) Fracking Action Network
- Broad Alliance of Scottish Communities Against UOGE
- Canonbie & District Residents Association
- Concerned Communities of Falkirk (CCoF)
- Cumbernauld Environmental Society
- Fife Communities Climate Action Network
- Frack Free Cotswolds
- Frack Free Ryedale
- Frack Free Worthing
- Frack Off Fife
- Frack Off From Lennoxton
- Frackwatch Glasgow
- Kilsyth and Villages Community Forum
- Kirkintilloch Against Fracking
- Our Forth Portobello Against Unconventional Gas
- Plataforma Ciudadana "Zaragoza sin Fractura"
- Sheffield Climate Alliance
- Shotts say Frack Off
- South Lanarkshire Against Unconventional Gas
- St Andrews TTIP Action Group
- Strathyre Outdoors Community Interest Company
- Torrance Against Fracking
- Women's Anti-Austerity Action Group for the Howe

Third sector / non-governmental organisations (33)

- 38 Degrees
- Ayrshire Global Justice Now
- Badenoch & Strathspey Conservation Group
- Christian Aid Scotland
- Community Chartering Network and Connecting Scotland
- Ecologistas en Acción
- Fidra
- Fisheries Management Scotland
- Food & Water Europe
- Food & Water Watch
- Forth District Salmon Fishery Board / River Forth Fisheries Trust
- Foundation Scotland
- Friends of the Earth
- Friends of the Earth Australia et al (45 international organisations)

- Friends of the Earth Scotland
- Friends of the Earth Scotland West Fife
- Global Justice Now
- Greenpeace UK
- Keep Scotland Beautiful
- National Trust for Scotland
- Nourish Scotland
- Park Ecovillage Trust
- Permaculture Scotland Policy Group
- Royal Society for the Protection of Birds (RSPB)
- Scottish Communities Climate Action Network
- Scottish Environment Link
- Scottish Hazards
- Scottish Wildlife Trust
- Stop Climate Chaos Scotland
- Transition Black Isle
- Transition Edinburgh
- Transition Linlithgow
- Transition Stirling

Private sector / industry (22)

- A Taylor & Son
- Accountancy Systems and Training Ltd
- AG Barr (Strathmore)
- Braw Design
- Buccleuch
- CNG Services Ltd
- Cream o' Galloway
- Ecoliving Ltd.
- Elemental Beings Ltd
- Highland Spring Group
- Ineos Shale
- JP's Workshop
- KKWG West Sussex
- Offbeat
- ReachCSG, Reach Coal Seam Gas Limited
- Remsol Limited
- RSKW
- Scotch Whisky Association
- UK Onshore Oil and Gas (UKOOG)
- Utterly Bespoke
- Wind Farm Analytics Ltd
- Zetland Group Limited

Public bodies / public sector organisations (16)

- COSLA
- Dumfries & Galloway Council

- East Dunbartonshire Council Planning Service (no political endorsement by Council)
- Falkirk Council
- Fife Council
- Forth Valley NHS Board
- Health and Safety Executive
- Historic Environment Scotland
- Inverclyde Council
- North Lanarkshire Council
- Scottish Natural Heritage
- Scottish Water
- SEPA (Scottish Environment Protection Agency)
- South Lanarkshire Council
- Stirling Council
- West Lothian Council

Professional bodies / membership organisations / trade bodies (13)

- British Ceramic Confederation
- Central Association of Agricultural Valuers
- Chemical Industries Association
- Chemical Sciences Scotland
- GMB Scotland
- Heads of Planning Scotland
- Law Society of Scotland
- Mining Institute of Scotland
- Natural Hydration Council
- Royal Environmental Health Institute of Scotland
- Royal Town Planning Institute Scotland
- Scottish Land & Estates
- Unison Scotland

Faith groups (10)

- Church in Society Committee of the Scottish Episcopal Church
- Church of Scotland
- East Lothian Quaker Meeting
- Inverness Local Meeting of the Society of Friends (Quakers)
- Justice and Peace Group, Holy Cross Parish, Croy
- Quakers in Britain
- Religious Society of Friends (Quakers), SE Scotland Area Meeting
- Salvation Army
- South Edinburgh Quakers Local Meeting
- United Reformed Church, Church & Society Committee

Academic / research organisations (7)

- Centre for Public Health and Population Health Research
- Centre for Energy Policy, University of Strathclyde International Public Policy Institute
- Common Weal
- Concerned Health Professionals of New York
- Ekklesia (think tank)
- M4 Shale Gas Project
- University of Edinburgh

Other organisational respondents (22)

- AIM for Yes Garnock Valley and West Kilbride
- Argyll & Bute Branch, Scottish Green Party
- Deep Green Resistance Scotland
- Eastwood SNP Branch Energy Group
- EB Scotland Limited
- End Ecocide England
- Fair Trade Stirling
- Gary Kelly Tommy Sheridan Indyref 2
- Glasgow Labour Group
- Glasgow University Climate Action Society
- Green Liberal Democrats
- Green Tau Organisation
- Maybole, North Carrick and Coylton SNP Branch
- New Brunswick Anti-Shale Gas Alliance
- Paisley Women for Independence
- Radical Independence Campaign East Kilbride
- Root n Toot Festival East Kilbride
- Scottish Green Party, Dundee & Angus Branch
- SMAUG (SNP Members Against Unconventional Oil and Gas)
- Women for Independence Maryhill
- Yes Kelty Campaign Group
- Yoga in Daily Life

Annex 5: Number of respondents answering each question

The table below shows the number of substantive responses and standard campaign responses which addressed each of the ten consultation questions.

Table A5.1: Number of responses to consultation questions

Question	Substantive responses*	Standard campaign responses	Petitions	Total
Question 1: What are your views on the social, community and health impacts of fracking?	6,415	16,503	–	22,918
Question 2: What are your views on the community benefit schemes that could apply, were an unconventional oil and gas industry to be developed in Scotland?	2,697	946	–	3,643
Question 3: What are your views on the potential impact of an unconventional oil and gas industry on Scotland's economy and manufacturing sector?	2,860	16,252	–	19,112
Question 4: What are your views on the potential role of unconventional oil and gas in Scotland's energy mix?	5,784	16,285	–	22,069
Question 5: What are your views on the potential environmental impacts of an unconventional oil and gas industry in Scotland?	5,536	16,403	–	21,939
Question 6: What are your views on the potential climate change impacts of an unconventional oil and gas industry in Scotland?	3,879	16,503	–	20,382
Question 7: What are your views on the regulatory framework that would apply to an unconventional oil and gas industry in Scotland?	2,667	1,061	185	3,913
Question 8: Overall, and in light of the available evidence, what do you think would be the main benefits, if any, of an unconventional oil and gas industry in Scotland?	2,724	946	–	3,670
Question 9: Overall, and in light of the available evidence, what do you think would be the main risks or challenges, if any, of an unconventional oil and gas industry in Scotland?	4,062	20,726	5,174	29,962
Question 10: If you have any other comments on the issues discussed in this consultation, please provide them here.	3,578	21,077	31,033	55,688

* Includes 52 responses from the Board Alliance on-line campaign submitted directly via the Scottish Government's online response form.



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