



**Study on Analysis and
presentation of the results of
the public consultation
"Unconventional fossil fuels
(e.g. shale gas) in Europe"**

October 2013



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Analysis and presentation of the results of the public consultation "Unconventional fossil fuels (e.g. shale gas) in Europe"

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Executive summary

A number of EU Member States are exploring the potential for production of unconventional fossil fuels such as shale gas. The European Commission aims to ensure a level playing field across the EU and that the development of unconventional fossil fuels is carried out with proper health, climate and environmental safeguards in place and under maximum legal clarity and predictability for competent authorities, citizens and operators, for the potential economic and energy security benefits to be reaped.

The European Commission conducted a public consultation "Unconventional fossil fuels (e.g. shale gas) in Europe" between 20 December 2012 and 23 March 2013, in all official EU languages. It was launched as part of the European Commission's wider efforts to listen to relevant stakeholders and the general public on this topic, to better understand their views and possible concerns, and to obtain evidence on issues relevant to unconventional fossil fuels (e.g. shale gas).

This report describes results of the public consultation on unconventional fossil fuels, which generated 22 875 responses, with citizen contributions accounting more than 95% of the total. More than 90% of citizen responses came from five EU countries: Poland, France, Romania, Spain and Germany. There were 696 responses from organisations, including 33% from companies and 32% from NGOs.

This report presents the answers of individuals, private organisations and public authorities to the nine closed questions and five open-ended questions of the online public consultation on unconventional fossil fuels. Summary statistics are presented, and complemented with:

- The use of illustrative weights to understand the sensitivity of the results of the public consultation to the different participation levels found among EU countries;
- A correlation analysis to identify patterns of answers for specific groups of respondents.

From the correlation analysis, it appears that a respondent's overall opinion about unconventional fossil fuels can explain many of the answers to the other closed questions. Three groups of respondents thus emerge:

- Respondents in favour of the development of unconventional fossil fuels (e.g. shale gas), identifying many potential benefits;
- Respondents who think that strict environmental and health safeguards should be put in place, and more likely to prefer regulation at EU level;
- Respondents against development, identifying many potential challenges, with some of them wanting a ban on unconventional fossil fuels in the EU.

Each of these three types makes up roughly one third of the individual respondents to the public consultation. The result of this split is that about half of individual respondents think that each benefit defined in the consultation could be major or significant and the other half think that each challenge defined in the consultation could be major or significant.

Opinions vary across countries and categories of respondents. The overall results appear to be sensitive to the variation in participation rate by Member State. Application of illustrative weights in order to even out participation rates leads to a different outcome: weighted results according to Member State population show EU citizens' opinions much less in favour of the development of unconventional fossil fuels (e.g. shale gas) than the non-weighted results.

However, despite the divergence of personal opinions of individual respondents about the development of unconventional fossil fuels (e.g. shale gas) in general, a broad consensus emerges that:

- Measures are necessary to address the potential challenges of unconventional fossil fuels (e.g. shale gas);
- Transparency and information are necessary at all stages.

Consistently, a large majority of individual respondents think that the current framework is not well adapted and that the EU should take some action: "doing nothing" was the least favoured option, and this result is robust even taking into account the fact that participation is uneven among countries.

Regarding private organisations and public institutions, views are split about unconventional fossil fuels (e.g. shale gas), as they are for individuals. NGOs appear to be among the least favourable to unconventional fossil fuels (e.g. shale gas), compared to companies, trade and industry associations, or national governments. However, most of these respondents share the view that there are important information needs associated with unconventional fossil fuel (e.g. shale gas) exploration and extraction, and that potential challenges should be addressed with appropriate measures. As is the case for individuals, no action at EU level appears to be the least favoured option for institutions and organisations.

Chapter 1: Introduction

1.1 Unconventional fossil fuels (e.g. shale gas) in the EU

Exploration and production of fossil fuels within Europe has in the past been mainly focused on conventional resources, which are limited and have declined. Meanwhile, technological progress (high volume hydraulic fracturing, or “fracking”, and horizontal drilling) is opening up new possibilities to extract unconventional fossil fuels such as shale gas, tight gas, coal bed methane, tight oil or shale oil, trapped in geological formations that were previously too complex or too expensive to exploit.

A number of EU Member States are exploring the potential for shale gas extraction. The European Commission aims to ensure a level playing field across the EU and that development of unconventional fossil fuels is carried out with proper health, climate and environmental safeguards in place and under maximum legal clarity and predictability for competent authorities, citizens and operators, for the potential economic and energy security benefits to be reaped.

Building on analytical work conducted since the end of 2011, the Commission included in its Work Programme for 2013 the development of an “Environmental, Climate and Energy Assessment Framework to Enable Safe and Secure Unconventional Hydrocarbon Extraction”.

1.2 The public consultation

The public consultation “Unconventional fossil fuels (e.g. shale gas) in Europe” took place between 20 December 2012 and 23 March 2013, to feed into the development of the Assessment Framework and the related analysis of impacts. This online consultation was part of the European Commission's wider efforts to listen to relevant stakeholders and the general public on this topic, to better understand their views and possible concerns, and to obtain evidence on issues relevant to unconventional fossil fuels (e.g. shale gas). Contributions were sought in particular from the oil and gas sector, environmental non-governmental organisations, geological surveys, scientists, experts in the management of industrial risks, national and local authorities and citizens at large. The consultation referred notably to shale gas, because it is currently expected to be the unconventional fossil fuel with the largest potential in the EU and for which most public concern is raised.

In total, 22 875 respondents participated in the consultation. Responses came from 22 122 individual respondents and 753 institutional respondents. The institutional respondents covered 696 organisations, principally Companies (33% of all institutions) and NGOs (32%).

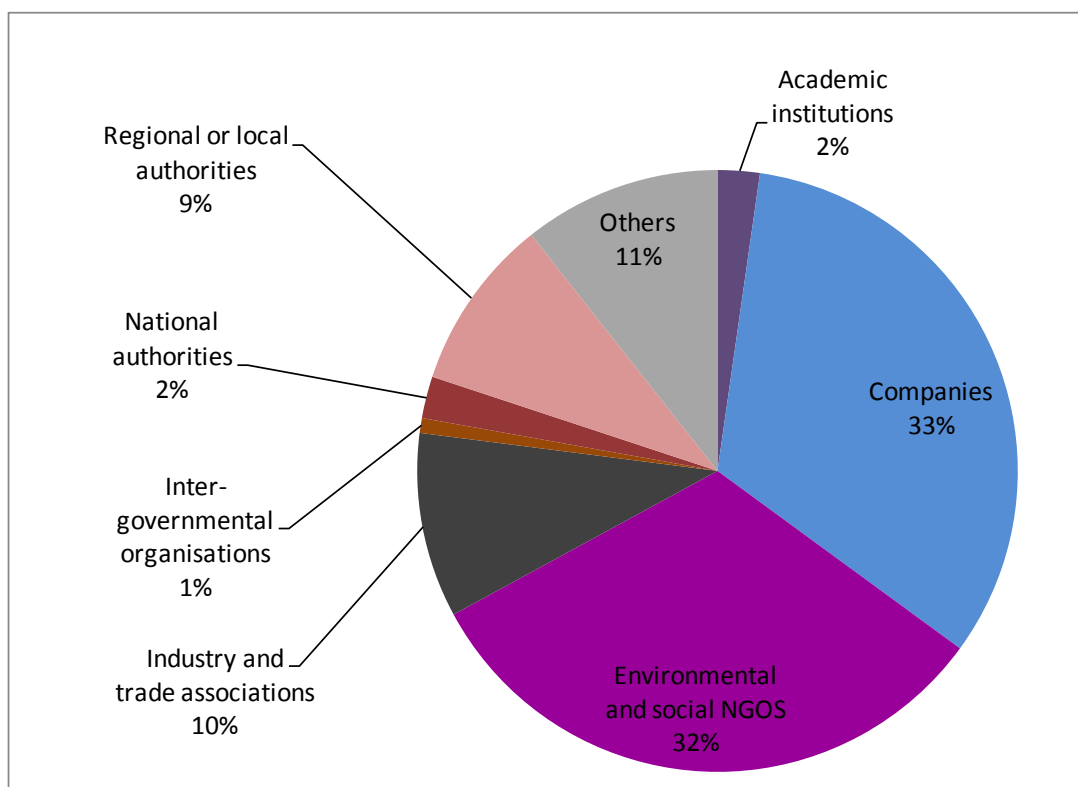


Figure 1: Breakdown of responding institutions by type

Participation was very high in five EU countries (Poland, France, Romania, Spain and Germany), which together made up more than 90% of individual responses. 1 536 individual answers were obtained for the remaining EU countries and 147 from individual respondents living outside the EU. The volume of responses from individual countries points to some active mobilisation campaigns, and reflects the presence of active public debate and information on unconventional fossil fuels at national level.

The detailed breakdown of answers from individuals and institutions (separating public authorities from other organisations) is provided in Table 1. Obvious duplicates were removed (e.g. an identical response from the same individual). The number of institutions was split when respondents from the same institution declared that it was either EU-wide or from a specific country. The views expressed by public authorities do not necessarily represent the official views of the governments of the countries mentioned in the table below.

Table 1: Number of respondents and institutions by type

	Type of respondents				
	Individuals	Companies and organisations		Public authorities	
	Number of respondents	Number of institutions	Number of respondents	Number of institutions	Number of respondents
Austria	144	12	14	1	1
Belgium	417	8.5	9	1	1
Bulgaria	40	13	13		
Cyprus	3				

	Type of respondents				
	Individuals	Companies and organisations		Public authorities	
	Number of respondents	Number of institutions	Number of respondents	Number of institutions	Number of respondents
Czech Republic	98	18	18	9	9
Germany	917	34	35	7	7
Denmark	13	2	2	1	1
Estonia	4				
Greece	3	1	1		
Spain	1 334	60	68	7	7
Finland	12				
France	3 308	83	83	10	10
Hungary	11	4	4		
Ireland	65	5	6		
Italy	118	10	10		
Lithuania	79	5	5		
Luxembourg	12	1	1		
Latvia	1				
Malta	3				
Netherlands	92	7	7	7	7
Poland	11 714	110.51	138	32	37
Portugal	46	5	5		
Romania	3 166	41.33	43	5	5
Sweden	23	3	3	1	1
Slovenia	4				
Slovak Republic	8	2	2		
United Kingdom	340	26	26		
EU-wide		148.65	159		
Australia	10				
Canada	13				
Norway	12	1	1		
Other	88	7	7	1	1
Russia	4				
United States	20	6	6		
Total	22 122	614	666	82	87

1.3 Objectives and methodology

This report describes the results of the public consultation on unconventional fossil fuels. By doing so, it provides an understanding of the views on opportunities and challenges and possible ways to address the challenges associated with unconventional fossil fuels (e.g. shale gas) extraction expressed by citizens, organisations and authorities across the EU (and beyond) through the public consultation.

1.3.1 Presentation of questions

The public consultation on unconventional fossil fuels consisted of nine closed questions and five open-ended questions.

For closed questions, respondents were to choose among multiple answers. In the report below, all the questions and potential answers to closed questions are presented the same way, the question first followed by the possible answers:

- ▶ Question
 - ▷ First possible answer
 - ▷ Second possible answer
 - ▷ Third possible answer
 - ▷ Etc.

For open-ended questions, the question is followed by a comment stating that respondents were not limited to multiple choices:

- ▶ Open-ended question
 - ▷ Respondents could provide their own answer to this question in the EU language of their choice.

1.3.2 Indicators used to present answers

The following indicators are used throughout this report to provide a summarised yet thorough overview of the results of the public consultation:

- **Number of respondents:** this is the number of respondents that chose a specific answer (e.g. "Yes", or "Very important") to a question;
- **Share of respondents:** this is the share of respondents that chose a specific answer (e.g. "Yes", or "Very important") to a question, calculated as the ratio between the number of respondents that chose a specific answer and the total number of respondents to the question of interest;
- **Total EU:** sum of answers from respondents from EU countries;

- **Total EU (weighted by population):** sum of answers from respondents from EU countries, weighted so that the sum of all the respondents from one specific country is given a weight equal to the population in this country.

This indicator can be used for illustrative purposes in complement with the sum of answers from respondents from EU countries (unweighted), in order to provide an answer to the following question: what would have been the results obtained with the public consultation on unconventional fossil fuels if the number of respondents from each EU country had been proportional to their population?

This indicator is used on statistics for individual answers only in Chapter 11 dedicated to weighted results.

- **Share of respondents that assess that a benefit, challenge or action could have major/significant impacts or should be considered as important or very important:** for some questions, respondents were asked to assess a potential issue or opportunity in a qualitative manner. These answers were grouped into two categories according to whether the problem presented to the respondents was assessed as significant/important or not. This indicator corresponds to the share of respondents that considered that a predefined element should be considered as important. People answering "I don't know" were not taken into account to calculate the percentages.

Note that with this indicator, 0% means that none of the respondents considered the benefit, challenge, etc. to be major, significant, important or very important.

- **Share of elements (e.g. benefits, challenges) identified by respondents as leading to major/significant changes, or that should be considered as important or very important.** To analyse the propensity of respondents to identify issues or opportunities as being of significant importance, this indicator calculates the share of benefits, challenges, etc. that each respondent identified as such over the range of elements included in the public consultation (and left to the appreciation of respondents). On the contrary, when this indicator is low (or equal to 0%), only a small share of the elements were considered as important or very important by respondents.

Only respondents that provided answers for the full set of elements were included in the calculation of this indicator.

- Furthermore, the number of respondents used to calculate most indicators is displayed in brackets.

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Chapter 2: Overall opinion of respondents about unconventional fossil fuels (e.g. shale gas)

2.1 Question asked to respondents

During the public consultation on unconventional fossil fuels, respondents were asked the following question:

- ▶ Question 1: which of the following statements reflects your overall opinion about unconventional fossil fuels (e.g. shale gas) best?
 - ▷ I am without an opinion so far;
 - ▷ I believe unconventional fossil fuels (e.g. shale gas) should be developed in Europe anyway;
 - ▷ I believe unconventional fossil fuels (e.g. shale gas) should be developed in Europe only if proper health and environmental safeguards are in place; or
 - ▷ I believe unconventional fossil fuels extraction (e.g. shale gas) should not be developed in Europe at all.

The answers to Question 1 from individuals, companies and organisations, and public authorities are summarised below.

2.2 Answers from individuals

Figure 2 displays the share of respondents according to their opinion about the development of unconventional fossil fuels in Europe:

- 32.5% of respondents believe unconventional fossil fuels (e.g. shale gas) should be developed in Europe anyway;
- 28.9% of respondents believe unconventional fossil fuels (e.g. shale gas) should be developed in Europe only if proper health and environmental safeguards are in place;
- 37.5% believe unconventional fossil fuels extraction (e.g. shale gas) should not be developed in Europe at all.

It shows also additional information for non-EU residents as compared to EU residents. Respondents from non-EU countries (see Table 1 above) have on average a more negative opinion of unconventional fossil fuels than respondents living in EU countries: 63.9% of them believe unconventional fossil fuels extraction (e.g. shale gas) should not be developed in Europe at all.

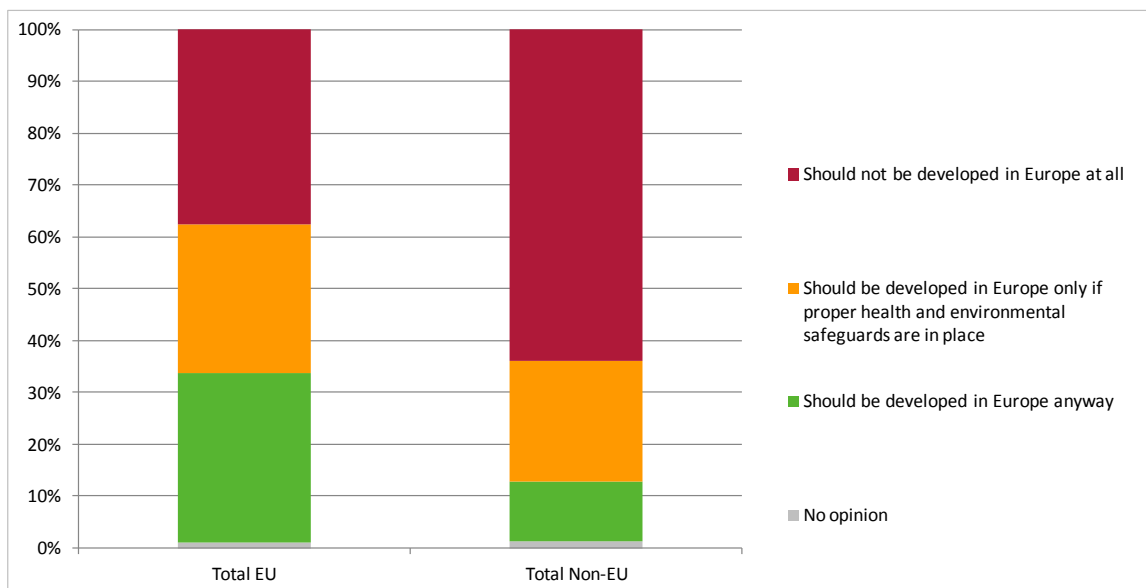


Figure 2: Opinions of EU and non-EU individuals about the development of unconventional fossil fuels (e.g. shale gas) in Europe

National differences are further presented in Figure 3:

- The majority of respondents (more than 50%) from many EU countries (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Ireland, Italy, Luxembourg, Latvia, Malta, the Netherlands, Romania, Sweden, Slovak Republic and the UK) believe that unconventional fossil fuels should not be developed in Europe at all. Note however that for some countries, only a few respondents participated in the public consultation.
- Respondents from Poland are the most favourable to unconventional fossil fuels, with more than 59% of respondents believing that unconventional fossil fuels should be developed in Europe anyway.

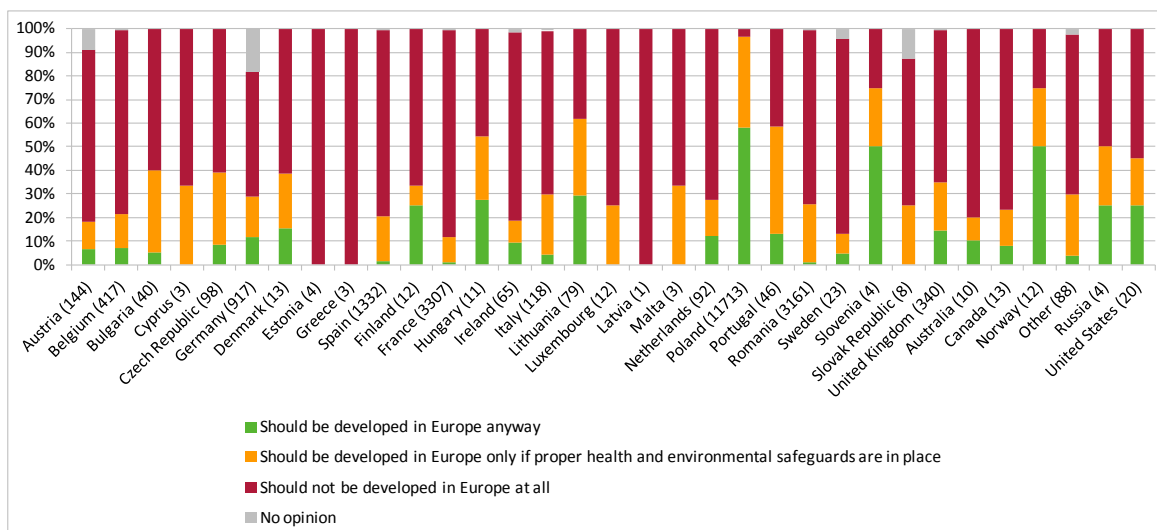


Figure 3: Opinion of individuals about the development of unconventional fossil fuels (e.g. shale gas) in Europe by country of residence (share of respondents)

2.3 Answers from companies and organisations

Figure 4 presents the answers to Question 1 for companies and organisations by type of organisation. It is interesting to look at the preferred proposition for the majority (at least 50% of responses) of each type of respondent:

- For the majority of academic institutions, companies, or industry or trade associations responding, unconventional fossil fuels should be developed in Europe only if proper health and environmental safeguards are in place.
- For the majority of the environmental or social non-governmental organisations or intergovernmental organisations responding, unconventional fossil fuels should not be developed in Europe at all.
- The types of institutions most favourable to the development of unconventional fossil fuels are companies and academic institutions, with nearly 30% and 25% of respondents respectively considering that unconventional fossil fuels should be developed in Europe anyway.

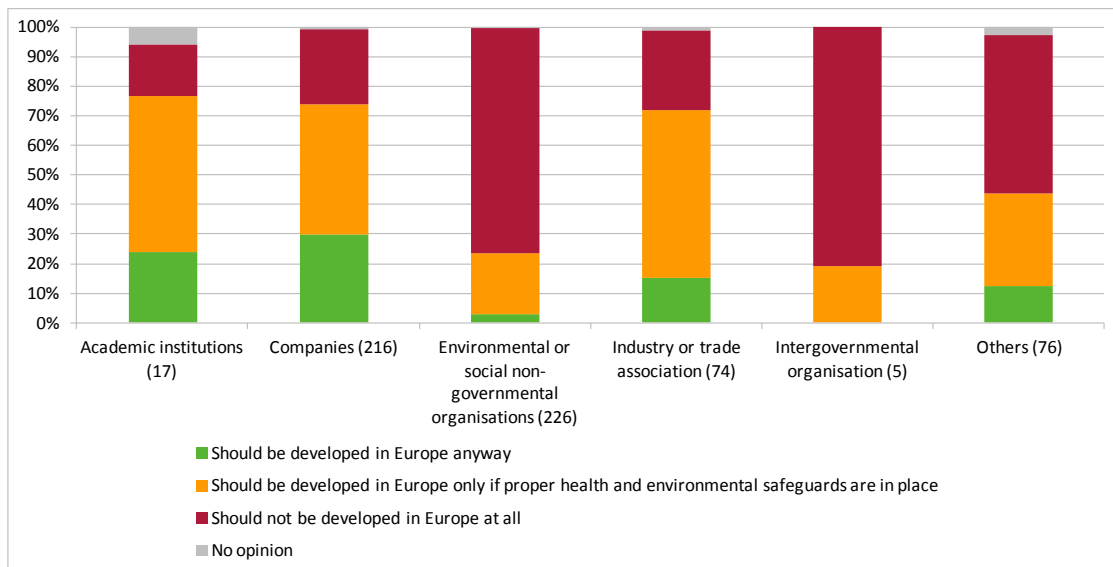


Figure 4: Opinion of companies and organisations about the development of unconventional fossil fuels (e.g. shale gas) in Europe by type of organisation

The breakdown of these institutions by country is provided in Figure 5:

- The countries that registered the highest share of respondents from companies and organisations favourable to the development of unconventional fossil fuels in Europe anyway are Lithuania (3 out of 5 respondents), the Slovak Republic (1 out of 2), the United States (3 out of 6), Poland (more than 45% of 111 respondents) and Hungary (1 out of 4 respondents).
- The countries that registered the highest share of respondents representing companies and organisations favourable to the ban on unconventional fossil fuels in Europe are France (more than 90% of 83 respondents), Italy (8 out of 10

respondents), Romania (75.8% of 41 respondents), Austria (9 out of 12 respondents) and the Czech Republic (72.2% of 18 respondents).

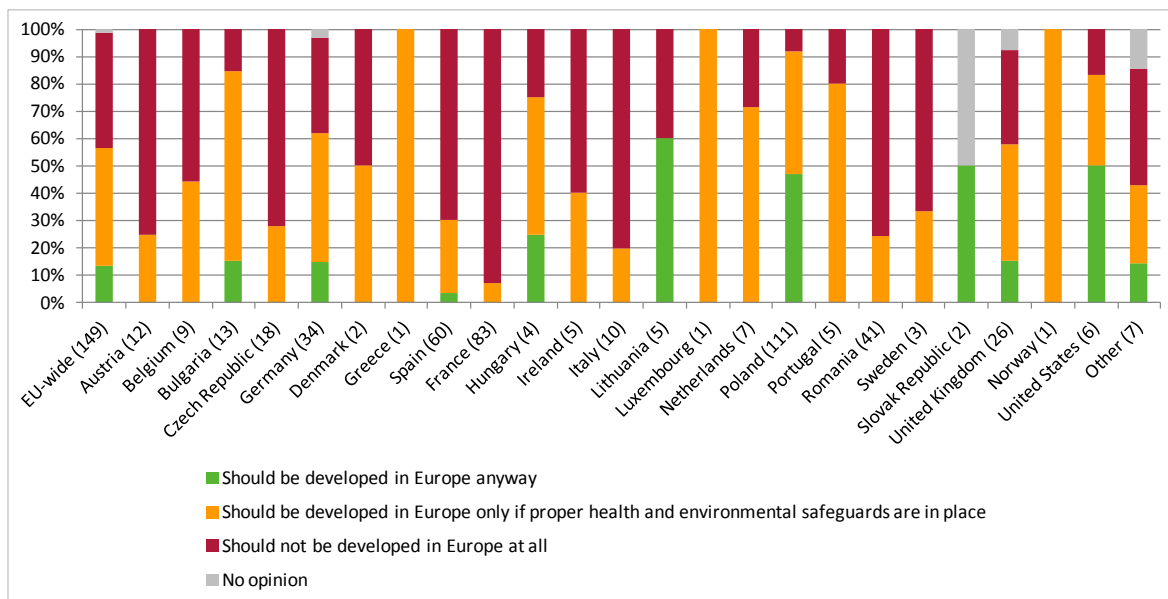


Figure 5: Opinion of companies and organisations about the development of unconventional fossil fuels (e.g. shale gas) in Europe by country

2.4 Answers from public authorities

Answers to Question 1 from national and regional or local authorities are displayed on Figure 6.

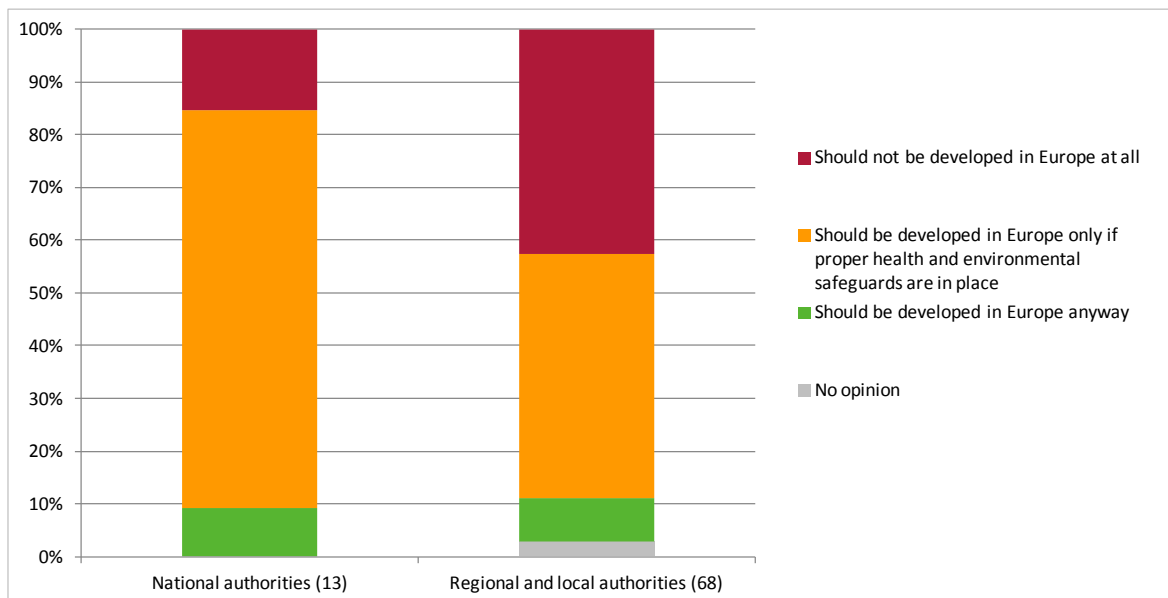


Figure 6: Opinion of responding national (13) and regional or local authorities (68) from the EU about the development of unconventional fossil fuels (e.g. shale gas) in Europe

In general, the respondents from national authorities appear to be more favourable to shale gas than the respondents from local authorities. In both cases though, the majority of respondents is favourable to the introduction of shale gas if proper health and environmental safeguards are implemented.

However, national and local and regional institutions from some countries were very responsive to the public consultation, whereas for other countries there are only a few respondents or even none at all. In addition, it has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country.

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Chapter 3: Benefits of unconventional fossil fuels (e.g. shale gas) as identified by respondents

3.1 Question asked to respondents

During the public consultation, respondents were asked their views on a series of 11 benefits. The question was formulated as follows:

- ▶ Question 2: please indicate for each area what level of benefits you expect from the development of unconventional fossil fuels (e.g. shale gas) in Europe.
 - ▷ A major benefit;
 - ▷ A significant benefit;
 - ▷ A modest benefit;
 - ▷ No benefit at all; or
 - ▷ I don't know.

The list of benefits submitted to the judgment of respondents is the following:

1. It could help diversify the EU energy mix;
2. It could avoid increasing the EU's energy import dependency;
3. It could strengthen the negotiation position of the EU operators towards external energy suppliers;
4. It could make energy cheaper for consumers;
5. It could enhance the competitiveness of Europe's Industry;
6. It could attract investment;
7. It could create employment;
8. It could generate revenues for public authorities (e.g. taxes or income benefits);
9. It could lead to technological innovations;
10. It could lead to a substitution of coal to the benefit of climate; and
11. It could help balancing the EU electrical grid.

Furthermore, respondents could freely answer an open-ended question on other benefits that they identified, not included in the list above.

- ▶ Question 3: it could have other benefits (please specify and indicate the level of benefits you expect: major/significant/modest benefit)

The answers to Question 2 and Question 3 from individuals, companies and organisations, and public authorities are summarised below.

3.2 Answers from individuals

3.2.1 Assessment of potential benefits

Figure 7 displays the share of respondents stating that each potential benefit could be major or significant if unconventional fossil fuels were developed in the EU:

- The reduction of EU energy import dependency was identified by respondents as the main benefit that unconventional fossil fuels could bring (59% of respondents), followed by the strengthening of EU negotiation position with external energy supplies and the diversification of the energy mix;
- However, the difference in the share of respondents identifying one potential benefit as major or significant from one potential benefit to the other is relatively small. The potential benefit that was least often identified as major or significant is the balancing of the EU electrical grid, with nevertheless 48% of respondents identifying it as potentially major or significant;

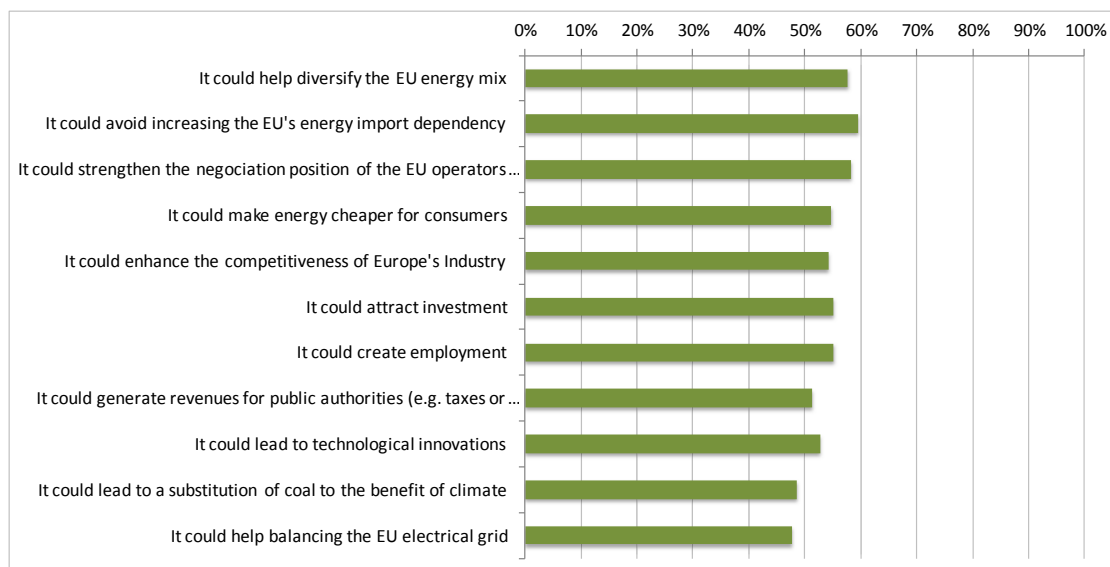


Figure 7: Share of respondents from EU countries stating that each potential benefit could be major or significant

National differences are further presented in Figure 8:

- The respondents from the majority of EU countries only identified, on average, less than one third of the benefits to be potentially major or significant.
- The countries in which more than one third of the benefits were identified, on average, as major or significant are Bulgaria, Hungary, Lithuania, Poland, Portugal and the Slovak Republic.
- Of these countries, Poland is clearly the country in which the amount of benefits considered as major or significant appeared to be larger, with an average of 87% of the eleven benefits identified as such by 11 175 respondents living in Poland.

- Outside the EU, Norwegian respondents (11) identified the highest share of benefits as potentially major or significant (about 60%).

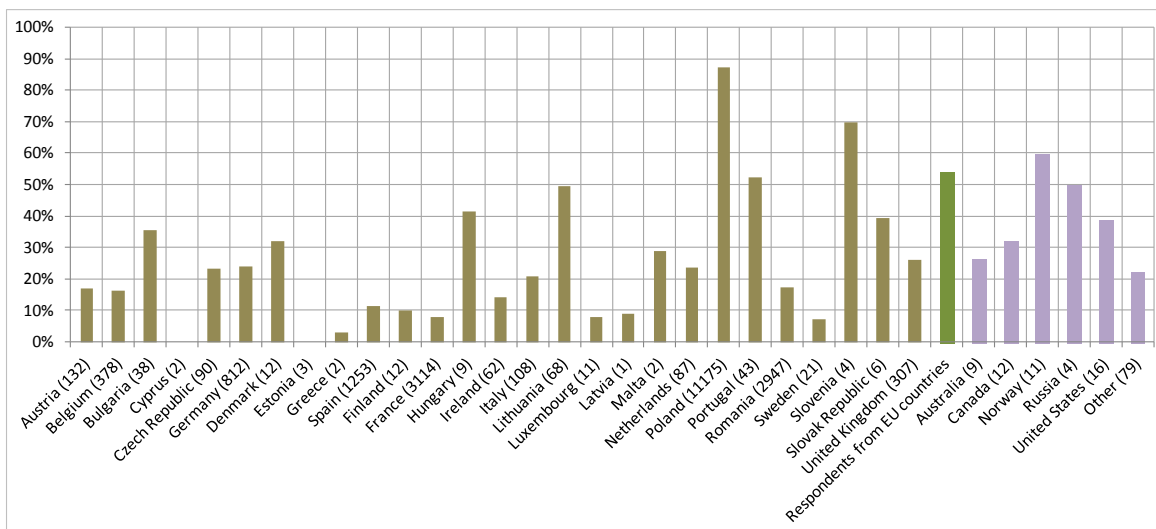


Figure 8: Average share of benefits considered as major or significant by individual respondents according to their country of residence

3.3 Answers from companies and organisations

3.3.1 Assessment of potential benefits

Figure 9 presents the detailed answers to Question 2 for companies and organisations by type of organisation, whereas Figure 10 provides the average share of potential benefits by type of organisation. The most interesting pieces of information displayed by these figures consist of:

- The relative homogeneity of answers for all the different types of potential benefits (Figure 9). In fact, there is not much difference between the share of respondents from one type of institution that identify one benefit as potentially major or significant and another benefit as potentially major or significant.
 - For academic institutions, and industry and trade associations, the benefit most commonly considered as major or significant is technological innovation (respectively 80% and 69% of respondents for these types of institutions).
 - For private companies, the benefit most commonly considered as major or significant is the decrease in the EU's energy import dependency (69% of respondents).
 - For social or environmental NGOs, the benefit most commonly considered as major or significant is the increase in private investments (16% of respondents).

- For almost all kinds of organisations (except the “other” category), the benefit that is least commonly identified as major or significant is the balance of the energy grid.
- The contrasting positions of the different types of organisation that participated in the public consultation (Figure 10) :
 - Academic institutions, industry and trade associations, along with companies are the types of institutions that identified the largest shares of benefits as major or significant.
 - On the other hand, social and environmental NGOs and intergovernmental organisations considered that only a small share of benefits could be major or significant.

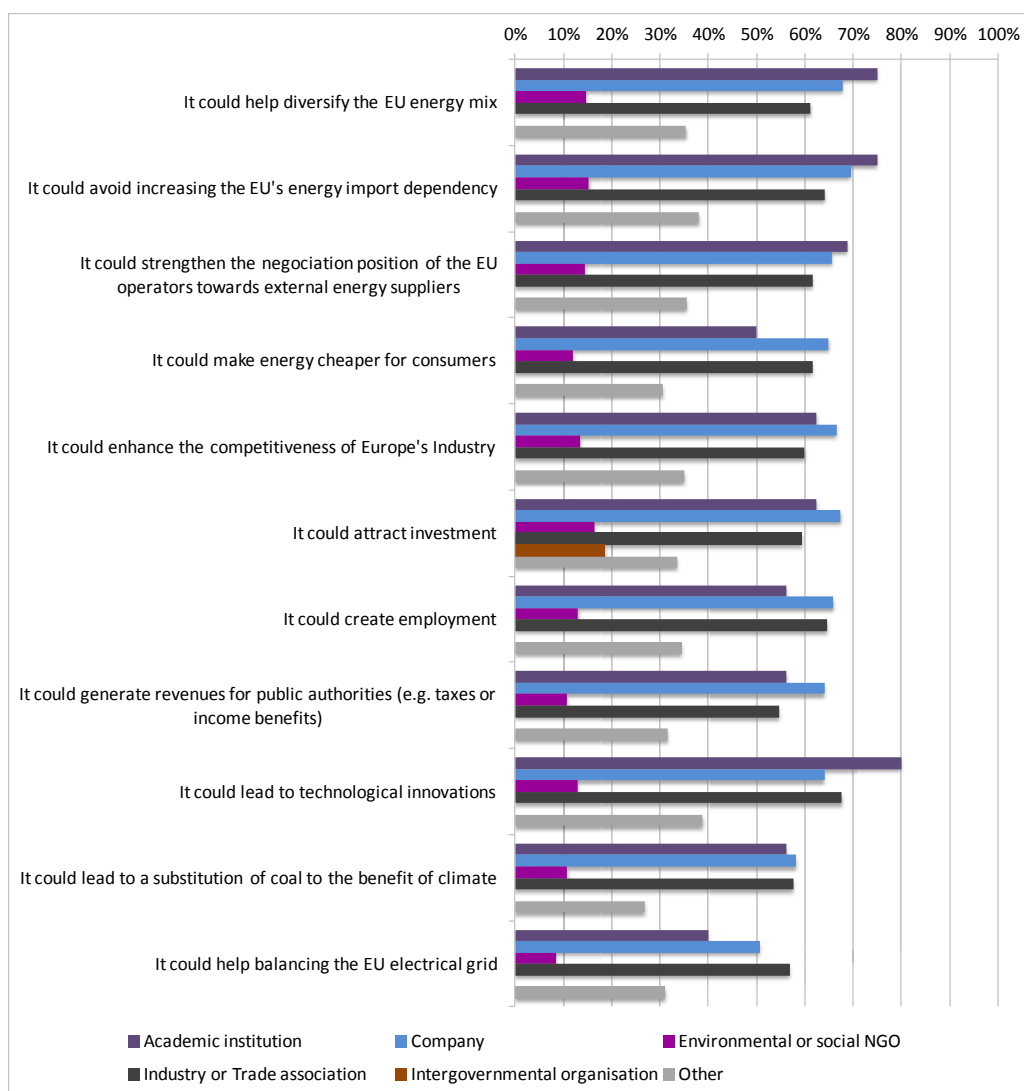


Figure 9: Share of companies and organisations from EU countries stating that each potential benefit could be major or significant

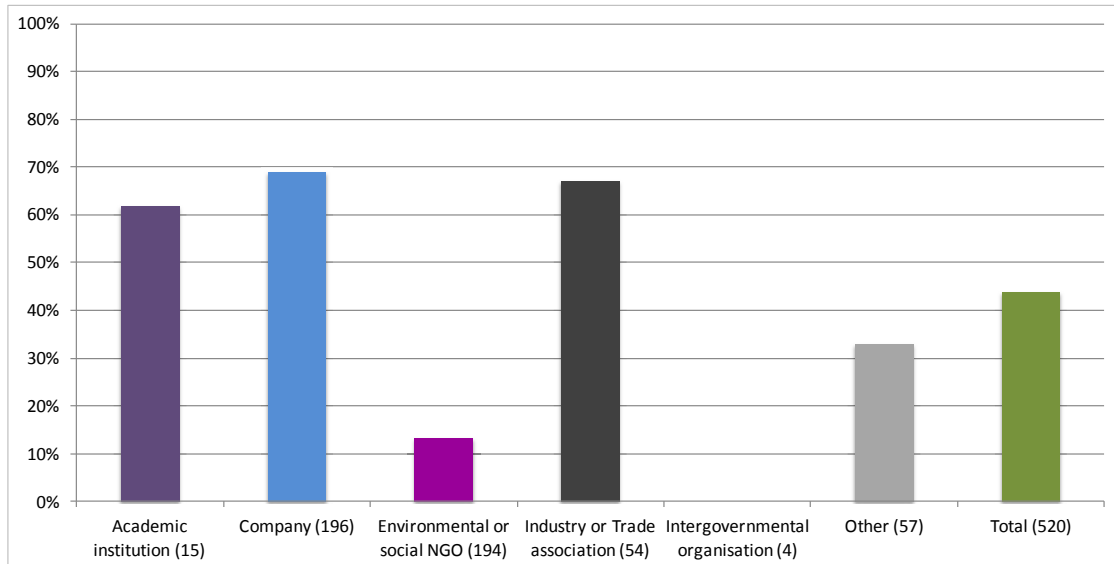


Figure 10: Average share of benefits considered as major or significant by type of organisations from EU countries

The breakdown by country of these institutions concerning their opinion about the benefits is provided in Figure 11:

- Unlike individual respondents, companies and organisations from a large share of EU countries identified more than one third of the benefits as potentially major or significant. This is in particular true for companies and organisations from Poland, Portugal, Lithuania and the Netherlands.
- The companies and organisations from countries that registered the lowest average of benefits considered major or significant (less than one third) are Austria, Belgium, Denmark, Spain, France, Italy and Romania.
- Outside the EU, responding companies and organisations appeared to consider a high amount of benefits to be potentially major or significant as compared with the EU average.

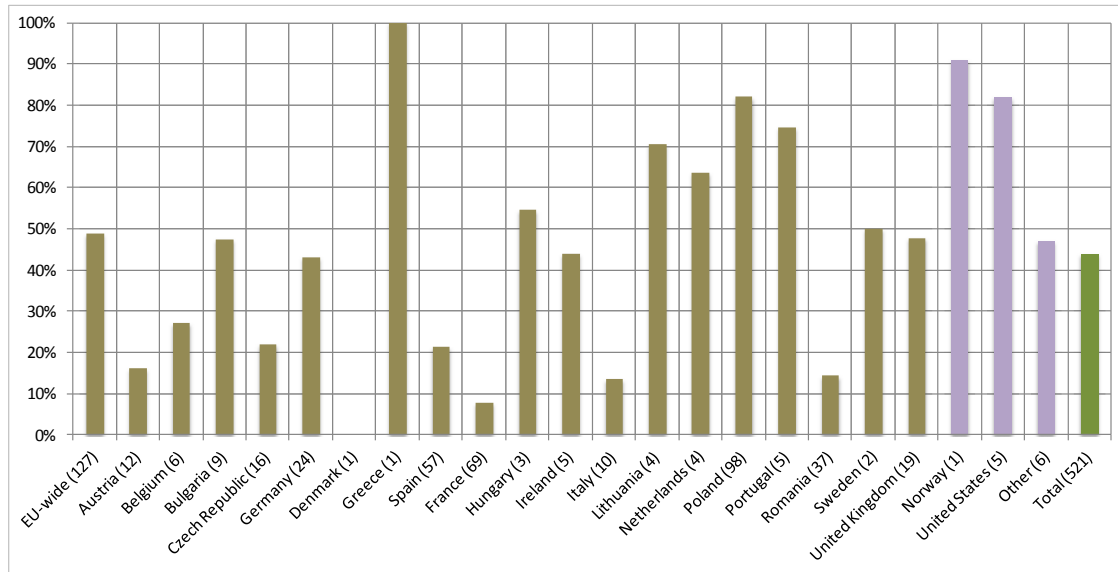


Figure 11: Average share of benefits considered as major or significant by companies and organisations, shown by country of residence

Additional information on answers to Question 2 by sector and size for companies and industry or trade associations is provided with Figure 12 and Figure 13. In particular, companies and industry associations in the following activity sectors appear to identify more benefits to unconventional companies than in other activity sectors:

- Oil and gas;
- Supply or material, equipment or services to the oil and gas industry;
- Energy trading;
- Supply or material, equipment or services to the other industries;
- Energy intensive industry;
- Investment.

In parallel, big companies considered, on average, that about 90% of the potential benefits from unconventional fossil fuels could be major or significant, whereas SMEs assessed, on average, that about 55% of these benefits could be major or significant if unconventional fossil fuels were developed in the EU.

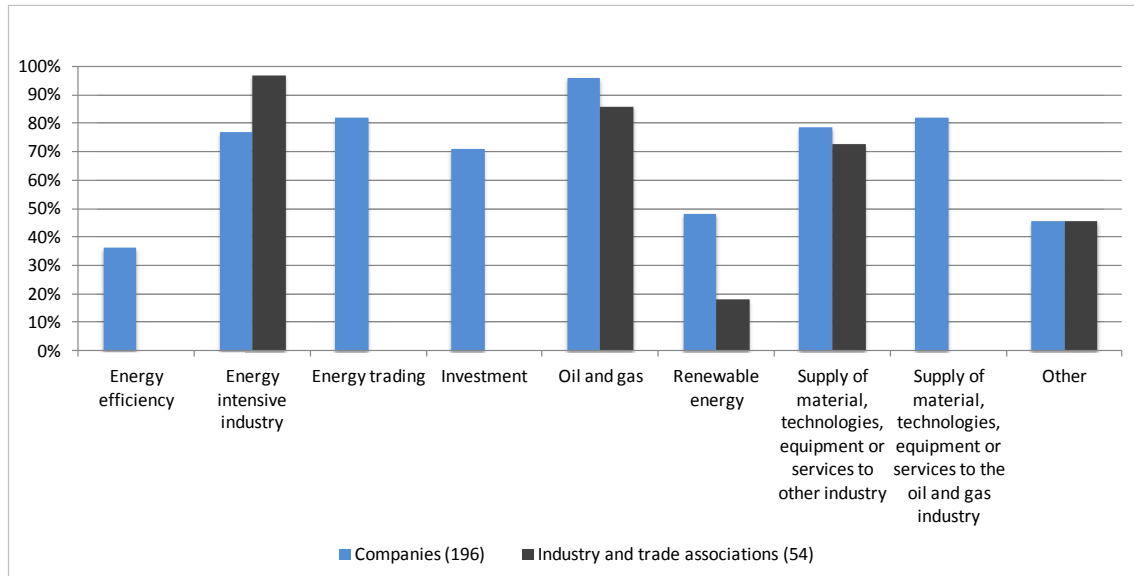


Figure 12: Average share of benefits considered as major or significant by companies and industry or trade associations according to sector of activity

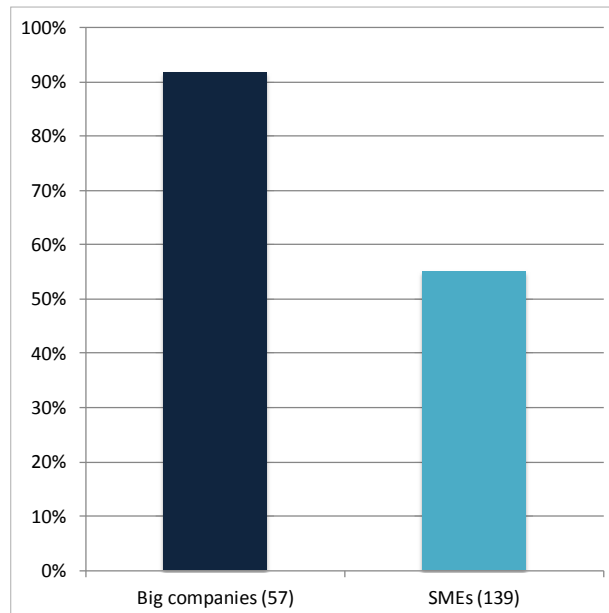


Figure 13: Average share of benefits considered as major or significant by companies according to company size

3.4 Answers from public authorities

3.4.1 Assessment of potential benefits

Answers to Question 2 from national authorities are summarised in Figure 14:

- National authorities (minimum 10 respondents in four countries) considered in large proportions that the 11 benefits could be major or significant if unconventional fossil fuels were exploited. In particular, 10 of the 11 benefits were identified as major or significant by more than 70% of national

authorities. Up to 90% of the respondents identified the diversification of the EU energy mix as a major or significant benefit for the EU.

- Lower proportions of local and regional authorities (minimum 58 respondents in eight countries) identified the benefits as potentially major or significant. On average, each benefit was identified by 40% of them as potentially major or significant.

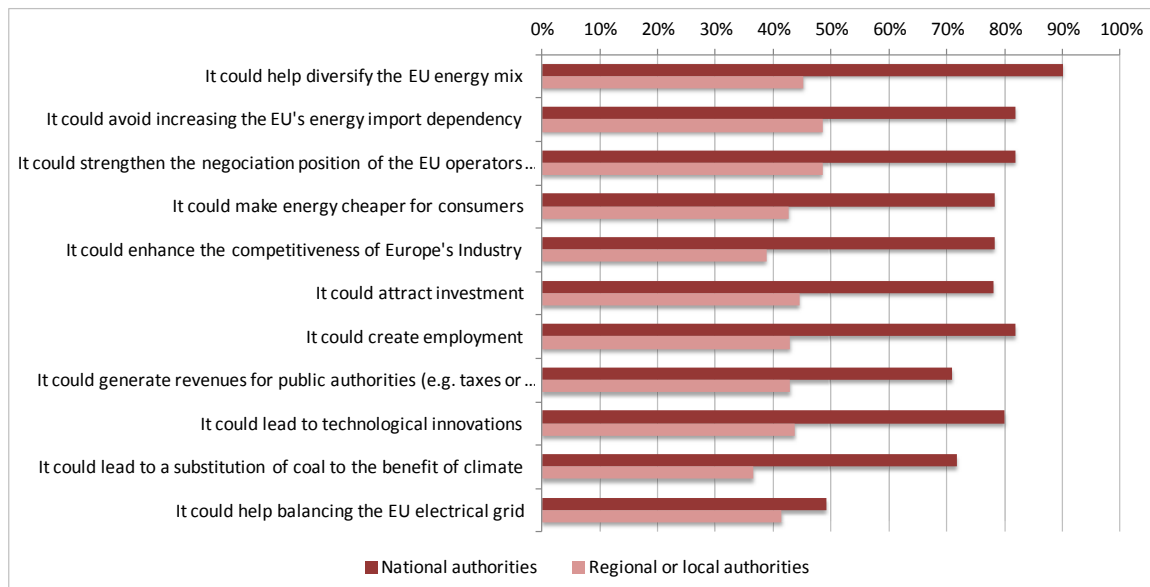


Figure 14: Share of national and regional or local authorities from EU countries stating that each potential benefit could be major or significant

Furthermore, the tables below provide additional information on the share of the 11 benefits identified as major or significant by public authorities, with a breakdown by country and a breakdown by field of action. It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration. The project team checked the identities of public authorities as far as possible but there may still be a small number of respondents from organisations that misidentified themselves.

- National differences are important, with the responding authorities from Poland considering that a large majority (86.6%) of the benefits could be major or significant, in contrast to the responding authorities from Germany (1.5%), France (13.1%), Spain (16.4%) and Romania (22.7%).
- The responding authorities principally involved in Health and Safety and Economics did not qualify the potential benefits as major or significant (average of only 3% of the benefits identified as such).
- On the other hand, the public authorities involved in Mining and Geology considered that a large proportion (over 80%) of the benefits could be major or significant if unconventional fossil fuels were exploited in the EU.

Table 2: Proportion of potential benefits identified as major or significant by public authorities, by country

Country	National authorities	Regional or local authorities	All authorities
Austria	NA	0% (1)	0% (1)
Belgium	NA	63.6% (1)	63.6% (1)
Czech Republic	90.9% (1)	18.2% (7)	27.3% (8)
Germany	NA	1.5% (6)	1.5% (6)
Denmark	72.7% (1)	NA	72.7% (1)
Spain	NA	16.4% (5)	16.4% (5)
France	0% (1)	14.8% (8)	13.1% (9)
Poland	89.3% (7)	85.4% (22)	86.6% (29)
Romania	NA	22.7% (4)	22.7% (4)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

Table 3: Proportion of potential benefits identified as major or significant by public authorities, by field of action

Field of action	National authorities	Regional or local authorities	All authorities
Economics	NA	3% (3)	3% (3)
Energy	100% (1)	9.1% (1)	54.5% (2)
Environment	93.9% (3)	49.1% (15)	56.6% (18)
Geology	78.8% (2)	90.9% (1)	80.5% (3)
Health and safety	0% (1)	4.5% (2)	3% (3)
Mining	90.9% (1)	81.8% (1)	86.4% (2)
Other	100% (2)	47.4% (31)	50.5% (33)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

3.5 Identification of additional potential benefits

The respondents additionally suggested a number of other potential benefits expected from the development of unconventional fossil fuels in Europe. Among the options provided, several appeared repeatedly and were identified by all types of respondents (individuals, companies or organisations, and public authorities). Many respondents stated that the development of unconventional fossil fuels would help reduce differences in the development level among EU regions, develop regional and local infrastructure and employment and speed economic recovery due to increased income. Some respondents mentioned that development of unconventional fossil fuels would help reinforce scientific collaboration within the EU and with bordering countries. Some public authorities referred to cost-efficient achievement of implementation of

EU climate policy. A large number of replies also praised benefits for EU industry, such as support for reindustrialisation in Europe, providing resources for the European chemical industry and hence improving its competitiveness, providing a transition solution between other fossil fuels and renewable energy and new opportunities for hybrid energy systems (e.g. renewable and gas). Some respondents identified as companies and organisations also mentioned increased investments in infrastructure and stimulation of use of natural gas as fuel for vehicles as other benefits for the EU. Some respondents highlighted benefits for technological innovations such as enhancing development of new extraction methods that are more environmentally friendly and the possibility of transferring the technology to develop other sources of energy, e.g. geothermal. Other additional benefits focused on energy security and access to energy. Several respondents identified as individuals or public authorities thought that unconventional fossil fuels development would improve knowledge of the geology of the EU and possibly allow discovery of new mineral resources. Some individual respondents mentioned a decrease of energy imports from countries where EU technological and environmental requirements are not in effect as a potential benefit. Some stated that unconventional fossil fuels development would limit development of nuclear energy, would ensure access to resources not as intermittent as renewable energy solutions (e.g. wind and photovoltaic), or that it would have a positive impact on quality of energy distributed and would help combat energy poverty.

The additional potential benefits described above were expressed by respondents mostly from Poland, England, Germany, Austria, Spain, Portugal and France.

In addition, a significant proportion of respondents of all kinds, also among those in favour of unconventional fossil fuels development, raised concerns that the negative social and environmental impacts would largely override potential economic benefits, which would be only short term and limited. Many of those who expressed these concerns worried that most benefits will be absorbed by the companies exploiting shale gas. The majority of answers pointed out that the benefits of unconventional fossil fuels could be obtained with alternative sources of energy, and that renewable energies in particular could lead to higher benefits. All or some of those additional concerns were expressed by at least some respondents in almost all countries who provided further replies (FR, CZ, ES, PT, AT, EN, IE, BE, BG, DK, NL, SE, IT, RO).

Chapter 4: Challenges of unconventional fossil fuels (e.g. shale gas) as identified by respondents

4.1 Questions asked to respondents

Respondents were asked to indicate their anticipation concerning areas of challenge. The question was formulated as follows:

- ▶ Question 4: please indicate for each area what level of challenges you expect from the development of unconventional fossil fuels (e.g. shale gas) in Europe.
 - ▷ A major challenge;
 - ▷ A significant challenge;
 - ▷ A modest challenge;
 - ▷ Not a challenge;
 - ▷ I don't know.

The list of challenges submitted to the assessment of respondents was:

1. It could lead to new problems related to the quantity of used water
2. It could lead to new problems related to water quality
3. It could lead to new problems related to air quality
4. It could lead to new problems related to soil
5. It could lead to new problems related to land take
6. It could lead to new problems related to nature and biodiversity (e.g. forests, vegetation, wildlife)
7. It could lead to new problems related to community disruption (e.g. noise, increased traffic)
8. It could lead to new problems related to seismic activity
9. It could give rise to long term geological risks (i.e. after the cessation of the operations)
10. It could increase risks to the climate (e.g. methane emissions)
11. It could divert resources away from other energy options (e.g. renewable energy sources, energy efficiency)
12. It could lead to health and safety risks for workers at the exploration and extraction sites
13. It could be bad for local image, tourism, and the value of properties
14. Lack of transparency and public information
15. Inadequate legislation applicable to these projects

16. Lack of level playing field for operators in Europe due to different national approaches
17. Lack of capacity of public authorities to supervise a large number of facilities
18. Lack of public acceptance

Furthermore, respondents could freely answer an open-ended question on other challenges that they identified, not included in the list above.

- ▶ Question 5: it could lead to other challenges (please specify and indicate the level of challenge you expect: major/significant/modest challenge)

The answers to Question 4 and Question 5 from individuals, companies and organisations, and public authorities are summarised below.

4.2 Answers from individuals

4.2.1 Assessment of potential challenges

Figure 15 displays the share of respondents stating that each potential issue could lead to major or significant challenge if unconventional fossil fuels were developed in the EU:

- The lack of transparency and public information was identified by respondents as the main challenge that development of unconventional fossil fuels would lead to (63% identified it as a major or significant challenge).
- Several other challenges were identified by the majority of respondents as major or significant: inadequate legislation applicable to these projects, lack of public acceptance, new problems related to water quality and the quantity of water used, lack of capacity public authorities to supervise a large number of facilities, lack of a level playing field for operators in Europe due to different national approaches, new problems related to soil as well as nature and biodiversity, and long term geological risks. All these responses were identified as major or significant by more than 50% of respondents)

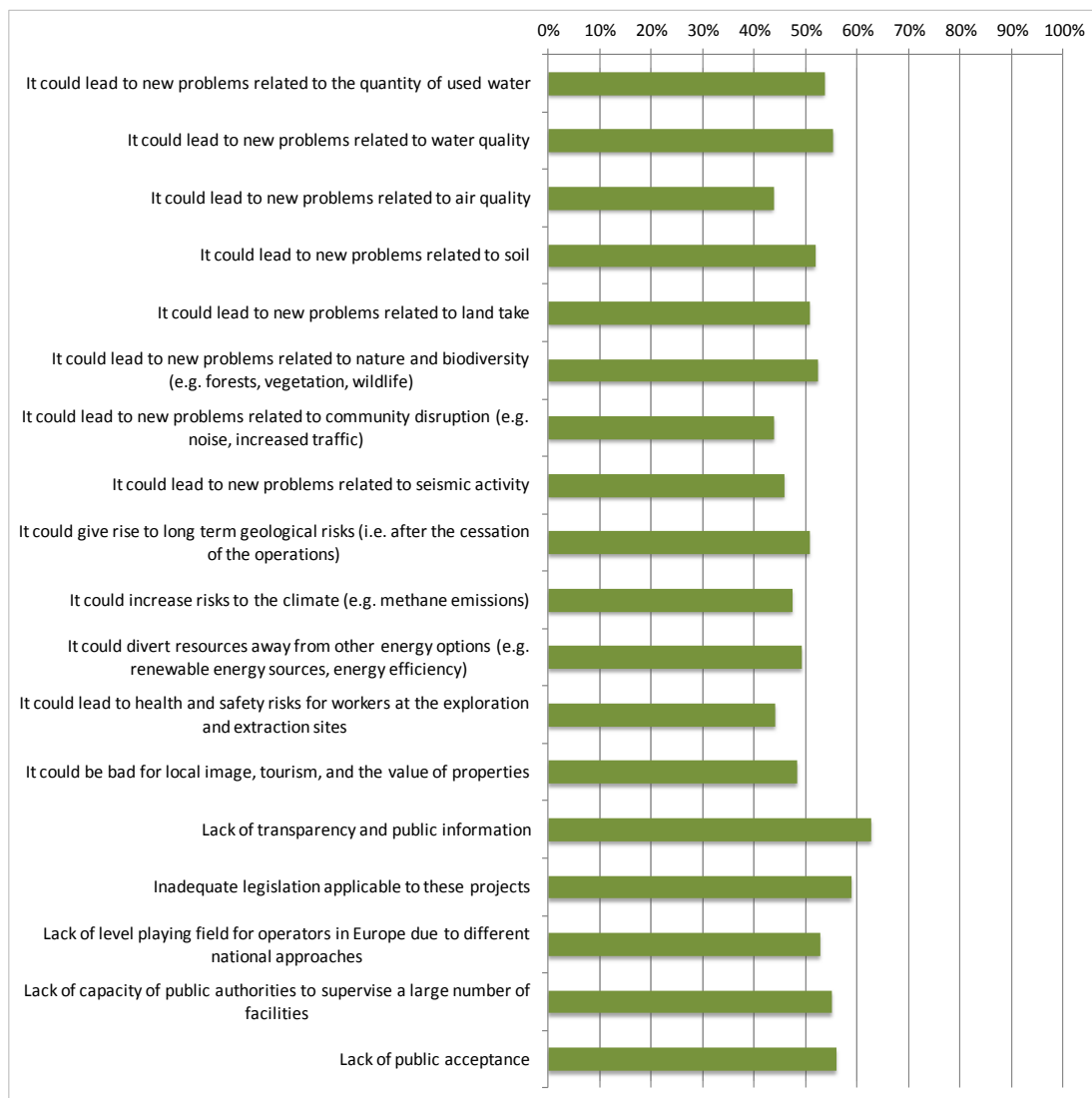


Figure 15: Share of individual respondents from EU countries stating that each issue could lead to major or significant challenge

National differences are further presented in Figure 16.

- Individual respondents from almost all EU countries identified, on average, more than 50% (and most of them more than 70%) of the challenges to be potentially major or significant;
- In Poland, 18% of the challenges were identified, on average, as major or significant. Poland is the country in which the amount of challenges considered as major or significant by individual respondents appeared to be very small compared to all other countries.
- Outside the EU, Norwegian respondents identified the lowest share of challenges as potentially major or significant (about 43%).

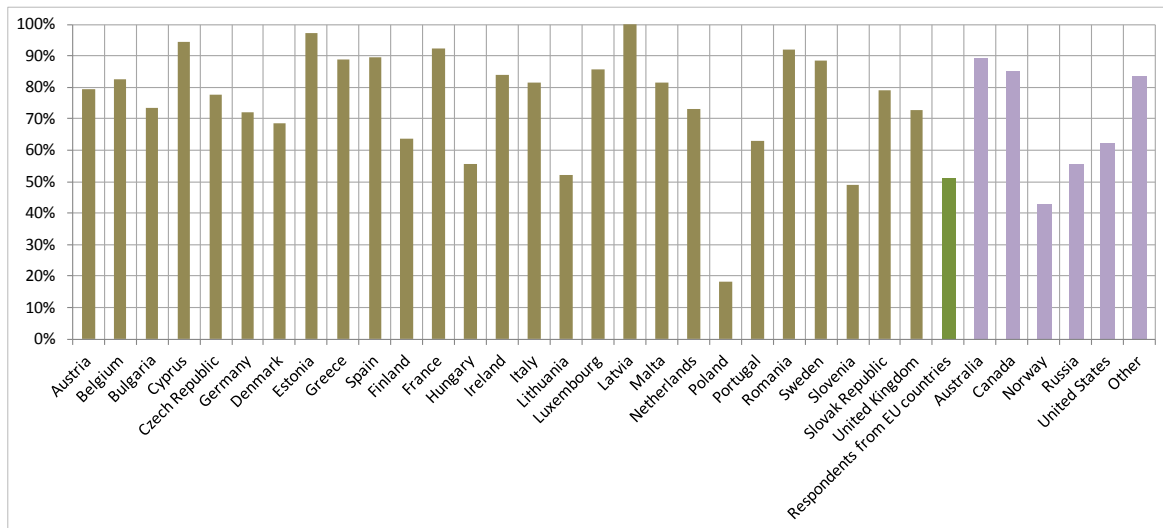


Figure 16: Average share of challenges considered as major or significant by individual respondents according to their country of residence

4.3 Answers from companies and organisations

4.3.1 Assessment of potential challenges

Figure 17 and Figure 18 present the detailed answers to Question 4 for companies and organisations by type of organisation, whereas Figure 19 provides the average share of potential challenges by type of organisation. The most interesting pieces of information displayed by these figures are:

- For academic institutions, private companies and industry and trade associations the challenge most commonly considered as major or significant is lack of public acceptance (73%, 58% and 66% of respondents respectively by type of organisation);
- For social or environmental NGOs and intergovernmental organisations almost all challenges are considered major or significant (mostly 100% of respondents from intergovernmental organisations for nearly all challenges and on average 90% of NGOs with very small differences among options);
- For respondents that qualified themselves in the “other” category, the challenge most commonly considered as major or significant is lack of transparency and public information
 - The contrasting positions of the different types of organisation that participated in the public consultation:
- Environmental and social NGOs and intergovernmental organisations identified the largest shares of challenges as major or significant;

- On the other hand, academic institutions, industry and trade associations, along with companies are the types of institutions that identified the lowest shares of challenges as major or significant.

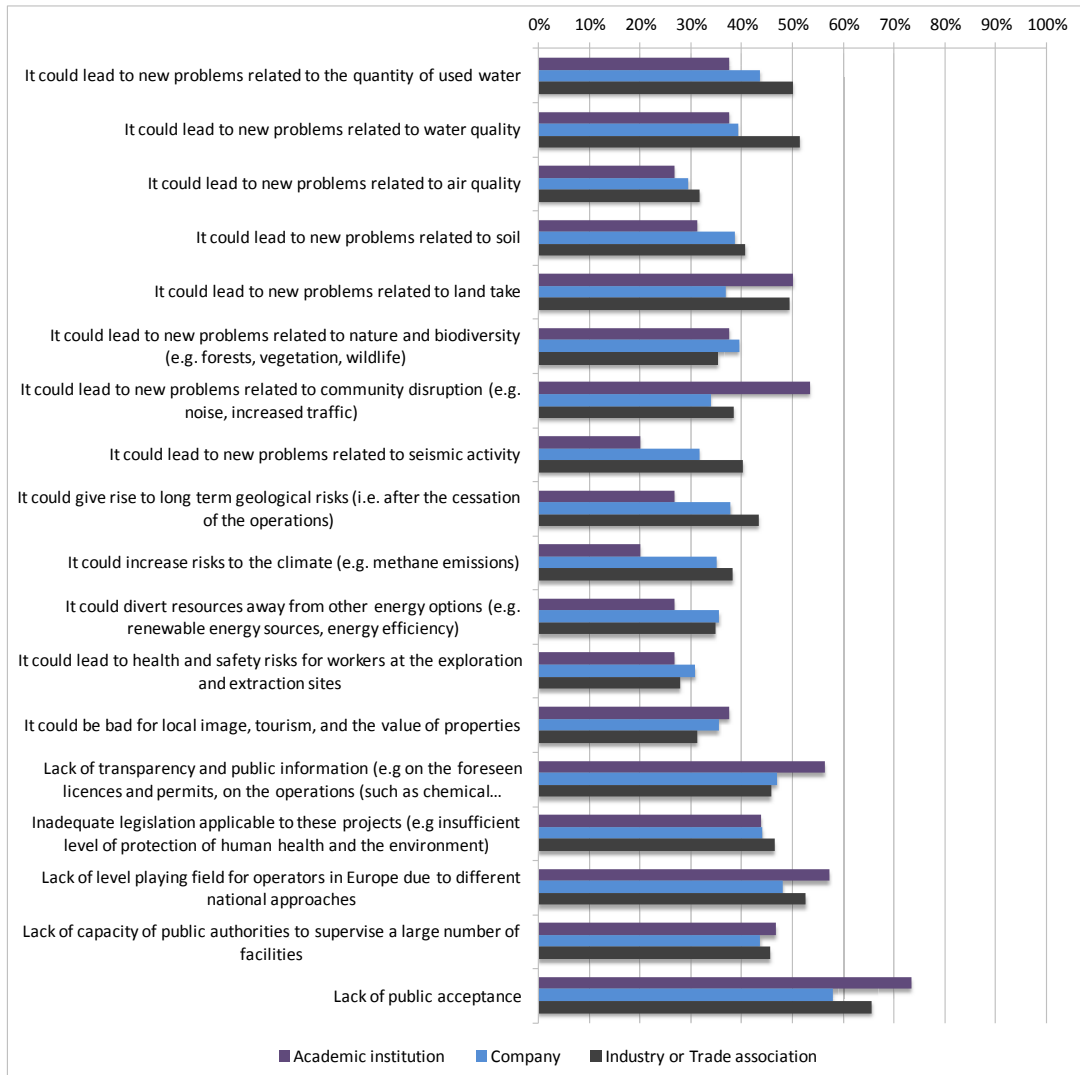


Figure 17: Share of companies and organisations from EU countries stating that each issue could lead to major or significant challenge

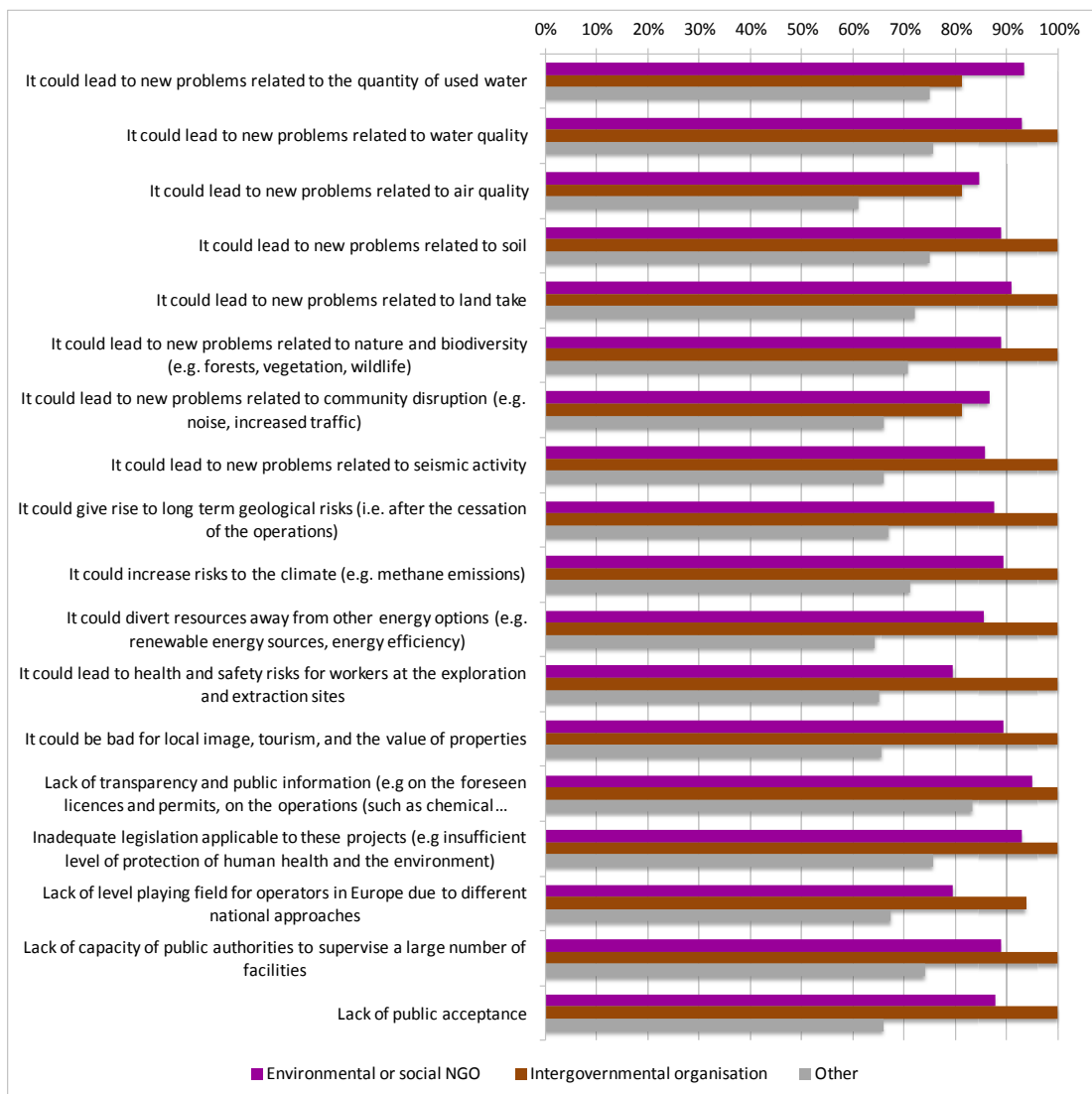


Figure 18: Share of companies and organisations from EU countries stating that each issue could lead to major or significant challenge - continued

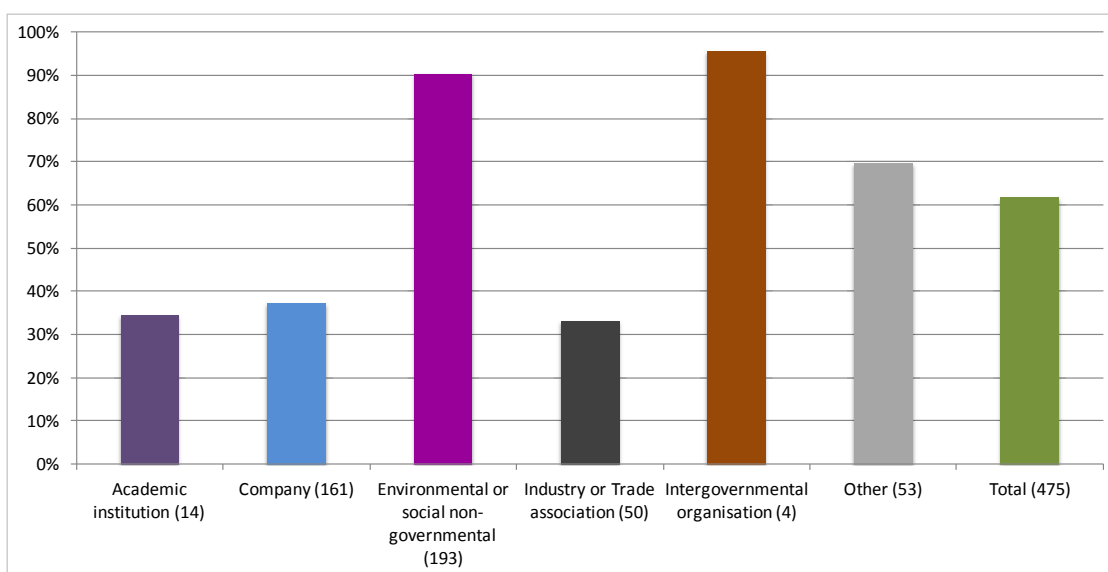


Figure 19: Average share of challenges considered as major or significant by type of organisation from EU countries

The breakdown by country of these institutions concerning their opinion about the benefits is provided in Figure 20:

- At least 60% of respondents assessed challenges as potentially major or significant within companies and organisations from 12 EU countries. This is in particular important for respondents from Denmark, Italy, Romania and France (at least 90% of challenges are considered major or significant);
- The companies and organisations that registered the lowest average of challenges considered major or significant (less than 30%) were registered as coming from Greece (1 respondent), Poland (78) and Portugal (4).

Out of the EU, companies and organisations from Norway (1) and the United States (4) consider an almost non-existing amount of challenges to be potentially major or significant as compared with the EU countries.

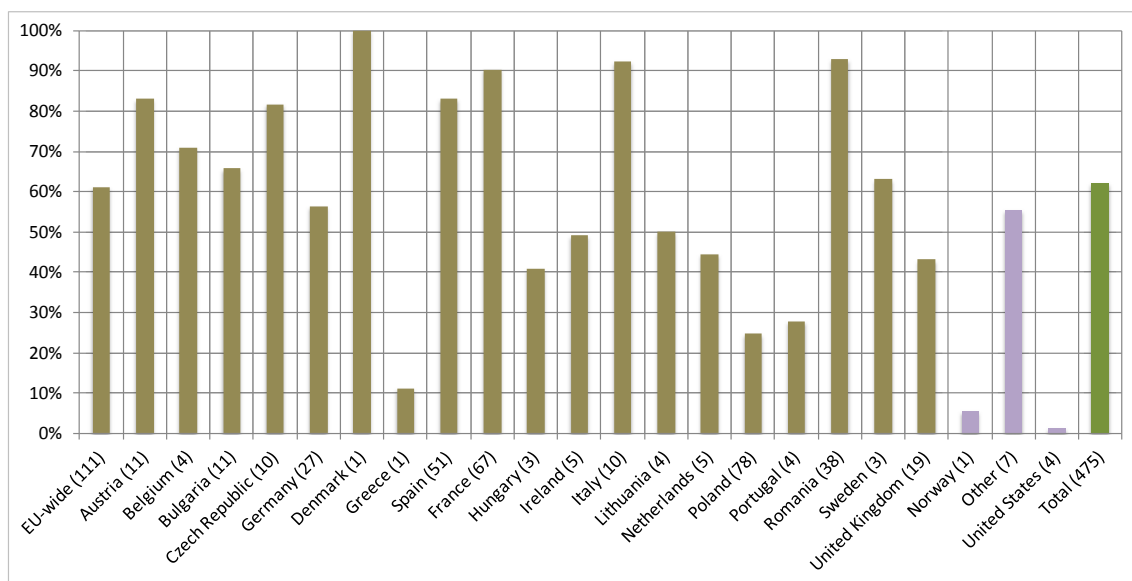


Figure 20: Average share of challenges considered as major or significant by country of residence

Additional information on answers to Question 4 by sector and size for companies and industry or trade associations is provided with Figure 21 and Figure 22. In particular, companies and industry and trade associations in the following activity sectors appear to identify fewer challenges that involve unconventional fossil fuels development than in other activity sectors:

- Oil and gas;
- Supply or material, equipment or services to the other industries;
- Energy trading;
- Energy intensive industry (although noticeable difference between organisations, nearly 40% of companies consider challenges as major or significant); and
- Renewable energy (although more than 40% of industry and trade associations consider challenges as major or significant)

In parallel, big companies considered on average that about 10% of the potential challenges that involve unconventional fossil fuels development could reveal to be major or significant, whereas SMEs assessed, on average that about 51% of these challenges could be major or significant if unconventional fossil fuels were developed in the EU.

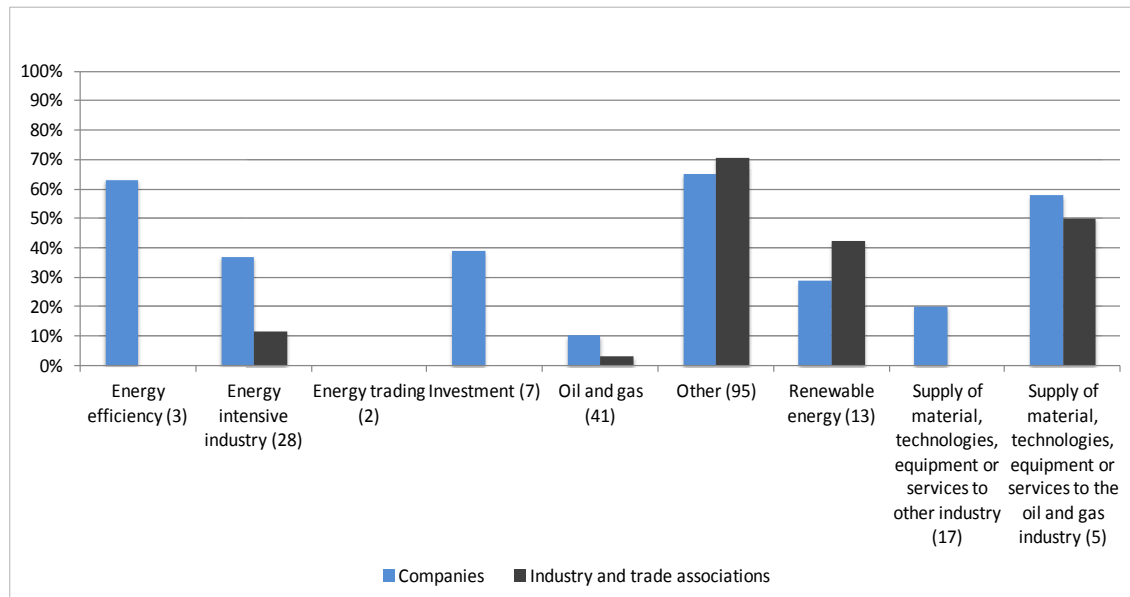


Figure 21: Average share of challenges considered as major or significant by companies and industry or trade associations according to sector of activity

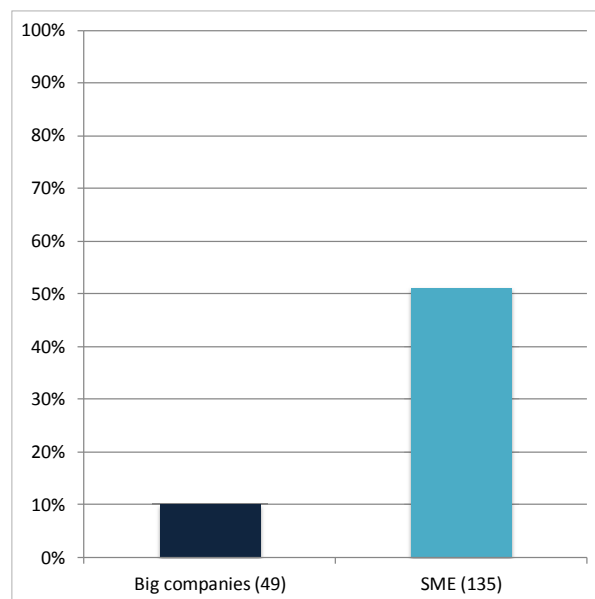


Figure 22: Average share of challenges considered as major or significant by companies according to company size

4.4 Answers from public authorities

4.4.1 Assessment of potential challenges

Answers to Question 4 from national, regional and local authorities are summarised in Figure 23:

- Regional and local authorities considered in large proportions that the 18 challenges could be major or significant if unconventional fossil fuels were developed. In particular, 11 out of the 18 challenges were identified as major or significant by more than 60% of regional and local authorities. 77% of these respondents identified the lack of public acceptance as a major or a significant challenge for the EU;
- Lower proportions of national authorities identified the challenges as potentially major or significant. On average, each challenge is identified by 29% of them as potentially major or significant. Only one challenge – lack of public acceptance – was identified by a majority of national authorities as major or significant.

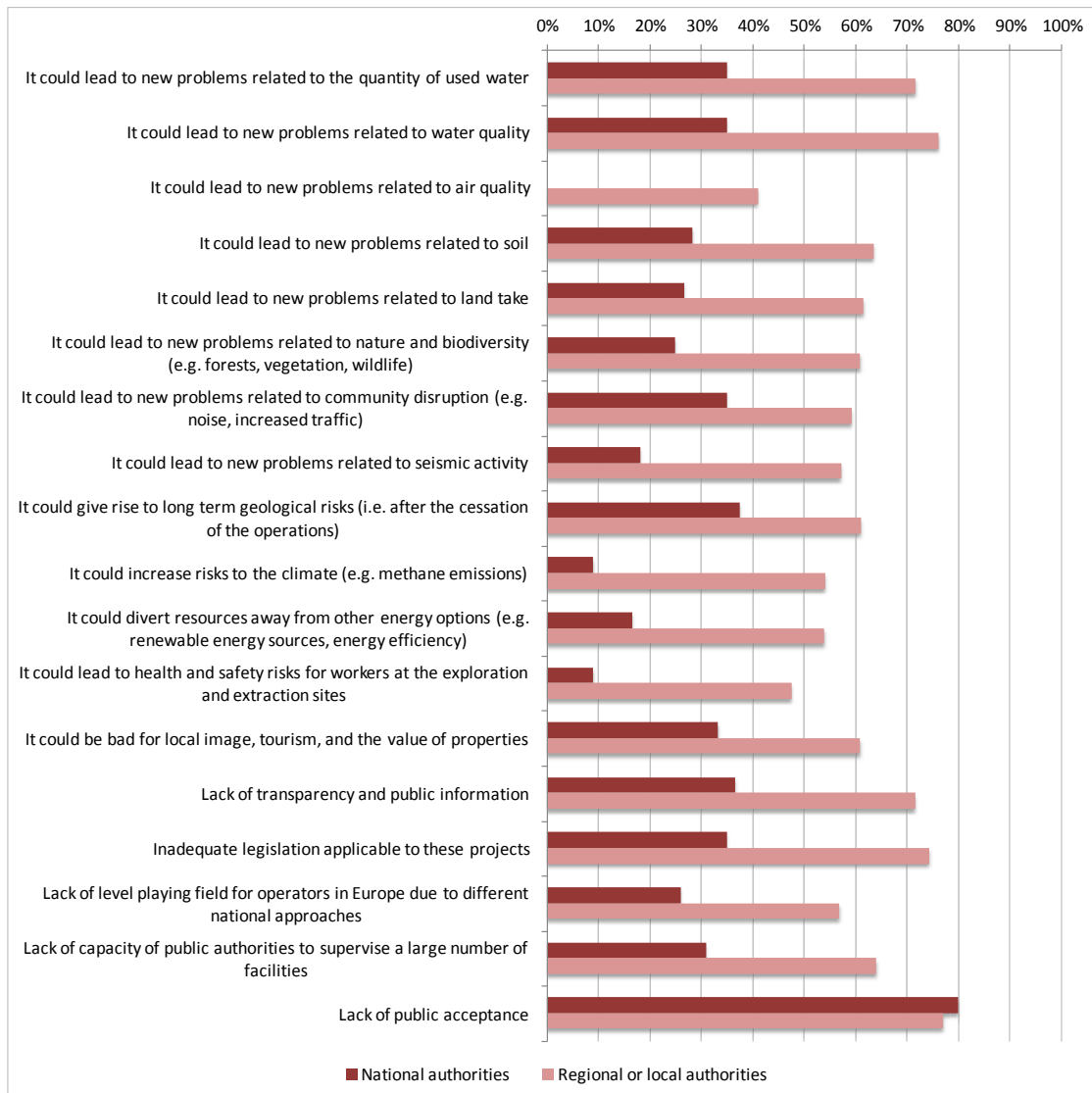


Figure 23: Share of national and regional or local authorities from EU countries stating that each issue could lead to major or significant challenge

Furthermore, the tables below provide additional information on the share of the 18 challenges identified as major or significant by public authorities, with a breakdown by country and a breakdown by field of action.

- National differences are important, with the responding authorities from Poland considering that only 20.4% of the challenges could be major or significant, conversely to the authorities from Romania (95.6%), France (83.3%), Germany (79.6%), Czech Republic (77%) and Belgium (66.7%).
- The responding authorities principally involved in Energy, Economics and Environment qualified the potential challenges as major or significant (average of 82% of the challenges identified as such).
- On the other hand, the public authorities involved in Mining and Geology considered that a small proportion (close to 18%) of the challenges could be major or significant if unconventional fossil fuels were exploited in the EU.

Table 4: Proportion of potential challenges identified as major or significant by public authorities, with a breakdown by country

Country	National authorities	Regional or local authorities	All types
Belgium	NA	66.7% (1)	66.7% (1)
Czech Republic	61.1% (1)	79.6% (6)	77% (7)
Germany	NA	79.6% (6)	79.6% (6)
Denmark	5.6% (1)	NA	5.6% (1)
Spain	NA	70% (5)	70% (5)
France	0% (1)	92.6% (9)	83.3% (10)
Poland	24.6% (3)	19% (20)	20.4% (23)
Romania	NA	95.6% (5)	95.6% (5)
Other	NA	100% (1)	100% (1)
Total	23.9% (6)	59% (53)	53.5% (59)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

Table 5: Proportion of potential challenges identified as major or significant by public authorities, with a breakdown by field of action

Field of action	National authorities	Regional authorities	All
Economics	NA	87% (3)	87% (3)
Energy	NA	100% (2)	100% (2)
Environment	66.7% (2)	57.9% (14)	59% (16)
Geology	16.7% (2)	NA	16.7% (2)
Health and safety	0% (1)	75% (2)	50% (3)
Mining	5.6% (1)	25% (2)	18.5% (3)
Other	NA	55.2% (30)	55.2% (30)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

4.5 Identification of additional potential challenges

Among the responses in this group, several themes can be identified such as legal and political failures, land and soil issues, lack in technology and other long-term issues. The respondents that cited additional challenges concerning potential legal or political failures, in particular many companies, organisations and individuals from several countries cited evoked risk of corruption of public authorities for delivery of exploitation permits as important challenge; many organisations and public authorities worried that increased lobbying activities would influence energy policies of countries. Some respondents were concerned about risk of conflicts with third countries e.g. Russia or other political consequences from external oil, gas or nuclear energy suppliers. Some evoke possible conflicts with environmental groups. There was also an apprehension of some individual respondents that the foreign gas companies would take control of the resource and most benefits would be taken by them and not the country and local population. Some organisations underlined lack of consistency in the application of existing EU legislation and policies. Some citizens think that development of unconventional fossil fuels would generate unequal distribution of revenues and the difficulty to find balance between establishing taxes and enabling price cuts for individuals and industry; others are afraid that there is a risk that the EU control the development of unconventional fossil fuels in Member States via directives and extraction limits.

Another type of responses concerned potential issues with land and soil. A significant proportion of respondents (organisations and citizens) raised potential problems such as risk of population displacement as a result either of labour opportunities (e.g. rural exodus or boomtown effect) or of soil contamination after cessation of extraction; possible raise of radioactivity and heavy metals presence in soil. Some citizens, mostly in Spain, Germany, Ireland, Sweden, Italy and Poland, worried that development of unconventional fossil fuels would have a negative impact on agriculture and breeding, and hence the quantity and quality of food produced. Some pointed to possible damage of infrastructure due to too strong burden.

There was also a large number of replies pointing out insufficient level of skills, technology and infrastructure (e.g. extraction techniques, waste treatment technology or gas transportation infrastructure, quantitative methods to measure impact of unconventional fossil fuels extraction) and also insufficient knowledge and unpredictability of consequences of extraction methods such as hydraulic fracturing process.

The last theme identified concerns other possible long-term issues due to development of unconventional fossil fuels. A significant number of citizens worried about possible increase of health and safety risks for local populations for a very long term. Some citizens and organisations expressed fear of economic downturn once the extraction finished, and hence impoverishment of population in a long run. Several respondents evoked issues with responsibility of companies arising after cessation of extraction and problems with site rehabilitation. Among other responses, some additional potential challenges were identified such as not taking end-of-lifecycle cost into account in the gas price, risk of increase in price of water and sand, possible new inequalities between counties or regions.

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Chapter 5: Ways of addressing the challenges of unconventional fossil fuels (e.g. shale gas) as identified by respondents

5.1 Questions asked to respondents

Respondents were asked to assess the importance of recommended measures to avoid or minimise environmental, climate and health risks of unconventional fossil fuels (e.g. shale gas) development in Europe. The question was formulated as follows:

- ▶ Question 6: How important do you consider that the below recommendations are to avoid or minimise environmental, climate and health risks of unconventional fossil fuels (e.g. shale gas)?
 - ▷ Very important;
 - ▷ Important;
 - ▷ Somewhat important;
 - ▷ Not important at all; and
 - ▷ I don't know.

The list of recommendations to address the challenges submitted to the assessment of respondents is presented hereafter:

1. Plan ahead of developments (e.g. expected number of wells; space between wells; distance to residential areas, aquifers, protected areas)
2. Assess the risks of the underground (geological) formation before deciding whether to proceed with drilling and hydraulic fracturing
3. Characterise operational risks before, during and after operations, including through the use of specific models
4. Make sure the well is properly constructed, isolated and does not leak
5. Monitor the quality of water, air and seismicity aspects before, during and after operations
6. Disclose operational data (e.g. volumes of water used; chemical additives used; waste characteristics; incidents)
7. Minimise the use of fracturing fluids, and substitute hazardous ones with safer alternatives
8. Minimise the use of water
9. Manage fracturing fluids and waste appropriately
10. Control releases to air, including of greenhouse gases such as methane

11. Limit noise
12. Minimise transportation needs
13. Ensure clear and robust liability regimes, including for the post-closure phase
14. Ensure that operators or permit holders have appropriate financial security in place (e.g. to cover possible accidents or post-closure requirements)
15. Provide for inspection of the wells and surveying of operations in the wider area
16. Provide for independent evaluation and verification of the projects
17. Ensure adequate responses in case of emergency

Furthermore, respondents could freely answer an open-ended question on other recommendations that they identified, not be included in the list above.

- ▶ Question 7: I have further recommendations (if so, please specify and indicate for each recommendation how important you consider it is to avoid or minimise environmental, climate and health risks of unconventional fossil fuels (e.g. shale gas): very important/important/somewhat important)

The answers to Question 6 and Question 7 from individuals, companies and organisations, and public authorities are summarised below.

5.2 Answers from individuals

5.2.1 Assessment of recommendations

Figure 24 displays the share of respondents stating that each recommendation was very important or important to avoid or minimise environmental, climate and health risks of unconventional fossil fuels (e.g. shale gas):

- Ensuring adequate responses in case of emergency was identified by respondents as the main recommendation to avoid or minimise risks (88% identified it as major or significant challenge).
- All presented recommendations were assessed as very important or important by at least 63% of respondents.

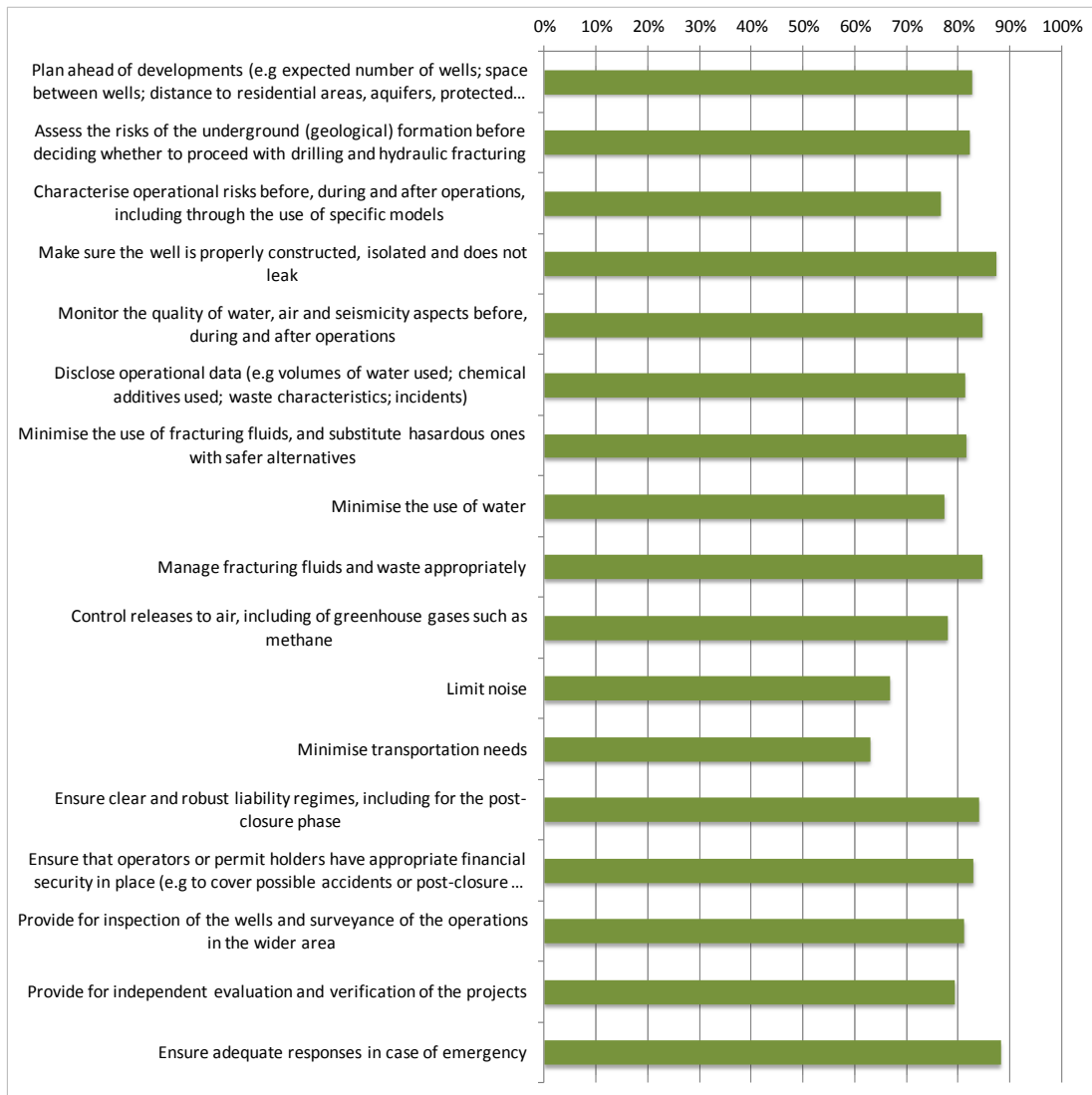


Figure 24: Share of respondents from EU countries stating that each measure was very important or important

National results are further presented in Figure 25:

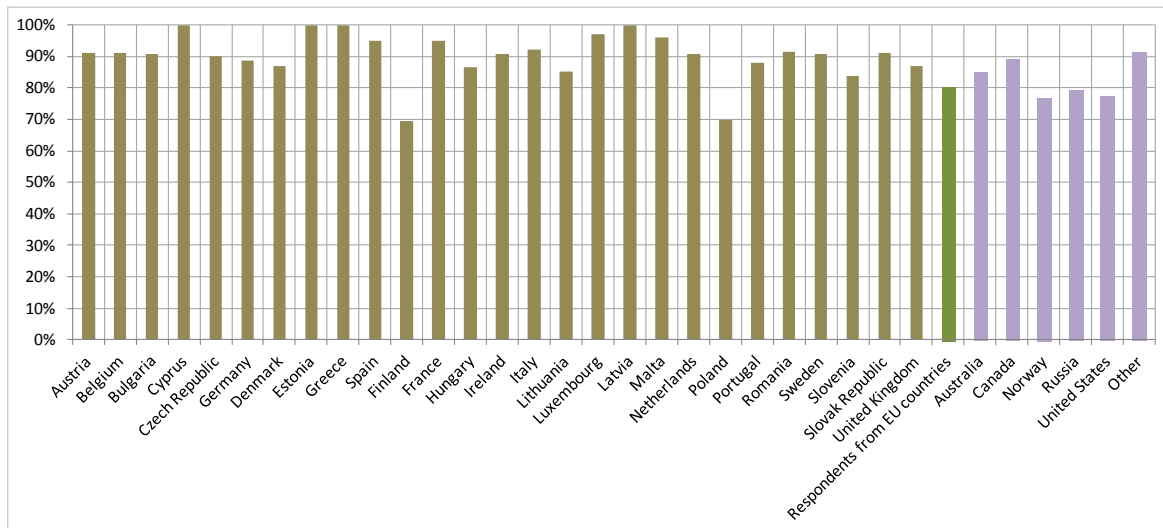


Figure 25: Average share of recommendations considered as very important or important by individual respondents according to their country of residence

5.3 Answers from companies and organisations

5.3.1 Assessment of recommendations

Figure 26 and Figure 27 present the detailed answers to Question 2 for companies and organisations by type of organisation, whereas Figure 28 provides the average share of recommendations by type of organisation. The most interesting pieces of information displayed by these figures are:

- The homogeneity of answers for all the different types of organisations – a very high proportion of respondents (88% in average), independently of the type of organisation assessed the recommendations as very important or important (Figure 28);
- The relative homogeneity of answers for all the different types of recommendations (Figure 27). There is not much difference between the share of respondents from one type of institution that identify one recommendation as very important or important and another;
- Over 80% of the respondents identified as academic institutions, industry and trade organisations agreed that planning ahead the developments, underground and operational risk assessment, well integrity, continual monitoring, disclosure of data, proper waste management, minimisation of fracturing fluids use, air emission control, liability regimes, wells inspection, independent evaluation, and adequate responses in case of emergency are very important or important;
- Almost all predefined recommendation were considered as very important or important by more than 80% of environmental NGOs and intergovernmental organisations.

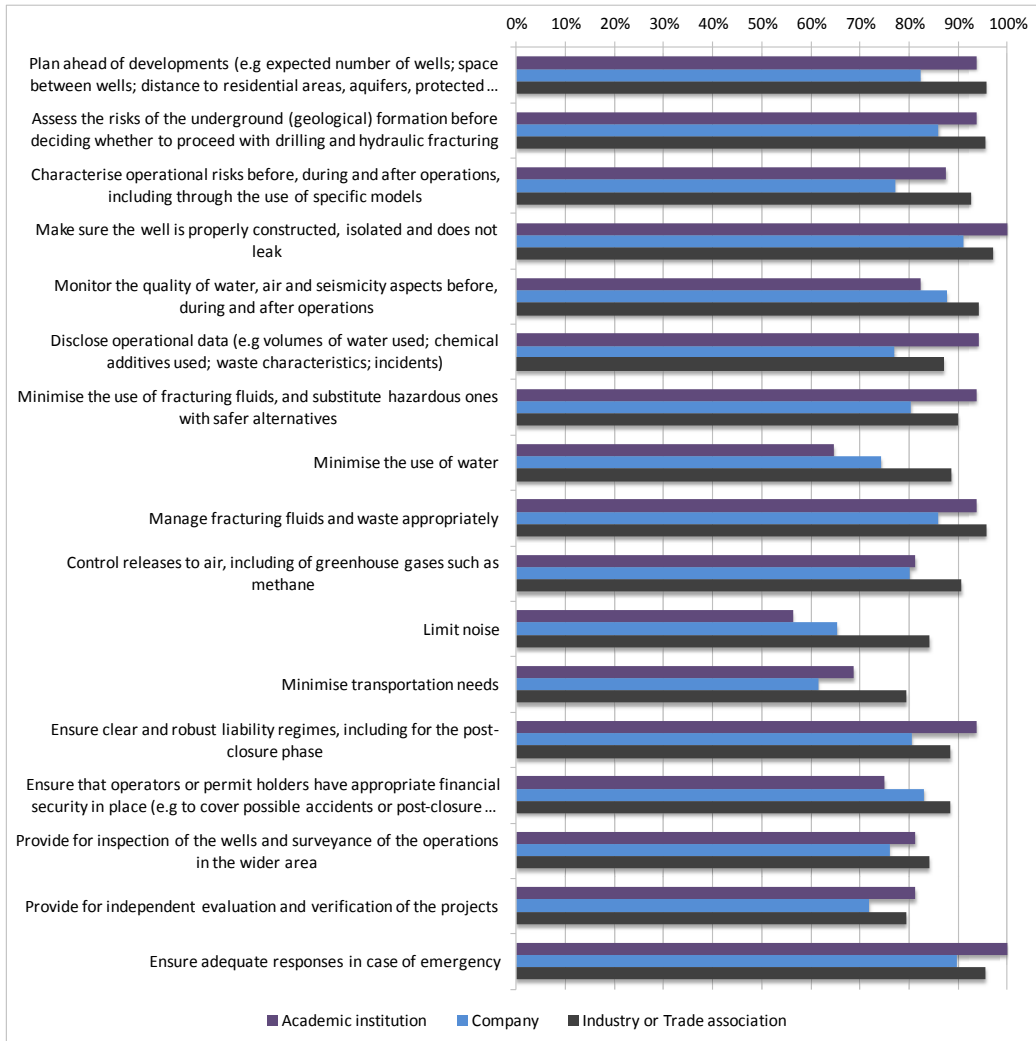


Figure 26: Share of companies and organisations stating that each measure was very important or important

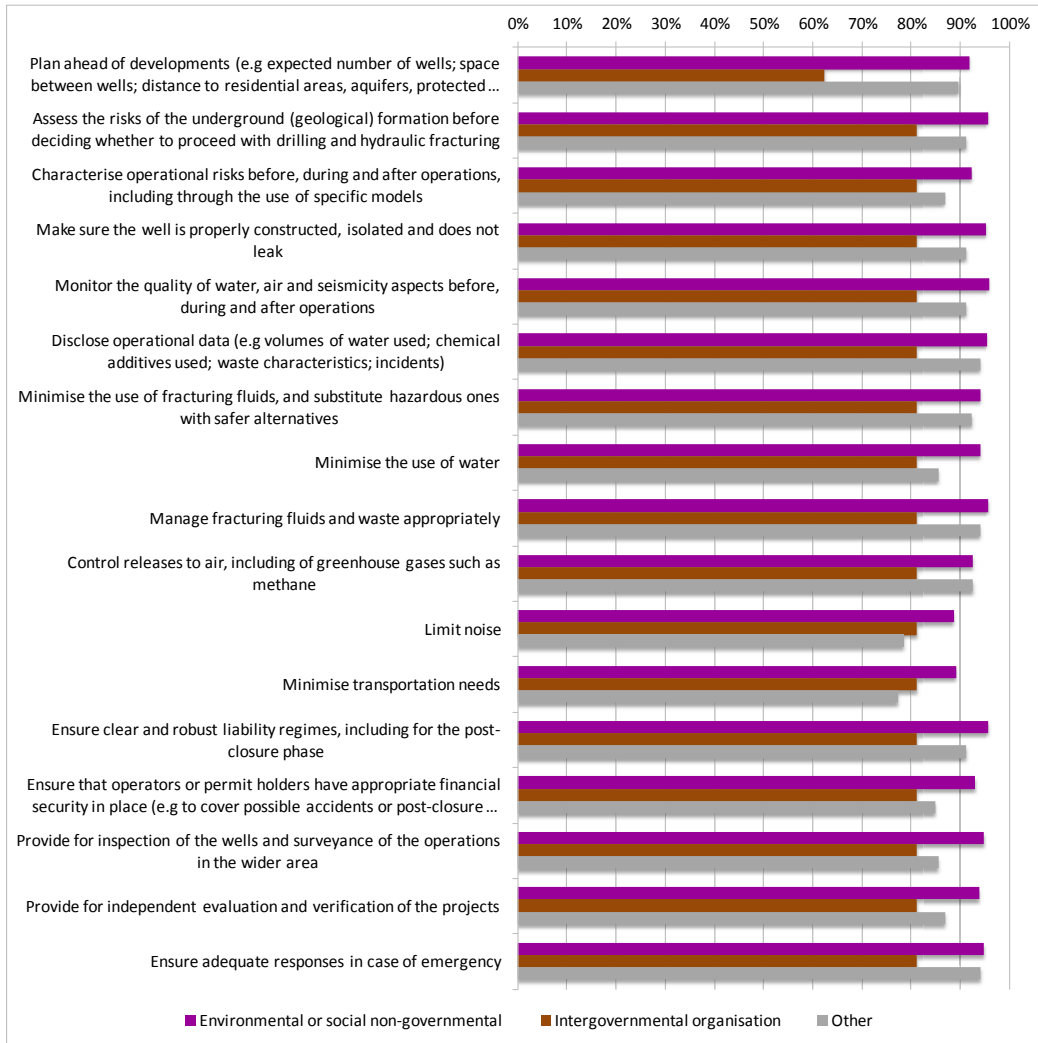


Figure 27: Share of companies and organisations stating that each measure was very important or important - continued

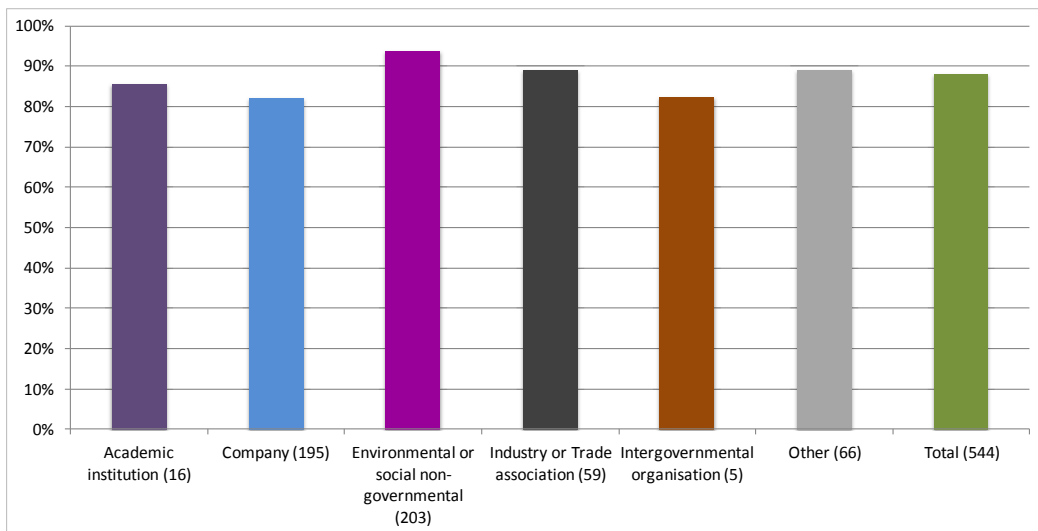


Figure 28: Average share of measures considered as very important or important by type of organisation

The breakdown by country of these institutions concerning their opinion about the benefits is provided in Figure 29:

- This breakdown shows also that there is not much difference between organisations from different countries that consider that recommendations are very important or important (at least 79% for Poland and 86% in average for EU countries);
- Out of the EU, respondents appeared to consider in the same high proportion the recommendations to be very important or important as compared with the EU average.

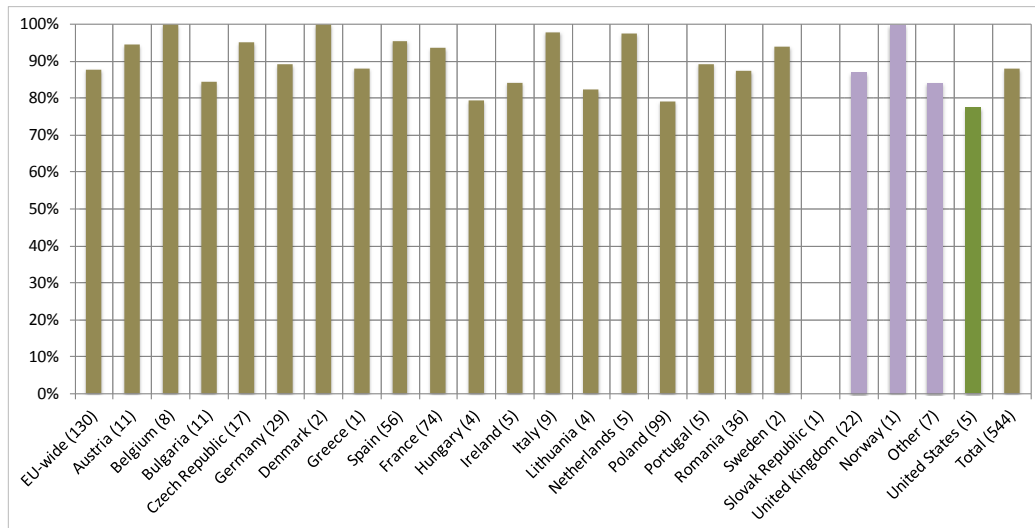


Figure 29: Average share of measures considered as very important or important by country of residence

Additional information on answers to Question 7 by sector and size for companies and industry or trade associations is provided with Figure 30 and Figure 31. In particular, companies and industry associations in all activity sectors appear to identify the recommendations as very important or important, with relatively high and homogeneous proportions of respondents:

- The lowest proportion of respondents from companies (79%) are from the energy efficiency sector and the highest (88%) are from the energy trading sector;
- 76% of respondents from oil and gas companies consider the recommendations as very important or important.

In parallel, both big companies and SMEs registered a large average of recommendations considered to be very important or important (respectively 79% and 76%).

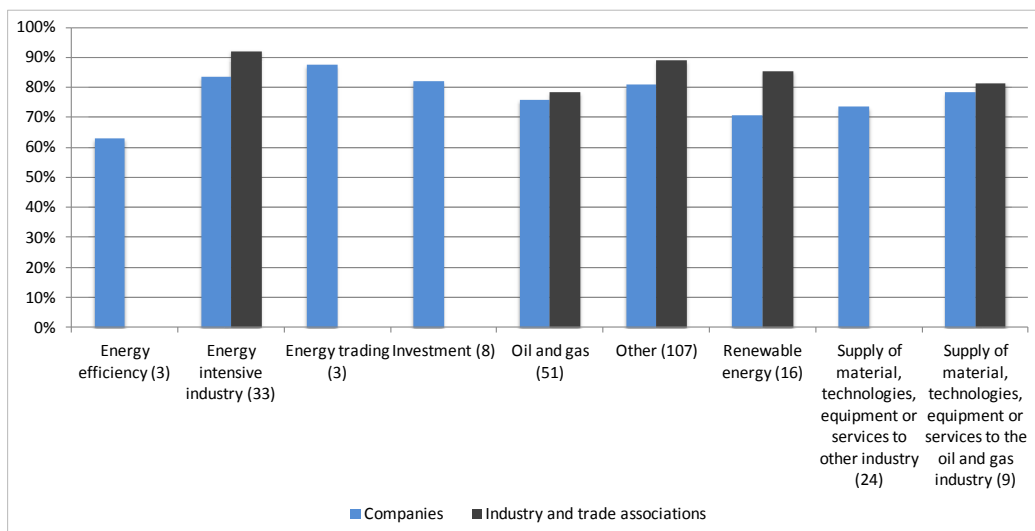


Figure 30: Average share of measures considered as very important or important by companies and industry or trade associations according to sector of activity

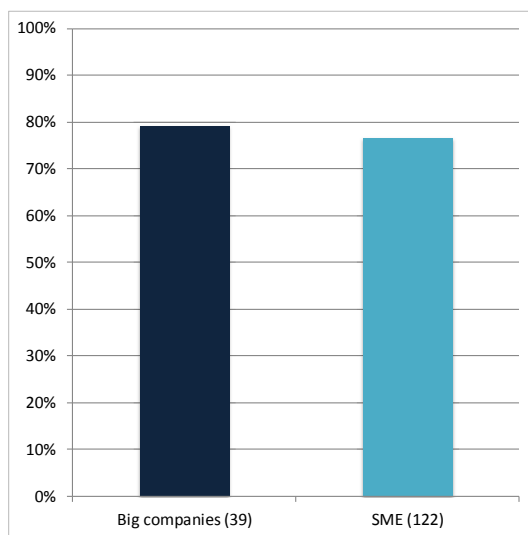


Figure 31: Average share of measures considered as very important or important by companies according to company size

5.4 Answers from public authorities

5.4.1 Assessment of recommendations

Answers to Question 7 from national, regional and local authorities are summarised in Figure 32:

- The relative homogeneity of responses among the recommendations as well as among national and regional/local authorities can be observed;
- All recommendations are defined as very important or important by a minimum of 80% of respondents from regional and local authorities (on average 93%);

- All recommendations are defined as very important or important by a minimum of 70% of respondents from national authorities (on average 85%);
- Monitor the quality of water, air and seismicity aspects before, during and after operations is the recommendation considered as very important or important by 99% of regional and local authorities responding to the survey;
- Three recommendations: "Make sure the well is properly constructed, isolated and does not leak", "Ensure clear and robust liability regimes, including for the post-closure phase", and "Ensure that operators or permit holders have appropriate financial security in place (e.g. to cover possible accidents or post-closure requirements)", are recommendations identified as very important or important by 92% of national authorities responding;
- For each response, there is a slightly lower proportion of national authorities that assessed options as very important or important than regional and local authorities.

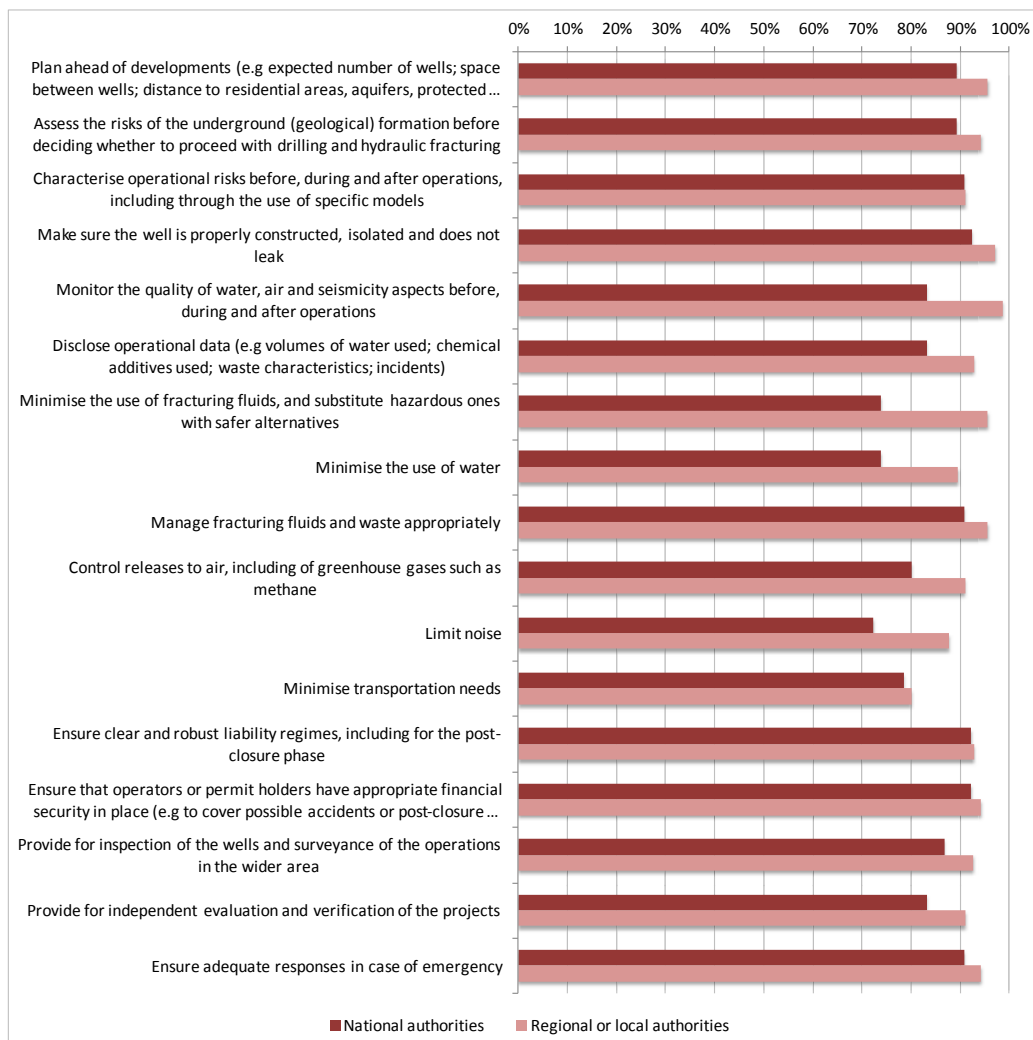


Figure 32: Share of national and regional or local authorities from EU countries stating that each measure was very important or important

Furthermore, the tables below provide additional information on the share of the 17 recommendations identified as very important or important by public authorities, with a breakdown by country and a breakdown by field of action.

- National differences are not significant, with 100% of the responding authorities from e.g. Germany, Netherlands and Romania considering that the recommendations could be very important or important.
- 94.4% of the recommendations have been qualified as very important or important by responding authorities involved in Economics.
- Public authorities involved in Health and safety considered that 63% of the recommendations could be very important or important to avoid or minimise risks of unconventional fossil fuels (e.g. shale gas) in Europe.

Table 6: Proportion of recommendations identified as very important or important by public authorities, with a breakdown by country

Country	National authorities	Regional authorities	All types
Austria	NA	100% (1)	100% (1)
Belgium	NA	82.4% (1)	82.4% (1)
Czech Republic	100% (2)	92.2% (6)	94.1% (8)
Germany	NA	100% (7)	100% (7)
Denmark	88.2% (1)	NA	88.2% (1)
Spain	NA	92.4% (7)	92.4% (7)
France	0% (1)	100% (8)	88.9% (9)
Netherlands	100% (1)	100% (3)	100% (4)
Poland	79.4% (2.8)	84.7% (22)	83.6% (24.8)
Romania	NA	100% (5)	100% (5)
Sweden	100% (1)	NA	100% (1)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

Table 7: Proportion of recommendations identified as very important or important by public authorities, with a breakdown by field of action

Field of action	National authorities	Regional authorities	All
Economics	NA	94.4% (2)	94.4% (2)
Energy	NA	88.9% (3)	88.9% (3)
Environment	93.1% (4)	85.6% (17)	87% (21)
Geology	81.5% (2.8)	72.2% (1)	80.2% (3.8)
Health and safety	0% (1)	94.4% (2)	63% (3)
Mining	50% (1)	77.8% (2)	68.5% (3)
Other	NA	88.1% (34)	88.1% (34)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

5.5 Identification of additional recommendations

The respondents additionally suggested a number of additional recommendations to avoid or minimise risks from development of unconventional fossil fuels (e.g. shale gas) in Europe. Among the recommendations provided, several themes can be identified such as legal options, information needs, technological standards to be implemented and innovation needs. Among responses that distinguished potential legal options to be implemented, many were in favour of abandoning unconventional energy sources e.g. shale gas and develop renewable energy technologies instead. A large number of respondents (from all types of respondents, mostly from FR, DE, AT, CZ, NL, RO, ES, BE, and NL) suggested banning the hydraulic fracturing process or banning unconventional fossil fuels extraction in Europe, some proposed restriction of extraction such as ban for exploitation in densely populated areas, drinking water extraction, conservation and production places, agriculture areas, natural habitats, critical infrastructure or other sensitive areas. Several citizens and public authorities (in DE, NL, PL, ES, and SI) encouraged introducing penal responsibility concerning decision making, implementation and monitoring of unconventional fossil fuels extraction for breaching environmental law. Some suggested better law enforcement in order to ensure that the companies respect the regulations and recommendations in the country they operate. There were also proposals in favour of establishing independent (financially independent from the industry), possibly international expert panel ensuring adequate inspections and law enforcement. According to several responses from citizens, a compensation system for environmental damage, for safety and environmental services, for private property values, and for loss in tourism and agriculture should be developed.

Another type of response concerned information needs. A significant proportion of respondents of all types supported the need of informing the civil society and local populations about any potential risks and precaution measures and ensuring that they accept those risks. Several organisations and citizens opted for systematic evaluation of risks and benefits in relation to the extraction process, establishment of a baseline and close monitoring of the state of the

ecosystem near the resource exploitation area, during and after the cessation of operations. Some suggested that studies on alternative methods of extraction (e.g. carbon dioxide fracturing) should be conducted and published. Some organisations supported the idea of carrying out pilot projects in order to demonstrate the safe and efficient production of unconventional fossil fuels.

The last theme identified concerns technological standards to be implemented and innovation needs. Among most repeatedly appearing responses identified by organisations and citizens were the obligation to carry out strategic impact assessment and/or environmental impact assessment of extraction projects, encouraging development of industry standards aiming for constant improvement and granting concessions for extraction only to companies with very high level of technological and ethical standards. Some respondents supported also conducting measurements of possible pollutants as well as life cycle and CO₂ emission assessment and comparing the results with alternative energy sources evaluation. A significant number of citizens and organisations opted for encouraging development of innovative exploitation methods alternative to existing fracturing processes. They also expressed support for collaboration with a wide variety of stakeholders on international level and learning from experience of unconventional fossil fuels development in other countries e.g. the United States.

Some respondents favourable to the unconventional fuels development remarked that standards should not be too ambitious, otherwise it would be difficult to reach them, and that only key elements should be regulated to allow more flexibility to the industry.

Chapter 6: Likelihood of change in respondents' opinions

6.1 Questions asked to respondents

Respondents were asked the following question:

- ▶ Question 8: if the above mentioned measures were implemented according to your ranking, would this change your overall opinion about unconventional fossil fuels (e.g. shale gas)?
 - ▷ Yes;
 - ▷ Maybe;
 - ▷ No; and
 - ▷ I don't know

The answers to Question 8 from individuals, companies and organisations, and public authorities are summarised hereafter.

6.2 Answers from individuals

Figure 33 displays the share of respondents according to readiness of respondents to change their opinion about unconventional fossil fuels (e.g. shale gas) development if the individual measures were implemented (as indicated in chapter 5):

- The majority of respondents from EU countries (64.3%) would not change their overall opinion if the individual measures were implemented according to their ranking;
- Only 15.3% of respondents would change their overall opinion and 15.7% would maybe change their overall opinion;
- Respondents from non-EU countries have on average very similar approach: over 66% would not change their overall opinion if the recommended measures were implemented.

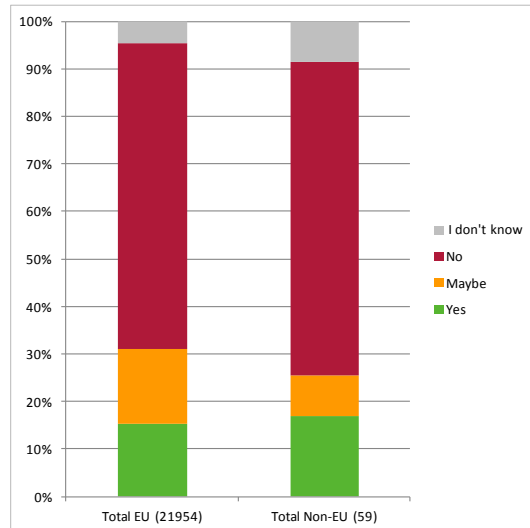


Figure 33: Readiness of respondents to change their opinion about unconventional fossil fuels (e.g. shale gas) development (EU and non-EU countries)

National differences are further presented in Figure 34:

- The majority of respondents (more than 60%) from 20 EU countries would not be ready to change their overall opinion if the recommended individual measures were implemented. A similar result (majority of respondents would not change their overall opinion) is observed in non-EU countries participating in the survey. Note however that for some countries, only a few respondents participated in the public consultation;
- In eight EU countries there is however quite an important share of respondents (in average 32% for these countries) that may change their overall opinion;

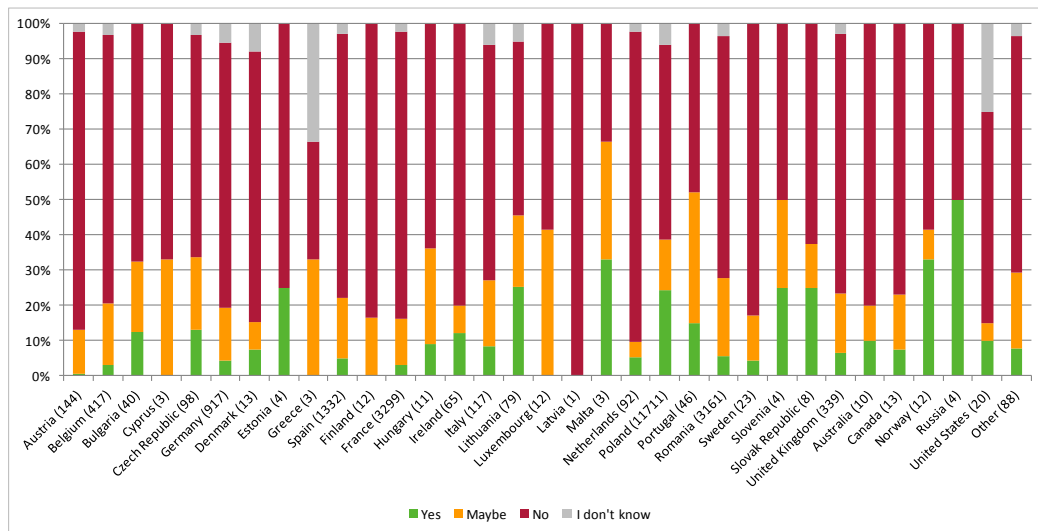


Figure 34: Readiness of individuals to change their overall opinion about unconventional fossil fuels (e.g. shale gas) development if the individual recommended measures are implemented, by country

6.3 Answers from companies and organisations

Figure 35 presents the answers to Question 8 for companies and organisations by type of organisation:

- For each type of organisations the majority of respondents would not change their overall opinion if the individual measures were implemented according to their ranking;
- None of the intergovernmental organisations responded to be ready to change their overall opinion; and on average 10% of organisations of any kind would change their opinion if the recommended individual measures were implemented;
- The share of respondents willing to change their overall opinion is in general very small (the highest share for academic institutions: 18% and 10% in average).

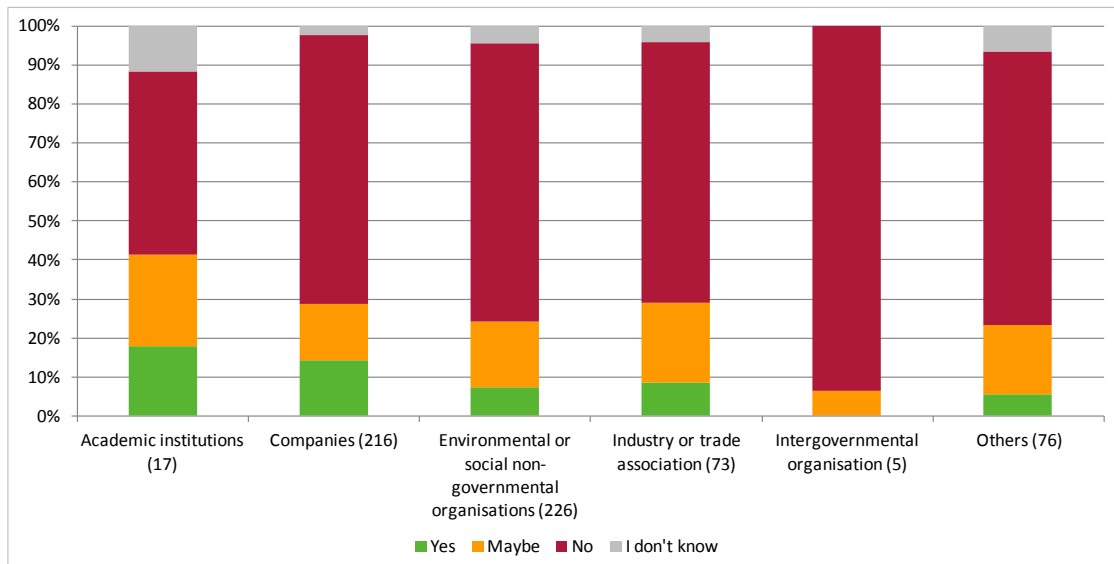


Figure 35: Readiness of companies and organisation to change their opinion about unconventional fossil fuels (e.g. shale gas) development by type of organisation

The breakdown of these institutions by country is provided in Figure 36:

- The countries that registered the highest share of respondents from companies and organisations favourable to changing their opinion on the development of unconventional fossil fuels in Europe are Sweden (1 out of 3), Poland (more than 21% of 111 respondents) and Bulgaria (2 out of 13 respondents);
- The countries that registered the highest share of respondents representing companies and organisations that would not change their overall opinion if the recommended measures were implemented are Denmark, Hungary and the United States (all respondents in those countries), Netherlands (6 out of 7), Spain (48 out of 60), United Kingdom (21 out of 26), Ireland (4 out of 5), France (65 out of 83).

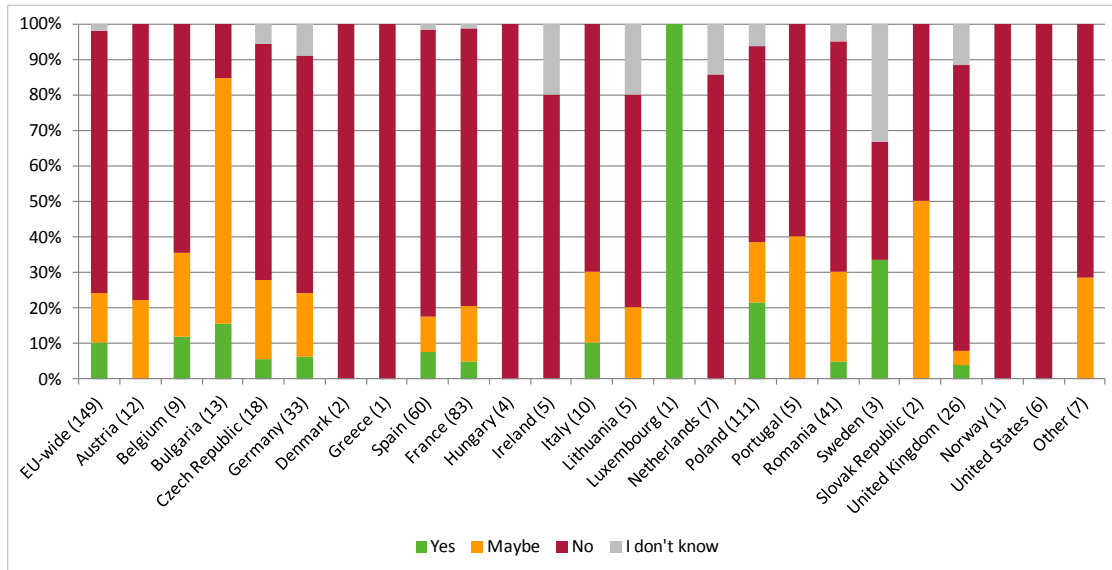


Figure 36: Readiness of companies and organisation to change their opinion about unconventional fossil fuels (e.g. shale gas) development by country of residence

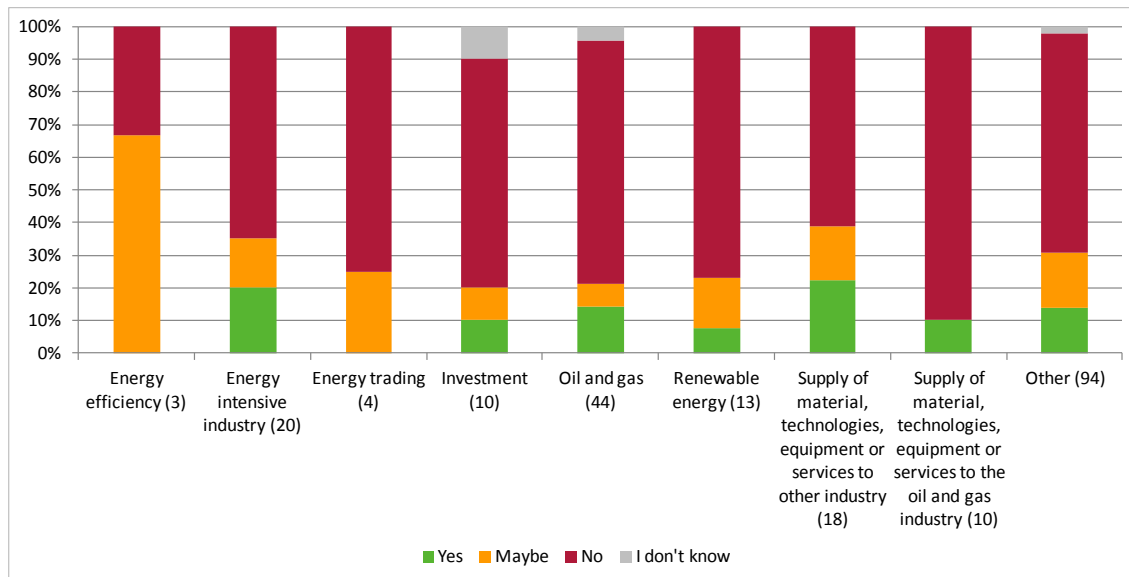


Figure 37: Readiness of companies to change their opinion about unconventional fossil fuels (e.g. shale gas) development by sector

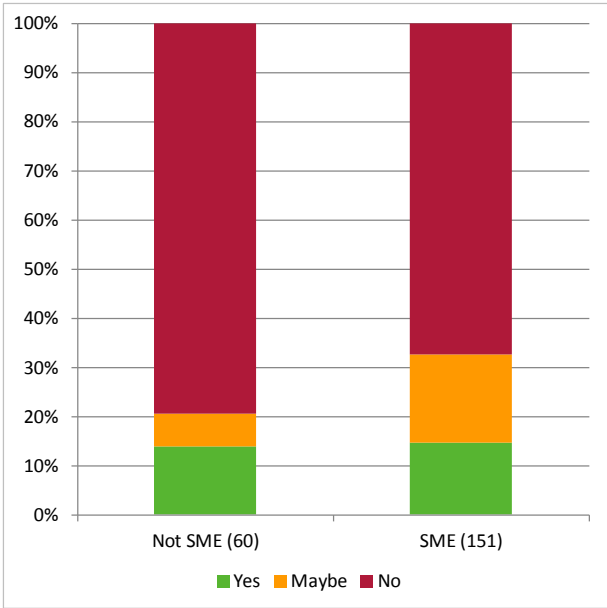


Figure 38: Readiness of companies to change their opinion about unconventional fossil fuels (e.g. shale gas) development by size

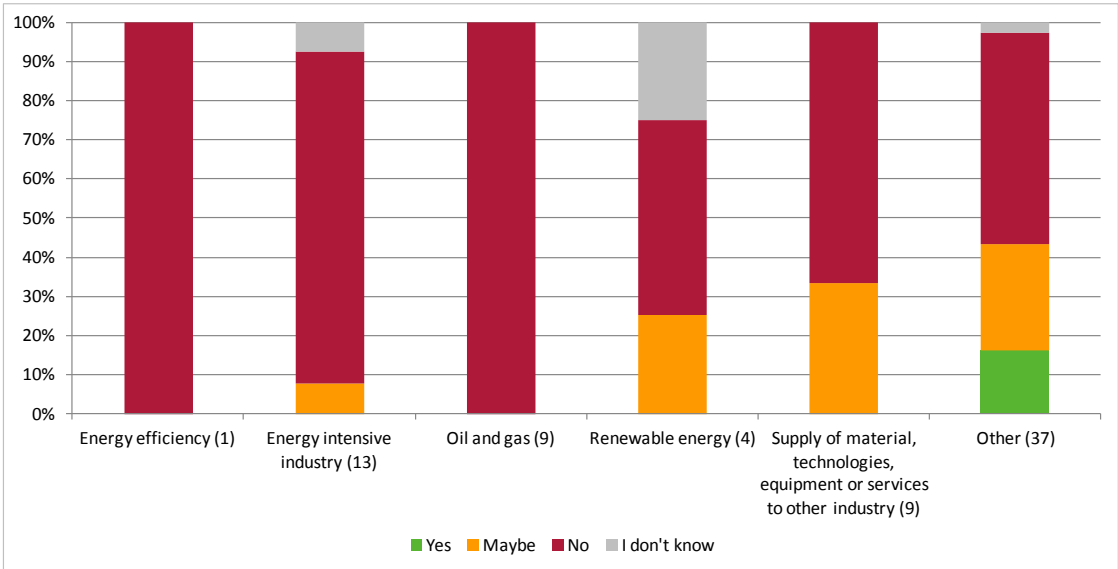


Figure 39: Readiness of industry and trade associations to change their opinion about unconventional fossil fuels (e.g. shale gas) development by sector

6.4 Answers from public authorities

Answers to Question 8 from national and public or local authorities are displayed in Figure 40:

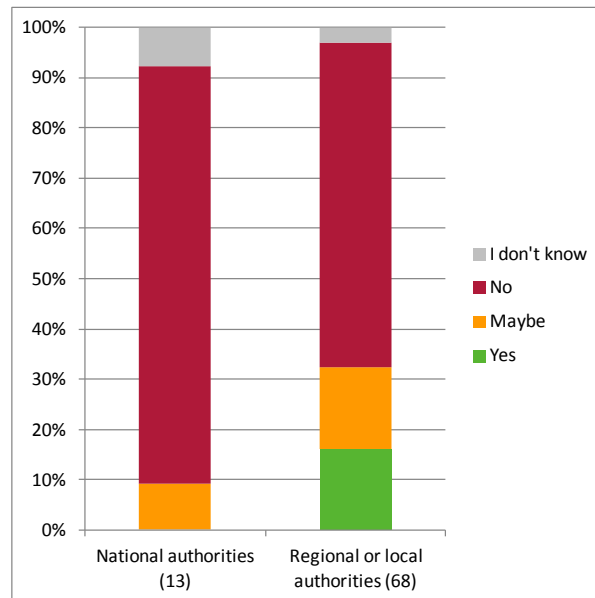


Figure 40: Readiness of public authorities to change their opinion about unconventional fossil fuels (e.g. shale gas) development

Respondents from regional and local authorities are more likely to change their overall opinion if the recommended individual measures were implemented (16.2% responded "Yes") than respondents from national authorities (none of them responded favourably). In both cases though, the majority of respondents is not favourable to a change in opinion about development of unconventional fossil fuels in Europe.

Chapter 7: Preferences for potential policy options

7.1 Questions asked to respondents

During the public consultation on unconventional fossil fuels, respondents were asked the following question:

- ▶ Question 9: What would you recommend to be done at EU level to address the identified challenges and risks?

Five policy options were submitted to respondents in the questionnaire.

1. Do nothing, the current framework is appropriate;
2. Develop information exchange, guidance on best practices and encourage voluntary approaches by the industry;
3. Clarify existing EU legislation through guidelines;
4. Adapt individual pieces of existing EU legislation; and
5. Develop a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas).

For each of these propositions, respondents could answer:

- ▶ Yes
- ▶ Maybe
- ▶ No; or
- ▶ I don't know.

The answers from individuals, companies and organisations, and public authorities are summarised hereafter for these five policy options.

Furthermore, respondents could freely answer an open-ended question on further suggestions that they identified, not included in the list above.

Question 10: I have further suggestions or details on the above options

The answers to Question 9 and Question 10 from individuals, companies and organisations, and public authorities are summarised hereafter.

7.2 Answers from individuals

Figure 41 presents the opinion of individual respondents on suitability of policy options to address the identified challenges and risks at EU level:

- 45% of individual respondents do not agree with the statement that the current framework is appropriate to address the identified challenges and risks

of unconventional fossil fuels (e.g. shale gas) development in Europe and 24% of respondents think that the current framework is appropriate and nothing should be done in this area;

- 52% think that information exchange, guidance on best practices and voluntary actions should be developed and industries should be encouraged to undertake voluntary approaches; 18% do not agree with this recommendation;
- 47% recommend clarifying existing EU legislation through guidelines; 24% do not share this opinion;
- 41% think that individual pieces of EU legislation could be adapted; 26% do not agree with this statement;
- 51% of individual respondents believe that a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas) should be developed; 29% consider that this option should not be adopted.

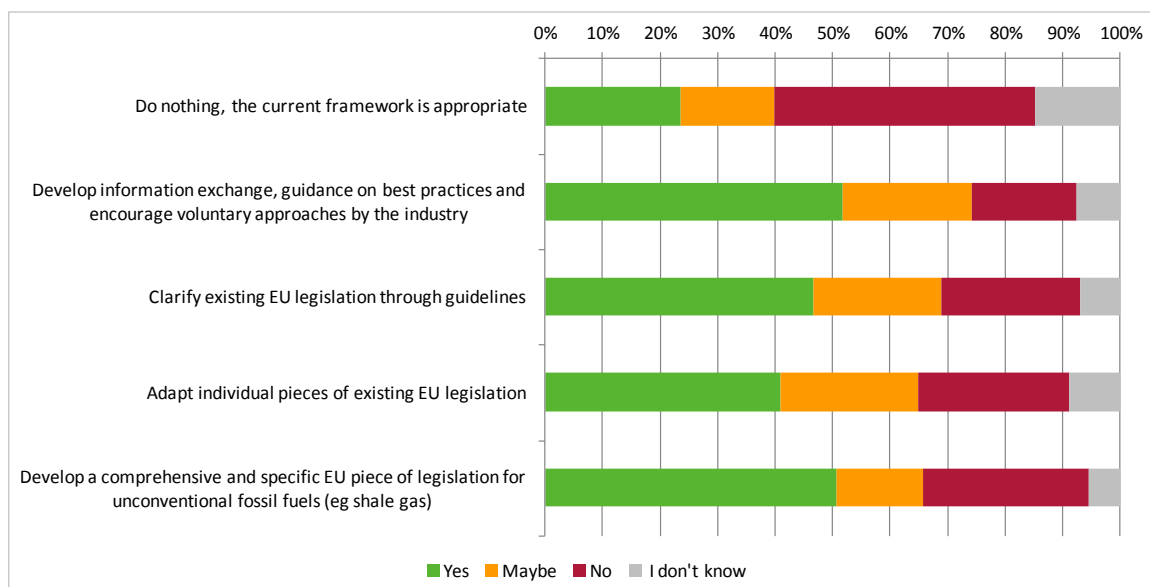


Figure 41: Answers from individual respondents from EU countries on policy options to address the identified challenges and risks at EU level

National differences are further presented for each option in the figures below:

- A majority of respondents (more than 50%) from most EU countries (all except for Poland, Romania and Slovenia (of four individual respondents) stated that the current framework is not appropriate to address the identified challenges and risks. Outside the EU, majorities of respondents from Russia and Norway think that nothing should be done at EU level in this area. Only in a few countries (Poland, Germany, Slovenia and Greece) the idea that the current framework is appropriate has more than 25% of supporters among the individual respondents;
- The majority of respondents in 14 EU countries (Bulgaria, Cyprus, Czech Republic, Estonia, Greece, Hungary, Italy, Lithuania, Poland, Portugal, Romania, Slovenia and Slovak Republic) believe that information exchange,

and guidance on best practices should be developed and industries should be encouraged to undertake voluntary approaches; outside the EU, majorities of respondents from Canada and Norway recommend this option;

- The majority of respondents in 14 EU countries (Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Greece, Spain, France, Hungary, Italy, Latvia, Portugal, Romania, and Slovak Republic) recommend clarifying existing EU legislation through guidelines; this opinion is shared by most of the respondents from Australia, Canada, Norway and other countries;
- In nine EU countries (Belgium, Bulgaria, Czech Republic, Estonia, Spain, Italy, Latvia, Romania and Slovak Republic) the majority of respondents believe that individual pieces of existing EU legislation should be adapted. The majority of respondents from Canada share this opinion;
- In all EU countries except for Poland and Cyprus, the majority of respondents believe that a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas) should be developed; this opinion is shared by most of the respondents from Australia, Canada and other countries. Poland is the only country where more respondents would prefer that a comprehensive and specific EU piece of legislation not be developed (40%).

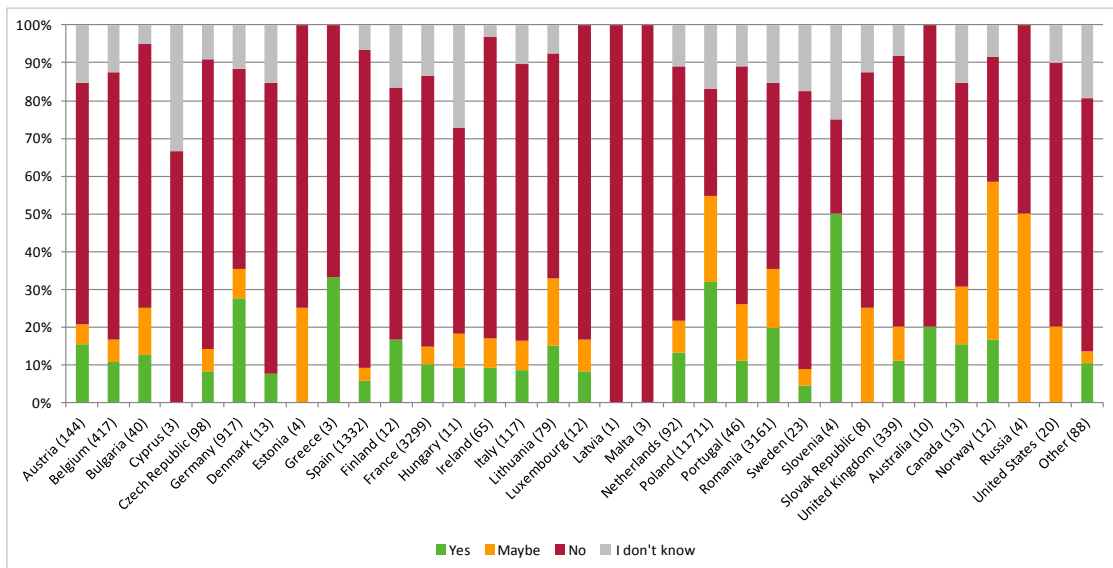


Figure 42: Breakdown of answers by country of residence regarding the policy option: "Do nothing, the current framework is appropriate"

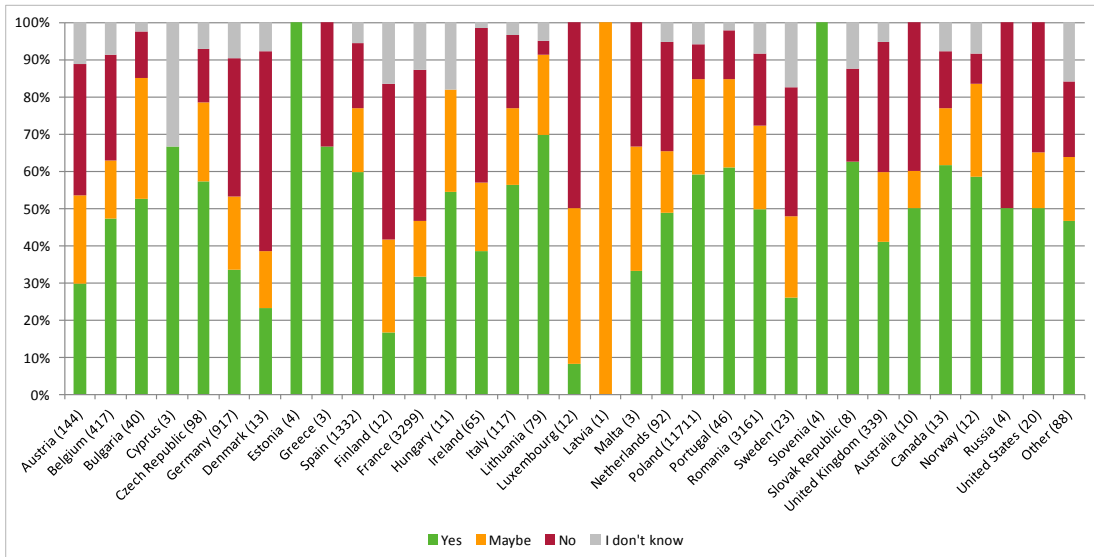


Figure 43: Breakdown of answers by country of residence regarding the policy option: "Develop information exchange, guidance on best practices and encourage voluntary approaches by the industry"

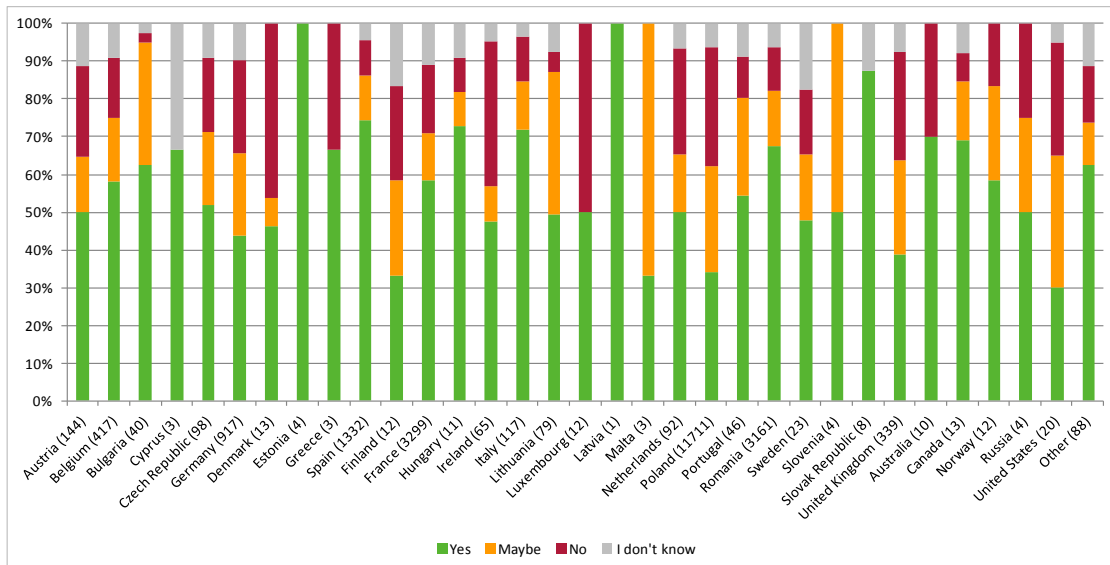


Figure 44: Breakdown of answers by country of residence regarding the policy option: "Clarify existing EU legislation through guidelines"

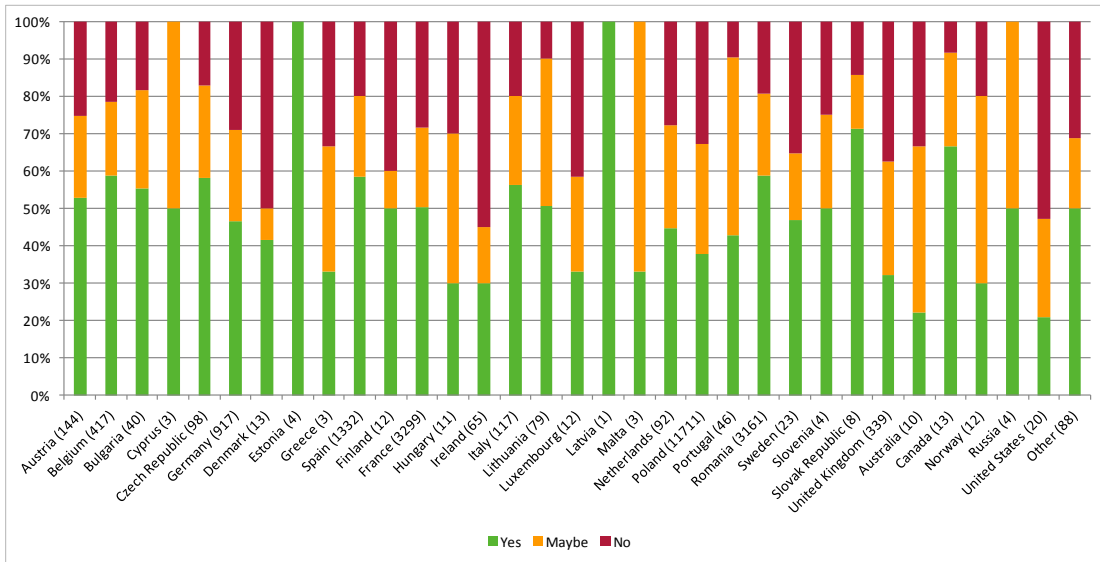


Figure 45: Breakdown of answers by country of residence regarding the policy option: "Adapt individual pieces of existing EU legislation"

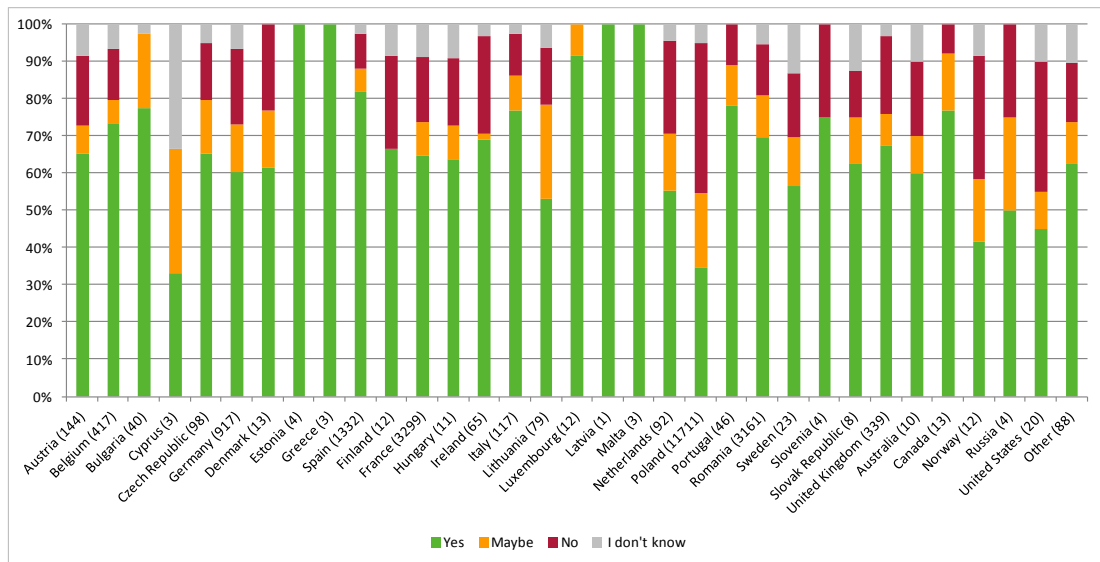


Figure 46: Breakdown of answers by country of residence regarding the policy option: "Develop a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas)"

7.3 Answers from companies and organisations

Figure 47 presents the opinion of companies and organisations on suitability of policy options to address the identified challenges and risks at EU level:

- 59% of all companies and organisations do not agree with the statement that the current framework is appropriate to address the identified challenges and risks of unconventional fossil fuels (e.g. shale gas) development in Europe and 21% think that the current framework is appropriate and nothing should be done in this area;

- 54% think that information exchange, guidance on best practices and voluntary actions should be developed and industries should be encouraged to undertake voluntary approaches; 23% do not agree with this recommendation;
- 56% recommend clarifying existing EU legislation through guidelines; 19% do not share this opinion;
- 45% think that individual pieces of EU legislation could be adapted; 27% do not agree with this statement;
- 55% of the respondents believe that a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas) should be developed; 28% consider that this option should not be adopted.

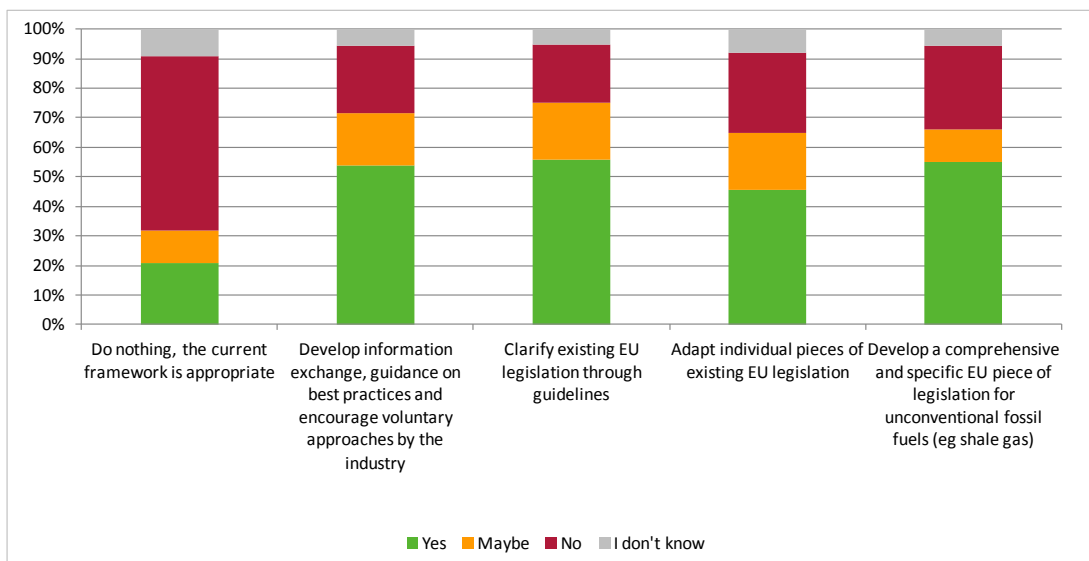


Figure 47: Answers from companies and organisations on policy options to address the identified challenges and risks at EU level

Preferences of respondents broken down by type of organisation are presented below.

Academic institutions

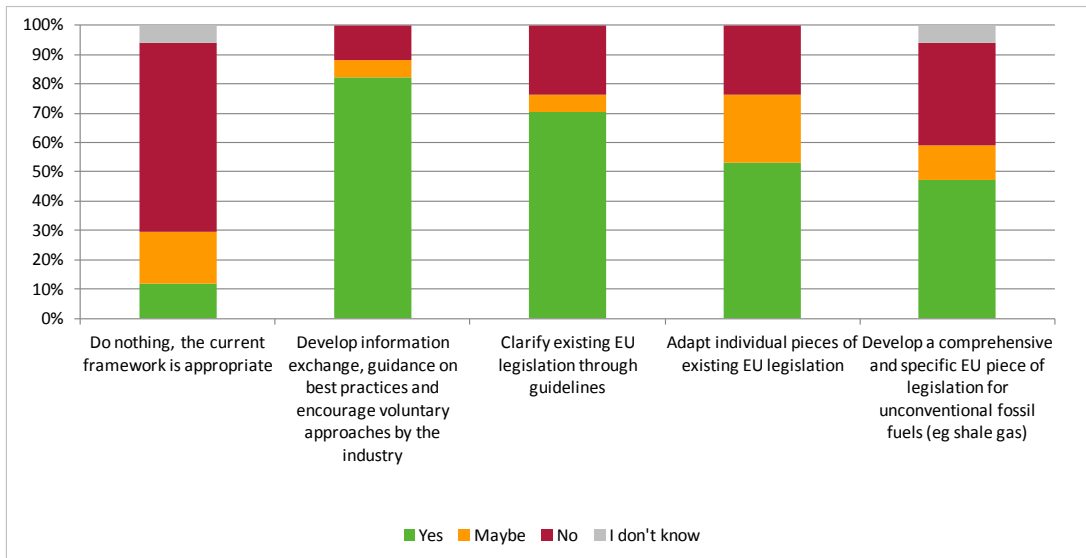


Figure 48: Answers from academic institutions on policy options to address the identified challenges and risks at EU level

Companies

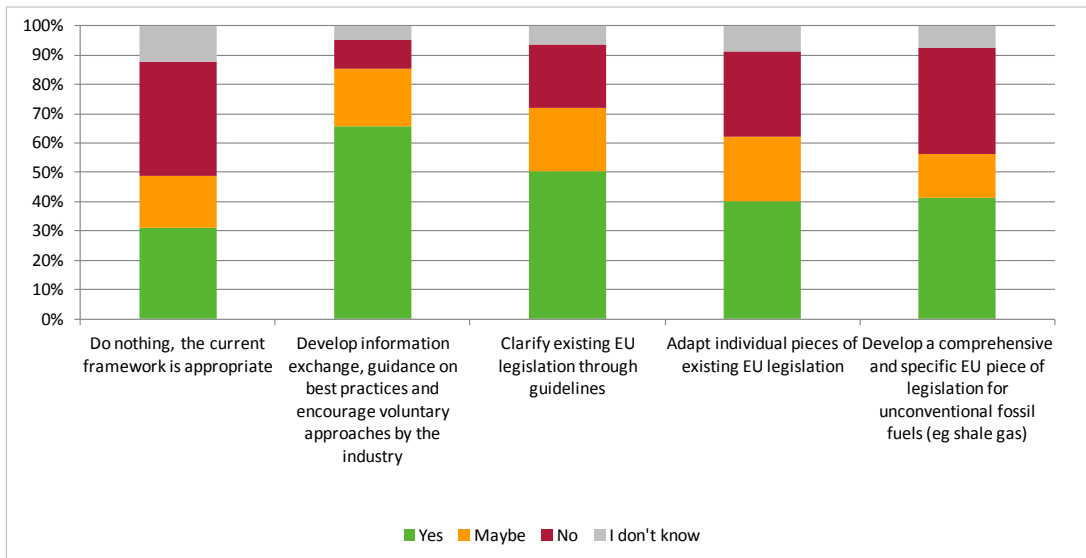


Figure 49: Answers from companies on policy options to address the identified challenges and risks at EU level

■ Environmental or social non-governmental organisations

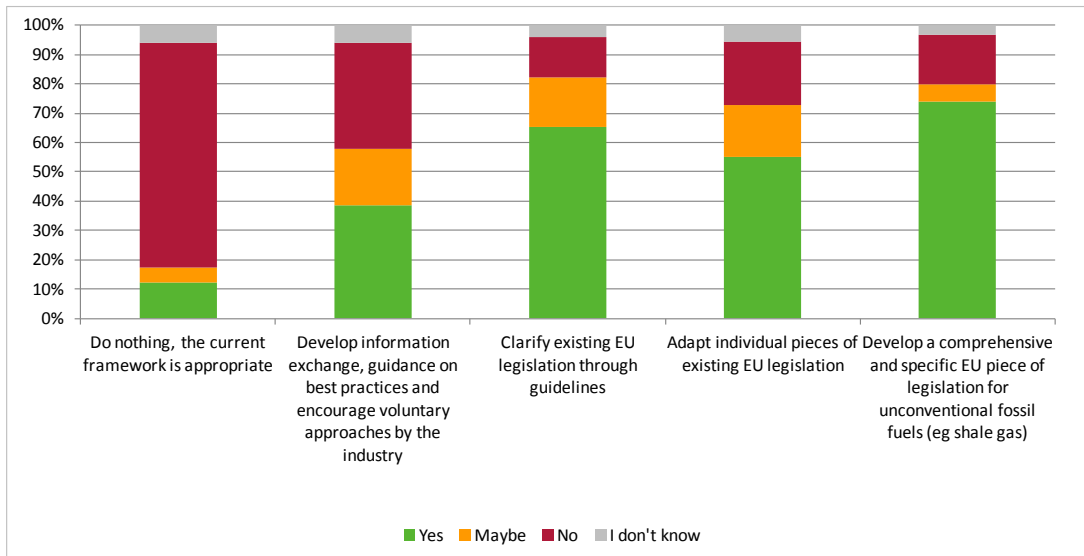


Figure 50: Answers from non-governmental organisations on policy options to address the identified challenges and risks at EU level

■ Industry or trade associations

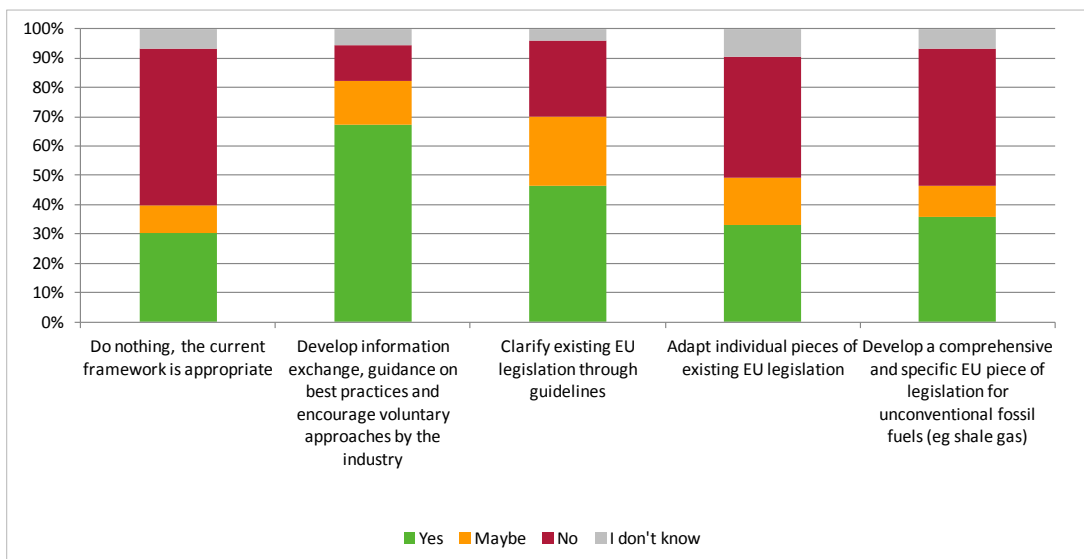


Figure 51: Answers from industry or trade associations on policy options to address the identified challenges and risks at EU level

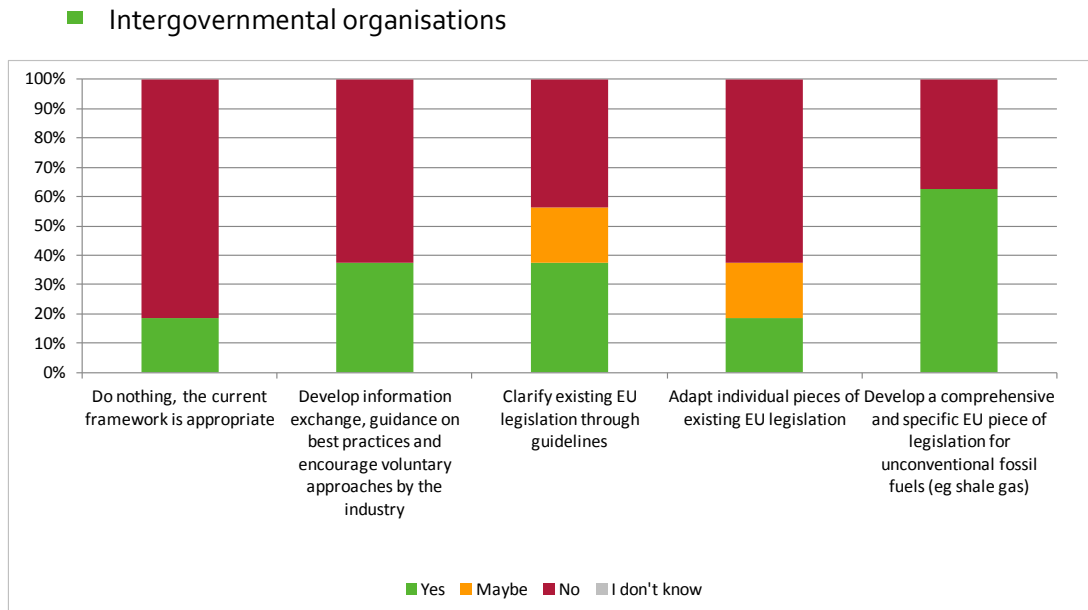


Figure 52: Answers from intergovernmental organisations on policy options to address the identified challenges and risks at EU level

Preferences of companies for particular option broken down by company sector and size are presented below.

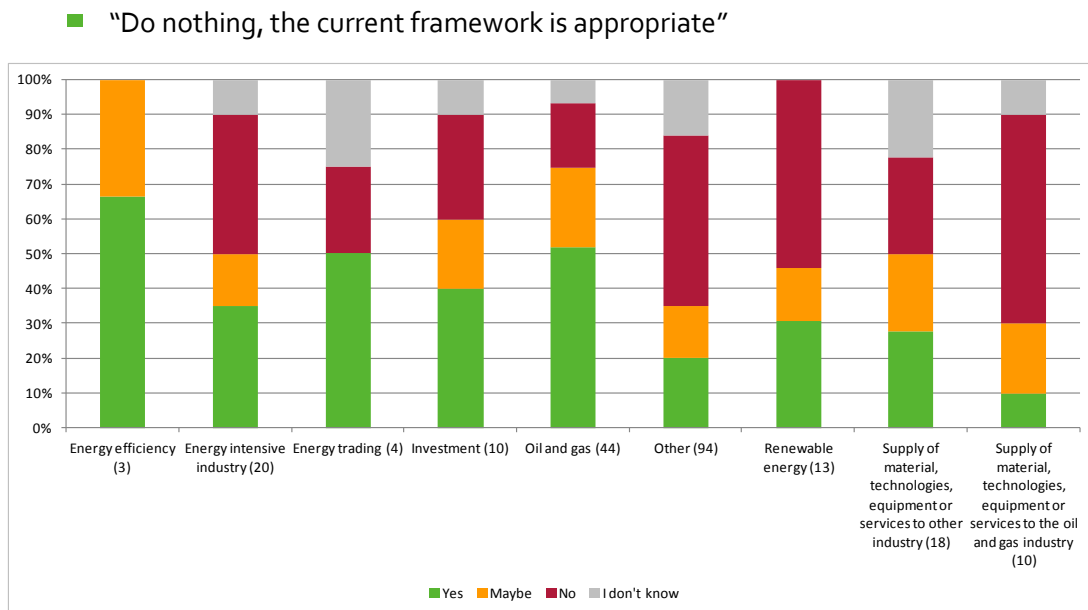


Figure 53: Answers from companies by sector on policy option to address the identified challenges and risks at EU level

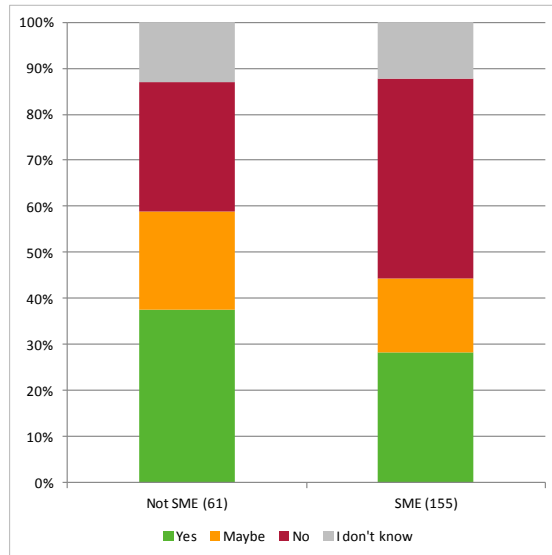


Figure 54: Answers from companies by size on policy option to address the identified challenges and risks at EU level

- "Develop information exchange, guidance on best practices and encourage voluntary approaches by the industry"

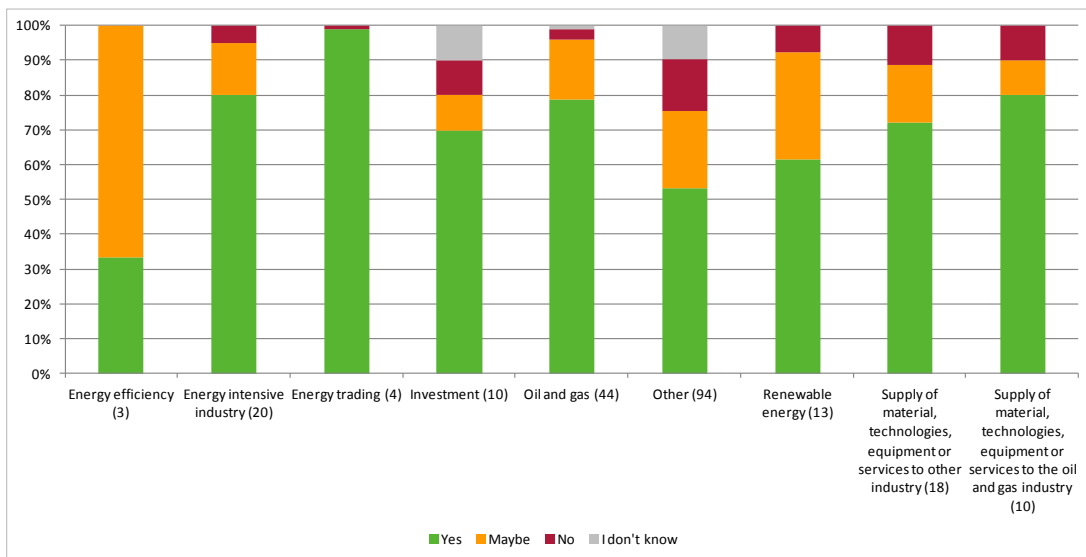


Figure 55: Answers from companies by sector on policy option to address the identified challenges and risks at EU level

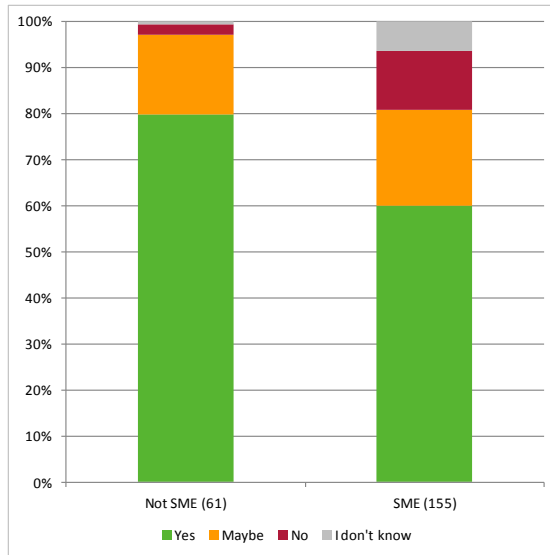


Figure 56: Answers from companies by size on policy option to address the identified challenges and risks at EU level

■ "Clarify existing EU legislation through guidelines"

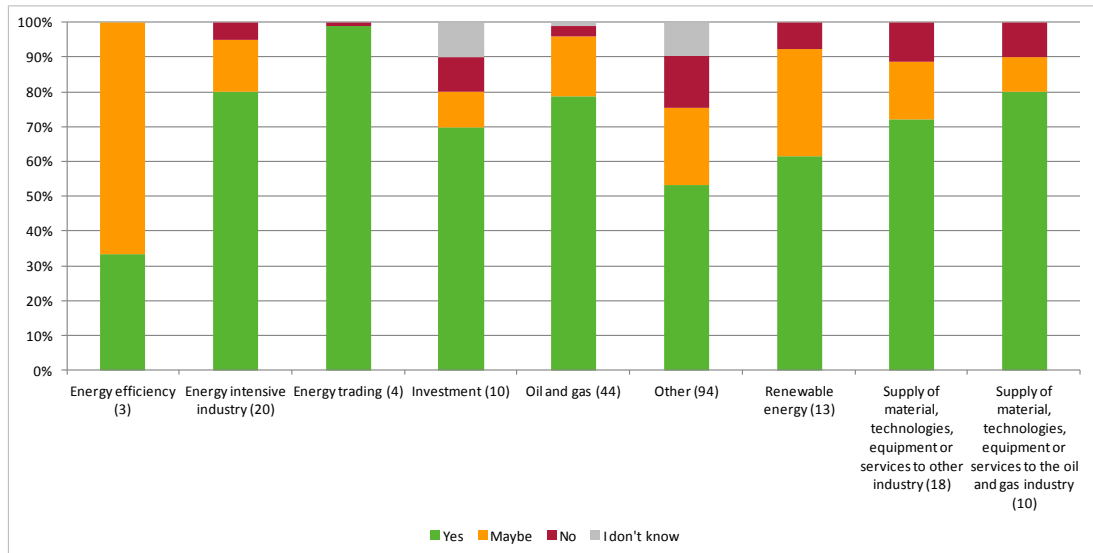


Figure 57: Answers from companies by sector on policy option to address the identified challenges and risks at EU level

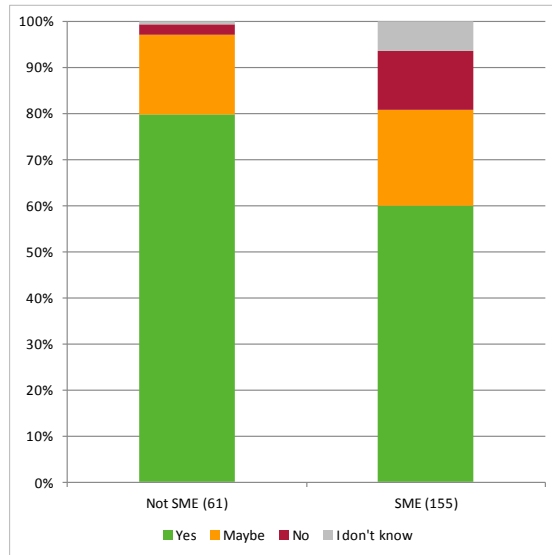


Figure 58: Answers from companies by size on policy option to address the identified challenges and risks at EU level

■ "Adapt individual pieces of existing EU legislation"

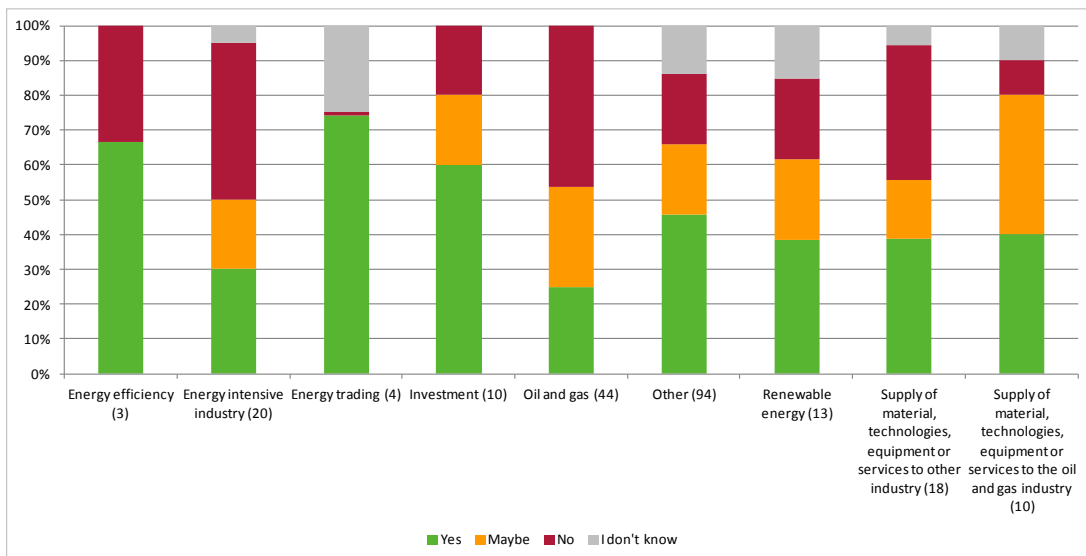


Figure 59: Answers from companies by sector on policy option to address the identified challenges and risks at EU level

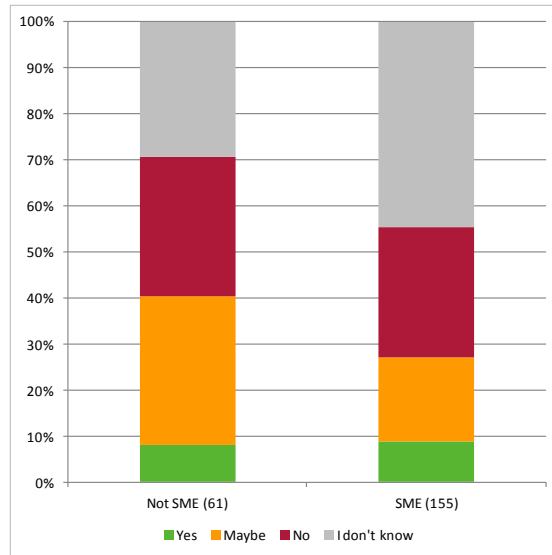


Figure 60: Answers from companies by size on policy option to address the identified challenges and risks at EU level

- "Develop a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas)"

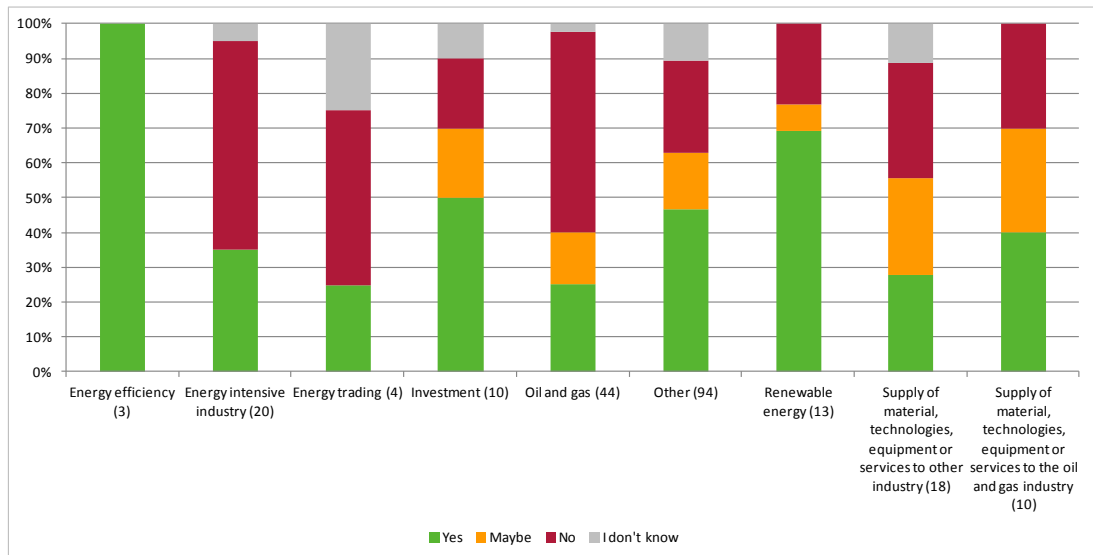


Figure 61: Answers from companies by sector on policy option to address the identified challenges and risks at EU level

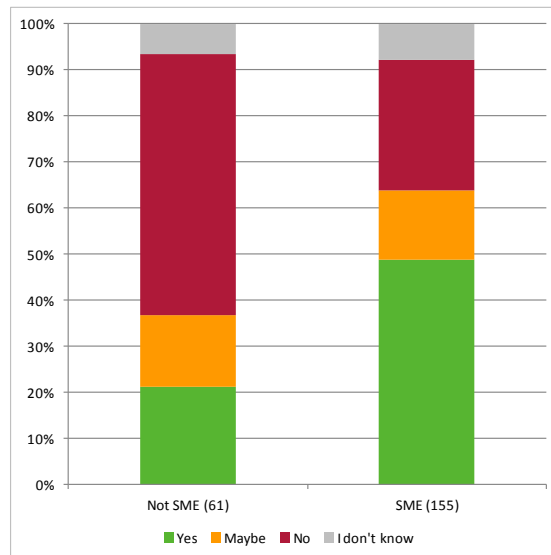


Figure 62: Answers from companies by size on policy option to address the identified challenges and risks at EU level

7.4 Answers from public authorities

13 responses from national public authorities in six Member States (Czech Republic, Denmark, France, Netherlands, Poland and Sweden) on policy options to address the identified challenges and risks at EU level were received. It has to be noted that views from responding public authorities do not necessarily represent the official views of governments. Figure 63 presents opinions of national public authorities on suitability of policy options to address the identified challenges and risks at EU level:

- 62% of respondents agree with the statement that the current framework is appropriate to address the identified challenges and risks of unconventional fossil fuels (e.g. shale gas) development in Europe and 32% of respondents think that the current framework is not appropriate and nothing should be done in this area;
- 37% think that information exchange, guidance on best practices and voluntary actions should be developed and industries should be encouraged to undertake voluntary approaches; 25% do not agree with this recommendation;
- 32% recommend clarifying existing EU legislation through guidelines; 15% do not share this opinion;
- The majority of respondents (54%) do not recommend adapting individual pieces of EU legislation; only 20% believe that this option should be adopted;
- The majority of respondents (55%) consider unnecessary the development of a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas); only 18% believe that this option should be adopted.

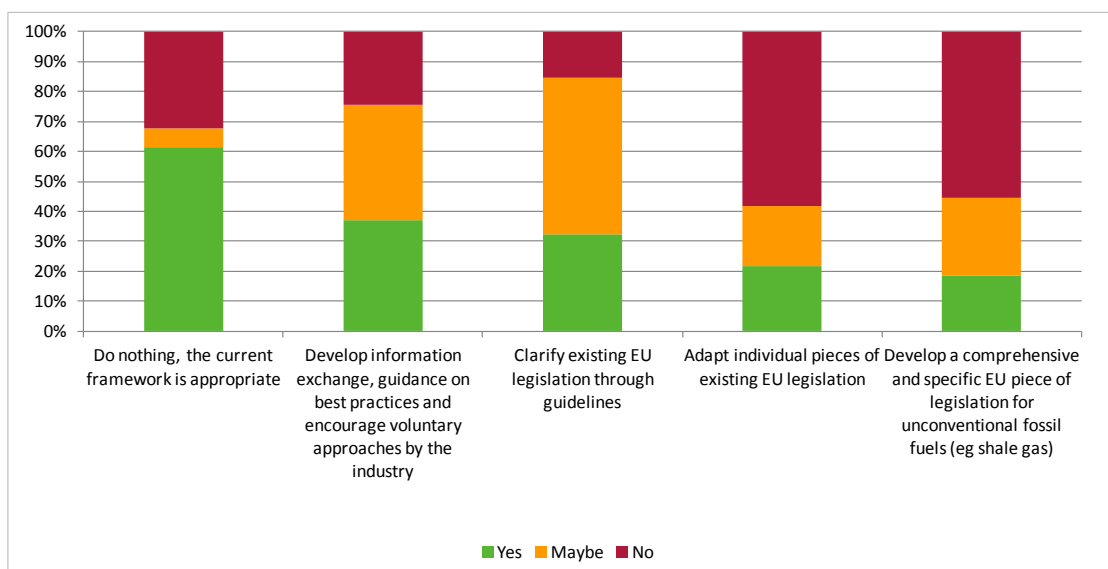


Figure 63: Answers from national public authorities on policy options to address the identified challenges and risks at EU level (13 responses from 6 Member States)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

68 responses from regional or local authorities in nine Member States (Austria, Belgium, Czech Republic, Germany, Spain, France, Netherlands, Poland and Romania) on policy options to address the identified challenges and risks at EU level were received. Figure 64 presents opinions of regional or local authorities on suitability of policy options to address the identified challenges and risks at EU level:

- 71% of respondents do not agree with the statement that the current framework is appropriate to address the identified challenges and risks of unconventional fossil fuels (e.g. shale gas) development in Europe and 15% of respondents think that the current framework is appropriate and nothing should be done in this area;
- 62% think that information exchange, guidance on best practices and voluntary actions should be developed and industries should be encouraged to undertake voluntary approaches; 22% do not agree with this recommendation;
- 68% recommend clarifying existing EU legislation through guidelines; 15% do not share this opinion;
- 60% think that individual pieces of EU legislation could be adapted; 12% do not agree with this statement;
- 65% of the respondents believe that a comprehensive and specific EU piece of legislation for unconventional fossil fuels (e.g. shale gas) should be developed; 16% consider that this option should not be adopted.

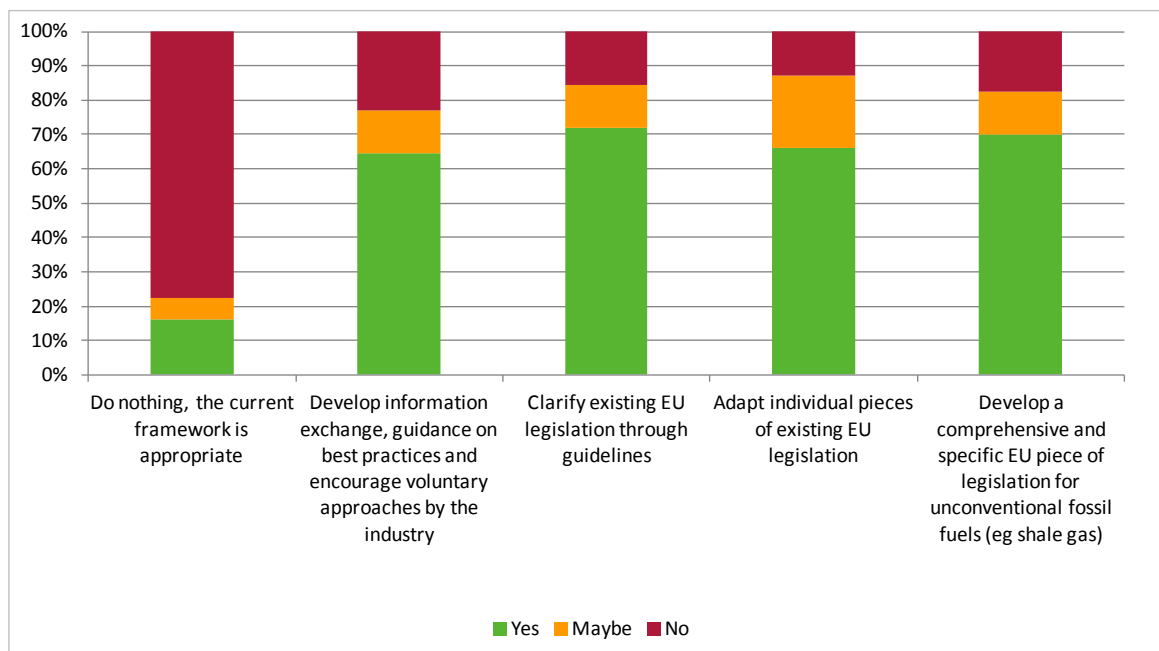


Figure 64: Answers from regional or local authorities on policy options to address the identified challenges and risks at EU level (68 responses from nine Member States)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

7.5 Further suggestions on policy options

Respondents suggested a number of additional policy options to address the potential challenges and risks from the development of unconventional fossil fuels in Europe. Most of the options provided by respondents describe general policy measures to be put in place, propositions for better law enforcement, information and risk assessment needs, and conditions for involvement of stakeholders in decision making.

A large proportion of responding citizens, organisations and public organisations are in favour of developing EU-wide legislation that prohibits unconventional fossil fuel extraction in Europe and many supported encouraging renewable energy development and energy efficiency. Many individuals recommended prohibition of hydraulic fracturing (fracking) and any techniques that could have negative impacts on the environment. Some recommended development of physical fracturing methods without use of chemicals or ban on the use of certain chemical substances in fracturing fluids. A significant number of organisations and citizens advocated leaving the choice on whether or not to exploit fossil energy sources to Member States. Many respondents highlight that energy policy should be the competence of each Member State and legislation should be adapted to local specificities. Some organisations presented arguments for simplifying the regulations. Several organisations and individuals recognised a need for adapting the EIA Directive (e.g. inclusion of shale gas projects to undergo an environmental impact assessment prior to authorisation; gas exploitations < 500 000 m³ should require an EIA; reduction of negative impact of the extraction). Among the less frequent responses there were suggestions to develop a European strategy in order to ensure a safe supply of resources and protect the poorest countries, to consider solutions adopted in the United States when preparing the EU legal

framework or to limit the amount of shale gas produced in order to meet international obligations (unspecified by respondents).

Several responses involving better legal implementation and enforcement identify a necessity for EU-wide liability regulations with provision of security from companies to cover all possible negative effects (threats and damages). Some individual respondents argued that a specific body regulating on behalf of the EU should be established. Some respondents recommended not taking a voluntary approach, which they considered ineffective, preferring comprehensive EU legislation. Others, on the contrary, think that EU recommendations should be only indications rather than regulations.

Another type of response expressed by organisations and citizens related to the need for information and risk assessment. Several organisations recommended that the EC summarise the scientific studies, current EU legal position, and outcomes of this consultation in a communication or a green/white paper. Various respondents considered that the use of unconventional fossil fuels should be delayed for a long period until technologies are safer, full information on environmental and health risks is available and an appropriate legislative framework is established. Several respondents expressed the necessity of guaranteeing independence of experts performing the environmental impact assessment, clarity of inspection procedures and putting in place anticorruption measures.

Another type of response concerned the involvement of stakeholders and the general public in decision making. According to a number of individuals and organisations, full information about unconventional fossil fuels extraction should be given to citizens and public acceptance should be ensured. Some respondents identified conducting local/national/EU-wide referendums on the question of unconventional fossil fuels as an important policy option. Some respondents argued that non-European companies should not be given the concessions to extract unconventional fossil fuels and that the economic benefits should go to local communities. Some public authorities underlined that current EU regulations transposed to the national law of Member States allow all potential challenges and risks resulting from unconventional fossil fuels extraction to be identified and easily prevented through close monitoring and supervision by state and local authorities. They add that law and policy making should involve consultations with local governments, research institutes and environmental protection organisations. Some individuals recommended involving organisations of professionals in technical and regulatory decisions.

Some less frequent responses related to the introduction of taxes and other financial measures. Several organisations recommended taxing unconventional fossil fuels production at EU level in order to finance a security fund against environmental risks.

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Chapter 8: Information needs

8.1 Questions asked to respondents

Respondents were asked the following question:

- ▶ Question 11: what information on unconventional fossil fuels (e.g. shale gas) activities in Europe do you consider most important to be made available to citizens)?
 - ▷ Very important;
 - ▷ Important;
 - ▷ Somewhat important;
 - ▷ Not important at all; and
 - ▷ I don't know

The list of options submitted to the assessment of respondents is presented hereafter:

1. Planned developments (e.g. number of wells and localisation)
2. Information about operators involved in unconventional fossil fuels (e.g. shale gas) activities, their licences and permits
3. Baseline data (e.g. data on water and air quality prior to operations)
4. Operational data (e.g. volumes of water used; chemical additives used)
5. Information on incidents associated with unconventional fossil fuels (e.g. shale gas) exploration and extraction
6. Information on potential risks associated with unconventional fossil fuels (e.g. shale gas) exploration and extraction
7. Information on potential benefits (e.g. employment and tax revenues)

The answers to Question 11 from individuals, companies and organisations, and public authorities are summarised hereafter.

8.2 Answers from individuals

Figure 65 displays the share of respondents from EU countries considering that each of the information on unconventional fossil fuels (e.g. shale gas) activities in Europe is very important or important:

- All presented options were assessed as very important or important by at least 74% of respondents;

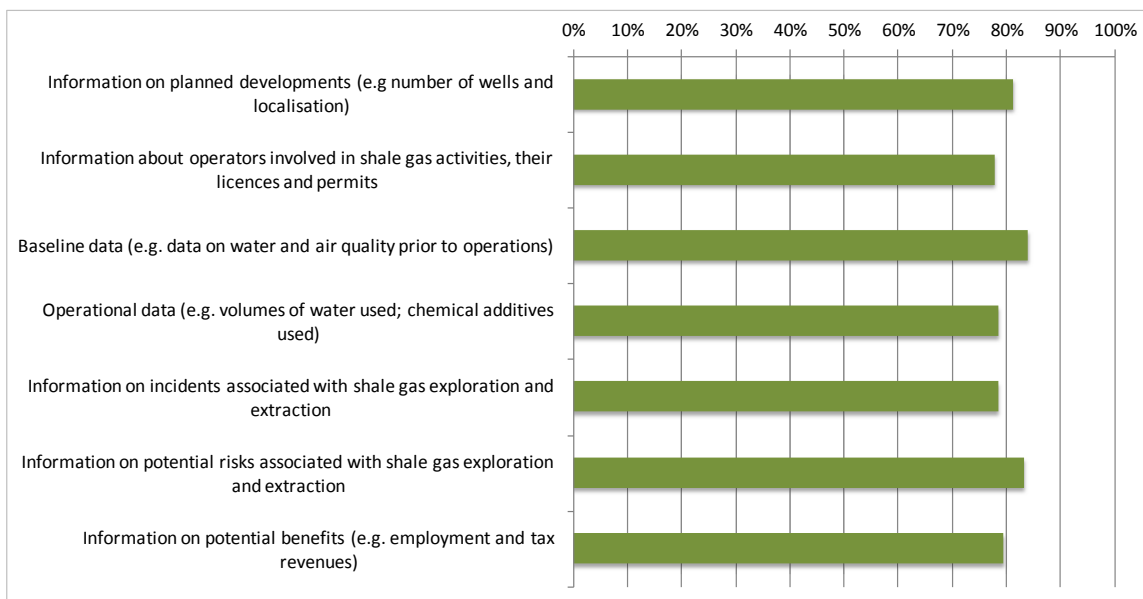


Figure 65: Share of respondents from EU countries stating that each information need is very important or important

As presented in the figure below, the national differences are also not significant – the majority of individual respondents consider that on average each information is very important or important.

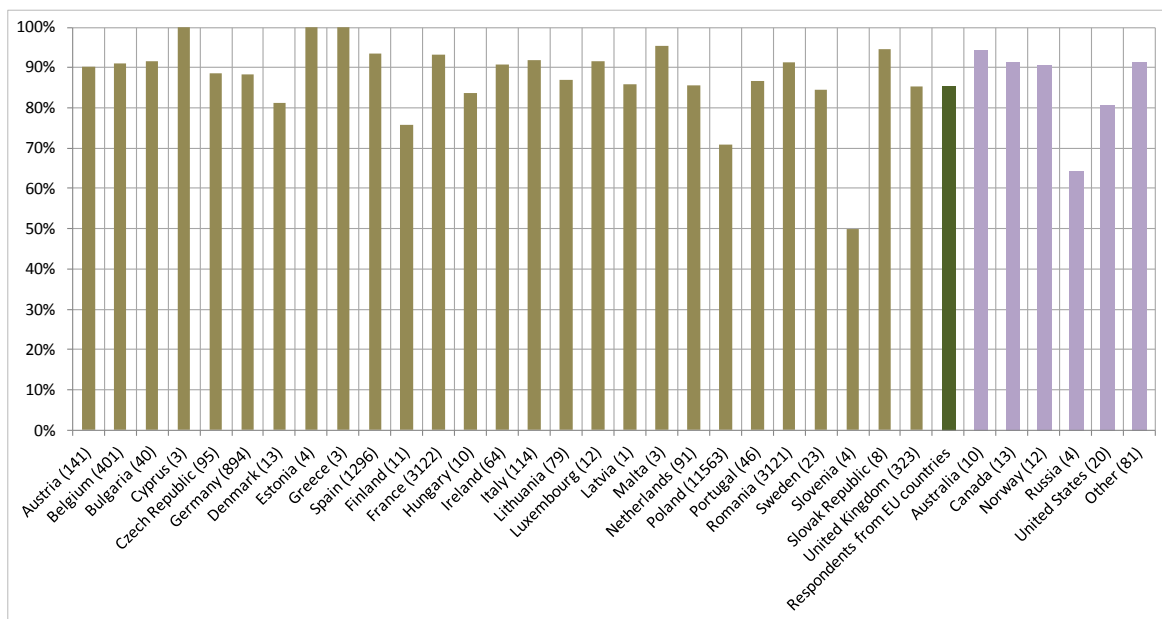


Figure 66: Average share of information needs considered as very important or important by individual respondents according to their country of residence

8.3 Answers from companies and organisations

Figure 67 and Figure 68 present the detailed answers to Question 11 for companies and organisations by type of organisation, whereas Figure 69 provides the average share of information needs considered as very important or important by type of organisation:

- The relative homogeneity of answers for all the different types of recommendations.
 - For academic institutions, the most important information to disclose would be baseline data (e.g. data on water and air quality prior to operations) and information on incidents associated with unconventional fossil fuels (e.g. shale gas) exploration and extraction (76.47% for both options);
 - For companies, the most important would be information on potential benefits (e.g. employment and tax revenues), however other options also were in majority considered as important;
 - For industry and trade associations, the most important information would be information on incidents associated with unconventional fossil fuels (e.g. shale gas) exploration and extraction (90.14%), however other options also were in majority considered as important;
 - For social or environmental NGOs, almost all presented options have been identified as very important or important by 92.15% of respondents in average;
 - Information on incidents associated with unconventional fossil fuels (e.g. shale gas) exploration and extraction is defined as very important or important by the largest proportion of respondents (average of 85.51% for this option).

- The relative homogeneity of answers for all the different types of organisations - a very high proportion of respondents (84% on average), independently of the type of organisation considered the information as very important or important to disclose.

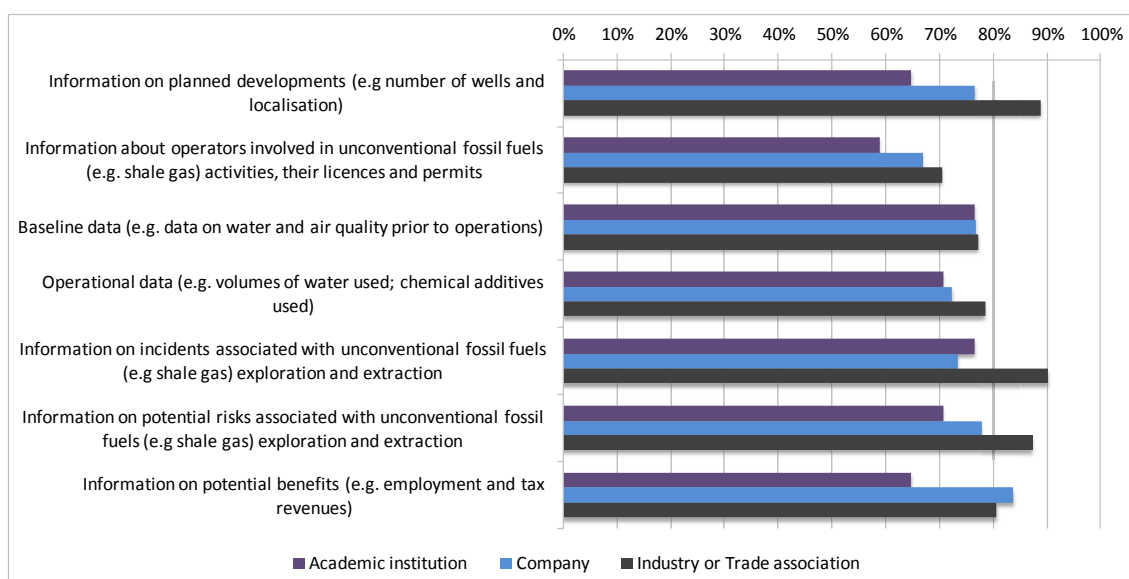


Figure 67: Share of companies and organisations stating that each information need was very important or important

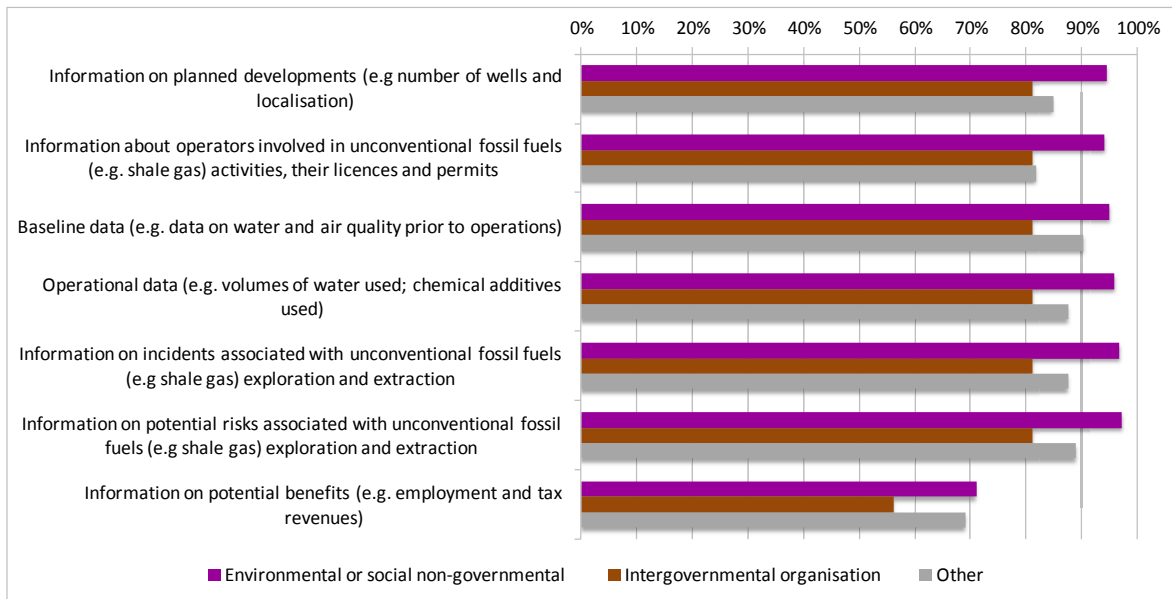


Figure 68: Share of companies and organisations stating that each information need was very important or important – continued

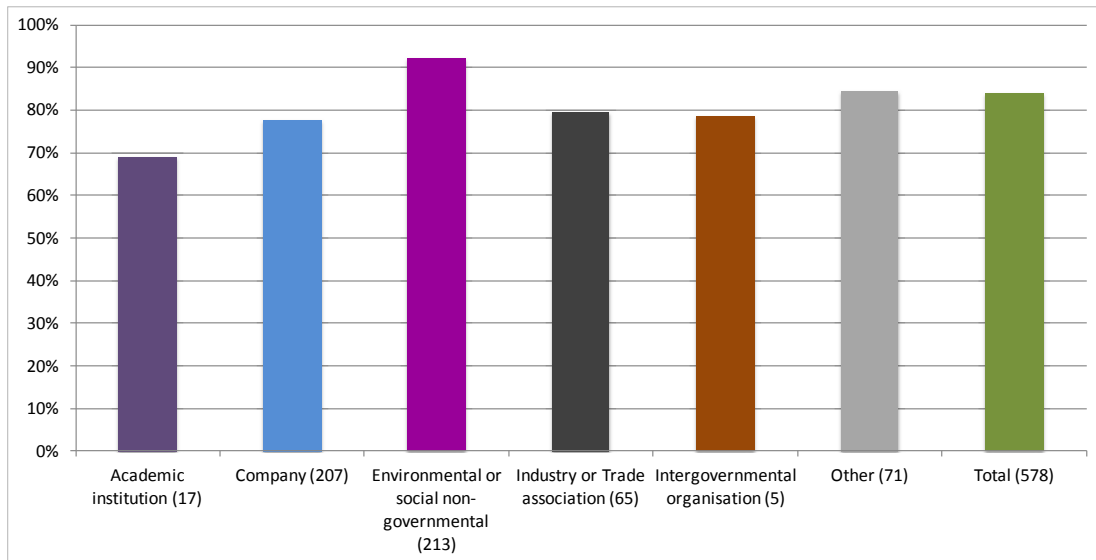


Figure 69: Average share of information needs considered as very important or important by type of organisation

The breakdown by country of these institutions concerning their opinion about the benefits is provided in Figure 70:

- This breakdown shows also that there is not much difference between organisations from different countries that consider that recommendations are very important or important (at least 63% for Portugal (five respondents) and 80% on average for EU countries);
- Outside the EU, respondents appeared to consider in the same high proportion the recommendations to be very important or important as compared with the EU average.

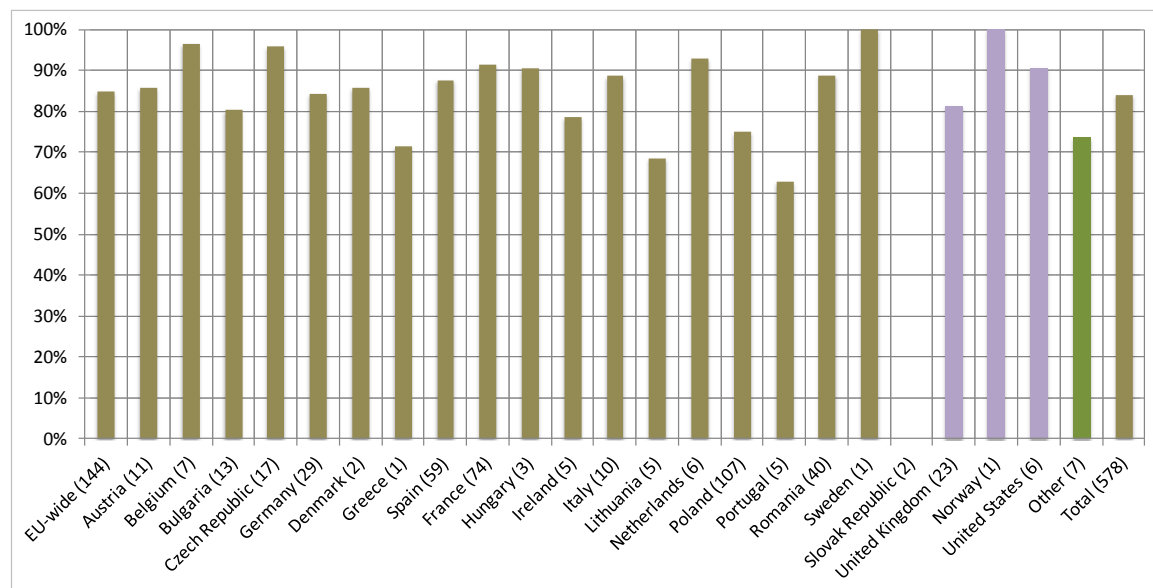


Figure 70: Average share of information needs considered as very important or important by country of residence

Additional information on answers to Question 11 by sector and size for companies and industry or trade associations is provided with Figure 71 and Figure 72. In particular, companies and industry associations in all activity sectors appear to identify the information as very important or important:

- The lowest proportion of respondents from companies (64%) and associations (59%) are from the energy intensive industry sector;
- 84% of companies and 94% of associations from the oil and gas sector consider the information as very important or important.

In parallel, both big companies and SMEs registered a large average of recommendations considered to be very important or important (respectively 69% and 68%).

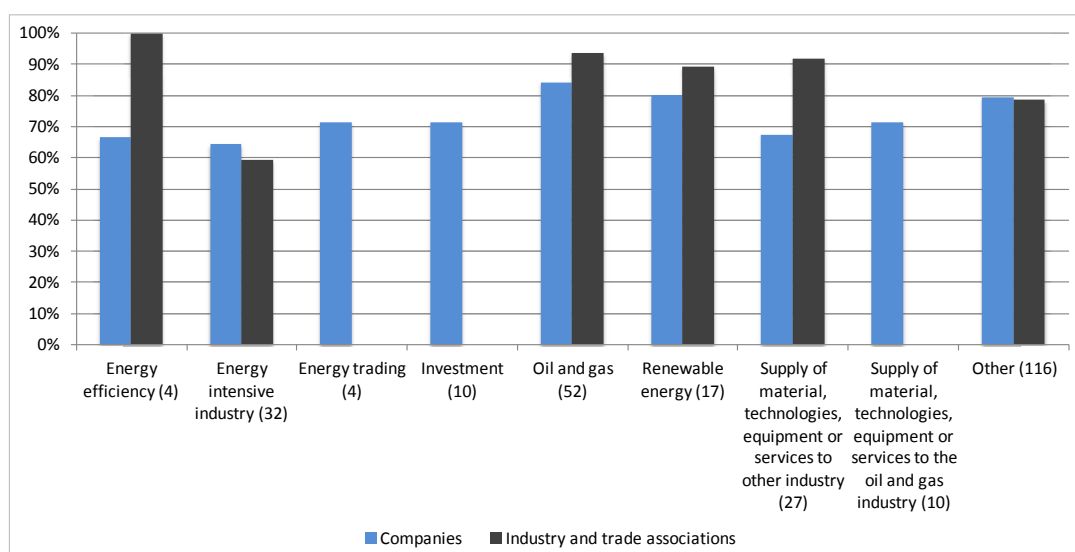


Figure 71: Average share of information needs considered as very important or important by companies and industry or trade associations according to sector of activity

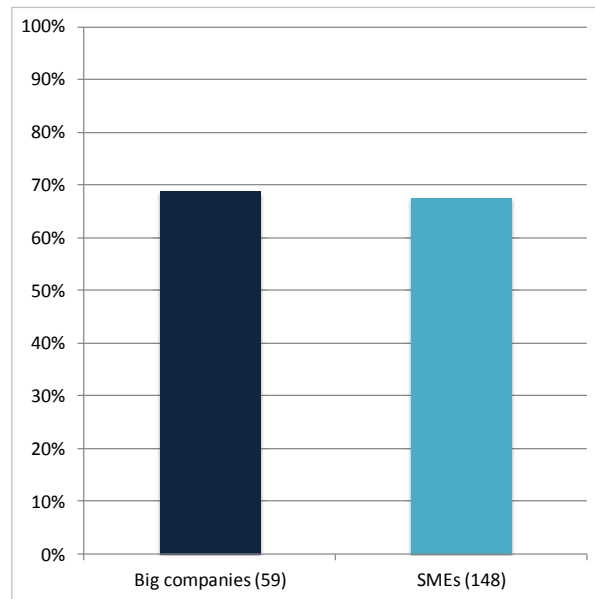


Figure 72: Average share of information needs considered as very important or important by companies according to size

8.4 Answers from public authorities

Answers to Question 11 from national, regional and local authorities are summarised in Figure 73:

- The relative homogeneity of responses between the information as well as among national and regional or local authorities can be observed;
- All options are defined as very important or important by a minimum of 83% of respondents from regional and local authorities (on average 89%);
- All options are defined as very important or important as minimum 74% of respondents from national authorities (in average 84%);
- "Baseline data", "Information on incidents associated with exploration and extraction" and "Information on potential risks associated with exploration and extraction", are considered as very important or important by almost 93% of regional or local authorities responding;
- "Information on planned developments", "Information on incidents associated with exploration and extraction", and "Information on potential risks associated with exploration and extraction", are considered as very important or important by 89% of national authorities responding to the survey;
- For each response, there is a slightly lower proportion of national authorities that assessed options as very important or important that at regional and local level.

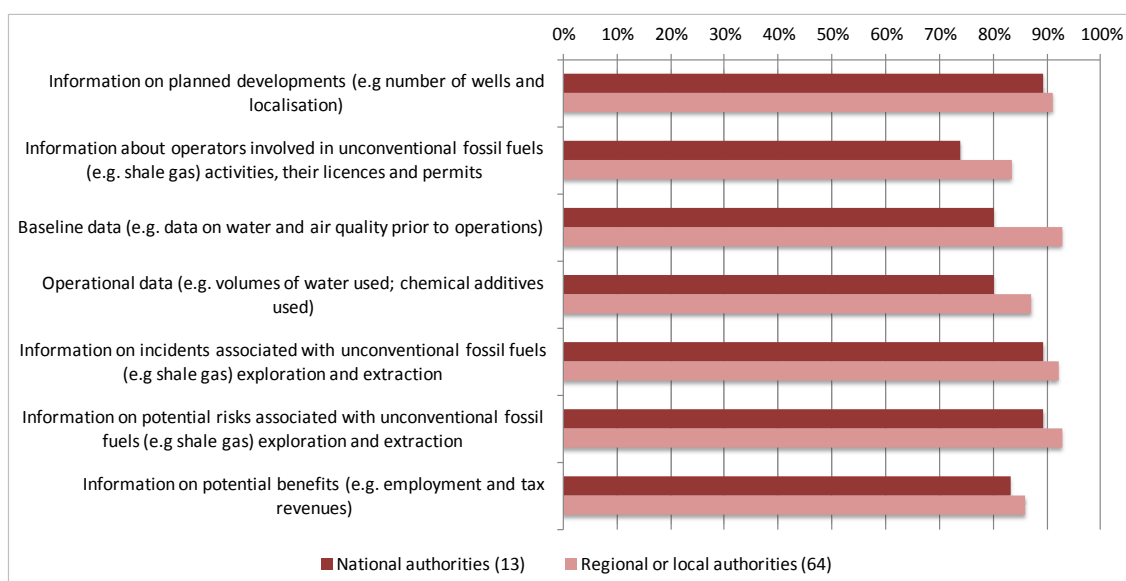


Figure 73: Share of public authorities stating that each information is very important or important

Furthermore, the tables below provide additional information on the share of the seven information types identified as very important or important by public authorities, with a breakdown by country and a breakdown by field of action.

- National differences are not significant, with the responding authorities from Belgium (one respondent) considering that 71.4% of the predefined recommendations could be very important or important, 100% in Austria, Denmark (one respondent) and Netherlands (three respondents), and 90.1% on average;
- 100% of the information options have been qualified as very important or important by responding authorities involved in Economics.
- Public authorities involved in Geology, Health and safety and Mining considered that almost 67% of the options could be very important or important to disclose to citizens.

Table 8: Proportion of information identified as very important or important by public authorities, with a breakdown by country

Country	National authorities	Regional authorities	All types
Austria	NA	100% (1)	100% (1)
Belgium	NA	71.4% (1)	71.4% (1)
Czech Republic	92.9% (2)	93.9% (7)	93.7% (9)
Germany	NA	93.9% (7)	93.9% (7)
Denmark	100% (1)	NA	100% (1)
Spain	NA	83.7% (7)	83.7% (7)
France	0% (1)	98.2% (8)	87.3% (9)
Netherlands	100% (1)	100% (2)	100% (3)
Poland	76.6% (7)	82.4% (25)	80.7% (32)
Romania	NA	94.3% (5)	94.3% (5)
Sweden	85.7% (1)	NA	85.7% (1)
Other	NA	100% (1)	100% (1)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

Table 9: Proportion of information identified as very important or important by public authorities, with a breakdown by field of action

Field of action	National authorities	Regional authorities	All
Economics		100% (2)	100% (2)
Energy	100% (1)	81% (3)	85.7% (4)
Environment	97.1% (5)	86.5% (18)	88.8% (23)
Geology	67.3% (3)	57.1% (1)	66.1% (4)
Health and safety	0% (1)	100% (2)	66.7% (3)
Mining	57.1% (1)	71.4% (2)	66.7% (3)
Other	100% (2)	91.1% (36)	91.6% (38)

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

Chapter 9: Unconventional fossil fuels (e.g. shale gas) and EU objectives on resource efficiency and low-carbon economy

9.1 Questions asked to respondents

Respondents were asked the following question:

- ▶ Question 12: Thinking about the next 40 years, do you consider that the development of unconventional fossil fuels (e.g. shale gas) fits within the EU objectives towards a resource-efficient and low carbon economy?
 - ▷ Yes, whatever the conditions of development;
 - ▷ Yes, only if there are proper health and environmental safeguards in place;
 - ▷ Yes, only if there are proper health and environmental safeguards as well as policies for reducing greenhouse gas emissions, improving energy efficiency and increasing the use of low-carbon energy sources and technologies (especially renewable energy sources) in place;
 - ▷ No; and
 - ▷ I don't know

The answers to Question 12 from individuals, companies and organisations, and public authorities are summarised hereafter.

9.2 Answers from individuals

Figure 74 displays the share of respondents according to their opinion about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low-carbon economy objectives in 40 years perspective:

- 22% of respondents from EU countries think that development of unconventional fossil fuels (e.g. shale gas) in Europe fits within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective whatever the conditions of development;
- 16% believe that development of the resource fits within the EU objectives only if proper health and environmental safeguards are in place;
- 24% believe that development of the resource fits within the EU objectives only if there are proper health and environmental safeguards as well as policies for reducing greenhouse gas emissions, improving energy efficiency and increasing the use of low-carbon energy sources and technologies (especially renewable energy sources) in place

- 37% consider that development of the resource does not fit within the EU objectives;
- The majority of respondents from non-EU countries consider that that development of unconventional fossil fuels (e.g. shale gas) in Europe does not fit within the EU objectives.

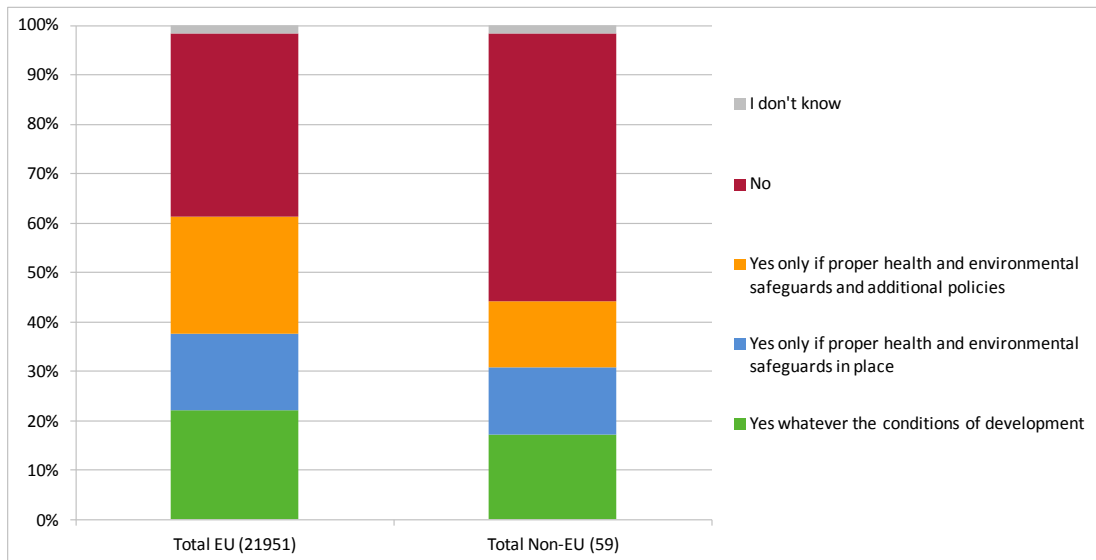


Figure 74: Opinion of individuals about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low-carbon economy objectives (40 years perspective) (EU and non-EU countries)

National differences are further presented in Figure 75:

- In a large majority of countries most respondents (more than 60%) think that development of unconventional fossil fuels (e.g. shale gas) in Europe does not fit within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective
- Only in Slovenia (80% of five respondents), Poland (54%) and Lithuania (51%) the majority of respondents consider that development of unconventional fossil fuels (e.g. shale gas) in Europe fits within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective whatever the conditions of development of this resource.
- Outside the EU, majorities of respondents from Australia and Canada consider that development of such a resource does not fit within the EU objectives.

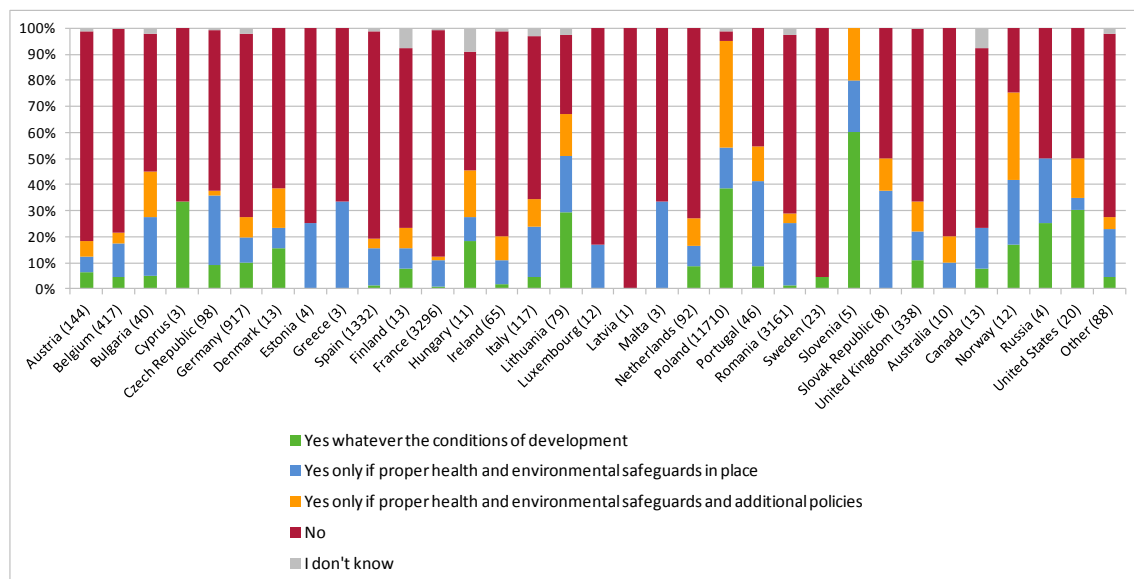


Figure 75: Opinion of individuals about role of unconventional fossil fuels (e.g. shale gas) in achieving EU objectives on resource efficiency and low carbon economy by country

9.3 Answers from companies and organisations

Figure 76 presents the answers to Question 12 for companies and organisations by type of organisation:

- A large majority of respondents from environmental or social NGOs, intergovernmental organisations or organisations defined as “other” thinks that the development of unconventional fossil fuels (e.g. shale gas) in Europe does not fit within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective;
- The opinion that registered most responses among academic institutions (35%) is that development of unconventional fossil fuels (e.g. shale gas) fits within the EU objectives only if there are proper health and environmental safeguards as well as policies for reducing greenhouse gas emissions, improving energy efficiency and increasing the use of low-carbon energy sources and technologies (especially renewable energy sources) in place;
- For companies and industry or trade associations the option that registered largest part of responses is that development of the unconventional fossil fuels (e.g. shale gas) fits within the EU objectives only if there are proper health and environmental safeguards in place (respectively 30% and 36%), although other options are similarly popular among those organisations.

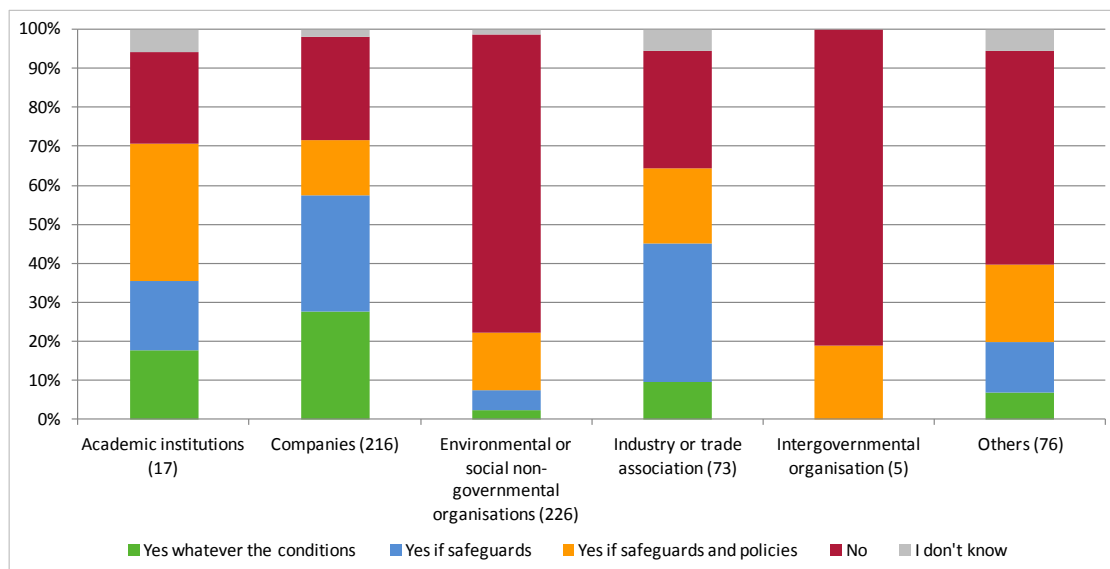


Figure 76: Opinion about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low carbon economy objectives by type of organisation

The breakdown of these institutions by country is provided in Figure 77:

- In half of the EU countries, the majority of respondents think that development of unconventional fossil fuels (e.g. shale gas) in Europe does not fit within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective
- Only in Poland (36%) and Lithuania (60%) the option saying that development of unconventional fossil fuels (e.g. shale gas) in Europe fits within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective whatever the conditions of development of this resource register the highest number of responses.

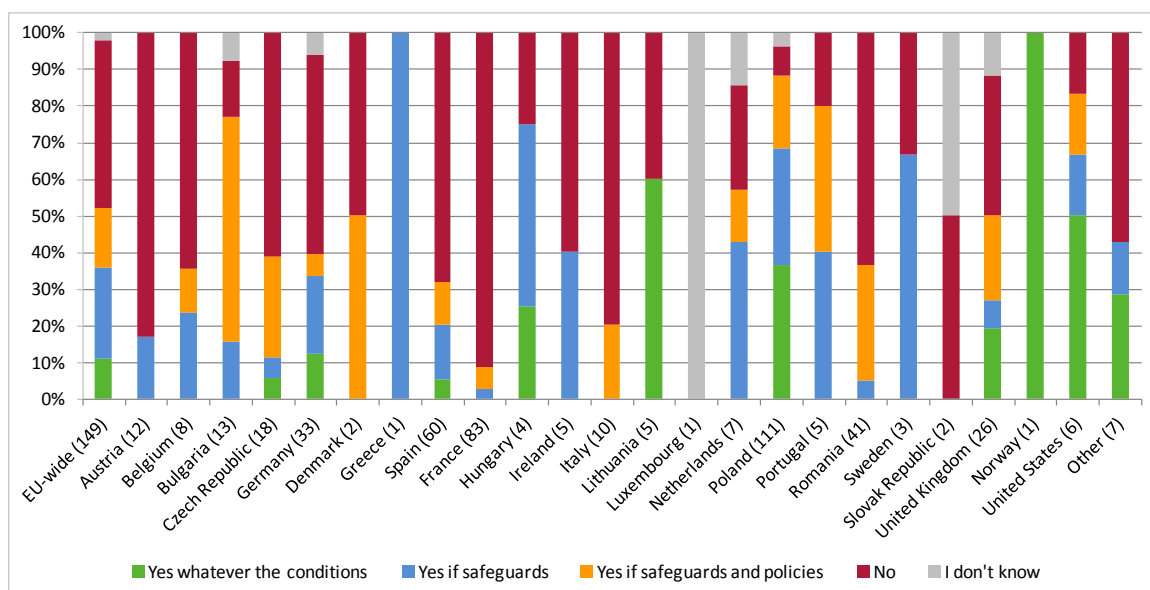


Figure 77: Opinion about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low carbon economy objectives – organisations by country of residence

The breakdown of companies alone by sector of activity is provided in Figure 78:

- Over 40 % of companies operating in investment , oil and gas , other industry supplies think that the development of unconventional fossil fuels (e.g. shale gas) in Europe fits within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective whatever the conditions of development;
- The opinion that registered most responses among companies from energy efficiency (67%), renewable energy (over 50%) and sectors identified as "other" (40 %) is that is that development of unconventional fossil fuels (e.g. shale gas) does not fit within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective.

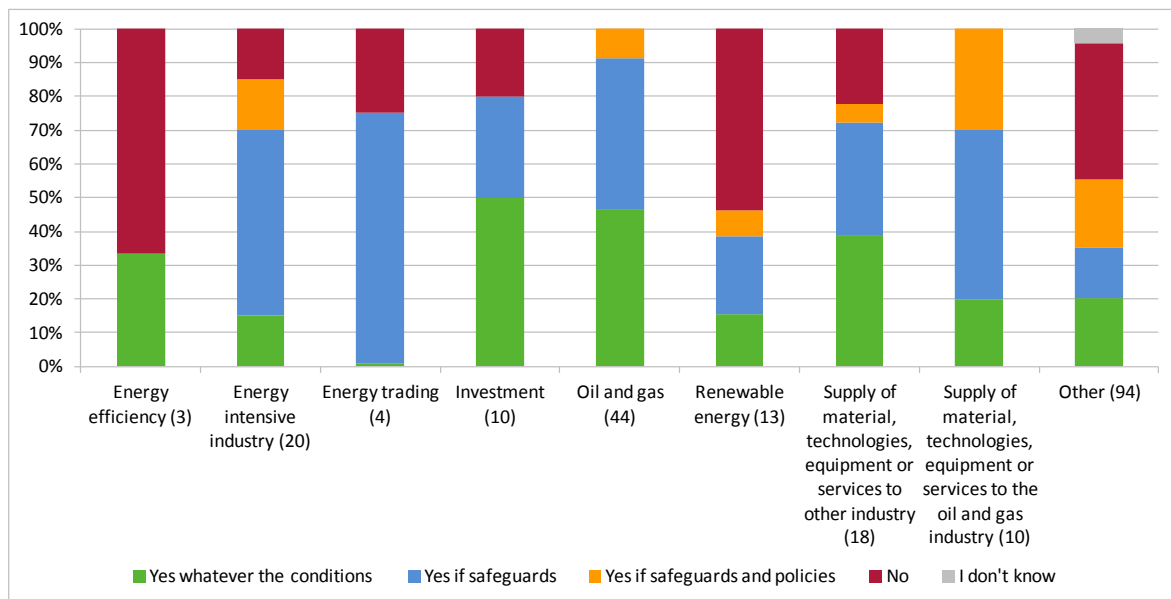


Figure 78: Opinion about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low carbon economy objectives – companies by sector

The breakdown of companies by size is presented in Figure 79:

- The majority of companies identified as not SMEs, expressed opinion that the development of unconventional fossil fuels (e.g. shale gas) in Europe does not fit within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective;
- Only 21% of SMEs share the same opinion, whereas 50% of them think that the development of unconventional fossil fuels (e.g. shale gas) fits within the EU objectives only if there are proper health and environmental safeguards as well as policies for reducing greenhouse gas emissions, improving energy efficiency and increasing the use of low-carbon energy sources and technologies (especially renewable energy sources) in place.

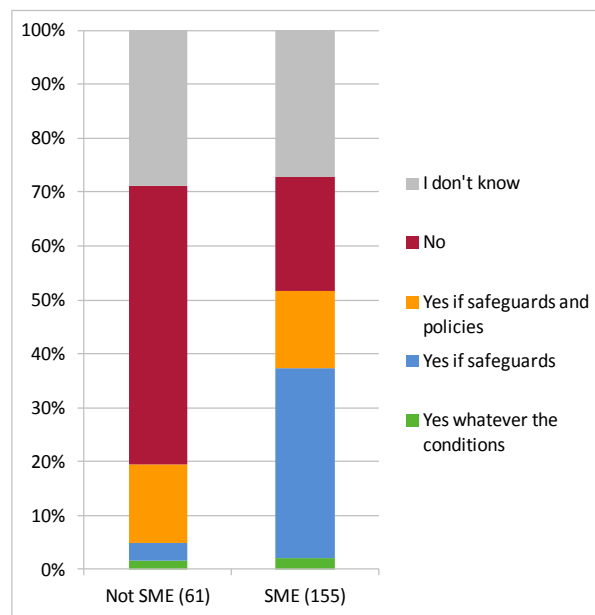


Figure 79: Opinion about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low carbon economy objectives – companies by size

9.4 Answers from public authorities

In general, respondents from national authorities appear to be more favourable to the idea that development of unconventional fossil fuels (e.g. shale gas) in Europe fits within the EU resource efficiency and low-carbon economy objectives in a 40-year perspective than respondents from regional or local authorities. There are many more respondents in regional or local authorities than in national ones who consider that development of unconventional fossil fuels (e.g. shale gas) in Europe does not fit within the EU resource efficiency and low-carbon economy objectives (respectively 41% and 7.7%).

The majority of respondents in national authorities think that development of unconventional fossil fuels (e.g. shale gas) in Europe fits within the EU resource efficiency and low-carbon economy objectives only if proper health and environmental safeguards as well as policies for reducing greenhouse gas emissions, improving energy efficiency and increasing the use of low-carbon energy sources and technologies (especially renewable energy sources) are in place.

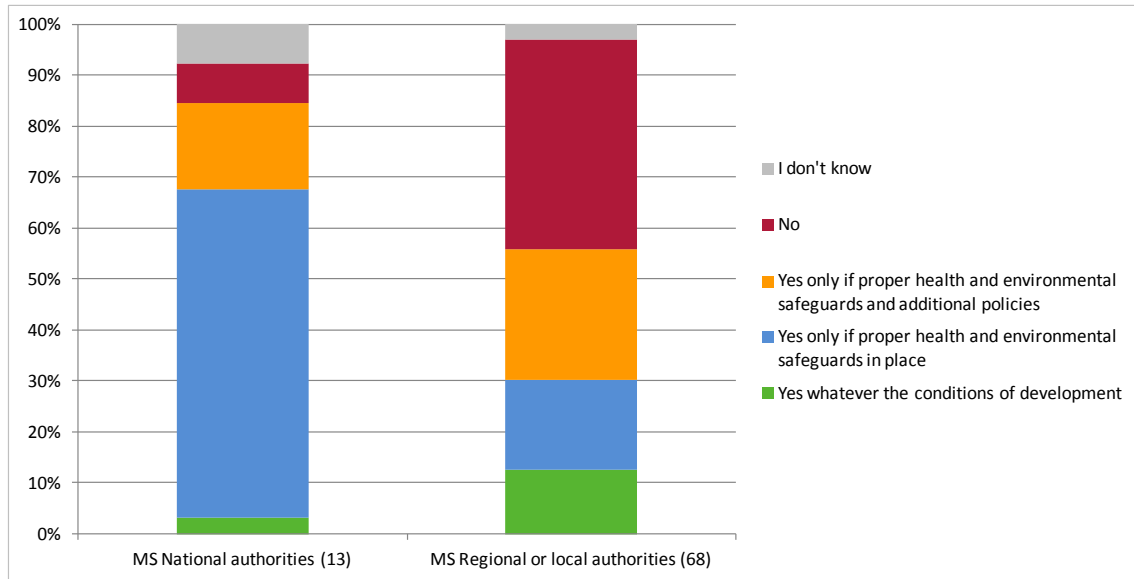


Figure 8o: Opinion of public authorities about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low carbon economy objectives

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

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Chapter 10: Survey satisfaction

10.1 Questions asked to respondents

The last question of the survey conducted during the public consultation on unconventional fossil fuels was concerned with respondents' satisfaction about the survey:

- ▶ Question 13: are you satisfied with this survey?
 - ▷ I am satisfied;
 - ▷ I am somewhat satisfied;
 - ▷ I am neither satisfied not dissatisfied
 - ▷ I am not satisfied; or
 - ▷ I don't know.

The answers this question as gathered from individuals, companies and organisations, and public authorities are summarised below.

10.2 Answers from individuals

Figure 81 displays the proportions of respondents that declared being satisfied or not at the end of the survey:

- A bit more than one quarter of individual respondents from EU countries declared being satisfied with the survey;
- This share sums up to more than 60% when it takes account of the respondents that declared being somewhat satisfied;
- About 20% of respondents declared that they were not satisfied with the survey;
- Respondents from non-EU countries seem to have been less satisfied with the survey, even though a bit more than half of them answered that they were whether satisfied or somewhat satisfied with the survey.

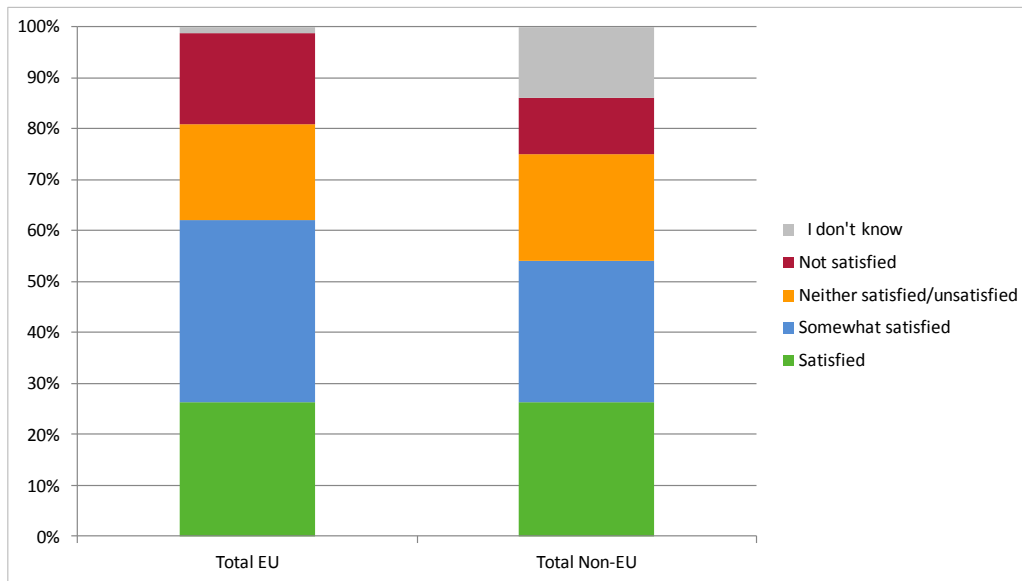


Figure 81: Level of satisfaction concerning the survey for EU and non-EU individual respondents

National differences are further presented in Figure 82:

- The highest satisfaction levels (about 70% of satisfied or somewhat satisfied respondents) were registered for the residents of Malta, Czech Republic, Slovak Republic and Romania.
- On the contrary, the lowest satisfaction levels (less than 30% of satisfied or somewhat satisfied respondents) were found among the residents of Hungary (with many indecisive respondents), Portugal, Finland, Denmark and Sweden.

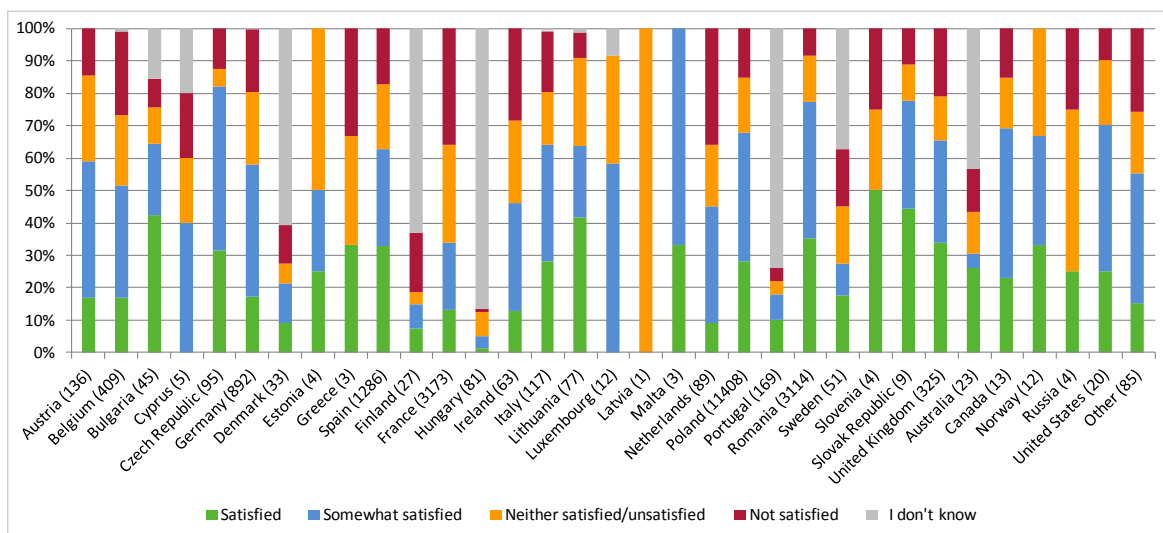


Figure 82: Level of satisfaction concerning the survey for individual respondents according to their country of residence

10.3 Answers from companies and organisations

Figure 83 presents the answers on survey satisfaction for companies and organisations by type of organisation:

- The most satisfied type of respondent was from academia (over 80%), followed by intergovernmental organisations (62.5%) and companies (61.4%).
- On the other hand, less than half (45.8%) of the representatives of trade and industry associations declared being at least somewhat satisfied with the survey.

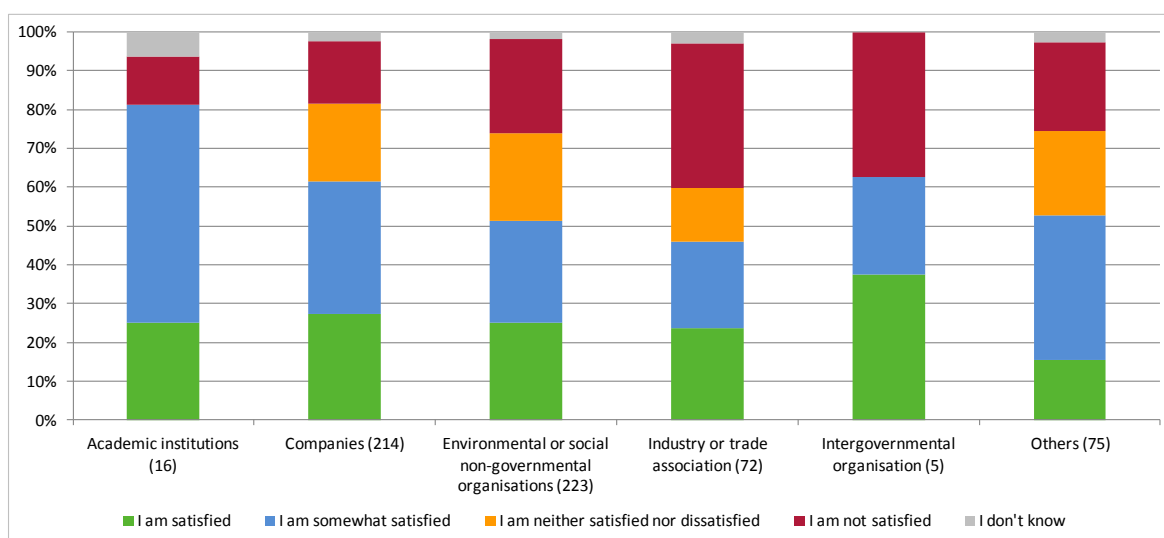


Figure 83: Level of satisfaction concerning the survey for EU companies and organisations

The breakdown of the answers of companies and organisations by country is provided in Figure 84:

- The highest satisfaction levels (about 70% satisfied or somewhat satisfied respondents) were registered for the responding companies and organisations of Bulgaria, Denmark, Greece, Luxembourg, Portugal, Sweden and Norway.
- By contrast, the lowest satisfaction levels (less than 30% of satisfied or somewhat satisfied respondents) were found among companies and organisations residing in France, Hungary, Ireland and the Netherlands.

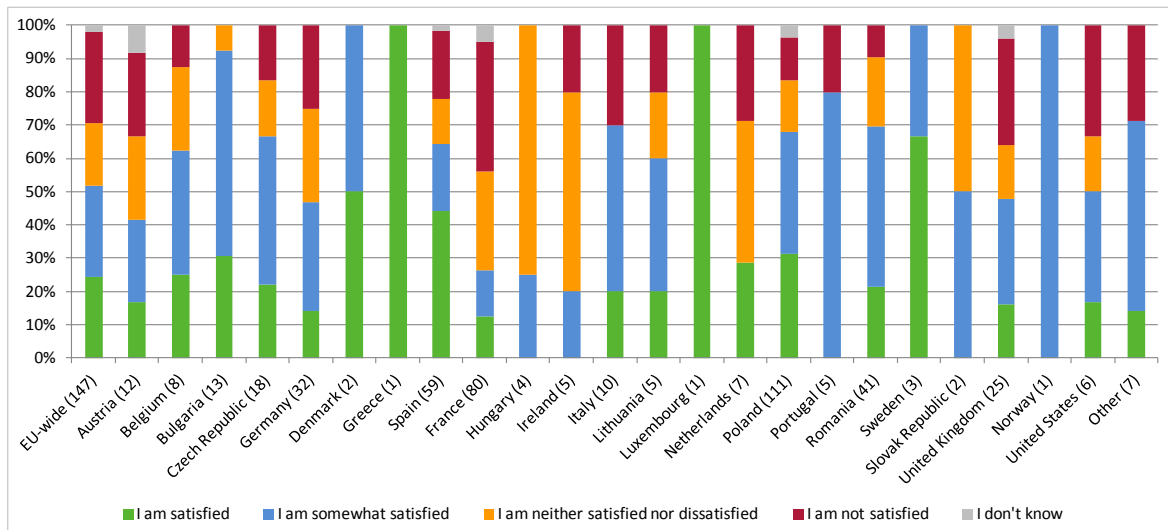


Figure 84: Level of satisfaction concerning the survey for EU and non-EU companies and organisations according to their country of residence

10.4 Answers from public authorities

The answers on survey satisfaction from national and local or regional authorities are displayed in Figure 85.

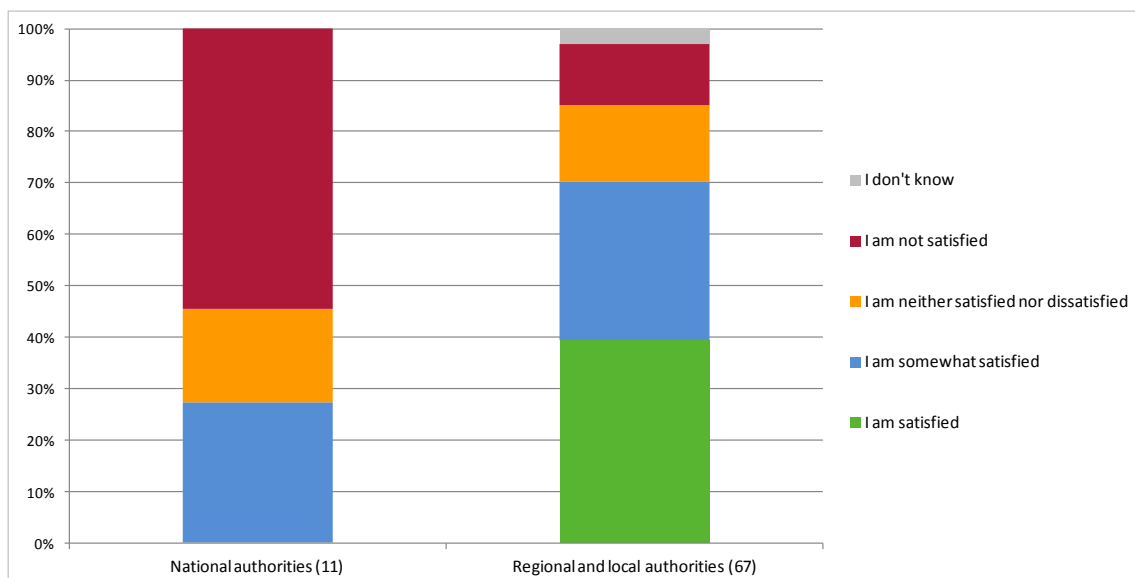


Figure 85: Level of satisfaction concerning the survey for responding EU national and regional or local authorities

It has to be noted that the views expressed by individual public authorities do not necessarily represent the official views of the government of a selected country. Also note that the survey relied on self-declaration.

In general, respondents from national authorities appear to be one of the most dissatisfied types of respondents, with more than half of respondents declaring that they were not satisfied with the survey. On the other hand, regional and local authorities appear to be globally satisfied with the survey, with seven respondents out of ten declaring that they were satisfied or somewhat satisfied with the survey.

Chapter 11: Illustrative weighting of main indicators by population

11.1 Introduction

During the public consultation, there was a very high participation in certain EU countries. The success of the online public consultation allowed answers to be gathered from 11 714 individuals in Poland, 3 308 in France, 3 166 in Romania, 1 334 in Spain and 917 in Germany. Other EU countries showed lower levels of participation, although 1 536 answers in total were gathered from individuals from the remaining 22 Member States, which represents a large amount of answers from individuals in the framework of such an online public consultation.

From an analysis perspective, the question thus emerges as to how the aggregate indicators are sensitive to the country of residence of respondents. In particular, what would the results of the public consultation have been if participation in all Member States had been proportionate to population?

This section displays illustrative calculations to complement the main results provided during the previous chapters, in order to try to answer to that question. The illustrative results presented below were obtained by weighting the raw results to even out participation levels for individuals in different EU countries.

Results are therefore reported for individuals only, using the following calculation method to weight individual answers and get averages at EU level:

- Each country is assigned a total weight equal to its population, based on Eurostat statistics for 2012 EU population in Member States.
- This weight by country is equally divided between all the respondents that declared themselves as living in that country.

This weight is then used to calculate weighted averages, at EU level, of the answers gathered during the public consultation.

11.2 Results with weights according to Member State population

In general, weighted totals are different from non-weighted EU totals. Firstly, the share of weighted answers not favourable to the development of unconventional fossil fuels (e.g. shale gas) in Europe at all is 64.2%, which is much higher than in the case of the non-weighted results (37.5%). Conversely, the share of weighted answers favourable to the development of unconventional fossil fuels anyway is much lower with the weighted total (11.5% instead of 32.5% non-weighted).

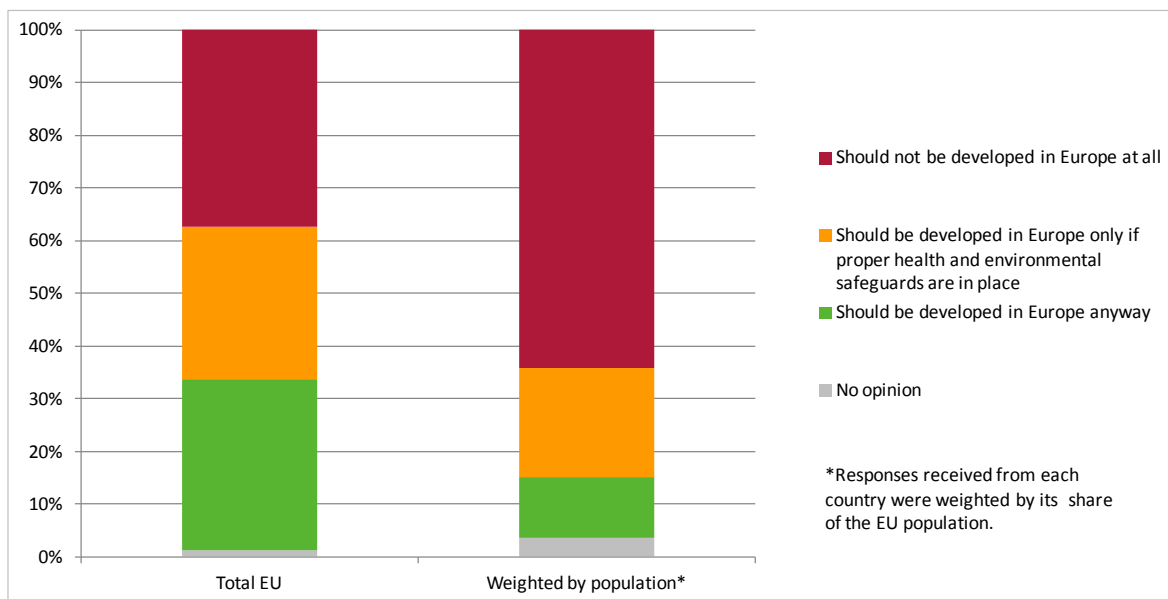


Figure 86: Opinions of EU individuals about the development of unconventional fossil fuels (e.g. shale gas) in Europe with and without weights by Member State population

The difference with non-weighted and weighted totals when assessing general opinion about unconventional fossil fuels (e.g. shale gas) can also be observed when looking at the benefits and challenges identified by respondents (see Figure 87 for benefits and Figure 88 for challenges):

- On average, about 54% of individual respondents from EU countries identified each benefit as potentially major or significant. With the weighted answers by Member State population, this share is 25%.
- 51% of respondents from EU countries identified each challenge as potentially major or significant. With the weighted answers by Member State population, this share is 75%.

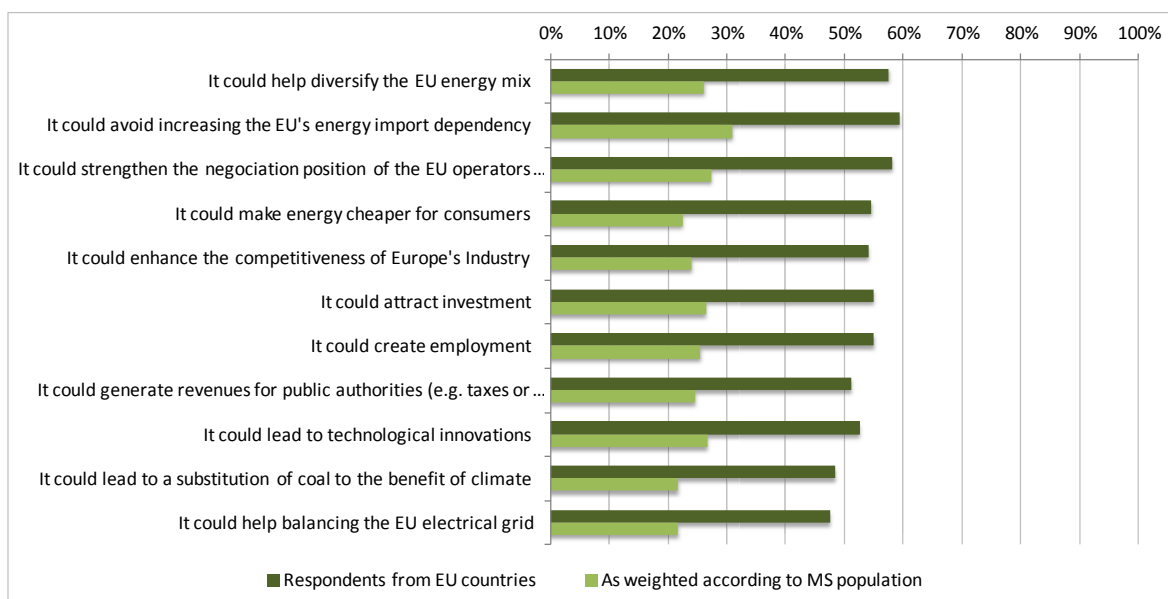


Figure 87: Share of respondents from EU countries stating that each potential benefit could be major or significant with and without weights by Member State population

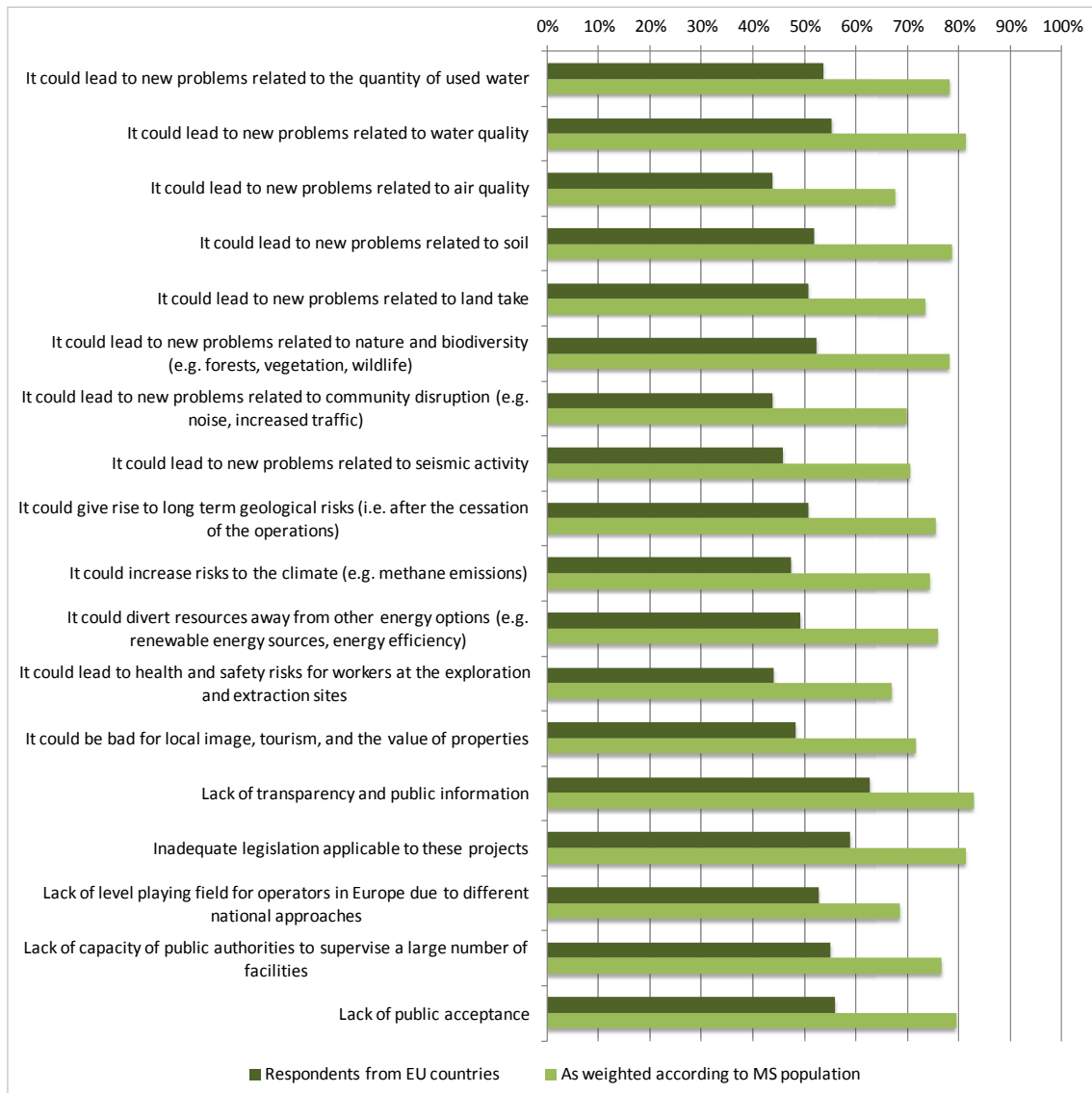


Figure 88: Share of respondents from EU countries stating that each issue could lead to major or significant challenge with and without weights by Member State population

When it comes to the measures that should be implemented to address the challenges, weighted answers lead to a higher share of responses that think that each potential measure would be important or very important (89% in average with weighting). However, this share was already very large without weighting (80% in average without weighting).

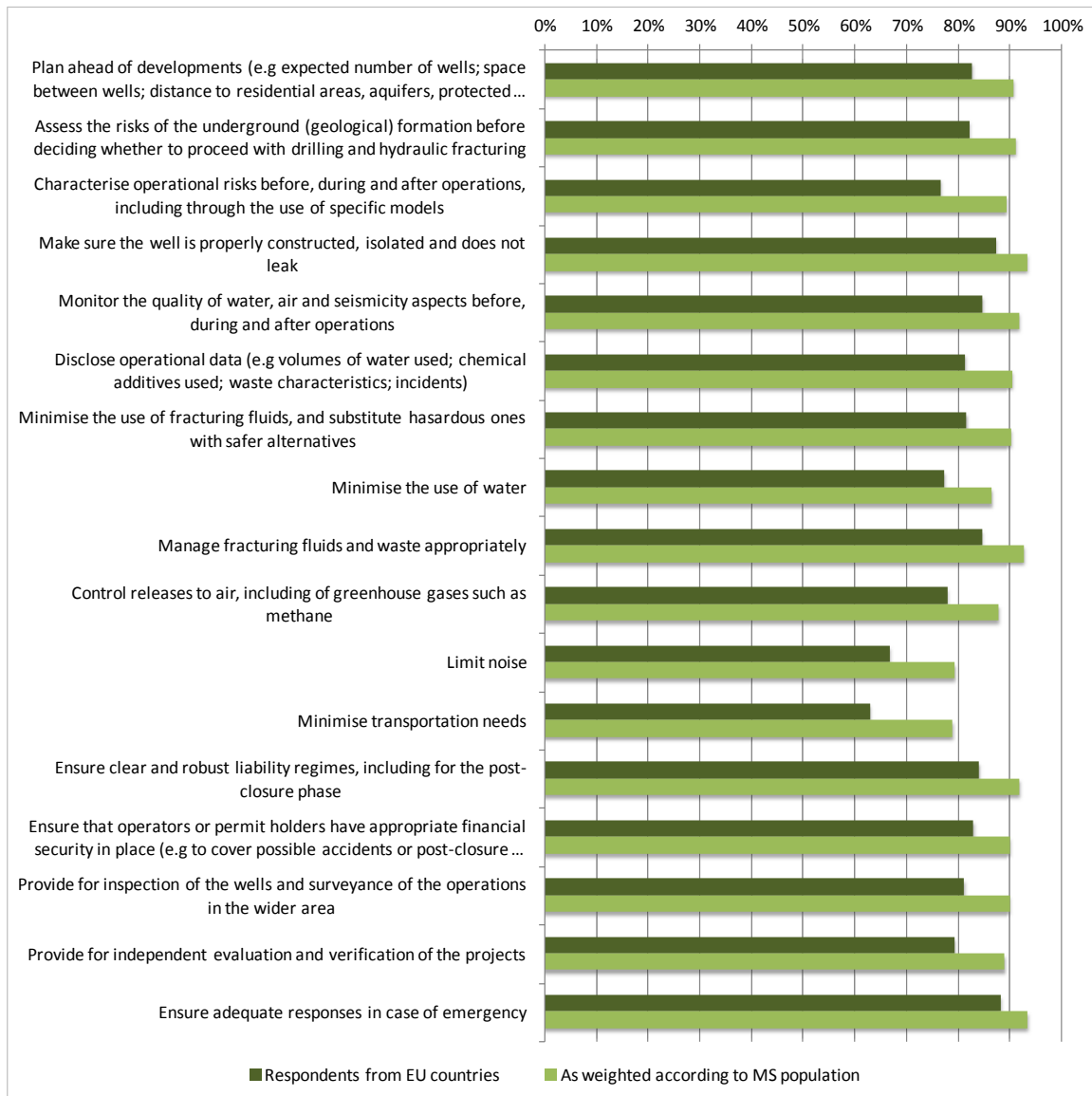


Figure 89: Share of respondents from EU countries stating that each measure was very important or important with and without weights by Member State population

Moreover, the weighting of results has a very small impact on the readiness of respondents to change their opinion about unconventional fossil fuels if the above measures would be implemented (see Figure 90).

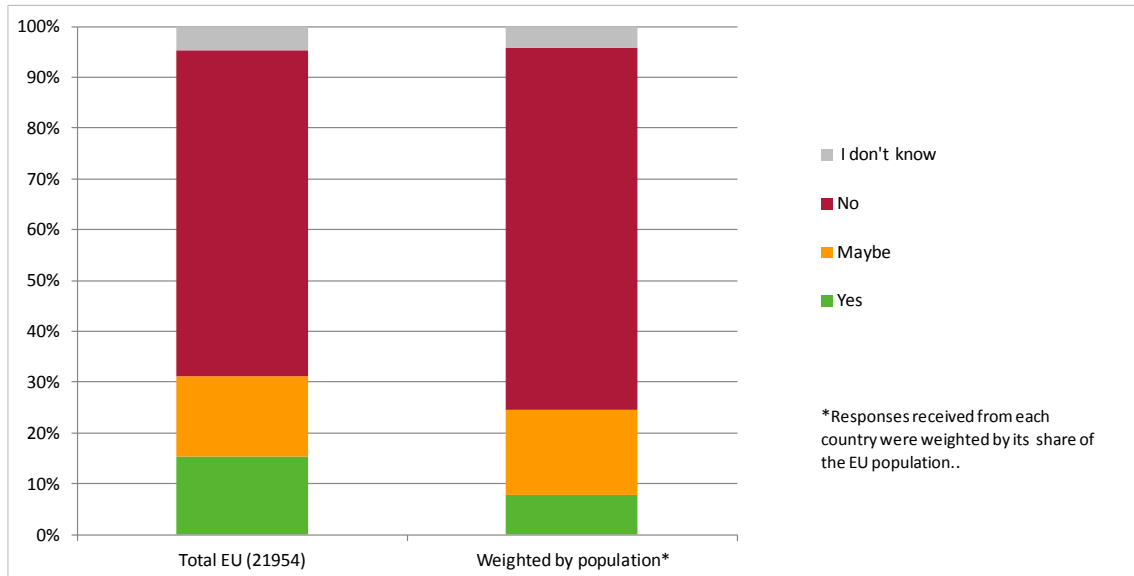


Figure 90: Readiness of respondents to change their opinion about unconventional fossil fuels (e.g. shale gas) development (EU and non-EU countries) with and without weights by Member State population

As regards the favoured policy option, non-weighted and weighted totals lead to the same conclusion that the least favoured option by respondents is “doing nothing” (23.6% of favourable opinions without weighting and 15.2% with). When using the weights according to Member State population, the most favoured option would be the development of a comprehensive and specific EU piece of legislation for unconventional fossil fuels, with 66.5% of favourable opinion among weighted answers.

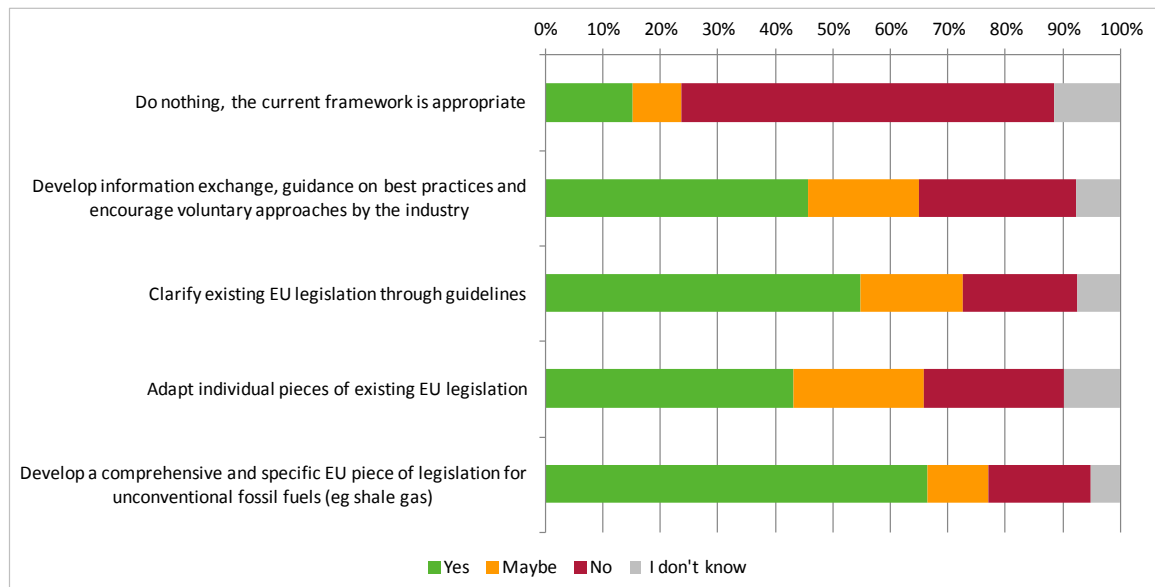


Figure 91: Answers from individual respondents from EU countries on policy options to address the identified challenges and risks at EU level

This was also one of the most favoured opinion without weighting (54.2% of favourable opinion), but it registered the same amount of favourable non-weighted answers than the development of information exchange, guidance on best practices and voluntary actions, and the gap was very small with the clarification of EU legislation through guidelines (52.5% of non-weighted answers

were favourable). These two policy options are also popular with weighting (respectively 45.8% and 54.9% of favourable weighted answers), but less than the development of a comprehensive framework.

Beyond the preferred policy option, weighted and non-weighted EU totals suggest that the great majority of respondents (respectively 72% of respondents without and 79% with weights) considered that information needs are important and very important.

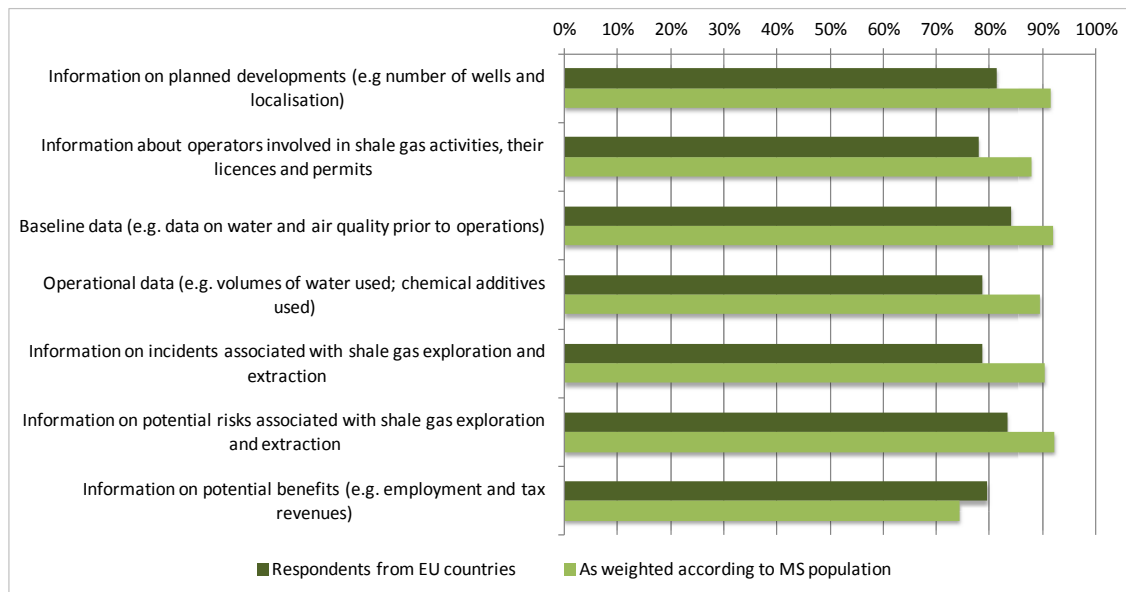


Figure 92: Share of respondents from EU countries stating that each information need is very important or important with and without weights by Member State population

On the other hand, opinions on whether the development of unconventional fossil fuels would be aligned with EU objectives of resource efficiency and low-carbon economy are sensitive to the use of weights (see Figure 93).

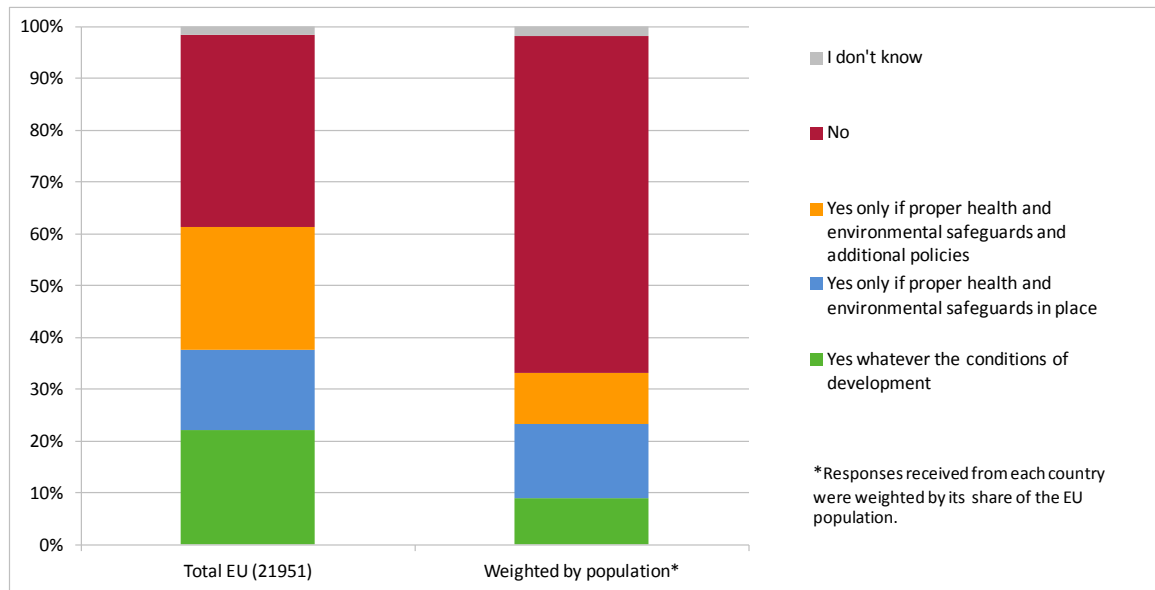


Figure 93: Opinion of individuals about role of unconventional fossil fuels (e.g. shale gas) in achieving EU resource efficiency and low-carbon economy objectives (40 years perspective) with and without weights by Member State population

The share of weighted answers that think that the development of unconventional fossil fuels could help achieve EU objectives of resource efficiency and low-carbon economy, whatever the conditions of development, shrinks to 8.8% with the weights according to Member State population (this share is 22% without the weights). On the other hand, whereas 37% of non-weighted answers considered that the development of unconventional fossil fuels would not contribute to reaching the objectives of resource efficiency and a low-carbon economy, this share increases to 65% with the use of weights by Member State population.

Finally, survey satisfaction would be relatively similar (even though lower) with the use of the weights as compared with the EU total without the weights.

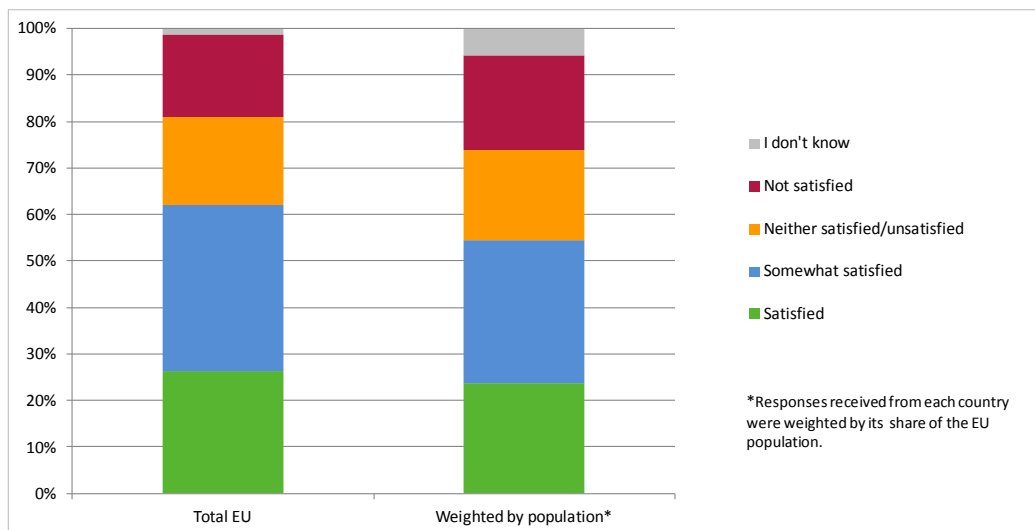


Figure 94: Level of satisfaction concerning the survey for EU respondents with and without weights by Member State population

11.3 Conclusions from the illustrative use of weights

The use of weights provides complementary information on the sensitiveness of the aggregate results to the fact that different levels of participation to the public consultation were registered among EU countries. In particular, the opinion about unconventional fossil fuels (e.g. shale gas) is clearly sensitive to the country of residence of respondents. This can be observed likewise as regards identified benefits and challenges, and the opinion about the relationship between unconventional fossil fuels and the EU objectives regarding the development of a low-carbon economy and resource efficiency. As a consequence, trying to even out participation levels in EU countries leads to different aggregate results. Based on the participation levels registered during the public consultation, weighted EU totals are less in favour of the development of unconventional fossil fuels (e.g. shale gas) than non-weighted results.

Some of the results of the public consultation are not sensitive to the differences registered in terms of participation levels between EU countries. In particular, the measures to address the challenges of unconventional fossil fuels were widely recommended by respondents independently of the use of weights or not, like the need for transparency and information. In this context, "doing nothing" at EU level appeared to be the least favoured policy option for respondents, whether answers were weighted or not.

Chapter 12: Patterns of answers to questions

12.1 Objectives and methodology

12.1.1 General approach

This chapter assesses if there are similar patterns of answers found between respondents: in particular, is it possible to associate the preference for a policy option with a specific opinion on unconventional fossil fuels or the identification of various benefits/challenges?

In order to make this assessment, a statistical technique known as **Principal Component Analysis (PCA)** is used separately for the answers of individuals, public authorities, and companies and organisations.

This method allows the construction of “principal components”, whose composition can be used to analyse the pattern of answers of respondents. The composition of the main two principal components is displayed on a scatter graph and interpreted graphically. The graphical representation is reported in the main body of the document below, with the details in annex.

The output graph of a PCA provides intuitive information on two elements:

- What types of answers are correlated: two answers are said to be correlated when answering one question in a certain way usually leads to another question being answered in a certain way. **Correlated (groups of) answers appear to be “close” on PCA graphs.**
- What questions divide people into groups: the construction of the principal components is such that the answers and/or questions that are given large weights in the principal components are the answers and/or questions that divide people’s opinion. **Therefore, when indicators appear at the extremes of a PCA graph, this is because they usually express the main differences between respondents.**

Note that the two axes of the graphs display informative content that should be interpreted in a specific order. First, one must look at the dispersion of questions/indicators for the first principal component, on the x-axis: the indicators that appear at the extremes from left to right are the ones that led to the highest level of difference among respondents. When indicators are “close” on the x-axis, they are particularly correlated.

After the interpretation of the x-axis is performed, the y-axis can be examined: it provides additional, second-order, information. This axis provides complementary information on other important elements that divide respondents, or creates correlations between answers but ones that are less important in magnitude than those presented on the x-axis. The relative magnitude of the information provided by the two axes is provided by the indicator presented near the x- and y-axes and called “share of variance”.

12.1.2 Indicators used

To run principal component analyses, it was necessary to construct indicators of interest based on the answers of respondents to the questions asked during the public consultation on unconventional fossil fuels (e.g. shale gas). The selected indicators are presented below:

- ▶ Indicators relating to opinion about unconventional fossil fuels (e.g. shale gas)

Three indicators are constructed to display respondents' opinions about unconventional fossil fuels (e.g. shale gas):

- **UFF "Anyway"**: a value of 1 is given to this indicator when people declared that unconventional fossil fuels (UFF) should be developed no matter what, and 0 otherwise;
- **UFF "Constraints"**: a value of 1 is given to this indicator when people declared that unconventional fossil fuels should be developed only if proper health and environmental constraints are implemented, and 0 otherwise; and
- **UFF "Not at all"**: a value of 1 is given to this indicator when people declared that unconventional fossil fuels should not be developed at all in the EU, and 0 otherwise.

- ▶ Indicators relating to specific sections

It was observed that there is very high correlation of answers for questions within the same section of the questionnaire. For example, people that identified one benefit as being major or significant usually identified the other benefits as being major or significant too. Therefore, it was decided that the PCA would not look at differences in the pattern of answers within groups of questions that are part of the same section of the questionnaire, but would rather look at the correlations that can be found between sections of the questionnaire. To do so, indicators were constructed for the various sections:

- **Identified benefits**: this indicator sums up the number of benefits identified by each respondent as major or significant (up to 11);
- **Identified challenges**: this indicator sums up the number of challenges identified by each respondent as major or significant (up to 18);
- **Identified actions**: this indicator sums up the number of ways of addressing the challenges identified by each respondent as important or very important (up to 18);
- **Information needs**: this indicator corresponds to the number of information needs identified by each respondent as important or very important; and
- **Survey satisfaction**: this indicator provides information on whether respondents were satisfied or not with the survey. A value of 2 is given to this indicator for respondents satisfied with the survey and 1 for respondents somewhat satisfied with the survey. A value of 0 is given to this indicator for other respondents, excluding respondents with no opinion.

► Regulation-based indicators

One key question that was to be asked with the correlation analysis was if it is possible to relate preferences on policy options with respondents' opinions about shale gas and their identification of benefits, challenges, actions and information needs. Four indicators were constructed to understand people's preferences on EU action:

- **EU OBJECTIVE:** This indicator is given a value of 1 when respondents think that unconventional fossil fuels are part of EU strategy towards a resource-efficient and low-carbon economy for the coming 40 years, and 0 when they think that it is not the case;
- **BASELINE:** This indicator is given a value of 1 when respondents think that the EU should not implement any additional policy, 0 otherwise;
- **BEST PRACTICES:** This indicator is given a value of 1 when respondents think that the EU should develop information exchange, guidance on best practices and encourage voluntary actions, 0 otherwise; and
- **LEGISLATE:** This indicator was constructed from the responses relating to the creation of guidelines, the adaptation of individual pieces of regulation and the creation of a specific regulation. The answers for these three questions were highly correlated and were therefore grouped thanks to the use of the "LEGISLATE" indicator. This indicator sums up the number of potential policy instruments that respondents considered that the EU should implement (of the three mentioned above – for each respondent, the value of this indicator ranges from 0 to 3).

► Country of residence

Country codes for 27 EU Member States are used to display the correlation between respondents' answers and their country of residence. These indicators are constructed based on respondents' declarations of their country of residence. International country codes (e.g. "FR" for France) are used to position each country-based indicator on the output graphs of the PCAs.

► Type of respondents

For public authorities, two additional indicators are used:

- **National authority:** This indicator is given a value of 1 when respondents declared representing a national authority. It aims to understand the difference in the pattern of answers between national vs. local and regional authorities; and
- **Regional or local authority:** similarly to the indicator for national authority, the average opinion of regional or local authorities is summarised with this indicator.

For the data including the answers of companies and organisations, similar indicators on the type of respondent are used. They distinguish between:

- Academic institutions;
- Social or environmental NGOs;

- Intergovernmental organisations;
- Industry or trade organisations;
- SMEs; and
- Big Companies.

12.2 Main results – Individual respondents

The main results of the PCA for the responses from individuals are presented in the graph below. An interpretation of these results is offered hereafter.

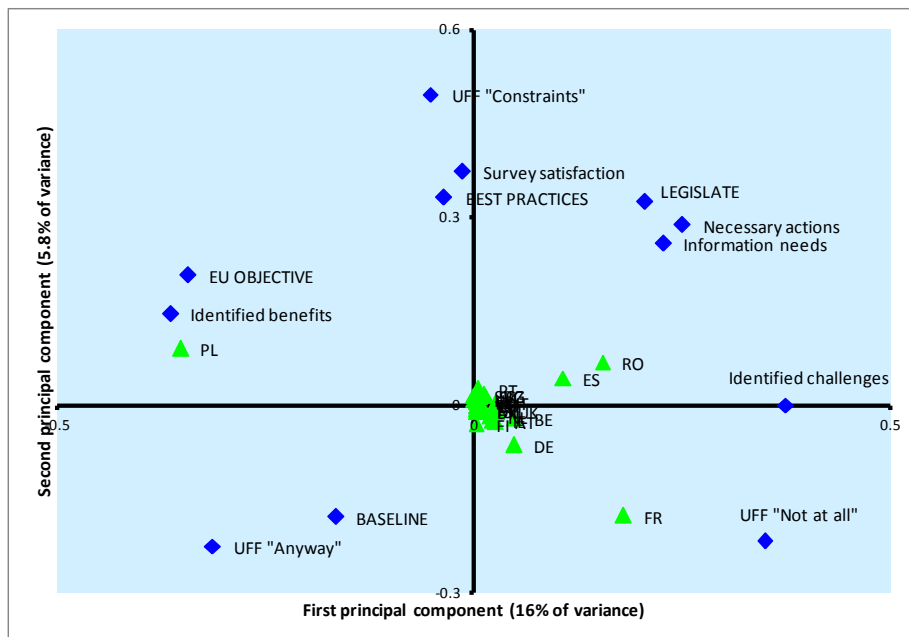


Figure 95: Results of principal component analysis for individuals

- ▶ Key variables necessary to understand the patterns of answers

In the graph above, the indicators located at the extremes of the first and second principal components are key to understanding the main differences among respondents (see Figure 96):

- When it comes to the first principal component, it seems clear that respondents are divided according to:
 - Their opinion about shale gas;
 - The way they identify benefits on the one hand, or challenges, necessary actions and information needs on the other.
- The second principal component clearly divides respondents according to their opinion about EU intervention. In particular, respondents who think that unconventional fossil fuels should be implemented only if safeguards are put in place expect that more action is taken at EU level than other respondents.

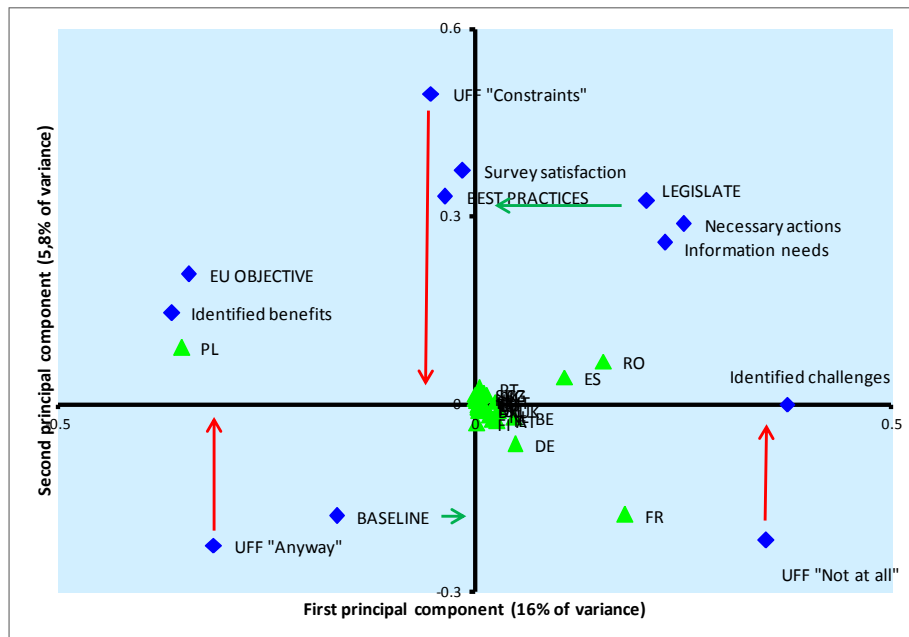


Figure 96: Indicators that divide respondents, based on the composition of the first and second principal components

► Correlated indicators

▷ Interpretation of the first principal component

The most correlated indicators are the ones that appear to be “close” on the first principal component (see Figure 97). From left to right:

- Respondents who identified many benefits usually considered that unconventional fossil fuels are part of EU objectives towards a resource-efficient and a low-carbon economy. These respondents are also more likely to be living in Poland than in another Member State and tend to consider that unconventional fossil fuels should be implemented in the EU “anyway”.
- The majority of residents of EU Member States (excluding Poland, Romania, Spain and France) seem to have a similar vision of shale gas, one that is much less favourable than Polish residents and also, a bit more favourable than Spanish, Romanian and French residents. These countries tend to be “closer” to the opinion that unconventional fossil fuels should be implemented only if health and environmental constraints are implemented, they are usually more satisfied with the survey and more often think that the EU should foster best practices and voluntary actions by the private sector to deal with the challenges identified.
- Spanish, Romanian and French residents are more likely to prefer that legislative action is taken at EU level. They also identified a greater number of necessary actions and information needs than residents of other Member States.

- Finally, the identification of a large number of challenges is highly correlated with the opinion that unconventional fossil fuels should not be implemented in the EU at all.

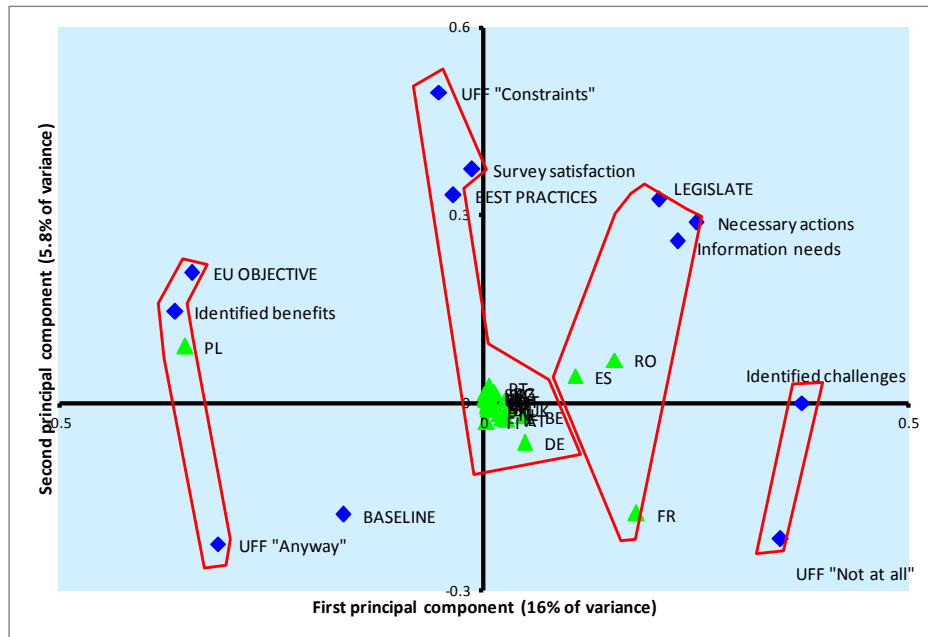


Figure 97: interpretation of correlations as identified with the first principal component

▷ Interpretation of the second principal component

While the correlations mentioned above are still valid, the second principal component provides additional information (see Figure 98).

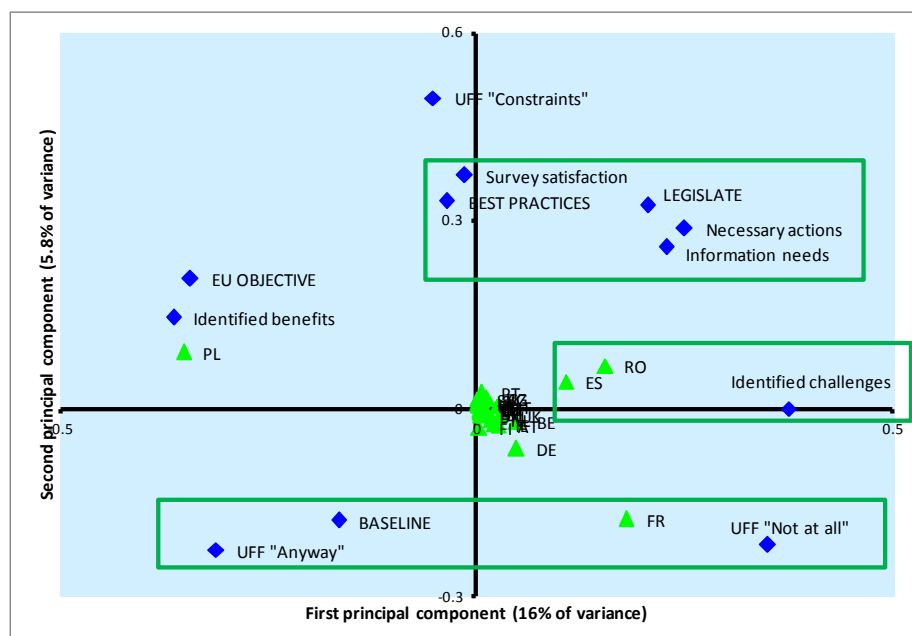


Figure 98: Interpretation of correlations as identified with the second principal component

In particular, from bottom to top:

- Respondents in favour or against the implementation of unconventional fossil fuels no matter what are somewhat prone to considering that the current EU

legislative framework is sufficient, whether to ban or pursue the exploitation of unconventional fossil fuels.

- Compared to Romania and Spain, French residents tend to identify fewer benefits and fewer challenges for unconventional fossil fuels.
- The development of best practices and voluntary actions is not necessarily opposed to the implementation of regulatory instruments (whether the drafting of guidelines, the adaptation of existing legislation or the drafting of new regulations). Similarly, the identification of necessary actions and information needs is correlated with the idea that the EU should encourage best practices from the private sector as well as with the idea that the EU should take legislative action.

12.3 Main results – companies and organisations

The results obtained from the data on companies and organisations are displayed in Figure 99. They are very similar to the results obtained with the answers from individuals. Therefore, the interpretation of results for individuals is valid for companies and organisations.

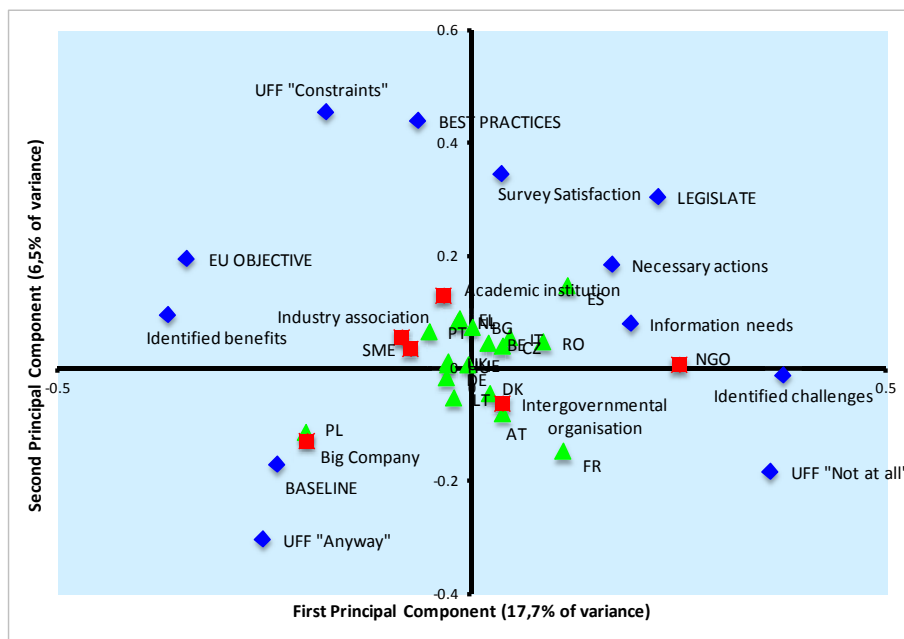


Figure 99: Main results of principal component analysis for companies and organisations¹

However, additional information is provided as to the relative position of the different types of companies and organisations that responded to the public consultation. In particular, big companies provided answers that are very favourable to the development of unconventional fossil fuels, and proved to be, on average, in favour of keeping current regulation as it is. On the

¹ For the sake of homogeneity of PCAs, "Identified benefits" are presented at the left even though the results of the PCA as computed were the exact inverse of the results provided on this graph (benefits appeared on the right and challenges on the left). The presentation of results on one side instead of another has no impact on their interpretation.

other hand, social and environmental NGOs are clearly more reluctant to see the development of unconventional fossil fuels.

12.4 Main results – public institutions

The results obtained for public institutions are displayed in Figure 100. They are once again very similar to the ones obtained for individuals. However, the figure provides information about the pattern of answers from national authorities as compared with local and regional ones. In particular, responding national authorities appear to be more favourable to the development of unconventional fossil fuels with no additional regulation being adopted at EU level, as opposed to the responses of local and regional authorities, which tend to be much less favourable to the development of unconventional fossil fuels without the implementation of any additional EU level regulation.

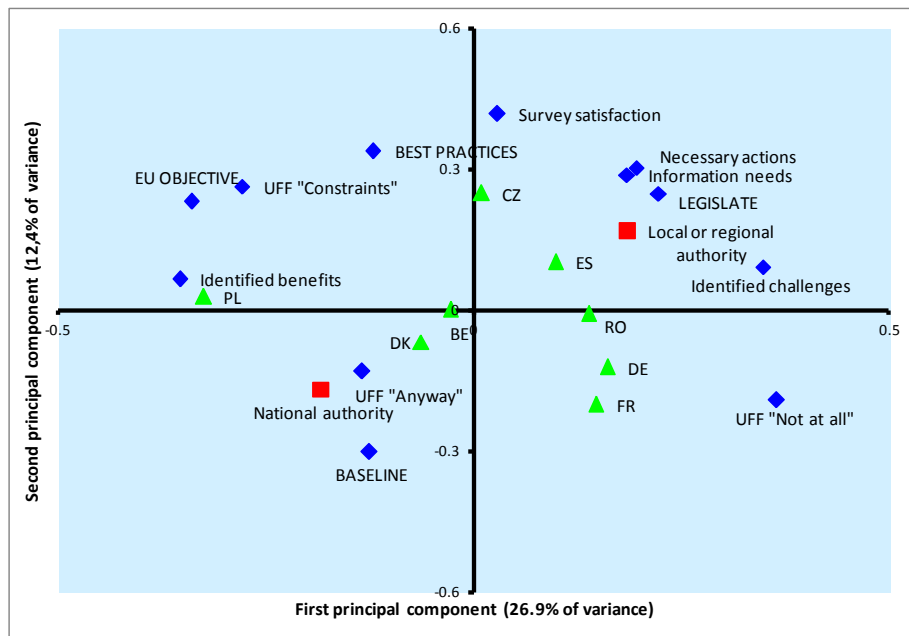


Figure 100: Main results of principal component analysis for public institutions

Chapter 13: Conclusions

This report has presented the answers of individuals, private organisations and public authorities to the nine closed questions and five open-ended questions of the online public consultation on unconventional fossil fuels (e.g. shale gas). Moreover, the presentation of summary statistics has been complemented with:

- The use of illustrative weights to understand the sensitivity of the results of the public consultation to the different participation levels found among EU countries; and
- A correlation analysis to identify patterns of answers for specific groups of respondents.

From the correlation analysis, it appears that opinion about unconventional fossil fuels (question 1) can explain many of the answers to the other closed questions. Three groups of respondents thus emerged:

- Respondents in favour of the development of unconventional fossil fuels, identifying many potential benefits;
- Respondents who think that strict environmental and health safeguards should be put in place, and more likely to prefer regulation at EU level; and
- Respondents against development, identifying many potential challenges, with some of them wanting a ban on unconventional fossil fuels in the EU.

Each of these types of respondents constituted about one third of the individual respondents of the public consultation. Such a breakdown led to the assessment by about half of the individual respondents that each benefit could be major or significant, and similarly, by about half of the individual respondents that each challenge could be major or significant.

The overall results appear to be sensitive to the variation in participation level in each Member State. The illustrative weights to even out participation led to different results about EU citizens' opinions about unconventional fossil fuels (e.g. shale gas): weighted results according to Member State population appeared to be much less in favour of the development of unconventional fossil fuels than non-weighted totals.

However, beyond personal opinions about the development of unconventional fossil fuels (e.g. shale gas), a large consensus emerges among individual respondents that:

- Measures are necessary to address the potential challenges of unconventional fossil fuels (e.g. shale gas); and
- Transparency and information are necessary at all stages.

Consistently, a large majority of individual respondents considered that the current framework was not well adapted and that the EU should take some action: "doing nothing" was the least favoured option, and this result is robust even taking into account the fact that participation was uneven among countries.

Regarding private organisations and public institutions, views were split about unconventional fossil fuels (e.g. shale gas), as they were for individuals. NGOs appeared to be among the least favourable to unconventional fossil fuels, compared to companies, trade and industry associations, or national governments. However, all these actors, like individuals, expressed the view that there were important information needs associated with unconventional fossil fuel exploration and extraction, and that potential challenges should be addressed with appropriate measures. In this context, “doing nothing” at the EU level also appeared to be the least favoured option for institutions and organisations.

Technical annex to chapter 13: Principal Component Analysis

Complementary information on PCA

In the dataset of the public consultation on shale gas, each respondent is defined by a vector of answers to the survey questions:

Respondent A
 = (A's answer to question 1, A's answer to question 2, ..., A's answer to question N)

This vector of answers is complex because it has as many dimensions as there are questions in the survey. The idea of principal component analysis (PCA) is to project answers into a space with limited dimensions (basically two dimensions) while losing as little information as possible: therefore, **the aim of this technique is to be able to position each respondent in a space with limited dimensions, potentially two dimensions.**

The dimensions created by PCA are called the principal components. Each component is an orthogonal projection of the survey questions. Such a projection simplifies the information contained in the dataset in order to keep only the essential features of it. Principal components are constructed in a specific order: the first component is a linear projection of the answers constructed so that the positions of the respondents on the principal component show the highest variation possible; the second component is a vector orthogonal to the first component constructed so that the position of the respondents on this second principal component shows the highest variation possible within the remaining heterogeneity; and so forth.

In other words, the first principal component displays the maximal level of difference among respondents that can be presented on one axis. It is therefore a good indicator of what questions are crucial in dividing respondents, and also what kind of answers are correlated. The second principal component displays second-order information: it shows the key variables that explain part of the remaining heterogeneity in the sample once the differences identified with the first principal component have been accounted for. Other components would provide similar third-order, fourth-order, etc. information on remaining differences between respondents.

For researchers interested in the full results of the PCAs performed on the survey consultation on unconventional fossil fuels, tables including the composition of all the principal components and complementary information on eigenvalues are provided below.

Full results of PCA – individual respondents

Principal component	Eigenvalue	Difference	Proportion	Cumulative
No. 1	6.23	3.96	16.0%	16.0%
No. 2	2.27	0.99	5.8%	21.8%
No. 3	1.28	0.13	3.3%	25.1%
No. 4	1.15	0.06	2.9%	28.0%
No. 5	1.09	0.05	2.8%	30.8%
No. 6	1.04	0.01	2.7%	33.5%
No. 7	1.03	0.01	2.6%	36.1%
No. 8	1.01	0.00	2.6%	38.7%
No. 9	1.01	0.00	2.6%	41.3%
No. 10	1.01	0.00	2.6%	43.9%
No. 11	1.01	0.00	2.6%	46.5%
No. 12	1.01	0.00	2.6%	49.0%
No. 13	1.00	0.00	2.6%	51.6%
No. 14	1.00	0.00	2.6%	54.2%
No. 15	1.00	0.00	2.6%	56.8%
No. 16	1.00	0.00	2.6%	59.3%
No. 17	1.00	0.00	2.6%	61.9%
No. 18	1.00	0.00	2.6%	64.5%
No. 19	1.00	0.00	2.6%	67.0%
No. 20	1.00	0.00	2.6%	69.6%
No. 21	1.00	0.00	2.6%	72.2%
No. 22	1.00	0.00	2.6%	74.7%
No. 23	1.00	0.00	2.6%	77.3%
No. 24	1.00	0.00	2.6%	79.9%
No. 25	1.00	0.00	2.6%	82.4%
No. 26	1.00	0.00	2.6%	85.0%
No. 27	1.00	0.05	2.6%	87.6%
No. 28	0.94	0.10	2.4%	90.0%
No. 29	0.85	0.04	2.2%	92.1%
No. 30	0.81	0.13	2.1%	94.2%
No. 31	0.68	0.19	1.7%	96.0%
No. 32	0.49	0.14	1.2%	97.2%
No. 33	0.35	0.06	0.9%	98.1%
No. 34	0.29	0.12	0.7%	98.8%
No. 35	0.17	0.02	0.4%	99.3%
No. 36	0.15	0.03	0.4%	99.7%
No. 37	0.11	0.10	0.3%	99.9%
No. 38	0.01	0.00	0.0%	100.0%
No. 39	0.01	0.00	0.0%	100.0%

Table 10: Eigenvalues and related indicators of PCA for individuals (calculated with correlation matrix)

Indicator	Principal components												
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13
Identified benefits	-0.3638	0.1462	-0.0543	-0.0194	-0.0223	-0.023	0.0102	-0.006	-0.017	-0.0004	0.0106	0.0049	0.002
Identified challenges	0.3747	-0.0004	0.0542	-0.0313	-0.0207	0.0147	-0.014	-0.0024	0.0077	-0.0124	-0.005	0.0009	0.0024
Necessary actions	0.2502	0.2878	-0.1614	-0.0362	-0.008	-0.1174	0.0341	-0.0137	-0.075	0.0031	0.0546	-0.0024	0.0351
Information needs	0.2282	0.2578	-0.133	-0.0172	-0.0309	-0.1417	0.0457	-0.0101	-0.0974	0.0137	0.0478	-0.0141	0.0288
UFF "Anyway"	-0.3134	-0.2255	0.0861	0.2156	-0.0747	-0.0564	0.0326	0.0293	-0.054	0.0243	0.0056	-0.0135	0.0248
UFF "Constraints"	-0.0525	0.4961	-0.1948	-0.3248	0.1041	0.084	-0.0472	-0.0418	0.0721	-0.0444	-0.0081	0.0201	-0.0324
UFF "Not at all"	0.3497	-0.218	0.0881	0.0923	-0.0588	0.0103	0.0103	0.0054	-0.0063	0.0084	0.0001	-0.0013	0.0059
BASELINE	-0.1656	-0.1793	0.2515	-0.0589	-0.0741	-0.2204	0.0124	0.0576	-0.0269	-0.0209	0.0318	0.0169	-0.0223
BEST PRACTICES	-0.036	0.3312	0.1025	0.3905	-0.1858	-0.1219	0.0802	0.1392	0.0291	-0.0011	0.032	0.001	-0.0002
LEGISLATE	0.206	0.3247	0.0172	0.1843	-0.1126	-0.0945	0.0472	0.033	-0.0055	0.0176	-0.0183	-0.0166	-0.0174
EU OBJECTIVE	-0.3437	0.2079	-0.0428	-0.053	-0.0222	0.0095	0.0105	0.0076	0.0024	0.0007	-0.0028	0.0048	0.0059
Survey Satisfaction	-0.0141	0.3729	0.3062	0.0272	0.0415	0.0379	-0.0438	0.0089	-0.0767	0.058	-0.0485	-0.0069	0.0199
AT	0.0265	-0.0261	0.0102	-0.0163	0.1239	0.0826	0.0263	-0.2974	-0.3757	0.5915	0.3162	0.2278	-0.374
BE	0.0478	-0.0207	-0.0269	0.1169	0.0921	0.0712	0.8725	-0.2073	-0.098	-0.227	-0.1818	0.0432	-0.0624
BG	0.0112	0.0166	-0.0031	-0.0291	0.0618	0.0459	0.0244	-0.0064	-0.0567	0.1787	-0.1093	0.0941	-0.0139
CY	0.0041	-0.0008	0.0059	0.031	-0.0052	-0.0081	0.0308	0.0673	-0.0453	0.0522	0.0688	-0.0184	0.1146
CZ	0.0137	0.016	0.0139	0.0337	0.0693	0.1573	0.0462	0.1999	0.1477	0.4413	-0.497	0.1714	0.3733
DE	0.0483	-0.0636	0.0343	-0.2398	0.6555	-0.5694	0.0006	0.1291	0.0203	-0.034	-0.0549	-0.0651	0.0278
DK	0.0038	-0.0101	-0.0198	-0.0703	0.084	0.1478	-0.0596	-0.2067	0.1665	-0.0568	-0.0714	0.1017	-0.0975
EE	0.0068	0.0021	0.0034	0.0666	-0.0362	-0.0622	0.0871	0.1361	-0.0288	0.0707	0.0875	-0.0745	0.0666
EL	0.0029	0.0055	0.0317	0.0347	-0.0412	-0.1359	0.0566	0.1913	-0.1593	0.0852	0.0553	0.0054	0.0298
ES	0.1075	0.043	-0.0058	0.6622	0.2963	0.0111	-0.3438	-0.1512	0.0339	-0.1355	-0.0385	0.0403	-0.0507
FI	0.003	-0.03	0.0196	0.0136	0.0475	0.1533	-0.0372	-0.0248	0.3203	0.0147	-0.2524	0.0504	-0.2594
FR	0.1801	-0.177	-0.5138	-0.1276	-0.4106	-0.0864	-0.1045	0.0988	-0.0312	0.0021	-0.0692	0.0113	-0.0157
HU	0.0006	0.009	-0.0293	-0.0122	0.0249	0.0473	0.0353	0.0263	0.1824	-0.0547	0.0696	0.0784	-0.0568
IE	0.0222	-0.0246	-0.0218	-0.0157	0.0972	0.1582	0.0251	-0.2668	0.1168	0.069	0.1915	-0.0217	0.6061
IT	0.0253	0.0045	-0.0216	0.049	0.0601	0.1164	0.1446	0.085	0.3699	0.3636	0.1423	-0.7519	-0.1942
LT	0.0036	0.0051	0.0311	0.0598	0.0127	-0.0262	0.118	0.4557	0.0793	0.2642	0.0146	0.3429	-0.047
LU	0.0074	0.0014	-0.0183	-0.0574	0.076	0.1228	-0.0488	-0.2073	0.0096	0.0381	-0.1001	0.0116	0.0323
LV	0.0046	-0.0052	-0.0072	-0.002	0.0124	0.022	0.0062	-0.0788	-0.0016	0.0177	-0.0181	-0.0382	0.0034
MT	0.0038	-0.0061	0.0003	-0.0164	0.0341	0.0552	-0.0267	-0.1039	-0.0765	0.0563	-0.0334	-0.0191	0.09
NL	0.0181	-0.017	-0.0237	0.0296	0.0485	0.0422	0.1302	0.0768	0.3712	-0.0612	0.641	0.2744	0.1968
PL	-0.3517	0.0906	-0.1121	0.0376	-0.1046	-0.0367	-0.0169	-0.0766	-0.0456	-0.0098	0.0135	-0.0365	0.0218
PT	0.0055	0.0256	-0.0345	-0.048	0.0767	0.1141	0.026	0.0488	0.3476	-0.0343	0.0015	0.2967	-0.283
RO	0.1544	0.069	0.6649	-0.2856	-0.2683	0.0464	-0.0481	-0.0644	0.0506	-0.0682	0.0104	-0.0074	-0.0045
SE	0.0125	-0.0079	-0.003	-0.0176	0.0728	0.1089	-0.0314	-0.1765	-0.1269	0.1297	-0.0362	-0.0568	0.2408
SI	0.0006	0.0155	-0.0066	-0.0313	0.0325	0.0596	-0.0266	0.0182	0.0936	-0.0146	-0.0517	0.0776	-0.0317
SK	0.0068	0.0135	-0.0026	0.0505	-0.0192	-0.0359	0.0899	0.1338	-0.0738	0.1304	0.0493	-0.0523	0.1192
UK	0.0281	-0.0101	-0.0022	-0.0572	0.2714	0.5897	-0.0428	0.4847	-0.3774	-0.2618	0.115	-0.1165	-0.0262

Table 11: Composition of principal components 1-13 based on responses from individuals

Indicator	Principal components												
	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23	No. 24	No. 25	No. 26
Identified benefits	0.002	0.0013	-0.0006	0.0044	0.0081	0.0068	-0.0106	-0.0053	-0.0019	-0.0013	-0.0017	-0.0008	0.0001
Identified challenges	0.0008	-0.0015	-0.0026	-0.0045	-0.0033	0.0002	-0.0004	0.003	-0.0006	-0.0035	0.0026	-0.0004	0.0014
Necessary actions	0.0007	-0.0023	0.0121	-0.0003	-0.003	0.0033	-0.001	-0.0046	0.0053	0.0013	-0.0022	0.0003	0.0017
Information needs	0.0119	0.0003	0.0154	-0.0024	0.0055	0.0026	-0.0079	-0.0001	-0.0005	0.0046	-0.0072	0.0005	-0.0031
UFF "Anyway"	0.0013	0.0005	0.0048	0.0082	0.0055	0.002	-0.0026	-0.0064	0.002	0.002	-0.0024	0.0002	0.0001
UFF "Constraints"	-0.0008	-0.0042	-0.0023	-0.0191	-0.0072	-0.0085	0.0073	0.0017	0.0005	-0.0028	0.0054	0.0003	-0.0006
UFF "Not at all"	0.0028	0.0068	-0.0038	0.0044	-0.0053	0.0062	-0.0044	0.0013	-0.0016	0.0042	-0.0027	0.0009	0.0006
BASELINE	0.0041	0.0028	-0.0201	-0.013	-0.0253	0.0035	-0.0007	0.0057	0.0066	-0.0006	-0.001	-0.0022	-0.0007
BEST PRACTICES	-0.0114	-0.0215	-0.0153	0.0067	0.0005	-0.0143	-0.0004	0.0045	-0.0017	0.0045	0.0031	-0.0024	0.0008
LEGISLATE	-0.0075	0.0075	-0.0273	0.0004	0.0136	0.0129	0.0074	-0.0067	0.0089	-0.0051	0.0054	0.001	-0.0005
EU OBJECTIVE	0.0122	0.0074	-0.0017	-0.0103	-0.0007	0.0072	0.0024	0.0069	0.0035	-0.0008	-0.0039	0.0011	0.0004
Survey Satisfaction	0.0003	0.012	0.0141	0.0158	-0.0099	0.0034	0.0051	0.0032	-0.007	0	-0.0005	0.0023	-0.0005
AT	-0.1192	-0.1794	-0.0872	-0.0897	0.0336	-0.0661	0.0216	0.004	-0.0134	-0.0207	0.0162	-0.0106	-0.0011
BE	-0.0034	-0.0079	0.0376	-0.031	-0.0433	-0.0182	0.0054	0.0012	-0.0206	-0.0156	-0.0033	-0.0037	-0.0042
BG	0.1861	0.7696	-0.3912	0.0961	-0.0173	-0.21	-0.117	-0.0912	-0.0463	0.0333	-0.0063	-0.04	0.0092
CY	-0.0172	-0.0676	0.0811	0.1909	-0.0515	-0.2335	-0.1122	0.1476	-0.3135	0.5495	-0.1256	-0.1232	0.6213
CZ	-0.4552	-0.1187	-0.0368	-0.1688	-0.059	0.0313	-0.0921	-0.0729	0.0289	-0.0074	-0.0251	-0.0215	-0.0041
DE	-0.0343	-0.0311	-0.0039	0.013	0.0368	-0.0124	0.0053	-0.0088	-0.0142	-0.0008	0.0078	0.0008	0.0009
DK	0.0951	0.1122	0.1789	-0.2631	0.0789	0.2444	-0.5632	0.4259	0.1086	0.1807	0.2579	-0.0515	0.0045
EE	-0.0625	-0.0728	-0.1572	0.214	0.2448	-0.0363	0.022	-0.0834	0.2196	0.5144	0.5772	0.1781	-0.2929
EL	0.0351	0.0729	-0.214	-0.0292	-0.4457	0.2954	0.1641	0.5042	0.42	0.1266	-0.205	0.0864	0.022
ES	0.0196	0.0078	0.0164	-0.0347	-0.0214	0.0026	-0.0126	-0.0035	-0.0034	-0.0086	-0.0121	-0.0041	-0.0025
FI	-0.0072	0.1017	-0.2006	0.2142	0.1531	-0.0907	0.2992	0.1879	0.0029	-0.0065	-0.0372	0.0294	-0.0081
FR	-0.0039	-0.0041	0.0049	0.0013	-0.0098	-0.0083	0.0063	0.0029	-0.0094	-0.0051	-0.0004	-0.001	-0.0022
HU	0.024	-0.1102	0.0058	-0.1986	0.4264	-0.4073	0.0373	0.0745	0.4808	0.1666	-0.4529	0.0712	-0.0009
IE	0.4545	-0.2504	-0.3699	-0.0781	-0.0478	-0.0265	0.046	0.0019	-0.0144	-0.0441	0.0175	-0.0137	-0.0197
IT	0.0608	0.0262	0.0783	-0.0642	-0.121	0.0164	-0.0421	-0.0202	-0.0168	-0.0222	-0.03	-0.013	-0.005
LT	0.5882	0.0201	0.3734	-0.1134	0.0434	0.0331	0.0203	-0.1294	-0.011	-0.0433	0.0526	0.0095	0.0033
LU	0.0563	0.1481	0.2315	-0.0946	0.1053	0.4077	0.6037	-0.0912	-0.0373	0.3661	-0.0308	-0.2283	0.0001
LV	-0.0036	0.0709	-0.0441	0.0233	0.1809	0.2961	0.0148	-0.2501	0.2858	-0.1823	0.1378	0.507	0.6382
MT	0.0347	0.076	0.1846	0.1201	-0.0287	0.1038	-0.124	-0.0145	-0.283	0.2264	-0.3975	0.6856	-0.3347
NL	-0.3957	0.3061	0.1138	-0.0137	-0.0483	0.0687	0.0606	-0.0134	-0.0428	-0.054	0.0043	0.0127	-0.0206
PL	-0.014	-0.002	0.0048	0.0032	-0.0028	0.0005	0.0046	-0.0023	-0.0019	0.0012	0.0056	0.0017	0.001
PT	0.0825	-0.3242	-0.1929	0.4983	-0.231	0.1922	-0.1061	-0.0924	-0.0092	0.0385	-0.0594	-0.0063	-0.0008
RO	-0.0045	-0.0155	0.0134	-0.0052	0.0226	-0.0077	-0.0098	-0.0142	-0.0021	-0.0004	-0.0046	-0.0026	-0.0006
SE	0.0126	0.0992	0.4915	0.572	-0.0957	-0.2077	-0.0065	0.1094	0.3776	-0.1851	0.0547	-0.1004	-0.0299
SI	0.012	-0.0534	0.0923	-0.1477	-0.1597	-0.3747	0.3593	0.4186	-0.2287	-0.1449	0.373	0.3731	0.0802
SK	-0.0031	-0.0196	-0.0918	0.2611	0.6026	0.2831	-0.0029	0.4426	-0.2632	-0.2689	-0.0835	-0.0756	-0.0058
UK	-0.0462	-0.0233	-0.063	-0.0227	0.0063	0.0169	-0.0037	-0.0231	0.0118	-0.0087	0.0053	-0.0051	-0.0024

Table 12: Composition of principal components 14-26 based on responses from individuals

Indicator	Principal components												
	No. 27	No. 28	No. 29	No. 30	No. 31	No. 32	No. 33	No. 34	No. 35	No. 36	No. 37	No. 38	No. 39
Identified benefits	-0.0037	0.0344	-0.074	0.0277	-0.0222	0.055	0.1145	0.0475	-0.3737	0.4299	0.7	-0.0174	-0.0081
Identified challenges	0.0119	-0.044	0.0513	0.011	0.008	-0.0138	-0.0134	0.0229	0.4848	-0.3664	0.6921	0.0221	0.0064
Necessary actions	-0.0338	0.1727	-0.3625	0.2529	-0.027	-0.0148	-0.1761	0.7316	-0.0625	0.0068	-0.0661	0.0029	-0.0016
Information needs	-0.0353	0.222	-0.4787	0.3299	-0.0549	-0.1056	0.2322	-0.6075	-0.0077	0.0094	-0.0306	0.0003	0.001
UFF "Anyway"	0.0225	0.2524	-0.2486	-0.0968	-0.0956	0.089	0.3119	0.1328	-0.0253	-0.3692	0.0155	0.6059	0.1008
UFF "Constraints"	-0.0452	-0.3422	0.2922	0.1689	0.078	-0.0449	0.019	-0.0518	-0.0998	-0.1509	-0.0453	0.5379	0.0907
UFF "Not at all"	0.0197	0.0482	-0.0207	-0.0501	0.0299	-0.0502	-0.341	-0.0918	0.1136	0.5831	0.0167	0.5609	0.0914
BASELINE	0.0078	0.1743	0.1965	0.6012	0.6015	0.1132	-0.0648	0.0026	0.0436	-0.025	0.0069	0.0012	-0.0016
BEST PRACTICES	0.0086	0.3797	0.4747	0.0417	-0.2213	-0.4754	-0.0355	0.008	0.0086	-0.0098	-0.0026	-0.003	0.0013
LEGISLATE	-0.0194	0.2094	0.2152	-0.1635	-0.0004	0.8138	0.0235	-0.0747	-0.0507	0.0149	-0.0414	0.0004	-0.0011
EU OBJECTIVE	-0.0035	-0.0208	-0.046	0.0226	-0.0402	0.0714	0.3019	0.1201	0.7465	0.3777	-0.1304	-0.0173	-0.006
Survey Satisfaction	-0.0001	0.0665	-0.2407	-0.516	0.6125	-0.2051	-0.0344	-0.0172	-0.0038	-0.0301	-0.008	0.0003	-0.0007
AT	-0.0772	0.0593	0.1094	0.002	-0.0118	-0.0147	0.0591	0.0166	0.0059	0.0157	0.0035	-0.0097	0.0962
BE	-0.0125	-0.1097	0.0256	0.0053	0.0973	-0.0275	0.0918	0.0272	-0.015	0.0139	0.003	-0.0289	0.162
BG	0.2612	0.0386	0.0173	0.0311	-0.0244	-0.0111	0.0094	0.0072	-0.0088	-0.0048	-0.0022	-0.01	0.0576
CY	-0.088	-0.0715	0.009	0.0086	0.0084	0.0218	0.0123	0.0024	-0.0004	0.0015	0.001	-0.0019	0.0108
CZ	0.0463	0.0045	-0.0263	0.1151	-0.0036	0.017	0.0106	0.0043	-0.0113	0.0059	0.0045	-0.0139	0.0775
DE	-0.0319	0.1829	0.1155	-0.1622	-0.0896	-0.0267	0.0744	0.0127	0.0134	0.0494	0.0141	-0.0109	0.2432
DK	-0.0339	0.2436	0.0292	-0.0065	0.011	-0.0037	0.0026	0.0028	0.0013	-0.0021	-0.0006	-0.005	0.0288
EE	-0.0062	-0.164	-0.0251	0.0124	0.0233	-0.0023	0.0165	0.0052	-0.0008	0.0026	0.0003	-0.0027	0.0153
EL	-0.0363	-0.1846	-0.0177	-0.0209	-0.0427	-0.0035	0.0057	0.0008	-0.0186	-0.0051	0.0025	-0.0016	0.011
ES	0.0459	-0.3216	-0.0304	0.1807	0.1149	0.0024	0.2025	0.0564	-0.0312	0.0589	0.0011	-0.0524	0.2955
FI	-0.6715	0.1481	-0.0515	0.0426	0.0132	-0.0133	0.006	0.0099	0.0058	0.0054	0.0137	-0.0056	0.0307
FR	-0.0082	0.0912	0.1524	-0.1787	0.2763	-0.1078	0.326	0.0766	-0.0511	0.0635	-0.0117	-0.0753	0.4203
HU	0.2474	0.0553	-0.032	-0.0104	0.0384	0.0079	-0.0126	-0.0039	0.0006	-0.0016	0.003	-0.0039	0.0218
IE	-0.1138	0.1385	0.0761	-0.0024	0.05	-0.0004	0.0512	0.0043	-0.009	0.0117	0.0016	-0.0131	0.0718
IT	0.0858	-0.0082	-0.0278	0.051	0.0585	-0.0033	0.0449	0.0196	-0.0106	0.0096	0.008	-0.0147	0.0901
LT	-0.1452	-0.1506	-0.0507	0.0195	-0.0128	0.0253	-0.0192	0	-0.0094	-0.0083	0.0059	-0.012	0.0698
LU	0.2343	0.1767	0.0567	0.0268	-0.0003	-0.0092	0.0122	0.0014	-0.0037	0.0041	0.0032	-0.0049	0.0266
LV	-0.0039	0.0274	0.0192	0.0086	0.0113	-0.0213	0.0117	-0.0001	0	0.0009	-0.0019	-0.002	0.0109
MT	-0.0617	0.0578	0.0593	0.0167	-0.0043	0.0046	0.0101	0.006	0.0017	-0.0006	0.001	-0.0018	0.0109
NL	-0.0961	0.0033	-0.0251	-0.0497	0.0676	0.0133	0.0394	-0.007	-0.0009	0.0035	0.0034	-0.0136	0.0767
PL	-0.0237	0.0252	-0.1489	-0.0043	-0.0859	0.0797	-0.5952	-0.1593	0.1357	-0.1457	0.0334	-0.1025	0.6026
PT	0.3778	0.1399	-0.0681	0.0105	0.0178	0.0153	-0.0072	-0.0067	0.0038	-0.006	-0.0031	-0.0098	0.0566
RO	0.018	-0.1104	-0.0288	0.0759	-0.247	0.0021	0.2459	0.0859	-0.112	0.0673	-0.0493	-0.0767	0.4302
SE	-0.006	0.0861	0.0955	0.0418	0.002	0.0112	0.0319	0.0031	0.002	0.0132	0.002	-0.003	0.0347
SI	0.3223	0.0843	-0.0287	0.015	-0.0093	0.0211	-0.0061	-0.0037	-0.0083	0.0063	0.0024	-0.0022	0.0108
SK	0.1845	-0.1443	-0.0032	0.0335	0.0185	0.0003	0.0054	0.0071	-0.0069	-0.0059	-0.0063	0.0001	0.0275
UK	-0.0311	0.2317	0.0473	0.0778	0.01	0.0404	0.0329	0.0049	-0.0072	0.0185	0.0051	-0.0273	0.1547

Table 13: Composition of principal components 27-39 based on responses from individuals

Full results of PCA – Companies and organisations

Principal component	Eigenvalue	Difference	Proportion	Cumulative
No. 1	6.37	4.05	17.7%	17.7%
No. 2	2.33	0.58	6.5%	24.2%
No. 3	1.74	0.13	4.8%	29.0%
No. 4	1.61	0.24	4.5%	33.5%
No. 5	1.37	0.10	3.8%	37.3%
No. 6	1.26	0.05	3.5%	40.8%
No. 7	1.22	0.06	3.4%	44.2%
No. 8	1.16	0.03	3.2%	47.4%
No. 9	1.13	0.03	3.1%	50.5%
No. 10	1.10	0.03	3.1%	53.6%
No. 11	1.07	0.02	3.0%	56.6%
No. 12	1.05	0.01	2.9%	59.5%
No. 13	1.04	0.01	2.9%	62.4%
No. 14	1.03	0.01	2.9%	65.2%
No. 15	1.02	0.01	2.8%	68.0%
No. 16	1.01	0.00	2.8%	70.9%
No. 17	1.01	0.00	2.8%	73.7%
No. 18	1.01	0.03	2.8%	76.5%
No. 19	0.98	0.07	2.7%	79.2%
No. 20	0.91	0.06	2.5%	81.7%
No. 21	0.85	0.08	2.4%	84.1%
No. 22	0.78	0.04	2.2%	86.2%
No. 23	0.74	0.03	2.1%	88.3%
No. 24	0.71	0.07	2.0%	90.3%
No. 25	0.64	0.11	1.8%	92.0%
No. 26	0.53	0.03	1.5%	93.5%
No. 27	0.50	0.08	1.4%	94.9%
No. 28	0.41	0.03	1.1%	96.1%
No. 29	0.39	0.03	1.1%	97.1%
No. 30	0.35	0.08	1.0%	98.1%
No. 31	0.27	0.13	0.7%	98.8%
No. 32	0.14	0.02	0.4%	99.2%
No. 33	0.12	0.03	0.3%	99.6%
No. 34	0.08	0.02	0.2%	99.8%
No. 35	0.06	0.06	0.2%	100.0%
No. 36	0.01	0.01	0.0%	100.0%

Table 14: Eigenvalues and related indicators of PCA for companies and organisations
(calculated with correlation matrix)

Indicator	Principal components												
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13
Identified benefits	0.3687	0.095	-0.0062	0.0674	0.006	-0.0144	-0.0054	0.0139	0.0223	-0.0135	0.0053	0.0133	-0.0053
Identified challenges	-0.3758	-0.0123	0.0021	-0.0118	-0.0013	0.0205	0.0021	-0.0294	-0.0086	-0.0022	0.0175	-0.0331	0.0148
Necessary actions	-0.1686	0.1856	0.1225	0.3955	0.1778	-0.3111	0.1043	0.0331	0.0379	0.0669	-0.0001	-0.0707	0.0138
Information needs	-0.1908	0.0808	0.0031	0.3929	0.1034	-0.2727	0.052	-0.156	0.1828	0.1806	-0.0407	-0.0461	-0.0697
UFF "Anyway"	0.2524	-0.303	-0.2619	0.0457	0.0291	-0.0492	-0.117	0.1176	0.0646	0.1691	-0.0656	-0.0423	0.0595
UFF "Constraints"	0.1763	0.4564	0.2078	0.0318	-0.0208	0.0751	0.0971	-0.1657	-0.0123	-0.1507	0.017	0.0296	-0.0721
UFF "Not at all"	-0.3597	-0.1823	0.0127	-0.0646	-0.004	-0.0217	-0.0044	0.0715	-0.033	0.0104	0.0454	0.0136	0.0147
BASELINE	0.2363	-0.171	0.0812	0.1071	-0.1377	-0.0316	0.173	0.058	-0.1467	0.1801	0.0496	-0.1392	-0.0471
BEST PRACTICES	0.0652	0.4403	-0.0252	-0.055	-0.0443	-0.2501	0.0062	0.0923	-0.0565	0.147	0.1566	0.0217	0.0352
LEGISLATE	-0.2238	0.3051	-0.2315	0.0405	0.0169	-0.0715	-0.0378	0.0865	0.0529	0.0305	0.1117	-0.1223	0.0017
EU OBJECTIVE	0.3445	0.1945	-0.0433	0.0858	-0.027	0.0521	-0.0374	-0.0606	0.0664	0.0408	0.0262	0.0189	0.0201
Survey Satisfaction	-0.0359	0.3469	-0.3282	-0.0942	-0.0151	0.2385	0.0576	0.0336	0.1771	-0.0484	-0.0941	-0.0084	0.041
AT	-0.0361	-0.0816	0.1047	-0.0615	0.2122	0.176	0.4665	0.0723	0.1798	0.0435	-0.1361	0.1143	-0.1632
BE	-0.0191	0.0455	-0.0513	0.048	-0.0375	0.0456	-0.04	0.0332	0.0717	0.1345	0.1276	0.0401	0.2058
BG	-0.0001	0.0741	0.0787	0.0434	-0.0448	0.1566	-0.0982	0.0888	0.5235	0.1414	-0.3694	-0.1453	0.2353
CZ	-0.0377	0.0391	-0.0193	0.1089	-0.0234	-0.0272	0.0141	-0.1106	0.0294	-0.0879	0.1927	0.5386	0.3775
DE	0.0307	-0.0176	0.051	-0.0402	0.0626	-0.2177	0.1845	-0.3995	-0.2637	-0.2958	-0.4032	-0.2777	0.2609
DK	-0.0206	-0.0438	0.0145	0.0233	-0.0295	0.1449	-0.0234	-0.0335	-0.0855	-0.1338	-0.2826	0.2982	0.0647
EL	0.0155	0.0893	-0.0046	-0.0195	0.002	0.0733	0.0474	-0.0603	0.131	-0.2363	0.0581	0.2393	0.0272
ES	-0.1148	0.1467	-0.1366	-0.0155	-0.1286	-0.155	0.0642	0.5737	-0.2338	-0.1196	-0.2855	-0.0021	-0.1679
FR	-0.1107	-0.1467	0.2035	-0.1596	0.0042	-0.2531	-0.3141	-0.1239	0.3081	-0.2139	0.2995	-0.093	-0.0608
HU	0.0297	0.0061	-0.0073	-0.0106	-0.1073	-0.1126	0.1034	-0.1069	-0.0894	0.4688	0.0582	0.0206	-0.1783
IE	0.0056	0.0069	0.1024	-0.0795	-0.1442	0.0009	0.1105	-0.1003	-0.1921	0.0767	0.1242	0.2786	-0.2896
IT	-0.0462	0.0545	-0.0492	-0.096	0.504	0.1289	-0.0251	0.0072	-0.1675	0.1201	0.249	-0.1299	0.1221
LT	0.023	-0.0534	-0.0762	-0.0312	-0.067	0.0058	0.035	0.1801	-0.1403	0.1505	0.0648	-0.1623	0.5154
NL	0.017	0.0831	0.2055	0.0137	0.1442	0.0721	-0.2873	-0.0337	-0.1341	0.1108	-0.1998	-0.0479	-0.2608
PL	0.2018	-0.1126	-0.3194	0.1885	0.0865	0.0419	-0.1675	0.0669	0.1603	-0.0643	0.1035	0.0457	-0.2192
PT	0.0522	0.0656	0.2293	-0.0463	-0.139	0.1616	0.1295	0.2578	-0.1473	-0.1814	0.3587	-0.236	0.1436
RO	-0.0854	0.0461	-0.1092	0.0609	-0.2575	0.3759	0.0638	-0.4189	-0.0465	0.2161	0.0847	-0.2888	-0.0337
UK	0.0294	0.0119	0.1614	-0.061	0.0297	-0.1146	-0.1272	-0.021	-0.15	0.3951	-0.1577	0.3343	0.2641
Academic institution	0.0341	0.1282	-0.0367	-0.0886	0.4357	0.1464	-0.4128	-0.04	-0.2649	0.01	-0.0723	-0.0273	-0.0211
NGO	-0.251	0.0071	-0.0796	0.2485	-0.2574	0.2488	-0.124	-0.0115	-0.1529	0.0343	-0.0151	0.0658	-0.0077
Industry association	0.084	0.0538	0.5252	-0.103	-0.0916	0.0408	-0.1031	0.1913	0.1868	0.1197	-0.043	-0.0891	0.0267
Intergovernmental	-0.0367	-0.0619	0.0456	-0.063	0.4263	0.1767	0.3997	0.0743	0.1048	0.1163	0.0753	0.0474	-0.0021
Big Company	0.1999	-0.1292	-0.0309	0.446	0.0989	-0.0945	0.0988	0.0238	-0.0711	-0.1874	0.0861	-0.0561	0.0566
SME	0.0746	0.0352	-0.2817	-0.5018	-0.0475	-0.3596	0.1419	-0.1458	0.1128	0.0658	-0.0101	-0.0274	-0.0159

Table 15: Composition of principal components 1-13 based on responses from companies and organisations

Indicator	Principal components												
	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23	No. 24	No. 25	No. 26
Identified benefits	0.0027	0.0166	0.0044	-0.0209	0.0272	0.0111	-0.0079	-0.029	-0.013	0.0387	0.0423	0.0748	0.0885
Identified challenges	-0.0176	-0.0214	0.0079	0.0046	-0.0135	0.0143	-0.003	-0.0014	-0.0186	-0.0217	-0.028	-0.0429	-0.0843
Necessary actions	-0.0126	-0.0043	0.0202	0.0088	0.0744	0.1577	0.0847	0.1709	0.0685	0.0992	0.044	0.0643	-0.1122
Information needs	-0.0013	0.0073	0.0026	-0.0057	0.034	0.1117	0.0857	0.0961	0.0841	0.1112	0.0621	0.2817	-0.1087
UFF "Anyway"	0.0196	-0.0008	-0.0076	-0.0088	0.0045	-0.0279	0.1622	0.1536	0.0674	0.1437	-0.1065	0.0604	0.1896
UFF "Constraints"	-0.0121	-0.0105	0.0142	-0.0168	0.0194	0.0289	-0.2304	-0.1885	-0.089	-0.1521	0.0499	0.0257	-0.143
UFF "Not at all"	-0.0075	0.012	-0.0082	0.0203	-0.0199	-0.0012	0.0815	0.0487	0.0275	0.03	0.0478	-0.0753	-0.0161
BASELINE	0.0313	0.0148	0.0117	0.0028	0.0139	0.0165	0.1172	0.1696	-0.1076	0.1448	0.0386	0.0939	0.4124
BEST PRACTICES	-0.0194	0.0145	-0.0004	0.0172	-0.005	0.093	0.0449	0.0501	0.0051	0.0648	-0.3218	-0.4528	0.2972
LEGISLATE	-0.0026	-0.0286	-0.0352	0.0012	0.0235	0.0157	0.0016	0.1546	-0.0601	-0.0933	-0.2235	-0.0758	0.1894
EU OBJECTIVE	0.0065	-0.0033	0.0107	0.0398	-0.0214	0.0103	-0.0256	-0.0608	-0.0327	0.0303	-0.0095	0.0381	0.0032
Survey Satisfaction	0.0125	0.0493	0.0148	0.0089	-0.0385	0.066	-0.0629	-0.0065	0.159	0.1845	0.1646	0.5418	0.2304
AT	-0.1141	0.2184	-0.1674	0.1398	-0.1228	0.0265	-0.3679	0.438	-0.1782	-0.0901	-0.0326	-0.0607	0.1289
BE	0.1383	0.0774	0.2499	0.8474	-0.1742	-0.1176	0.0626	-0.0527	-0.0555	0.0074	0.1389	-0.0538	-0.0704
BG	0.279	-0.2921	0.0091	-0.1475	0.0761	-0.1596	0.0065	0.1072	0.1578	-0.197	0.1586	-0.2807	0.0524
CZ	0.1823	0.0405	-0.2978	-0.2409	-0.4392	-0.101	0.1518	0.0493	-0.0645	0.1516	0.0809	-0.0116	0.0245
DE	0.1301	-0.052	0.0436	0.1053	-0.0807	-0.2258	0.0291	0.0424	0.0731	0.0556	-0.2927	0.0941	0.0669
DK	0.1819	0.0683	0.5125	-0.063	0.0427	0.6475	0.0826	0.0787	-0.0577	0.0452	-0.0373	-0.1074	0.057
EL	-0.0903	0.3939	0.1135	-0.0062	0.5976	-0.3538	0.366	0.1951	0.0241	0.0122	-0.0105	-0.0362	-0.0301
ES	-0.0421	-0.0011	0.0167	-0.0425	-0.0205	-0.144	0.052	-0.181	-0.0771	0.1785	0.2555	-0.0321	-0.0246
FR	0.0237	0.1231	0.1072	-0.0039	0.0722	0.0865	-0.2809	-0.1251	0.095	0.1074	0.099	0.0648	0.3754
HU	0.3557	0.3442	0.3849	-0.2802	-0.0956	-0.2839	-0.2011	-0.0292	0.0786	-0.0172	0.0416	0.0017	-0.1463
IE	0.3863	-0.4765	-0.2295	0.1977	0.348	0.0435	-0.0248	0.1462	0.2034	0.0826	0.0651	0.0583	0.0104
IT	0.1559	-0.2359	0.1708	-0.1412	0.1163	-0.0457	0.1671	0.0172	-0.476	-0.2328	0.1047	0.1744	0.0874
LT	0.2074	0.3085	-0.3369	0.0077	0.3741	0.2793	-0.2737	-0.0803	0.0212	-0.0103	-0.0562	0.0596	-0.1946
NL	0.1543	0.3807	-0.35	0.1054	-0.1424	0.1471	0.3631	-0.0723	0.1576	-0.3772	0.066	0.0507	0.1456
PL	-0.0506	-0.08	0.0072	0.026	-0.058	0.0647	-0.023	0.0588	0.0655	-0.1067	-0.4084	0.0435	-0.3637
PT	-0.0449	-0.0313	0.203	-0.0946	-0.2124	0.0402	0.127	0.3507	0.4667	-0.1893	0.0271	0.1109	-0.0981
RO	-0.2873	0.012	-0.0821	-0.0582	0.0128	0.1311	0.178	-0.0107	-0.0482	0.2484	0.1865	-0.2381	-0.0505
UK	-0.5755	-0.1526	0.1055	0.0209	0.1007	-0.044	-0.1005	-0.0052	0.1844	-0.2045	0.0274	0.1496	0.0759
Academic institution	0.0221	0.036	-0.0076	0.0054	-0.0297	-0.0924	-0.2262	0.3001	0.2166	0.4064	0.121	-0.1743	-0.0973
NGO	0.0771	-0.0223	0.0388	-0.0086	0.0164	-0.1327	-0.1237	-0.0707	0.0169	-0.1642	-0.2993	0.1435	0.2457
Industry association	0.0069	-0.0383	-0.0213	0.0009	-0.0368	0.0251	0.1782	0.0023	-0.2805	0.3533	-0.2228	0.172	-0.1841
Intergovernmental	0.0147	-0.0203	0.0337	-0.0077	0.0137	0.0249	0.1479	-0.5134	0.3972	0.1812	-0.2028	-0.0948	0.0949
Big Company	-0.0422	-0.0258	0.0049	0.0005	0.0553	0.0288	-0.0753	-0.1002	0.0306	-0.1201	0.3612	-0.222	0.0992
SME	-0.0081	-0.0232	-0.0266	-0.0018	-0.0721	0.1893	0.1829	0.0883	0.0491	-0.1581	0.1613	0.0075	-0.1435

Table 16: Composition of principal components 14-26 based on responses from companies and organisations

Indicator	Principal components									
	No. 27	No. 28	No. 29	No. 30	No. 31	No. 32	No. 33	No. 34	No. 35	No. 36
Identified benefits	0.0407	0.2307	0.0526	-0.0645	-0.0813	0.4199	-0.1478	-0.035	0.7492	-0.0252
Identified challenges	-0.0414	-0.1276	0.0215	0.0038	0.0705	-0.5316	0.1901	0.3624	0.608	0.0246
Necessary actions	-0.0204	0.0947	0.4121	-0.5714	-0.0264	-0.0112	-0.0111	-0.0052	-0.0829	0.0033
Information needs	-0.1673	0.1551	-0.4986	0.4073	-0.0164	0.0537	-0.0152	-0.0297	0.0174	0.0004
UFF "Anyway"	0.1928	0.3296	0.0301	0.0003	-0.0346	-0.2011	-0.0291	0.31	-0.0931	0.5286
UFF "Constraints"	-0.2452	-0.0289	0.0403	0.0632	0.0661	-0.0023	-0.0596	0.2143	-0.0851	0.6094
UFF "Not at all"	0.0881	-0.2265	-0.0592	-0.0583	-0.0239	0.1846	0.0846	-0.5628	0.1827	0.5881
BASELINE	-0.5551	-0.4168	0.1064	0.0417	0.0942	-0.0533	-0.0151	-0.0156	0.0346	0.0054
BEST PRACTICES	0.1361	-0.1151	-0.4328	-0.1884	-0.0324	-0.0495	-0.0164	0.0232	0.0046	0.0026
LEGISLATE	0.1053	0.0034	0.5343	0.5535	0.0538	0.1268	-0.0501	-0.0308	-0.0032	-0.0053
EU OBJECTIVE	-0.0259	0.2541	0.0878	0.0571	0.0954	-0.4861	0.3962	-0.5705	0.0463	-0.0419
Survey Satisfaction	0.2531	-0.3367	-0.0685	-0.1533	-0.0471	-0.0401	0.0003	0.0163	-0.0202	0
AT	0.0839	0.1485	-0.0752	-0.0288	0.1718	0.0339	0.0843	0.0059	0.0122	-0.0033
BE	-0.0507	0.0166	0.0108	0.0004	0.062	0.0584	-0.0472	0.0605	-0.005	0.0032
BG	-0.1214	-0.0536	-0.0262	-0.05	0.1173	0.0353	-0.0237	-0.0191	0.0211	-0.0025
CZ	-0.0546	0.0111	0.0473	0.0146	0.1961	0.0361	-0.0236	0.0477	-0.01	0.0011
DE	0.1372	-0.0252	-0.0224	0.003	0.2463	0.0236	-0.006	-0.0488	0.029	0.0076
DK	0.0087	0.0234	0.0281	0.088	0.0759	0.0127	-0.0111	-0.0038	-0.0003	-0.0014
EL	-0.0489	-0.0235	-0.0187	0.0099	0.0633	0.0035	0.0631	0.0271	-0.0031	0.0019
ES	-0.0691	0.1946	-0.0685	0.0186	0.4244	0.0249	-0.001	0.0098	-0.0095	-0.005
FR	-0.0118	0.127	0.0118	-0.0596	0.3842	0.0197	-0.0016	0.0125	-0.0189	-0.0047
HU	0.1915	-0.08	0.0823	0.0084	0.0828	0.0071	-0.0021	0.0087	0.0126	-0.0014
IE	0.1698	0.0304	0.0229	0.0348	0.1384	-0.0177	-0.008	0.0163	0.0111	-0.0012
IT	0.0422	0.0793	-0.1433	-0.0917	0.1875	0.0201	-0.0028	-0.0101	-0.0172	-0.0028
LT	-0.0428	0.0009	-0.0425	0.0205	0.1107	0.0204	-0.0099	-0.0094	0.0051	-0.0017
NL	0.0811	-0.0353	0.012	-0.0037	0.1219	-0.0223	-0.0089	0.0097	0.0128	-0.0002
PL	-0.0539	-0.2911	-0.0527	-0.1166	0.4733	0.0916	-0.0258	-0.0099	0.0387	-0.0049
PT	0.0174	0.1334	-0.0892	0.0571	0.0692	-0.0228	-0.0025	0.0106	0.0017	0.001
RO	0.0994	0.1317	0.0093	-0.0702	0.3154	0.1047	-0.0557	0.0259	-0.0258	-0.0038
UK	0.0705	-0.0757	0.059	0.0445	0.2094	0.0189	-0.0073	0.0017	0.0158	-0.0025
Academic institution	-0.2007	-0.038	0.006	0.0606	-0.0686	0.0943	0.1807	0.0485	0.0016	0.0019
NGO	-0.1921	0.2308	-0.0682	-0.1879	-0.0623	0.2797	0.4766	0.1021	-0.0474	0.0045
Industry association	0.2374	-0.1238	0.0423	0.1005	0.0417	0.1572	0.3282	0.1265	-0.0225	0.0041
Intergovernmental	-0.1116	0.0515	0.0843	0.0658	0.0499	0.0623	0.0826	0.0239	-0.0031	-0.0001
Big_Company	0.3604	-0.2762	-0.0215	0.1436	0.0097	0.1085	0.412	0.1545	-0.0266	0.0047
SME	-0.1938	0.0354	0.0496	-0.049	-0.0092	0.2145	0.4554	0.1256	-0.0143	0.009

Table 17: Composition of principal components 27-36 based on responses from companies and organisations

Full results of PCA – public authorities

Principal component	Eigenvalue	Difference	Proportion	Cumulative
No. 1	5.91	3.18	26.9%	26.9%
No. 2	2.73	0.78	12.4%	39.3%
No. 3	1.96	0.25	8.9%	48.2%
No. 4	1.70	0.22	7.7%	55.9%
No. 5	1.48	0.22	6.7%	62.7%
No. 6	1.26	0.03	5.7%	68.4%
No. 7	1.23	0.13	5.6%	74.0%
No. 8	1.10	0.04	5.0%	79.0%
No. 9	1.06	0.28	4.8%	83.8%
No. 10	0.79	0.17	3.6%	87.4%
No. 11	0.62	0.07	2.8%	90.2%
No. 12	0.55	0.14	2.5%	92.7%
No. 13	0.41	0.06	1.9%	94.6%
No. 14	0.35	0.08	1.6%	96.1%
No. 15	0.27	0.08	1.2%	97.3%
No. 16	0.19	0.01	0.9%	98.2%
No. 17	0.18	0.05	0.8%	99.0%
No. 18	0.13	0.04	0.6%	99.6%
No. 19	0.09	0.09	0.4%	100.0%
No. 20	0.00	0.00	0.0%	100.0%
No. 21	0.00	0.00	0.0%	100.0%

**Table 18: Eigenvalues and related indicators of PCA for companies and organisations
(calculated with correlation matrix)**

Indicator	Principal components												
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13
Identified benefits	-0.3538	0.067	-0.1267	0.0875	0.0261	-0.0452	0.086	-0.0488	0.1096	0.0525	0.1436	0.0306	0.1801
Identified challenges	0.3482	0.0927	0.0775	-0.1535	0.0212	-0.0427	0.1307	0.0202	0.0383	0.1833	0.1005	-0.0826	-0.1288
Necessary actions	0.1958	0.3044	0.1176	0.0958	-0.2748	-0.2294	0.1765	-0.1122	0.2563	0.1065	-0.209	-0.1868	0.2818
Information needs	0.1844	0.2883	0.0407	0.1939	-0.2254	-0.1518	0.2292	-0.171	0.1621	0.4357	-0.1092	0.1886	-0.0374
UFF "Anyway"	-0.134	-0.13	-0.0265	0.5671	-0.195	0.2732	0.0869	-0.0262	-0.1104	-0.0203	0.0697	-0.4008	0.036
UFF "Constraints"	-0.2794	0.2646	-0.0283	-0.3487	-0.0158	-0.1814	-0.019	0.0065	0.1043	0.0515	0.1598	0.2497	-0.202
UFF "Not at all"	0.3647	-0.1903	0.0448	0.0115	0.1339	0.0191	-0.0332	0.0092	-0.0393	-0.0401	-0.2045	-0.0114	0.1834
BASELINE	-0.1264	-0.3013	-0.2706	0.0846	0.285	-0.157	0.2306	0.0406	-0.1073	0.4045	0.1317	0.2301	0.1056
BEST PRACTICES	-0.1215	0.3404	0.1213	0.012	0.3	0.2528	0.0584	0.0747	0.0663	-0.327	-0.3654	0.2949	0.4419
LEGISLATE	0.2232	0.2487	0.0305	0.0254	0.153	-0.0859	0.0437	-0.0915	-0.0195	-0.2099	0.7709	-0.1131	0.3804
EU OBJECTIVE	-0.3398	0.2314	-0.0086	-0.0553	-0.1296	0.1093	0.1111	-0.0625	-0.1074	0.0768	0.0878	-0.0281	-0.012
Survey Satisfaction	0.0279	0.419	0.0546	0.2837	0.184	-0.1024	-0.2538	-0.0238	-0.066	-0.1955	0.0026	-0.1015	-0.5552
BE	-0.0278	0.0026	-0.0698	-0.2622	-0.1254	0.3922	0.2517	0.446	0.5063	-0.0138	0.0989	-0.2543	-0.1224
CZ	0.0095	0.2496	0.1868	-0.2067	0.0365	0.2389	0.2265	0.0816	-0.6616	0.2507	-0.0553	-0.1448	0.0203
DE	0.1614	-0.1213	-0.048	-0.0731	-0.5027	-0.292	-0.1316	0.3001	-0.2006	-0.2914	0.0492	0.2214	0.0813
DK	-0.0629	-0.0666	0.3893	0.4082	-0.1659	0.2068	0.1387	0.1198	0.0795	-0.0182	0.2103	0.5414	-0.1123
ES	0.0989	0.104	0.0039	0.121	0.1916	0.1588	-0.6465	0.2344	0.1815	0.4591	0.0689	0.0189	0.1538
FR	0.1474	-0.2003	0.0938	-0.1658	0.0891	0.2769	0.0407	-0.6744	0.185	-0.0958	0.0582	0.1002	-0.1477
PL	-0.325	0.0296	-0.211	0.0837	-0.0346	-0.273	-0.0742	-0.1894	0.1145	-0.0655	-0.128	-0.1955	0.1276
RO	0.1385	-0.008	-0.0756	0.2101	0.4603	-0.2789	0.4123	0.2753	0.0898	-0.1443	-0.0655	-0.0362	-0.1884
Local or regional authority	0.1847	0.1689	-0.5542	0.0724	-0.09	0.2247	0.0254	-0.0395	-0.0662	-0.0537	-0.0108	0.1692	-0.0388
National authority	-0.1847	-0.1689	0.5542	-0.0724	0.09	-0.2247	-0.0254	0.0395	0.0662	0.0537	0.0108	-0.1692	0.0388

Table 19: Composition of principal components 1-13 based on responses from public authorities

Indicator	Principal components					
	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19
Identified benefits	-0.1374	0.5521	0.0999	-0.2754	0.5492	0.2328
Identified challenges	-0.0429	-0.4151	0.551	0.0266	0.519	0.0667
Necessary actions	-0.2507	0.0963	-0.276	0.5248	0.1244	-0.0041
Information needs	0.3895	0.1124	0.1024	-0.4217	-0.2616	-0.0438
UFF "Anyway"	0.1328	0.039	0.3084	0.1562	-0.0229	-0.2258
UFF "Constraints"	-0.105	0.0246	0.0635	0.1314	-0.061	-0.2943
UFF "Not at all"	0.0265	-0.0486	-0.2509	-0.2278	0.0758	0.4354
BASELINE	0.4033	-0.1047	-0.1937	0.4003	0.1542	0.0215
BEST PRACTICES	0.2934	-0.0827	0.2196	0.0923	0.0682	-0.1009
LEGISLATE	0.0988	-0.0612	-0.1053	-0.0825	-0.1294	-0.0365
EU OBJECTIVE	-0.0323	-0.171	0.1922	0.2035	-0.3316	0.7337
Survey Satisfaction	0.3364	0.0503	-0.2379	0.1186	0.2457	0.1515
BE	0.2654	0.0052	-0.2184	-0.0394	0.0405	0.0363
CZ	-0.0581	0.1232	-0.1861	-0.0689	0.0831	-0.1343
DE	0.2777	0.202	0.1871	0.1477	0.0456	0.1022
DK	-0.268	-0.2369	-0.206	-0.038	0.1257	0.0179
ES	-0.1073	0.1061	0.1268	0.1084	-0.1069	0.0322
FR	0.0965	0.2277	0.0828	0.1994	-0.0154	0.0359
PL	-0.0076	-0.4782	-0.127	-0.2523	0.0867	-0.0622
RO	-0.2713	0.191	0.2114	0.0294	-0.2711	0.0437
Local or regional authority	-0.1507	-0.0366	-0.0432	0.006	0.0171	-0.0201
National authority	0.1507	0.0366	0.0432	-0.006	-0.0171	0.0201

Table 20: Composition of principal components 14-19 based on responses from public authorities

Technical annex on sample selection of answers to the open-ended questions

Objective

To provide a comprehensive overview of the answers to open-ended questions, all the answers from public authorities and organisations were fully read by staff fluent in all the languages used by respondents. However, it was not possible to read and analyse similarly all the many answers of individuals.

Because reading the complete set of answers from individuals was not feasible (due to the massive amount of answers), a sample of open-ended answers was randomly selected with a process whose purpose was to ensure that:

- Answers from all countries would be revised; and
- The diversity of the opinion of respondents on unconventional fossil fuels would be taken into account.

The process used to randomly select a sample that would abide with these two requirements is presented below.

Methodology

First, answers were filtered to exclude the ones that were very likely to be irrelevant using key words such as:

- "No benefit" for the question on additional benefits; or
- "No additional comment" to the question on additional comments.

These filters ensured that some irrelevant answers were excluded, even though this filtering was not to exclude all irrelevant answers from any random sample of respondents. The use of key words for filtering was performed only in the main languages used by respondents².

Then, different samples of individuals were selected for each open-ended question. This is because individuals rarely answered all five open-ended questions, and that it was a requirement that the selected samples always include respondents that actually answered to the question at stake. The selection of each respondent for one question was independent from the selection of the same respondent for another question.

However, the probability of selecting one specific respondent was not the same for all respondents, to ensure that the random samples cover respondents from diverse countries and diverse opinions about shale gas.

² Polish, French, Romanian, German, Spanish and Portuguese. Using filters for least common languages would have been more time consuming than reading the answers, as they were not numerous for other languages.

The probability of selecting an answer depended on the number of respondents from the same country of residence c and the same opinion about shale gas k .

$$P = P_{c,k}$$

Therefore, a function $g(.)$ was used to define a number of answers to be included in the sample depending on the number N for respondents from the same country of residence and the same opinion about shale gas:

$$g(N_{c,k}) = P_{c,k} * N_{c,k}$$

The following definition for $g(N_{c,k})$ was used:

$$g(N_{c,k}) = \begin{cases} 1 & \text{if } N_{c,k} \leq 10 \\ 10 + (N_{c,k} - 10) * 1/3 & \text{if } 10 < N_{c,k} \leq 100 \\ 40 + (N_{c,k} - 100) * 1/10 & \text{if } 100 < N_{c,k} \leq 500 \\ 80 + (N_{c,k} - 500) * 1/50 & \text{if } 500 < N_{c,k} \end{cases}$$

This formula ensured that representative samples of respondents were selected from all countries and with all kinds of opinions about shale gas. It also ensured that the amount of selected answers was increasing in the number of respondents from a given country of residence and a given opinion about shale gas. The implications of the formula for $g(N_{c,k})$ are summarised in the figure below, as regards the amount of selected respondents depending on the number of respondents from the same country or/and with the same opinion about shale gas.

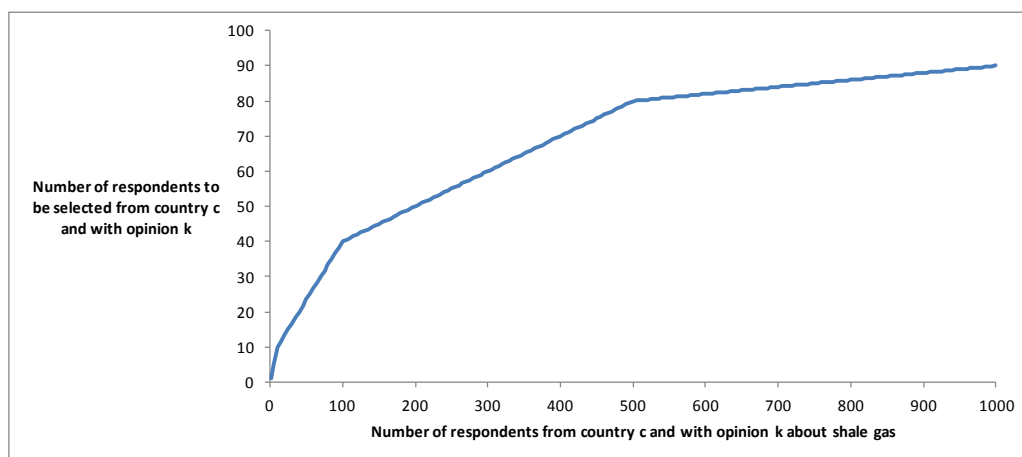


Figure 101: Amount of selected open-ended answers according to the number of respondents from the same country and with the same opinion about unconventional fossil fuels

Once $g(N_{c,k})$ was computed for all the groups of respondents, a corresponding amount of answers was randomly selected from the pool of $N_{c,k}$ answers for each country of residence c and each different opinion about shale gas k .

This procedure was performed five times, once for each open-ended question. The tables below present the amount of selected answers for each country and opinion about unconventional fossil fuels for the five open-ended questions of the public consultation.

Country	Opinion about unconventional fossil fuels				All answers
	No opinion	Should be developed in Europe anyway	Should be developed in Europe only if proper health and environmental safeguards are in place	Should not be developed in Europe at all	
Austria		1 (100%)	2 (100%)	15 (100%)	18 (100%)
Belgium		3 (100%)	4 (100%)	34 (73.91%)	41 (77.35%)
Bulgaria			2 (100%)	4 (100%)	6 (100%)
Czech Republic		3 (100%)	4 (100%)	9 (100%)	16 (100%)
Germany	16 (100%)	15 (100%)	20 (100%)	38 (44.7%)	89 (65.44%)
Denmark		1 (100%)		1 (100%)	2 (100%)
Estonia				1 (100%)	1 (100%)
Spain		4 (100%)	26 (100%)	46 (27.54%)	76 (38.57%)
France	3 (100%)	8 (100%)	34 (80.95%)	80 (15.38%)	125 (21.81%)
Hungary		1 (100%)			1 (100%)
Ireland			1 (100%)	7 (100%)	8 (100%)
Italy	1 (100%)	2 (100%)	3 (100%)	9 (100%)	15 (100%)
Lithuania			2 (100%)	1 (100%)	3 (100%)
Netherlands		2 (100%)	3 (100%)	16 (100%)	21 (100%)
Poland	3 (100%)	94 (7.69%)	83 (11.94%)	39 (42.39%)	219 (10.89%)
Portugal			1 (100%)	3 (100%)	4 (100%)
Romania	2 (100%)	2 (100%)	37 (51.38%)	58 (20.13%)	99 (27.19%)
Sweden				3 (100%)	3 (100%)
Slovenia		2 (100%)		1 (100%)	3 (100%)
Slovak Republic	1 (100%)		1 (100%)		2 (100%)
United Kingdom		6 (100%)	8 (100%)	33 (86.84%)	47 (90.38%)
Australia				1 (100%)	1 (100%)
Canada			1 (100%)	1 (100%)	2 (100%)
Norway		2 (100%)	2 (100%)		4 (100%)
Other			2 (100%)	11 (100%)	13 (100%)
Russia		1 (100%)			1 (100%)
United States			1 (100%)	5 (100%)	6 (100%)
Total	26 (100%)	147 (11.53%)	237 (26.56%)	416 (31.41%)	826 (23.49%)

Table 21: Amount and share (in brackets) of open-ended answers to the question on additional benefits randomly selected for analysis

Country	Opinion about unconventional fossil fuels				All answers
	No opinion	Should be developed in Europe anyway	Should be developed in Europe only if proper health and environmental safeguards are in place	Should not be developed in Europe at all	
Austria	1 (100%)	2 (100%)	2 (100%)	33 (100%)	38 (100%)
Belgium		3 (100%)	6 (100%)	39 (41.48%)	48 (46.6%)
Bulgaria		1 (100%)	1 (100%)	6 (100%)	8 (100%)
Czech Republic		1 (100%)	2 (100%)	8 (100%)	11 (100%)
Germany	34 (82.92%)	14 (100%)	23 (100%)	46 (28.04%)	117 (48.34%)
Denmark				1 (100%)	1 (100%)
Estonia				1 (100%)	1 (100%)
Spain	1 (100%)	2 (100%)	28 (100%)	52 (23.21%)	83 (32.54%)
Finland				1 (100%)	1 (100%)
France	4 (100%)	6 (100%)	34 (69.38%)	87 (10.01%)	131 (14.11%)
Hungary		2 (100%)		1 (100%)	3 (100%)
Ireland				23 (100%)	23 (100%)
Italy	1 (100%)	1 (100%)	4 (100%)	8 (100%)	14 (100%)
Lithuania				6 (100%)	6 (100%)
Luxembourg				1 (100%)	1 (100%)
Latvia				1 (100%)	1 (100%)
Netherlands		1 (100%)		30 (100%)	31 (100%)
Poland	2 (100%)	77 (16.27%)	58 (20.06%)	38 (44.18%)	175 (20.58%)
Portugal			1 (100%)	4 (100%)	5 (100%)
Romania		2 (100%)	36 (57.14%)	60 (19.73%)	98 (26.55%)
Sweden			1 (100%)	5 (100%)	6 (100%)
Slovenia				1 (100%)	1 (100%)
Slovak Republic	1 (100%)				1 (100%)
United Kingdom	1 (100%)	2 (100%)	10 (100%)	37 (48.68%)	50 (56.17%)
Australia				4 (100%)	4 (100%)
Canada				3 (100%)	3 (100%)
Norway		1 (100%)			1 (100%)
Other			4 (100%)	14 (100%)	18 (100%)
Russia				1 (100%)	1 (100%)
United States				6 (100%)	6 (100%)
Total	45 (86.53%)	115 (22.5%)	210 (43.47%)	517 (26.17%)	887 (29.36%)

Table 22: Amount and share (in brackets) of open-ended answers to the question on additional challenges randomly selected for analysis

Country	Opinion about unconventional fossil fuels				All answers
	No opinion	Should be developed in Europe anyway	Should be developed in Europe only if proper health and environmental safeguards are in place	Should not be developed in Europe at all	
Austria	1 (100%)	2 (100%)	2 (100%)	32 (100%)	37 (100%)
Belgium		1 (100%)	6 (100%)	40 (38.83%)	47 (42.72%)
Bulgaria		1 (100%)	1 (100%)	8 (100%)	10 (100%)
Czech Republic			3 (100%)	16 (100%)	19 (100%)
Germany	33 (100%)	10 (100%)	22 (100%)	46 (27.38%)	111 (47.63%)
Denmark				1 (100%)	1 (100%)
Estonia				3 (100%)	3 (100%)
Greece				1 (100%)	1 (100%)
Spain	1 (100%)		27 (100%)	53 (22.64%)	81 (30.91%)
Finland				1 (100%)	1 (100%)
France	4 (100%)	3 (100%)	35 (67.3%)	91 (8.61%)	133 (11.92%)
Hungary		1 (100%)		1 (100%)	2 (100%)
Ireland	1 (100%)			20 (100%)	21 (100%)
Italy	1 (100%)	1 (100%)	3 (100%)	15 (100%)	20 (100%)
Lithuania		1 (100%)	2 (100%)	5 (100%)	8 (100%)
Luxembourg				2 (100%)	2 (100%)
Netherlands		1 (100%)	3 (100%)	33 (97.05%)	37 (97.36%)
Poland	2 (100%)	61 (19.24%)	54 (22.31%)	39 (40.2%)	156 (23.7%)
Portugal			1 (100%)	3 (100%)	4 (100%)
Romania	3 (100%)	2 (100%)	35 (60.34%)	70 (17.36%)	110 (23.6%)
Sweden				7 (100%)	7 (100%)
Slovenia			1 (100%)	1 (100%)	2 (100%)
Slovak Republic	1 (100%)				1 (100%)
United Kingdom	1 (100%)	5 (100%)	11 (100%)	38 (43.18%)	55 (52.38%)
Australia				3 (100%)	3 (100%)
Canada			1 (100%)	3 (100%)	4 (100%)
Other			3 (100%)	19 (100%)	22 (100%)
Russia		1 (100%)		1 (100%)	2 (100%)
United States				7 (100%)	7 (100%)
Total	48 (100%)	90 (26.01%)	210 (47.94%)	559 (23.97%)	907 (28.66%)

Table 23: Amount and share (in brackets) of open-ended answers to the question on further recommendations randomly selected for analysis

Country	Opinion about unconventional fossil fuels				
	No opinion	Should be developed in Europe anyway	Should be developed in Europe only if proper health and environmental safeguards are in place	Should not be developed in Europe at all	All answers
Austria	1 (100%)	1 (100%)	1 (100%)	33 (91.66%)	36 (92.3%)
Belgium		3 (100%)	6 (100%)	39 (41.05%)	48 (46.15%)
Bulgaria		1 (100%)		11 (100%)	12 (100%)
Czech Republic			1 (100%)	15 (100%)	16 (100%)
Germany	27 (100%)	6 (100%)	21 (100%)	46 (28.04%)	100 (45.87%)
Denmark				1 (100%)	1 (100%)
Estonia				2 (100%)	2 (100%)
Greece				1 (100%)	1 (100%)
Spain	1 (100%)	2 (100%)	23 (100%)	59 (19.93%)	85 (26.39%)
Finland		1 (100%)			1 (100%)
France	3 (100%)	4 (100%)	36 (58.06%)	91 (8.49%)	134 (11.75%)
Hungary		1 (100%)		1 (100%)	2 (100%)
Ireland	1 (100%)			24 (100%)	25 (100%)
Italy	1 (100%)	1 (100%)	3 (100%)	15 (100%)	20 (100%)
Lithuania		1 (100%)	4 (100%)	6 (100%)	11 (100%)
Luxembourg				2 (100%)	2 (100%)
Netherlands		2 (100%)	2 (100%)	28 (100%)	32 (100%)
Poland	2 (100%)	80 (14.67%)	52 (22.7%)	37 (52.11%)	171 (20.18%)
Portugal			1 (100%)	4 (100%)	5 (100%)
Romania	3 (100%)	3 (100%)	34 (73.91%)	62 (18.9%)	102 (26.84%)
Sweden				8 (100%)	8 (100%)
Slovenia				1 (100%)	1 (100%)
United Kingdom	1 (100%)	3 (100%)	14 (100%)	38 (44.7%)	56 (54.36%)
Australia				4 (100%)	4 (100%)
Canada				2 (100%)	2 (100%)
Norway		1 (100%)			1 (100%)
Other			1 (100%)	20 (100%)	21 (100%)
Russia		1 (100%)		1 (100%)	2 (100%)
United States				5 (100%)	5 (100%)
Total	40 (100%)	111 (19.27%)	199 (48.06%)	556 (24.2%)	906 (27.23%)

Table 24: Amount and share (in brackets) of open-ended answers to the question on ideas about policy options randomly selected for analysis

Country	Opinion about unconventional fossil fuels				All answers
	No opinion	Should be developed in Europe anyway	Should be developed in Europe only if proper health and environmental safeguards are in place	Should not be developed in Europe at all	
Austria	4 (100%)	4 (100%)	3 (100%)	34 (85%)	45 (88.23%)
Belgium	1 (100%)	14 (100%)	19 (100%)	43 (30.93%)	77 (44.5%)
Bulgaria			1 (100%)	13 (100%)	14 (100%)
Cyprus				1 (100%)	1 (100%)
Czech Republic		2 (100%)	5 (100%)	19 (100%)	26 (100%)
Germany	35 (64.81%)	28 (100%)	34 (72.34%)	54 (21.86%)	151 (40.15%)
Denmark		2 (100%)		2 (100%)	4 (100%)
Estonia				3 (100%)	3 (100%)
Greece				2 (100%)	2 (100%)
Spain	1 (100%)	4 (100%)	34 (72.34%)	70 (17.32%)	109 (23.9%)
Finland		3 (100%)		1 (100%)	4 (100%)
France	6 (100%)	10 (100%)	40 (37.03%)	102 (6.34%)	158 (9.12%)
Hungary		1 (100%)	1 (100%)	3 (100%)	5 (100%)
Ireland	1 (100%)	2 (100%)	2 (100%)	30 (100%)	35 (100%)
Italy	1 (100%)	2 (100%)	4 (100%)	29 (100%)	36 (100%)
Lithuania		2 (100%)	3 (100%)	6 (100%)	11 (100%)
Luxembourg			1 (100%)	1 (100%)	2 (100%)
Latvia				1 (100%)	1 (100%)
Netherlands		5 (100%)	5 (100%)	33 (86.84%)	43 (89.58%)
Poland	4 (100%)	102 (6.26%)	81 (13.75%)	44 (31.42%)	231 (9.78%)
Portugal			5 (100%)	12 (100%)	17 (100%)
Romania	4 (100%)	3 (100%)	42 (32.81%)	84 (11.78%)	133 (15.68%)
Sweden				9 (100%)	9 (100%)
Slovenia		1 (100%)	1 (100%)	1 (100%)	3 (100%)
Slovak Republic				1 (100%)	1 (100%)
United Kingdom	2 (100%)	12 (100%)	28 (100%)	41 (35.96%)	83 (53.2%)
Australia			1 (100%)	4 (100%)	5 (100%)
Canada			1 (100%)	4 (100%)	5 (100%)
Norway		2 (100%)		1 (100%)	3 (100%)
Other	1 (100%)	1 (100%)	7 (100%)	30 (100%)	39 (100%)
Russia		1 (100%)	1 (100%)	1 (100%)	3 (100%)
United States		1 (100%)	1 (100%)	4 (100%)	6 (100%)
Total	60 (75.94%)	202 (11.69%)	320 (31.74%)	683 (18.86%)	1265 (19.65%)

Table 25: Amount and share (in brackets) of open-ended answers to the question on further comments randomly selected for analysis



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