The European Foresight Monitoring Network

2005 Mapping Report

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Authors:	Rafael Popper (PREST) Michael Keenan (PREST) Maurits Butter (TNO)

Executive Summary

A central pillar of the European Foresight Monitoring Network (EFMN) is the mapping of the European foresight landscape. An international network of correspondents that stretches across Europe and around the world is involved in this activity. Data is being collected in a systematic way and entered into a database – known as Dynamo – from where it can be searched and analysed. The purpose of this report is to provide the first analysis of the data collected on the European foresight landscape.

It has taken considerable time to set up the infrastructure for mapping the foresight landscape and this has left little time for data to be actually entered into the database. However, in recent months, project partners have been busy collecting and entering data, whilst data collected in the course of other related projects has also been transferred into the database. Even though incomplete, this data provides us with a first comprehensive glimpse of the foresight landscape in Europe. In future years, with more data collected, a rich picture of that landscape is likely to emerge, which should prove invaluable to both policy makers and foresight practitioners alike.

But for now, the 2005 EFMN Mapping report is limited to a largely rudimentary analysis of thirteen of the indicators used for mapping (see Section 2). From these thirteen indicators, we have used four (audience, sponsor, outputs and methods) to create a series of cross-tabulations (see Section 3). Highlights of this analysis include the following:

- In terms of **country coverage** the largest EU Member State, Germany, has by far the highest number of exercises mapped into the Dynamo database. This is followed by the Netherlands, the UK, Finland, France, Denmark, Belgium and Austria.

- As for the **year of completion** about 65% of the cases mapped have been completed in the last 5 years, reflecting the bias in our sample whereby we have sought to first map the most recently completed or ongoing exercises.

- Regarding **territorial scope** the data shows that half the mapped exercises have a national focus and almost 40% a sub-national focus.

- Governments (both national and sub-national) are the main **sponsors** of mapped foresight exercises, accounting for around 80% of our sample.

- As for the **target audience** for foresight exercises, the data shows these to be broad in scope, with single exercises typically having multiple audiences.

- Policy recommendations are the most common type of **output** from the exercises mapped, followed by scenarios, analysis of trends and drivers, and research priorities.

- On the **methods** used, four were particularly popular: literature review, scenarios, brainstorming, and expert panels.

- 2030, 2020, 2015 and 2010 are the most common **time horizons** used in the mapped exercises.

- The number of **participants** engaged in the mapped exercises was variable, with no discernible pattern in evidence.

- The **research areas** covered, as defined by the Frascati Manual, have been broad-ranging, although those related to Information and Communications Technologies (ICTs) have proven the most popular

- From the 17 **industries** mapped using the NACE classification, most of the exercises have been focused upon transport, ICT, construction, electricity, gas and water supply; manufacturing; and agriculture.

- In terms of **markets** covered, as defined by the Consumer Price Index (CPI), five emerge as the most targeted ones: health; transport; communication; food and non-alcoholic beverages; and housing, water, electricity, gas and other fuels.

In Section 3, the report turns to secondary analysis based upon the cross-tabulation of indicators. This provides a much deeper insight into mapping data than that of simply counting frequencies. It offers the possibility of identifying and investigating causal relationships between the various indicators and has the potential to provide considerable added value to the EFMN Mapping Report. On the other hand, the fact that mapping data is limited for the 2005 Report calls into question the viability and reliability of much cross-tabulation analysis and for this reason we have taken care in selecting appropriate cross-tabulations to examine.

- **Countries & Methods** – Here we discovered that the average number of methods used per exercise is five, but that there was much variation between countries.

- **Methods & Methods** – Here we looked at how combinable methods are, and found that combinations of some methods are more popular with practitioners than others.

- **Outputs & Methods** – The most striking result from this analysis is the popularity of four methods – expert panels, brainstorming, literature review, and scenarios – largely irrespective of the type of outputs being generated.

- **Sponsors & Methods** – Little could be drawn from this analysis due to insufficient data.

- **Sponsors & Outputs** and **Sponsors & Audience** – Given the dominance of government-sponsored exercises in the database, the data can only suggest possible differences in the outputs and audiences targeted according to sponsor.

In a final section, we consider the prospects for future mapping reports, where more data will be available to allow for more sophisticated analysis.

Table of Content

1. Introduction

The European Foresight Monitoring Network (EFMN) is an EC-funded network of policy professionals, foresight experts and practitioners as well as analysts of Science, Technology and Innovation related issues. The primary aim of the EFMN is **to develop foresight related content and gather information about foresight projects from all over the world by means of a mapping process carried out by an international consortium** – which includes ARC-SA, VDI, PREST, CKA, TNO, Atlantis, Fhg-ISI, Dialogik, Louis Lengrand & Associates and Technology Centre Prague. Though in practice, the network is open to anyone to contribute data through a 'correspondent's network' – more on this below.

The EFMN has several component parts, including (a) the mapping of information about foresight exercises into a database, (b) the preparation of short policy-oriented briefs on current and recently completed foresight exercises, and (c) the organisation of issue analysis workshops where a particular issue common to several foresight exercises is discussed and debated with a view to knowledge-sharing and networking across Member States.

The mapping of foresight exercises is done through a web-based platform called 'Dynamo', which is directly linked to the EFMN website (www.efmn.info). This platform is essentially an online database that is used to gather information on foresight exercises. Several indicators have been developed to map the exercises, drawing upon earlier work carried out in other projects (e.g. Eurofore), and where possible, using internationally accepted classification systems such as the OECD's Frascati Manual and the EC's NACE.

As its title suggests, this report is limited to consideration of the mapping component of the EFMN, and represents a first attempt to analyse the information mapped into the EFMN database to date. At the time of writing (September 2005), an active mapping strategy has been in place for only 4-5 months. This means that much of the data is rather limited and patchy in scope. Nevertheless, a total of 437 cases have already been partially mapped, and from those, a considerable number have been mapped in greater detail. This has enabled the authors to carry out some cross-comparisons (cross-tabulation), which already point to the EFMN's future potential to provide new insights into the foresight field.

As for the structure of this report, the following section (Section 2) provides a general analysis of the data (e.g. number of exercises per country, costs, year of completion and number of participants and common time horizons, research areas, market and industries). Section 3 presents a deeper look into the type of analyses that could be done when the database becomes larger and more representative of the existing population of foresight exercises. Finally, Section 4 discusses the prospects and potential of the EFMN mapping activity.

2. General Analysis

In this section we make some general analyses of the database. We have selected thirteen mapping indicators (see table below) based upon the availability of sufficient data for analysis. The table below indicates the type of indicators we will be discussing in this section as well as the number of cases mapped and type of visual representation used in the report.

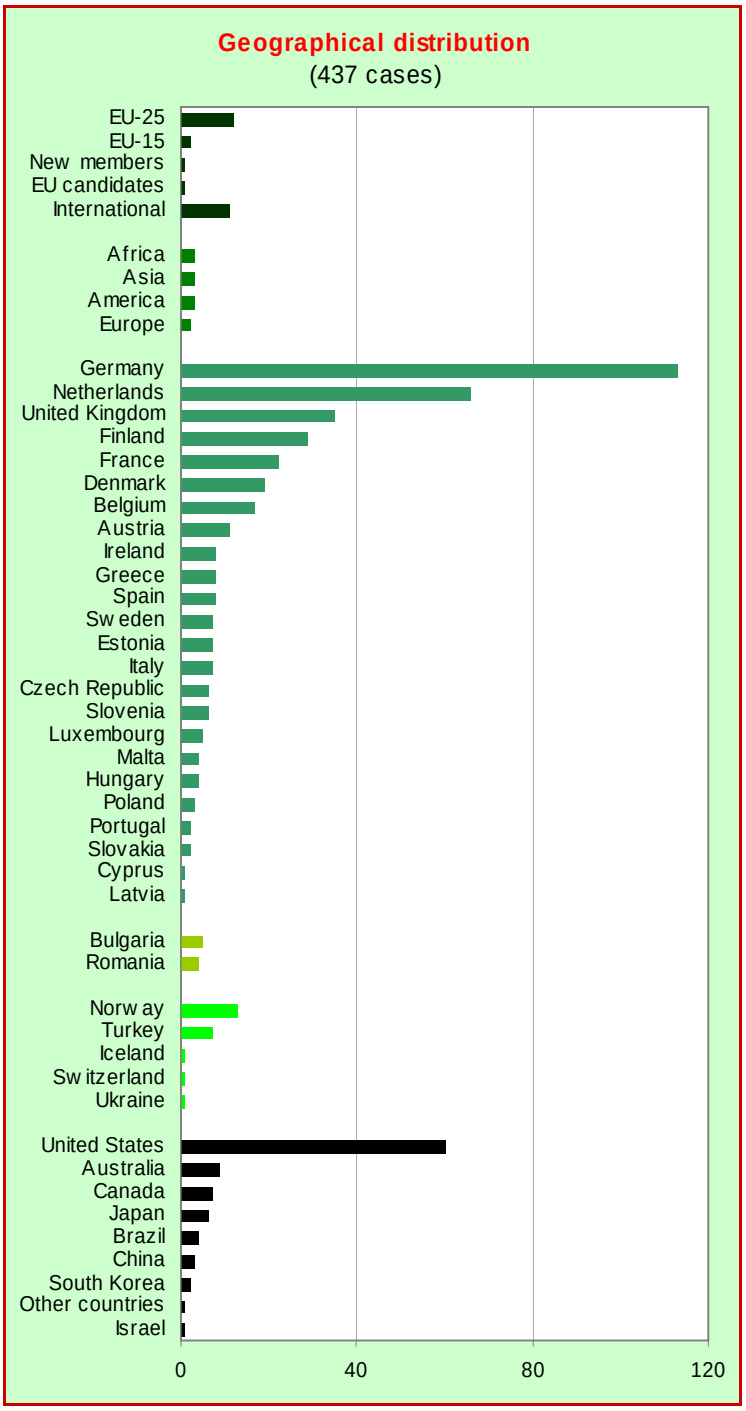
Mapping Indicator	No. Cases	Visualisation
Exercises & countries	437	Bar chart
Year of Completion	437	Bar chart
Territorial Scope	290	Pie chart
Sponsor Organisation	150	Bar chart
Audience / Users	150	Bar chart
Outputs	150	Bar chart
Methods	150	Bar chart
Time Horizons	121	Bar chart
Number of Participants	116	Bar chart
Cost in Euros	111	Bar chart
Research Areas	49	Bar chart
Industries	49	Bar chart
Markets	49	Bar chart

2.1. Geographical distribution

An obvious starting point for our analysis is to look at the geographical spread of mapped exercises. At the moment, the majority of the 437 exercises mapped have been carried out mostly by European countries. This is to be expected given the remit of the EFMN to focus most of its mapping efforts on Europe.

Taking a closer look at the data, the top of the chart shows the number of transnational (mostly EU) exercises that have been mapped. The numbers here are relatively low, though perhaps not disproportionately so – it is a simple fact of life that most foresight exercises are conducted at the national or sub-national level, reflecting the dominance of nation states and their sub-units in decision-making processes. The numbers for the other regions, i.e. Africa, Asia, and the Americas, are also low, though this is explained by the Eurocentric remit of the EFMN. Country coverage has been split into two zones for the purposes of mapping, with European countries deemed 'Zone 1' countries, where all known foresight activities will be mapped; and all other regions deemed 'Zone 2', where only a selection of 'flagship' foresight exercises will be mapped. Irrespective of this bias, it is probably fair to assume that in terms of absolute numbers of

exercises, EU countries are likely to be way ahead of most of the rest of the world, with the possible exception of the United States and Japan.

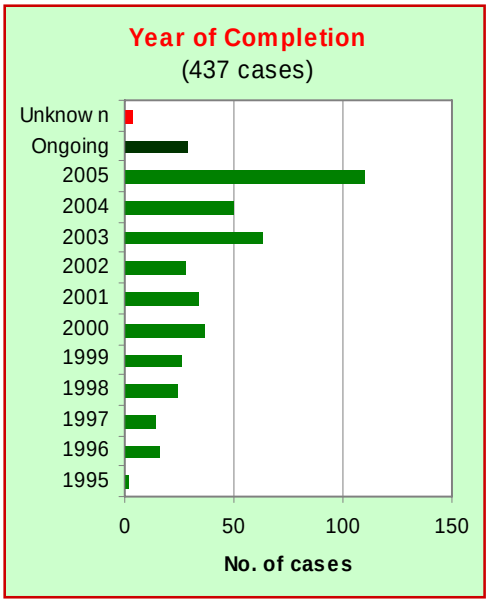


Turning to the individual countries of Europe and, unsurprisingly, the largest EU Member State, Germany, has by far the highest number of exercises mapped into the Dynamo database. This is followed by the Netherlands, the UK, Finland, France, Denmark, Belgium and Austria. Clearly, from this list, size is not everything. So how to explain the figures? There are two main explanations that can be offered: the first is the bias present in the mapping data itself. Thus, whilst is it is unsurprising to find Germany on top by virtue of its size, both France and the UK should not be as far behind as they are. Indeed, France has a very long and distinguished tradition of foresight-type studies and the numbers in the database fail to capture this. The reason for this bias is because three teams have been mapping exercises in Germany, and only one each in France and the UK. When mapping is more complete by 2006-07, this bias should be reduced. The second explanation for the figures, and especially for the high numbers seen in some of the small countries like the Netherlands and Finland, is that some countries are indeed foresight-intensive. By contrast, some of the larger Member States, such as Italy, Poland, and Spain, are known to have a weak foresight tradition by comparison.

2.2. Year of Completion

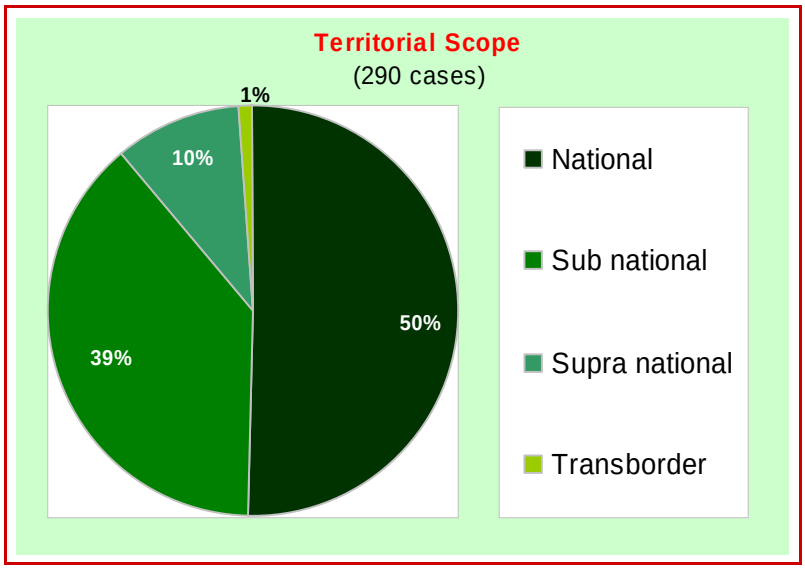
Looking at the data opposite, it can be seen that about 65% of the cases mapped have been completed in the last 5 years. Of course, this does not mean that 65% of all foresight exercises in Europe have been done in this time period. Rather, it reflects the bias in our sample, where we deliberately sought to map recently completed and ongoing exercises.

It would be interesting to map foresight exercises that reach further back in time, since this would allow us to detect and assess any major changes in approach or focus. The EFMN intends to do some of this work, though will probably not look much further back than 1995. This is because reliable data can be difficult to attain on older exercises.



2.3. Territorial Scope

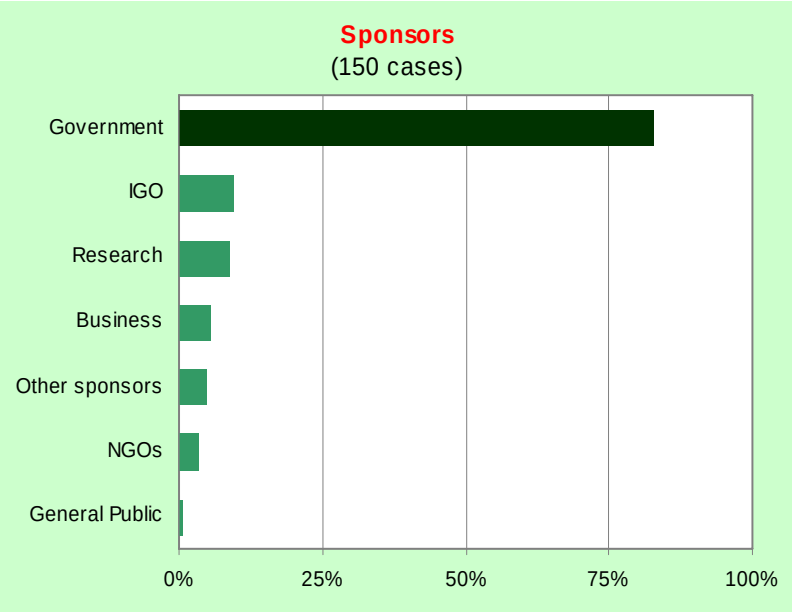
The Territorial Scope data is based upon a sample of 290 mapped exercises and aligns with the geographical distribution data already presented above (see section 2.1). As expected, the data shows that half the mapped exercises have a national focus and almost 40% a sub-national focus. As mentioned above, this reflects the fact that the most important decision-making processes continue to be found at the level of the nation state or its sub-units. The data also shows that around 10% of mapped exercises are at a supranational level – mostly European exercises if the data in Section 2.1 is indicative.



2.4. Sponsor Organisations

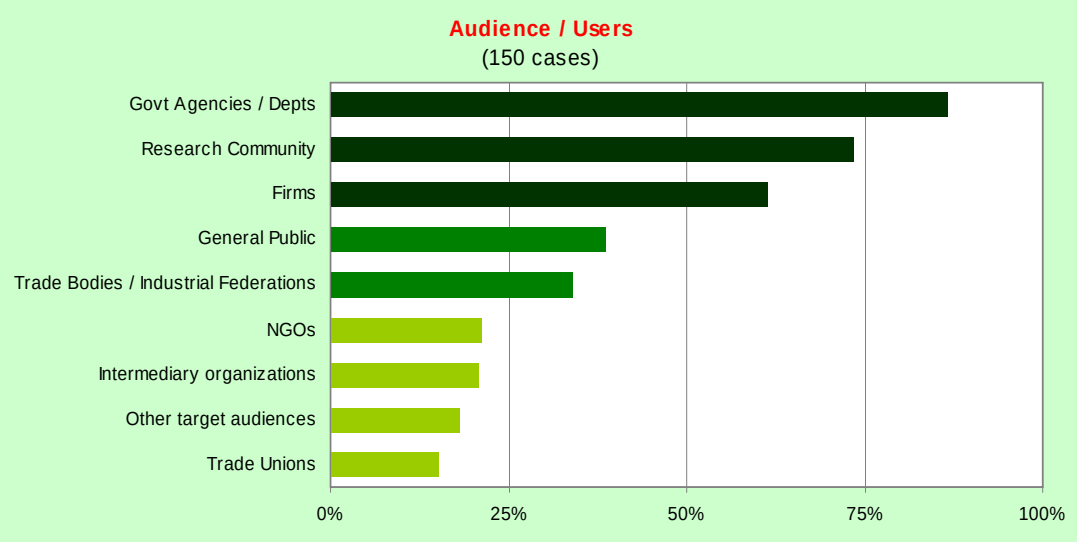
The chart below shows that governments (both national and sub-national) are the main sponsors of mapped foresight exercises, accounting for around 80% of our sample of 150 exercises. Intergovernmental Organisations (IGOs) and research organisations are each sponsors of just under 10% of our sample – significantly far behind. This would seem to be in line with our findings in Sections 2.1 and 2.3.

The data also shows that businesses are even less likely to be the sponsors of these exercises, accounting for only 5% of our sample. A couple of possible explanations may be offered for this: first, the EFMN is focused on mapping foresight exercises that are in the public domain. Unfortunately for EFMN, most business foresight exercises – which tend to be organised by and focused upon the individual firm – cannot be easily captured, given their proprietary nature. It is therefore inevitable that most private sector activity will remain unmapped by the EFMN. A second reason concerns the fact that the sorts of foresight exercises found in the public domain are seen as being a public good and, as such, firms are usually unwilling to financially support such public activities, preferring instead to leave the sponsoring of such exercises to the public sector.



2.5. Audience / Users

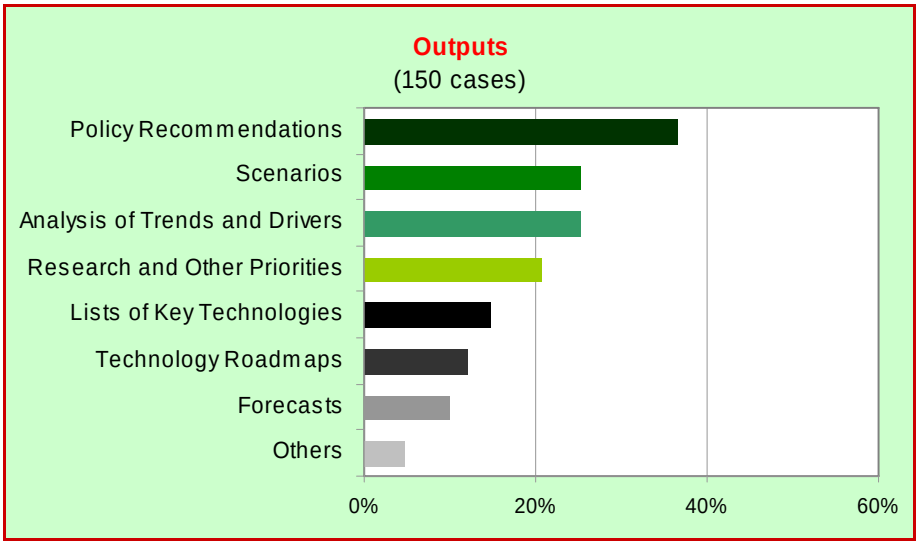
Although government departments and agencies are by far the main sponsors of the foresight exercises mapped by the EFMN to date, the chart below shows that the target audience is much broader. This is hardly surprising given that governments are in place to serve the 'socio-economic fabric' of their countries or regions. Moreover, foresight exercises typically address several types of users – including government decision makers and regulators, academics, and the business community – since action for the future on most topics can rarely be confined to one specific group.



This fact is well reflected in the data shown above. In more than 80% of the 150 cases mapped, government departments and agencies are the main target audience / user of the results of the foresight exercise. The research community is not far behind, accounting for around 70% of our mapped sample, followed by firms, which are the target audience in just over 60% of the sample. Interestingly, the general public is seen as the audience / user in almost 40% of cases, whilst trade bodies and industrial federations account for around one third of cases. The final group of users with the smallest coverage in our sample are NGOs, intermediary organisations, and trade unions.

2.6. Outputs

The chart below indicates that policy recommendations are the most common type of output (37%). This should not be surprising given the fact that foresight generally relates to strategic decision making and problem solving processes. Two other frequent outputs are scenarios and analysis of trends and drivers (both were present in 25% of cases). Research and other priorities is the fourth most popular output of foresight (21%). We can also see that the lists of key technologies, technology roadmaps and forecasts are outputs in 10-15% of mapped exercises. Further analysis of this indicator is presented in Section 3, where types of outputs have been cross-tabulated with type of sponsor and methods.

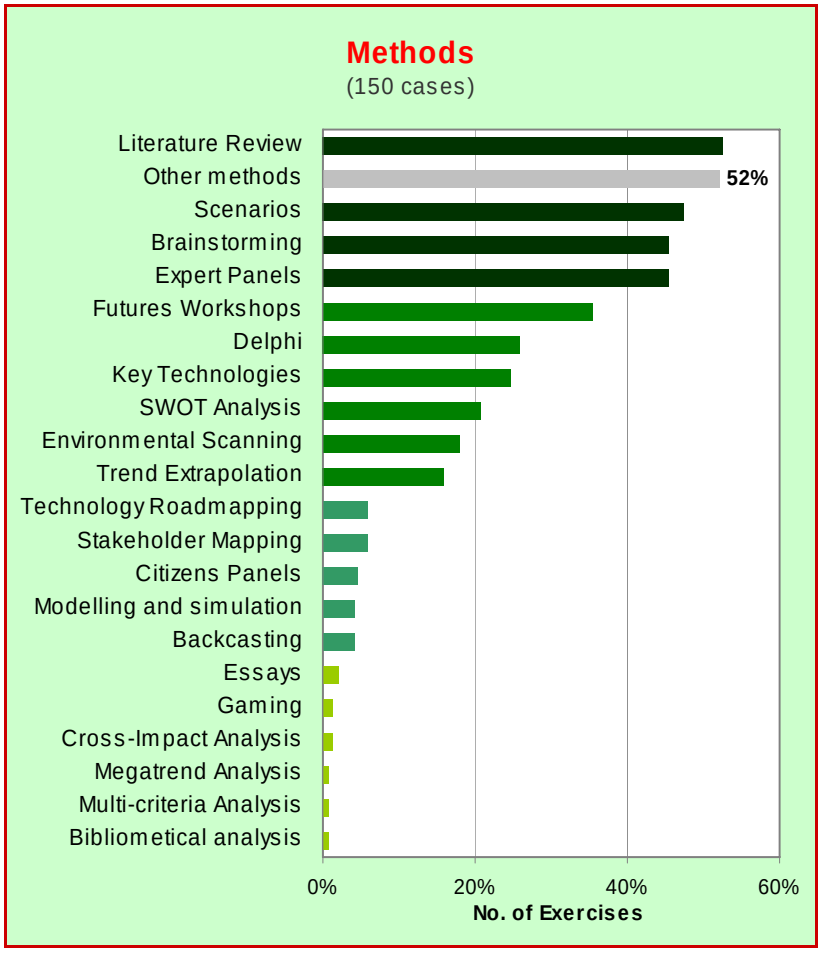


2.7. Methods

The chart below shows the results of the mapping of methods. The methods have been classified into four groups according to their popularity.

The first group is shown in dark green and includes methods which may well be considered key ones. These include: literature review (53%), scenarios (47%), brainstorming (45%), and expert panels (45%). Also among this group is the 'other methods' category – despite the long list of 21

methods provided, it seems the database has yet to capture the full range of methods being used in foresight exercises. This suggests two things: first, the need for the EFMN to review the list of mapping indicators to assess whether any major methods have been overlooked. And second, to acknowledge the versatility and complexity in methodological approaches to foresight, where the full range of methods found in the social sciences and action research are often brought to bear.

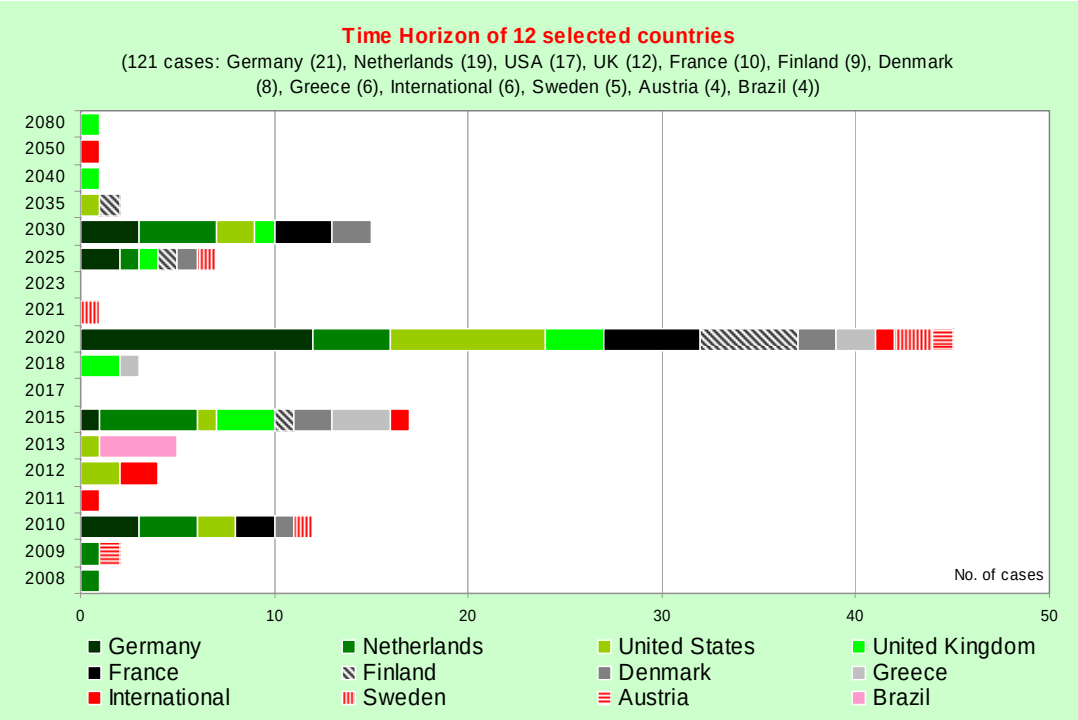


In a second group are those methods that are considered popular and useful, including futures workshops, Delphi, key technologies, SWOT analysis, scanning and trend extrapolation. Following these is a third group, which includes emerging methods, such as technology roadmapping, stakeholders mapping, citizens' panels, modelling and simulation and backcasting. Finally a handful of cases have used methods such as essays, gaming, cross-impact analysis, and megatrend, multicriteria and bibliometrical analyses.

In Section 3 we present several co-relational analyses using the methods, including the average number of methods used by 15 countries (this indicates the willingness to combine them). We also try to identify methods that are highly combinable and the frequency of those combinations.

2.8. Time Horizon

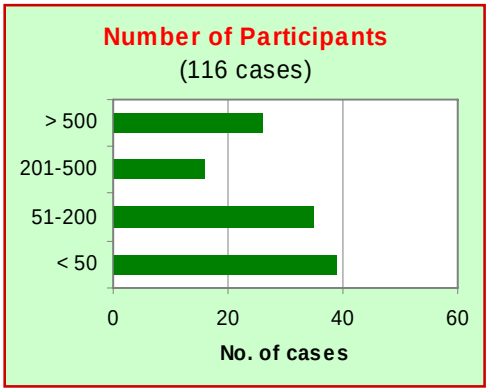
The analysis of time horizons was done using a selection of 12 countries that had more than four exercises mapped – 118 exercises in all. It is quite visible that 2030, 2020, 2015 and 2010 are the most common time horizons used, something that is hardly surprising given that these represent landmark milestones in time.



2020 is the most popular time horizon with most selected countries, constituting in total around 40% of mapped exercises. 2015 and 2030 are the second most popular time horizons, each constituting around 15% of the mapped sample. The fourth most represented year is 2010 and here we find those exercises with a 10-year time horizon starting in the year 2000. These results are not surprising given that (a) foresight exercises typically have a time horizon of 10-30 years and (b) most exercises mapped by the EFMN have been carried out in the last five years. Rather than setting a future milestone date, some countries have had programmes with a fixed time horizon of 10 or 15 years from the moment the exercises have been initiated. For example, this is the case of four exercise mapped for Brazil (2013) and some of those mapped for the UK and Denmark (2018).

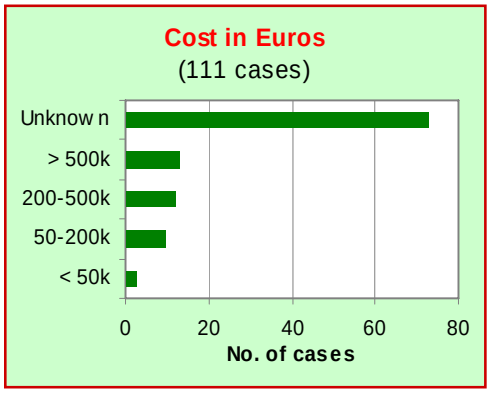
2.9. Number of Participants

The chart on the right shows the number of participants in a sample of 116 mapped foresight exercises. 34% of exercises mapped had less than fifty participants (<50). On the face of it, this seems something of a surprising result, given foresight's emphasis on wide participation. However, it must be taken into account that the EFMN has sought to map activities beyond the usual foresight exercises, for example to also include technology road mapping exercises, future reviews, and so on. Many such activities tend to be more restricted in the number of participants engaged, which might explain the data.



Around 30% of sample mapped exercises have between 51-200 participants – a typical number found in a sectoral exercise for example. The more extensive regional and national exercises tend to have more participants than this, and we can see that around 40% of mapped exercises in our sample had more than 200 participants.

2.10. Cost in Euros



Information on the costs of exercises has always been the most difficult to map. Other projects, such as Eurofore, also tried to collect this type of data but it seems that not even managers of programmes are able (or willing) to estimate the costs of their exercises. For this reason we can see that the cost for two-thirds of our sample mapped data is unknown. Then we see a rather similar proportion of exercises that exceed the 500 thousand Euros mark (13 cases), that cost between 200 and 500 thousand Euros (12 cases) and that cost between 50 and 200 thousand Euros (10 cases). Only three sample mapped exercises cost less than 50 thousand Euros.

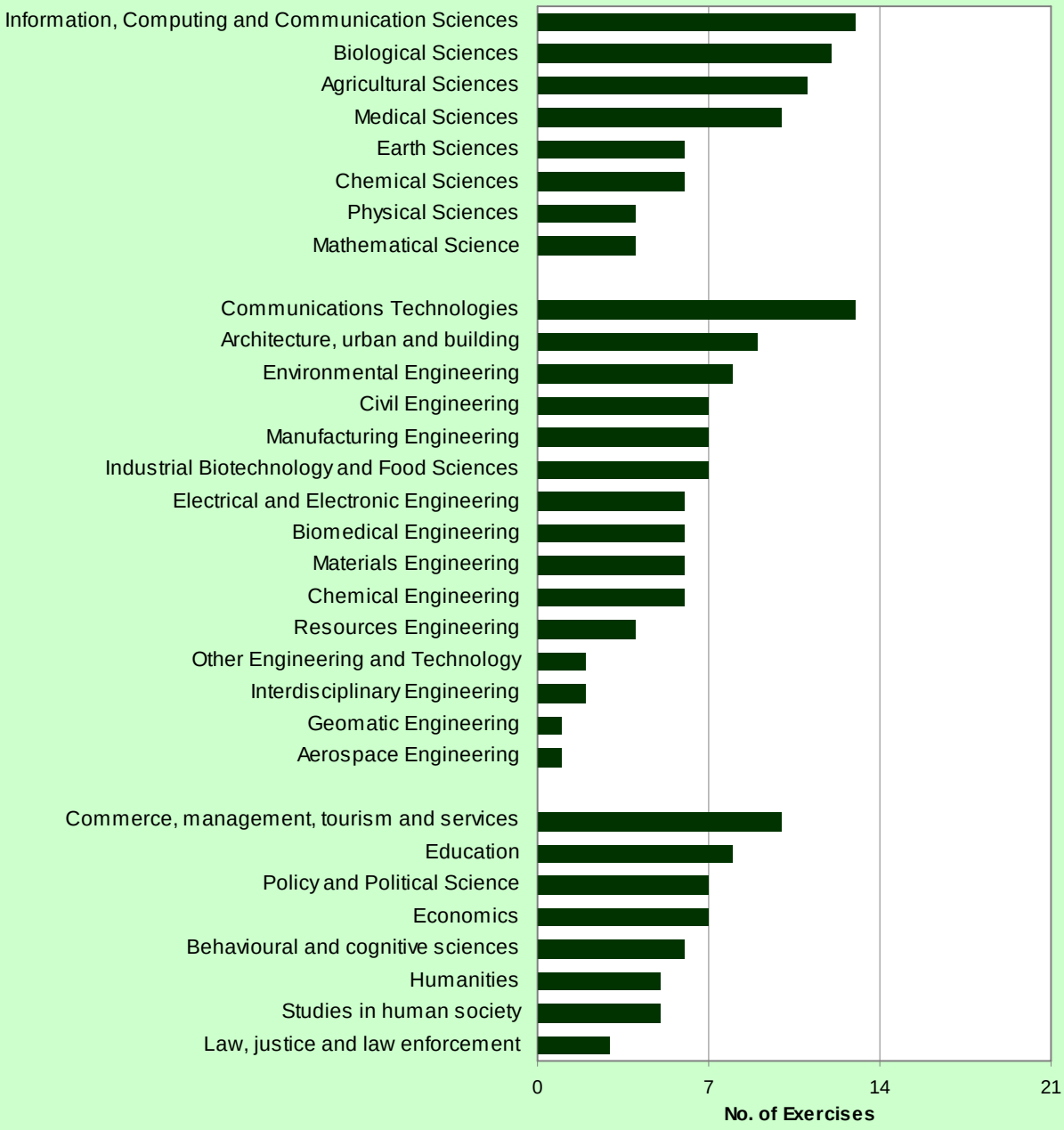
2.11. Research Areas

Research areas covered by foresight exercises have been mapped by the EFMN using the OECD's standard Frascati Manual classification system. In the chart below, the Frascati areas have been clustered into 3 major groups:

- Natural, medical and agricultural sciences (at the top)
- Engineering and technology (in the middle)
- Social sciences and humanities (at the bottom)

Research Areas Based on FRASCATI classification

(49 foresight exercises mapped)

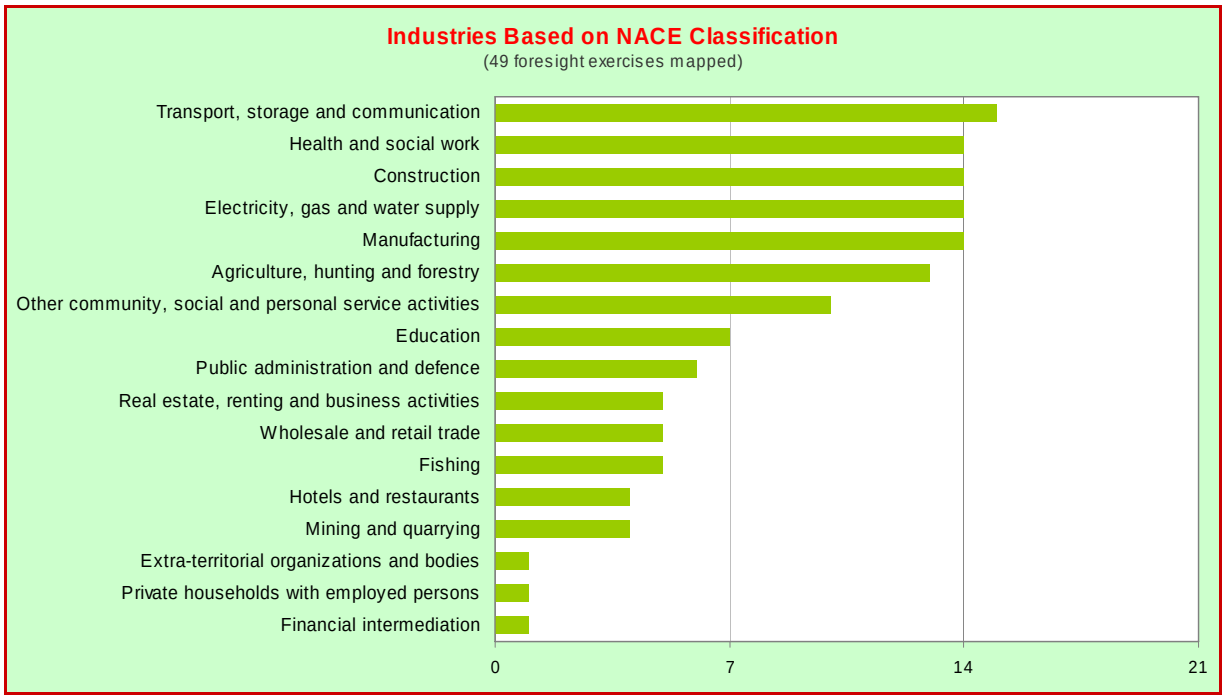


Whilst the numbers are very small – the sample of exercises numbers just 49 – the results are nevertheless revealing. For example, in the natural sciences category, Information, Computing, and Communication Sciences is the most popular research area covered in the sample of mapped exercises, closely followed by biological sciences and agricultural sciences.

Turning to Engineering and Technology, again, we see that Communications Technologies are the most popular. Whilst in the social sciences and humanities, services come out on top. With so few cases to work on, it would be unwise to draw too many conclusions from the data. Nevertheless, it would seem that the pervasiveness of information and communications science and technology and their applications are well reflected by the subject matter of foresight exercises.

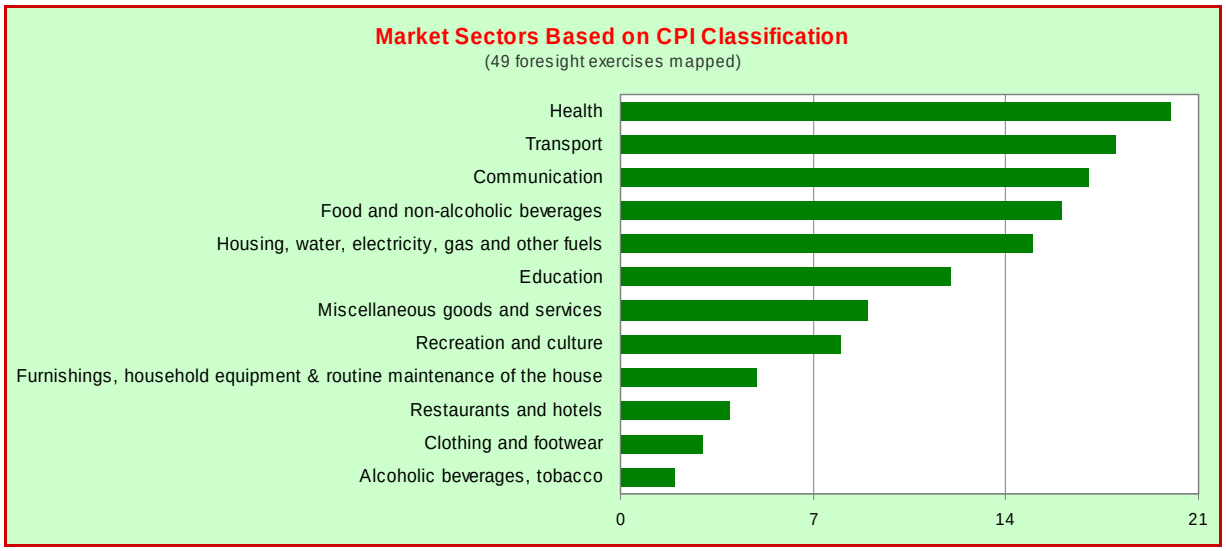
2.12. Industries

The chart below indicates how a sample of 49 mapped exercises relates to 17 industry groups of the European Commission's NACE classification system. As we can observe, most of the exercises have focused upon Transport, Storage and Communications, Health and Social Work, Construction, Electricity, Gas and Water Supply; Manufacturing; and Agriculture, Hunting and Forestry. The numbers are very small here, so it is unwise to draw conclusions at this stage. But such an indicator holds out much promise for further analysis once more data is collected.



2.13. Market Sectors

The chart below relates the 49 mapped exercises with market sectors using the Consumer Price Index classification system. Five markets emerge as the most targeted ones: Health; Transport; Communication; Food and Non-alcoholic Beverages; and Housing, Water, Electricity, Gas and other Fuels. These results are broadly in line with the data gathered for the NACE classification system (Section 2.12).



3. A Deeper Look

In this section the results of some secondary analysis based upon the cross-tabulation of indicators is presented. This provides a much deeper insight into mapping data than that of simply counting frequencies. It offers the possibility of identifying and investigating causal relationships between the various indicators and has the potential to provide considerable added value to the EFMN Mapping Report. On the other hand, the fact that mapping data is limited for the 2005 Report calls into question the viability and reliability of much cross-tabulation analysis and for this reason we have taken care in selecting appropriate cross-tabulations to examine.

	country	year of completion	territory	sponsor	audience	outputs	methods	time horizon	participants	costs	research areas	industries	markets	duration
duration	P	P	P	P	P	P	P	P	P	P	P	P	P	
markets	P	P	P	P	P	P	P	P	P	P	P	P	P	
industries	P	P	P	P	P	P	P	P	P	P	P	P		
research areas	P	P	P	P	P	P	P	P	P	P	P			
costs	P	P	P	P	P	P	P	P	P					
participants	P	P	P	P	P	P	P	P						
time horizon	P	P	P	P	P	P	P							
methods	3.1	P	P	3.4	P	3.3	3.2							
outputs	P	P	P	3.5	P									
audience	P	P	P	3.6										
sponsor	P	P	P											
territory	P	P												
year of completion	P													
country	P													

The table above shows the wide range of possible combinations (using a 'P') that could be done in the future using the EFMN database. In dark green we indicate those cross-tabulations that are neither available nor interesting enough to be analysed. Then in light grey we identify 86 possible cross-tabulations that would require more data before we could undertake serious analyses. A further five similar cross-tabulations, marked in light-green, are investigated, since there is sufficient data to begin to look at these. We also believe that 5 of the 14 indicators could be cross-tabulated with themselves to provide interesting information (see mild-green boxes in the diagonal). Only one of these is investigated in the report: 'methods & methods'. Thus, in

total, we present 6 different types of analysis which hopefully will provide the reader with a deeper insight into the potential of the EFMN mapping data.

3.1. Countries & Methods

For the following analysis we first selected 15 countries with more than 5 exercises mapped against the methods category. Then we looked at the total number of methods used and divided this figure by the number of cases in order to get the average number of methods per exercise. Taking all countries' cases into account we discovered that the average number of methods per exercise is five. Then we looked at countries well below that average (light grey), countries within and close to the average (light green), and finally those countries which are well above the average (mild green). From this, it would seem that Turkey and the UK have the greatest willingness to mix methods. By contrast, exercises from countries like Denmark and the US seem to have a narrower methodological scope.

Country	Number of exercises mapped	Number of methods used	Average Number of methods per exercise
France	18	82	5
Germany	15	71	5
Denmark	13	31	2
Netherlands	13	49	4
United Kingdom	13	95	7
Finland	9	52	6
Belgium	8	50	6
Austria	6	34	6
Czech Republic	6	34	6
Estonia	6	30	5
Italy	6	27	5
Turkey	6	52	9
Spain	5	22	4
Sweden	5	14	3
United States	5	9	2
	Total Exercises	**Total Methods**	**Average**
	134	652	5

Whilst this is interesting, the reliability of the figures should not be taken at face-value. To begin with, these are relatively small numbers of exercises we are dealing with. On top of this, there has been some bias in the selection of cases in some countries. Thus, for the US, most mapped cases are technology road mapping exercises, which tend to be less methodologically sophisticated. This compares to the UK situation, where many of the exercises mapped are large-scale national exercises. Finally, there is also likely to be some bias in the knowledge and interpretation of the people doing the mapping, which in turn affects the extent to which the range of methods used have been mapped. With different teams in the EFMN responsible for

different countries, this is likely to have happened. Quality controls are being introduced to try to minimise this in future years.

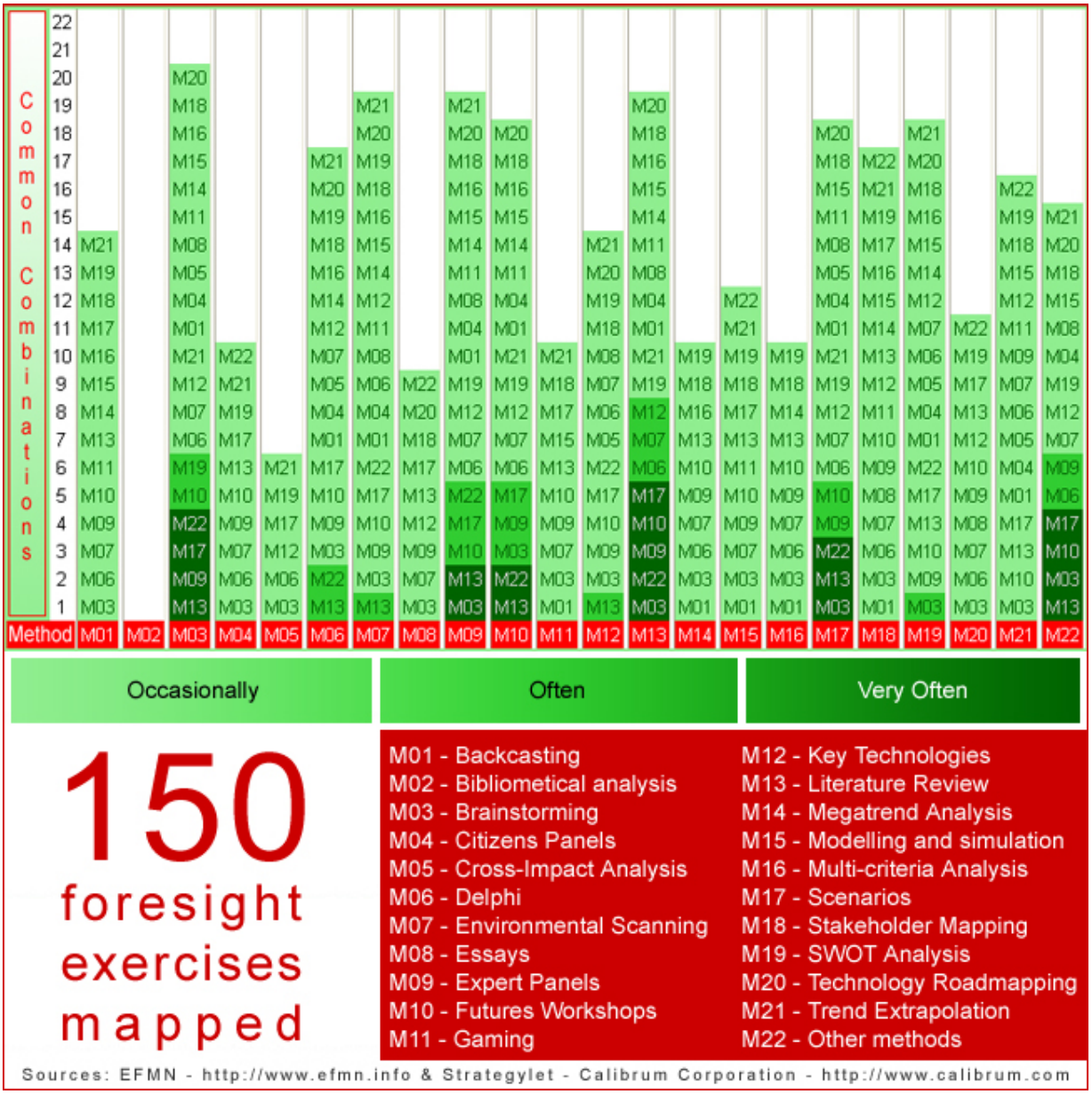
3.2. Methods & Methods

Here we look much deeper into the type of methodological combinations using the same 150 cases of the methods chart (Section 2.7). The results may look a bit puzzling at first but for those who are thinking about undertaking a new foresight project this chart may be useful. Here we present the common combinations of the methods considered in EFMN mapping. The methods are listed in order from M01 to M22 at the horizontal-axis of the bar chart. So, beginning with *bibliometrical analysis:* in Section 2.7 we can see that this method was apparently the least used, and the chart below shows it was not combined with other methods at all – this is why the M02 column is blank. If we again return to Section 2.7, we can see that *multicriteria analysis* was the second least used method but here we see that it was combined with 10 other methods. The chart below shows how combinable methods have been (looking at the height of the columns) and the frequency of combinations (intensity of the green colour).

In this way, ten methods have been identified as **highly combinable**:

- Brainstorming
- Environmental scanning
- Expert panel
- Literature review
- Futures workshops
- Scenarios
- SWOT analysis
- Delphi
- Trend extrapolation

A word of warning here: returning to our two examples of *bibliometric analysis* and *multicriteria analysis*, there is no inherent characteristic of the former method that prevents it from being used more widely in foresight exercises. Indeed, the case for making greater use of such analysis could readily be made. Rather, the figures show that foresight practitioners have rarely used this method, at least in our relatively small sample. In other words, the data in this analysis does not necessarily point to some inherent 'combinable' quality for the given methods, but instead reflects the current practices of foresight practitioners in their approach to foresight.


Common Combinations
Method
M01 M02 M03 M04 M05 M06 M07 M08 M09 M10 M11 M12 M13 M14 M15 M16 M17 M18 M19 M20 M21 M22
Occasionally
Often
Very Often
150
foresight
exercises
mapped
M01 - Backcasting
M02 - Bibliometical analysis
M03 - Brainstorming
M04 - Citizens Panels
M05 - Cross-Impact Analysis
M06 - Delphi
M07 - Environmental Scanning
M08 - Essays
M09 - Expert Panels
M10 - Futures Workshops
M11 - Gaming
M12 - Key Technologies
M13 - Literature Review
M14 - Megatrend Analysis
M15 - Modelling and simulation
M16 - Multi-criteria Analysis
M17 - Scenarios
M18 - Stakeholder Mapping
M19 - SWOT Analysis
M20 - Technology Roadmapping
M21 - Trend Extrapolation
M22 - Other methods
Sources: EFMN - http://www.efmn.info & Strategylet - Calibrum Corporation - http://www.calibrum.com

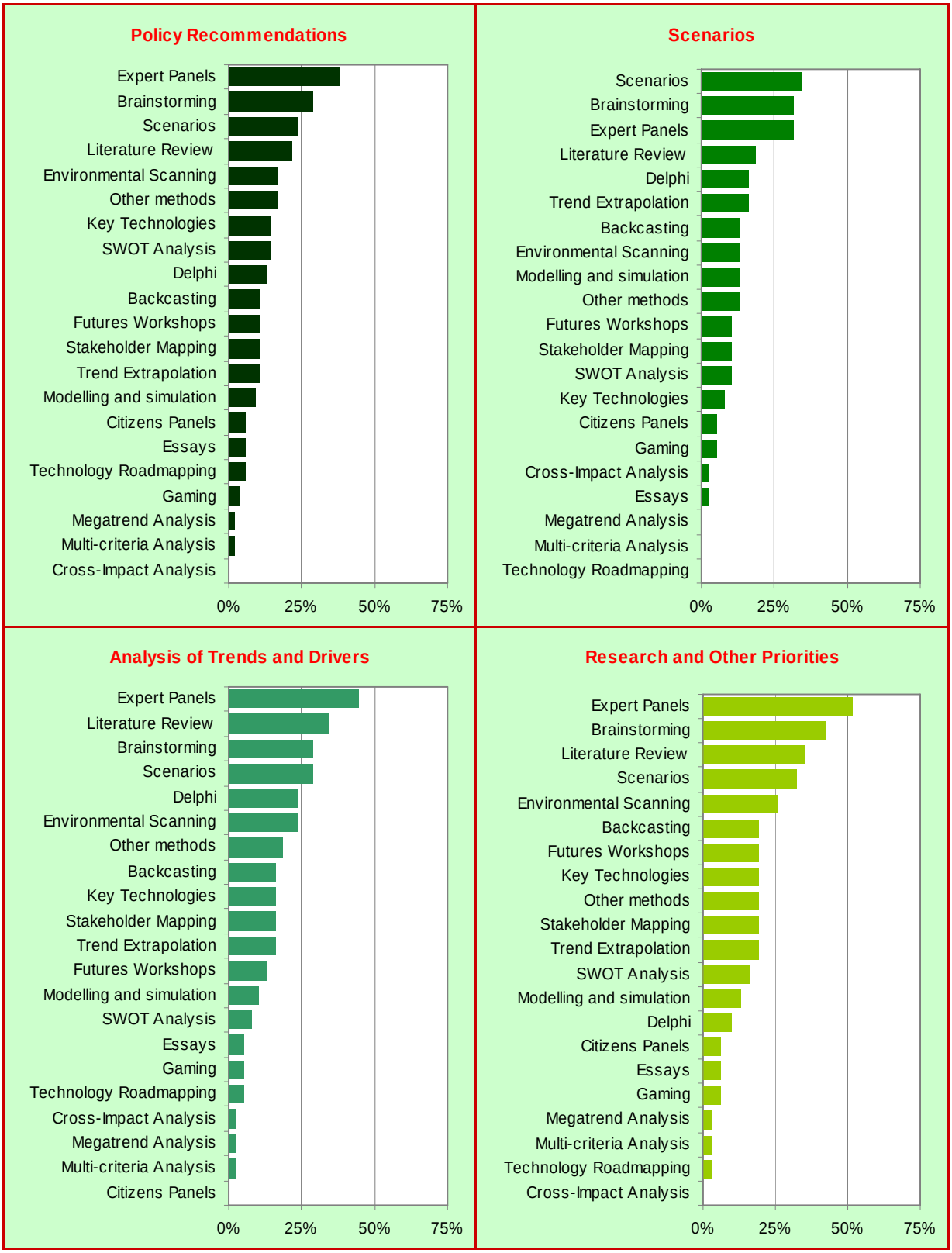
Despite this caveat, some interesting results can be observed. In relation to the **frequency of combinations** we have identified the following patterns:

- Literature review is *very often* combined with brainstorming, other methods, expert panels, futures workshops and scenarios. It is *often* combined with Delphi, environmental scanning and key technologies. And, it is *occasionally* combined with the other 11 methods.
- Brainstorming is *very often* combined with literature review, expert panels, scenarios and other methods. It is *often* combined with Futures workshops and SWOT analysis. And, *occasionally* combined with the other 14 methods.
- Scenarios are *very often* combined with brainstorming, literature review and other methods. They are *often* combined with expert panels and futures workshops. And, *occasionally* combined with the other 13 methods.
- Expert panels are *very often* combined with brainstorming and literature review. The method is *often* combined with futures workshops, scenarios and other methods. And, *occasionally* combined with the other 14 methods.
- Futures workshops are *very often* combined with literature review and other methods. They are *often* combined with brainstorming, expert panels and scenarios. And, *occasionally* combined with the other 13 methods.
- Delphi is *often* combined with literature review and other methods. And, *occasionally* combined with the other 15 methods.
- Environmental scanning is *often* combined with literature review and *occasionally* combined with the other 18 methods.
- SWOT analysis is *often* combined with brainstorming and *occasionally* combined with the other 18 methods.
- Key technologies are *often* combined with literature review and *occasionally* combined with the other 13 methods.

Other combinations are certainly possible, but they have only happened occasionally in the 150 cases mapped.

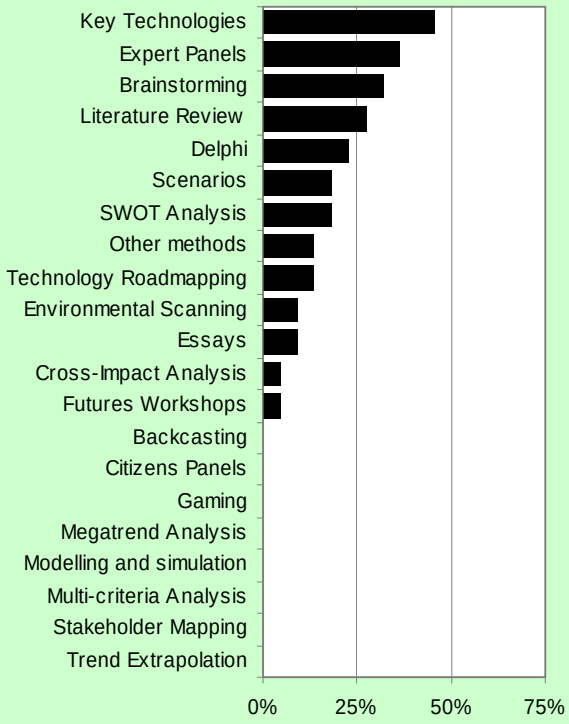
3.3 Outputs and Methods

The most striking result from this analysis is the popularity of four methods – expert panels, brainstorming, literature review, and scenarios – largely irrespective of the type of outputs being generated. As we have already noted in Section 2.7, these four methods are key ones in foresight exercises, so it is hardly surprising to find them dominating here. The only instances where they do not totally dominate are in key technology, technology roadmapping, and forecasting exercises, where one or two other methods displace them as the most popular method.

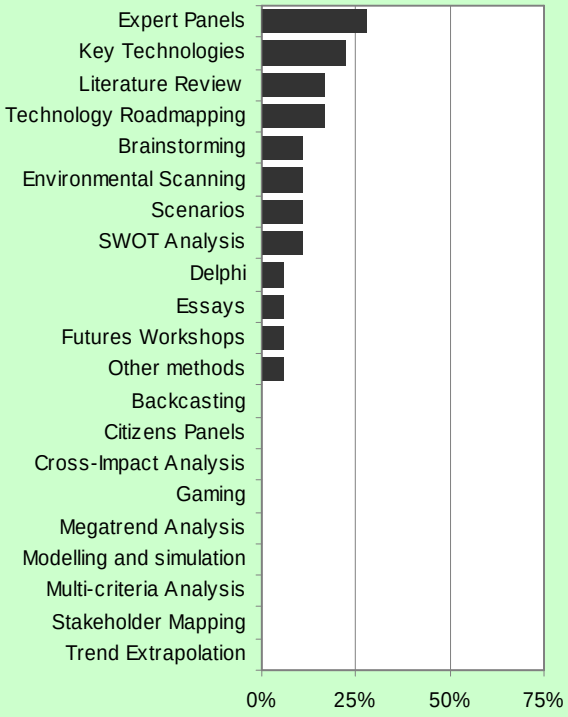

Policy Recommendations
Expert Panels
Brainstorming
Scenarios
Literature Review
Environmental Scanning
Other methods
Key Technologies
SWOT Analysis
Delphi
Backcasting
Futures Workshops
Stakeholder Mapping
Trend Extrapolation
Modelling and simulation
Citizens Panels
Essays
Technology Roadmapping
Gaming
Megatrend Analysis
Multi-criteria Analysis
Cross-Impact Analysis
0%
25%
50%
75%
Scenarios
Scenarios
Brainstorming
Expert Panels
Literature Review
Delphi
Trend Extrapolation
Backcasting
Environmental Scanning
Modelling and simulation
Other methods
Futures Workshops
Stakeholder Mapping
SWOT Analysis
Key Technologies
Citizens Panels
Gaming
Cross-Impact Analysis
Essays
Megatrend Analysis
Multi-criteria Analysis
Technology Roadmapping
0%
25%
50%
75%
Analysis of Trends and Drivers
Expert Panels
Literature Review
Brainstorming
Scenarios
Delphi
Environmental Scanning
Other methods
Backcasting
Key Technologies
Stakeholder Mapping
Trend Extrapolation
Futures Workshops
Modelling and simulation
SWOT Analysis
Essays
Gaming
Technology Roadmapping
Cross-Impact Analysis
Megatrend Analysis
Multi-criteria Analysis
Citizens Panels
0%
25%
50%
75%
Research and Other Priorities
Expert Panels
Brainstorming
Literature Review
Scenarios
Environmental Scanning
Backcasting
Futures Workshops
Key Technologies
Other methods
Stakeholder Mapping
Trend Extrapolation
SWOT Analysis
Modelling and simulation
Delphi
Citizens Panels
Essays
Gaming
Megatrend Analysis
Multi-criteria Analysis
Technology Roadmapping
Cross-Impact Analysis
0%
25%
50%
75%

…other outputs and methods

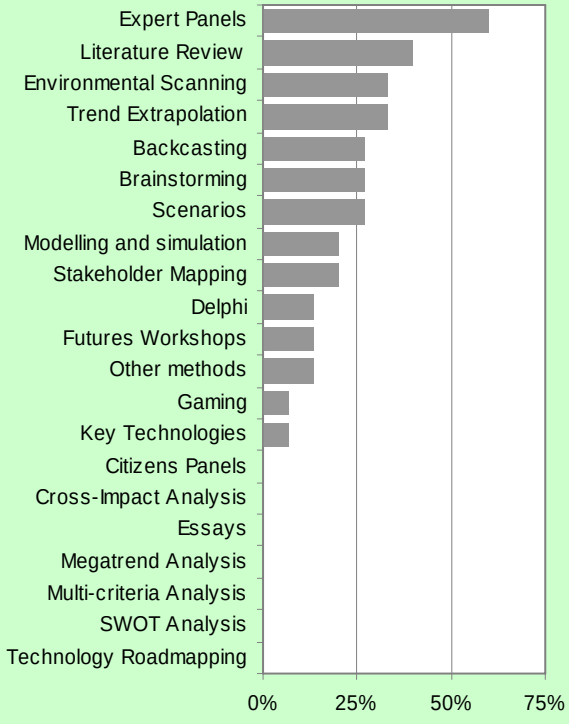
Lists of Key Technologies



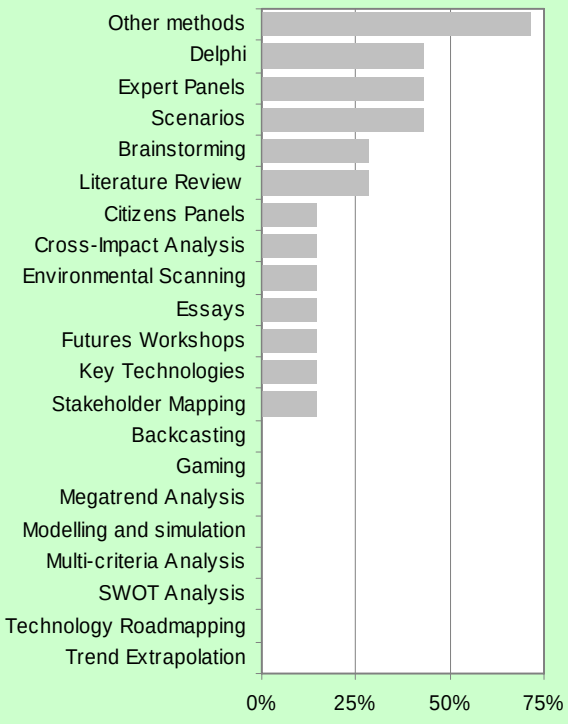
Technology Roadmaps



Forecasts



Other outputs



3.3. Sponsors & Methods

In this analysis we first mapped the exercises sponsored by different stakeholders (here we should also bear in mind that some exercises had two or more sponsors). Then we looked at the most commonly used methods (see the table below). Finally, we have prepared a radar diagram for government-sponsored cases, where there are 124 cases mapped in sufficient detail for further analysis.

Sponsor	Use of foresight methods
Government	Other methods (60%), Literature Review (59%), Brainstorming (48%), Expert Panels (48%), Scenarios (46%), Futures Workshops (40%), Delphi (27%), Key Technologies (26%), SWOT (21%)
Business	Expert Panels (50%), Scenarios (38%), Technology Roadmapping (25%), Other methods (13%), Brainstorming (13%), Futures Workshops (13%), Citizens Panels (13%), Delphi (13%), SWOT (13%), Trend extrapolation (13%)
Research	Delphi (38%), Expert Panels (38%), Literature Review (38%), Other methods (38%), Scenarios (38%), Brainstorming (23%), Key Technologies (23%), SWOT (23%)
IGOs	Literature Review (64%), Other methods (64%), Expert Panels (57%), Brainstorming (50%), Delphi (50%), Futures Workshops (43%), Scenarios (36%), SWOT Analysis (29%)
NGOs	Scenarios (60%), Technology Roadmapping (60%), Expert Panels (40%), Key Technologies (40%), Brainstorming (20%), Essays (20%), Futures Workshops (20%), SWOT (20%), Literature Review (20%)
General public	Backcasting, Brainstorming, Delphi, Environmental Scanning, Expert Panels, Foresight, Futures Workshops
Other sponsors	Brainstorming (57%), Expert Panels (57%), Scenarios (57%), Key Technologies (29%), Other methods (29%), SWOT Analysis (29%), Futures Workshops (14%), Delphi (14%), Essays (14%), Citizens Panels (14%)

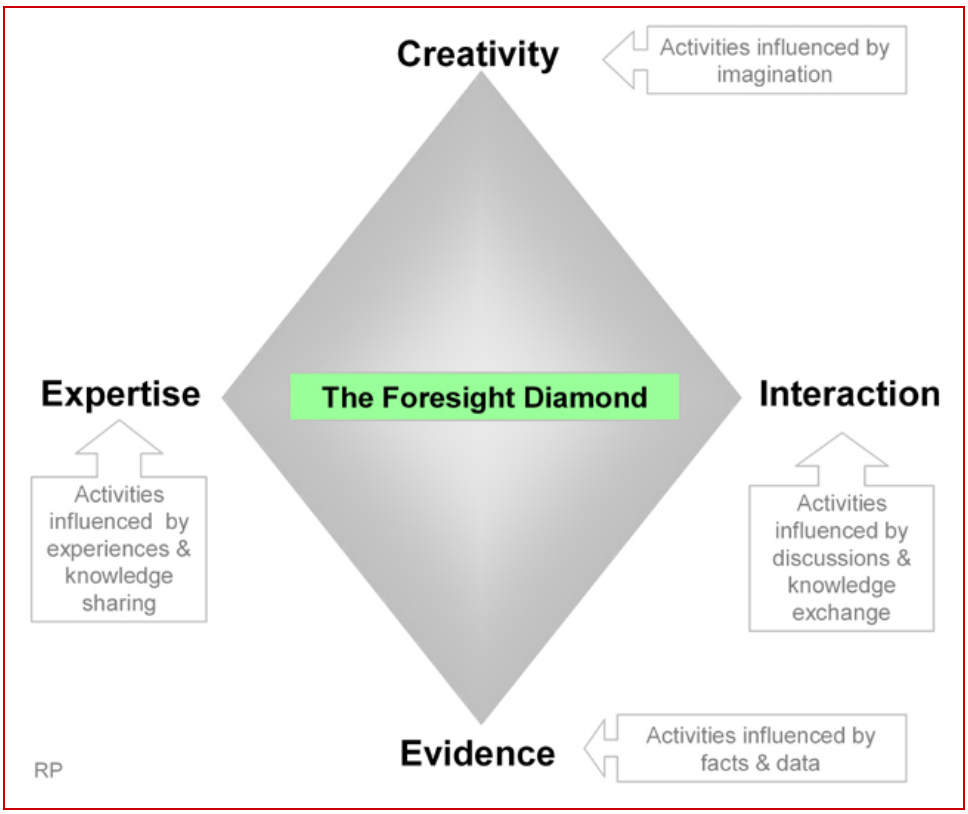
150 cases: Government (124), Business (8), Research (13), IGOs (8), NGOs (5), General public (1), Other sponsors (7)

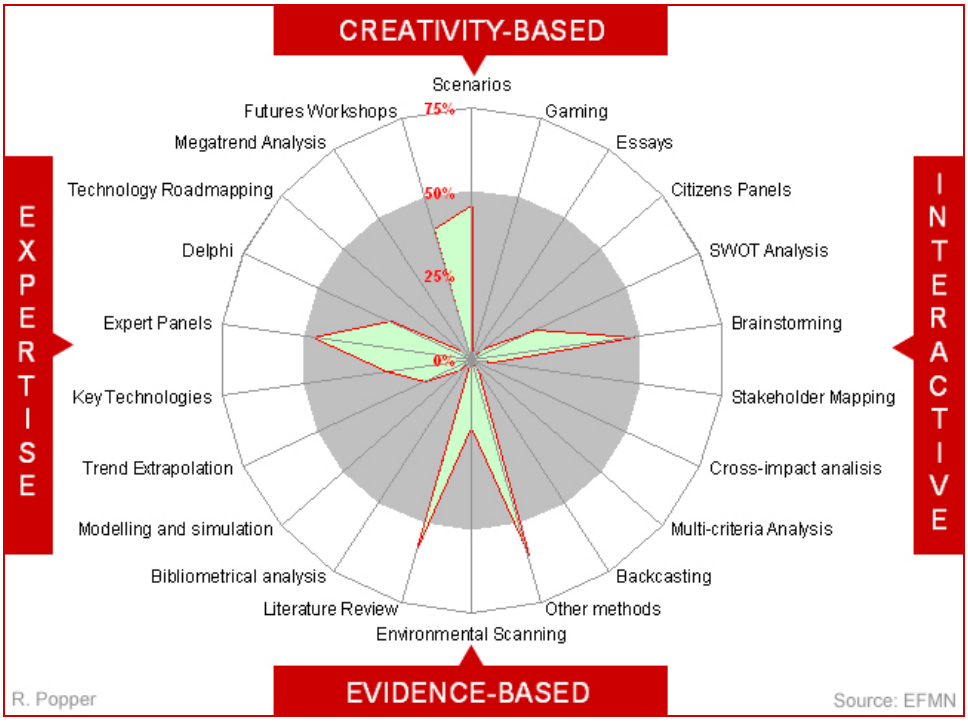
The figures in the table above essentially indicate that the numbers are still too small for any serious analysis of differences in methods used according to the type of sponsor(s). The only figures where analysis is meaningful is for government-sponsored exercises, where there are 124 cases mapped. Unsurprisingly, and given that government-sponsored exercises account for more than 80% of those entered into the EFMN database, the five most popular methods identified in Section 2.7 also show up as the five most popular methods here.

In the radar diagram below we have rearranged the methods into the four dimensions of what we call the *foresight diamond*, which groups foresight methods in the following categories:

- **creativity**-based activities (influenced by imagination)
- **evidence**-based activities (influenced by facts & data)
- **expertise**- based activities (influenced by experiences & knowledge sharing)
- **interaction**-based activities (influenced by discussions & knowledge exchange)

The results indicate that although it is clear that there is a slight tendency towards expert-based methods, most exercises have a healthy presence of evidence-based, creative and interactive activities.


Creativity
Activities influenced by imagination
Expertise
The Foresight Diamond
Interaction
Activities influenced by experiences & knowledge sharing
Activities influenced by discussions & knowledge exchange
Evidence
Activities influenced by facts & data
RP

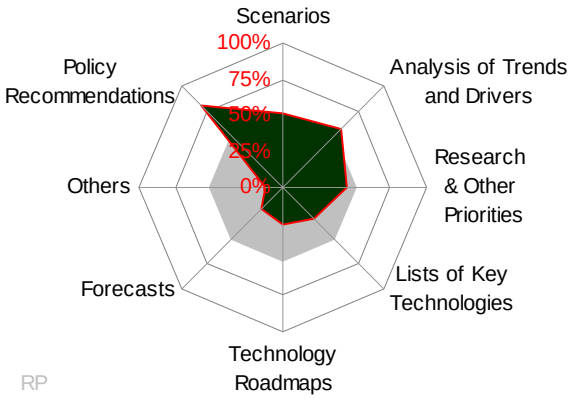

CREATIVITY-BASED
EXPERTISE
INTERACTIVE
EVIDENCE-BASED
Scenarios
Gaming
Essays
Citizens Panels
SWOT Analysis
Brainstorming
Stakeholder Mapping
Cross-impact analisis
Multi-criteria Analysis
Backcasting
Other methods
Environmental Scanning
Literature Review
Bibliometrical analysis
Modelling and simulation
Trend Extrapolation
Key Technologies
Expert Panels
Delphi
Technology Roadmapping
Megatrend Analysis
Futures Workshops
75%
50%
25%
0%
R. Popper
Source: EFMN

3.4 Sponsors and Outputs

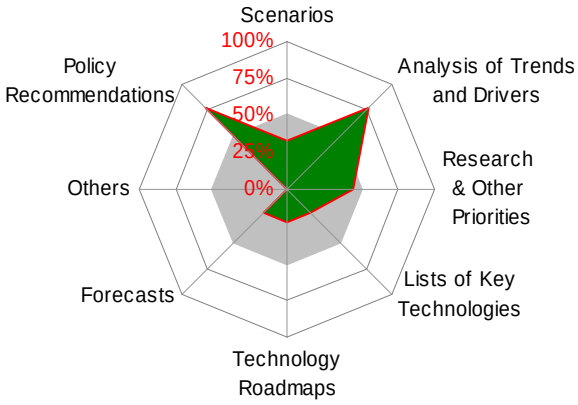
In Section 2.6, we saw that Policy Recommendations are the most common type of output of foresight exercises, followed by Scenarios, Analysis of Trends and Drivers, and Research and Other Priorities. Broadly speaking, these results are reflected in the charts below where the types of output have been cross-tabulated against the sponsors. There are some deviations, for example, with Business and Research, where Analysis of Trends and Drivers is more pronounced. Also, the low number of IGO-sponsored exercises that generated policy recommendations is noteworthy. In all cases, however, caution should be exercised in interpreting this data, given the small number of exercises in the samples.

Note: 81 cases mapped and some cases have been co-sponsored by 2 or 3 stakeholders.
Government (63), Business (9), Research (15), IGOs (7)

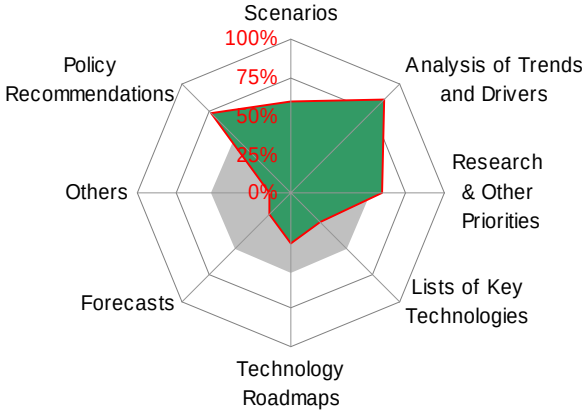
Government Foresight Outputs



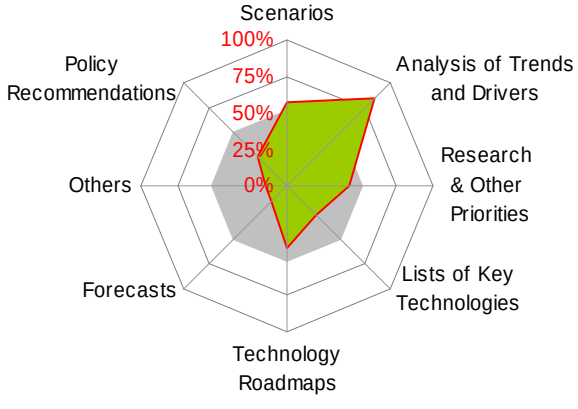
Business Foresight Outputs



Research Foresight Outputs



IGOs Foresight Outputs

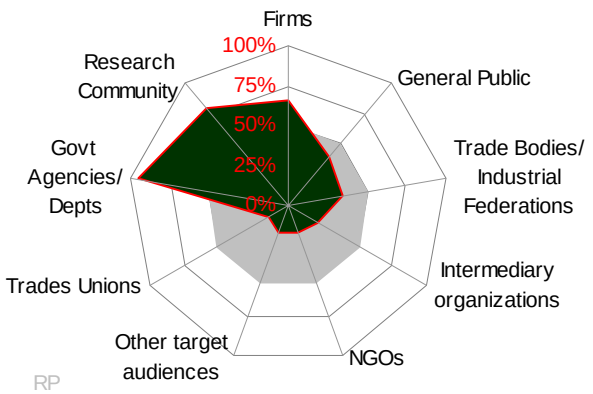


3.4. Sponsors and Audience

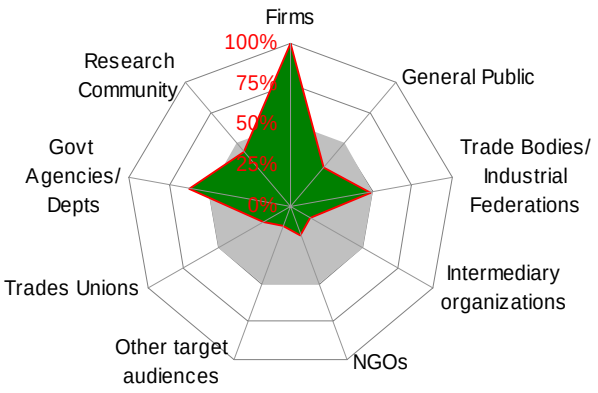
The charts below show the sorts of audiences targeted by exercises that are sponsored by different types of organisation. Government-sponsored exercises, which form by far the largest part of our sample, largely reflect the results already presented in Section 2.5. Of more interest are the results for the other sponsors. Business-sponsored exercises unsurprisingly focus upon firms, although trade bodies and government are also secondary targets. But compared to the other sponsors, these exercises are the most focused. By comparison, both research and IGO sponsored exercises show the broadest scope in terms of target audience, with both placing more emphasis upon the research community than other sponsors.

Note: 171 cases mapped and some cases have been co-sponsored by 2 or 3 stakeholders. Government (143), Business (16), Research (16), IGOs (13)

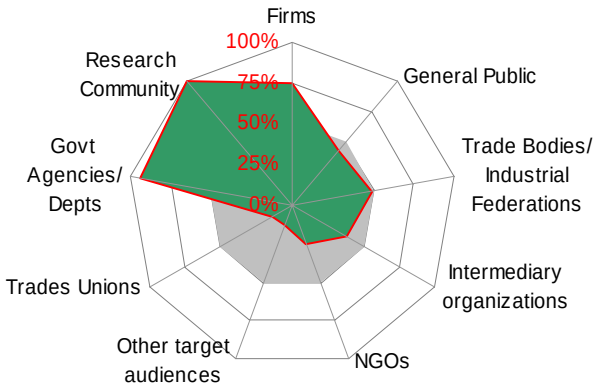
Government Foresight Audience



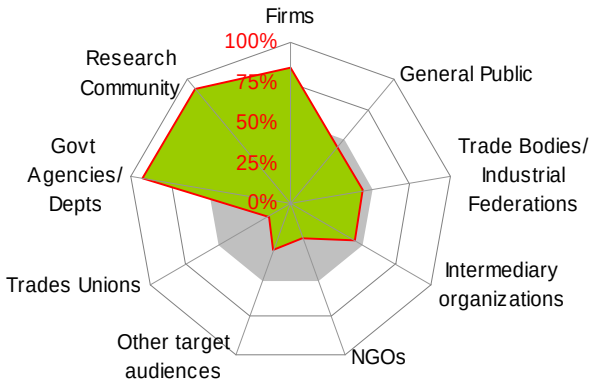
Business Foresight Audience



Research Foresight Audience



IGOs Foresight Audience



4. Future Reports

In just a few short months, sufficient data has already been collected to prepare this report. With more time and therefore more data, the depth and scope of future reports holds out the promise of providing truly unique insights into the foresight field, which should prove invaluable to both policy makers and practitioners. In the sections below, we briefly consider the implications of having more data to work with for future reports.

4.1 More Data Means More Sophisticated Analysis

It is apparent from the report that more data would drastically improve the sorts of analysis that could be done. At the moment, the data is rather incomplete, making interpretation of frequency counts unreliable. Patchy data also makes meaningful secondary analysis through cross-tabulation difficult and often impossible. However, by the time of the 2006 Mapping Report, the situation should improve markedly. Over the coming 9-12 moths, the following data collection activities will be undertaken:

- More exercises will be nominated into Dynamo, especially for those countries that are currently under-represented in the database. The target is to have 600-700 exercises nominated by June 2006.

- All exercises in the database will be mapped to a minimum threshold "Level 1" state. This means that all exercises will be 'tagged' with Country, Date, Sponsor, Time Horizon, Territorial Coverage, Research Area, and Industry. This will not only allow for more reliable and extensive data analysis, but will also improve the way the database can be searched by potential users.

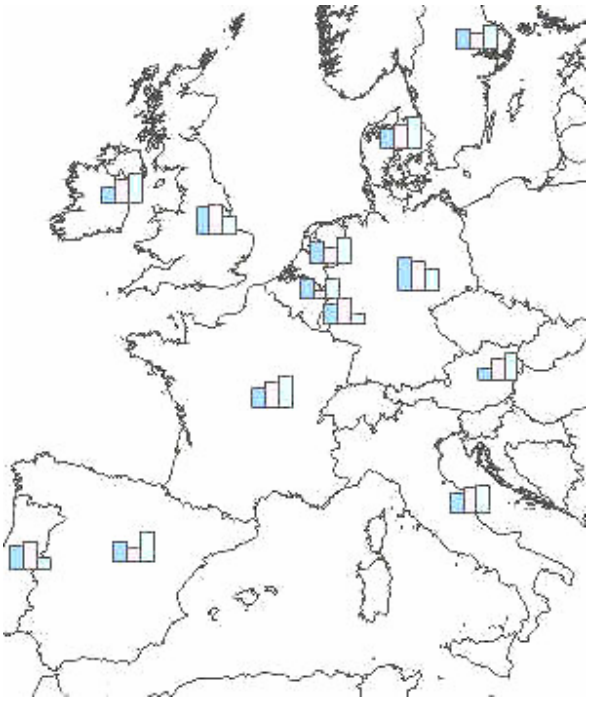
- In addition to this Level 1 mapping, more in-depth mapping will be carried out on a selection of cases, probably numbering in the region of around 200 exercises. This data will prove invaluable for more in-depth secondary analysis of the EFMN database.

Two further points should be made here. First, the EFMN database also has textual fields that are likely to be populated with useful data by 2006. This should allow for some qualitative analysis of the database, which should also enhance the interpretation of the statistical data. Secondly, if older exercises are to be mapped into the database – and this decision lies partly with the European Commission – then some time series analysis might be possible that tries to capture the changing nature of foresight activities in Europe.

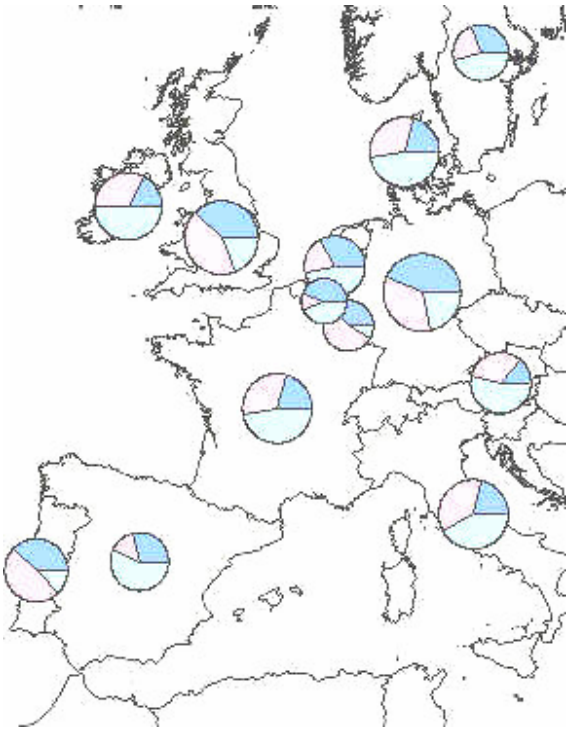
4.2 Improvements in Data Presentation

In the current report, visual presentation of data has been limited largely to bar charts, with some additional, though minimal, use of radar diagrams. In future reports, the aim will be to improve the visual attractiveness of the ways data is presented. To achieve this, network and mapping software are likely to be employed to show the relations between different mapped elements.

The EFMN has also investigated the possible use of Geographical Information Systems (GIS) software in order to superimpose data onto geographical ordinates (such as countries). This would result in the production of proportional symbol maps, which can be used to represent frequency counts and actual values. This is done by superimposing bar charts and pie charts onto topographical maps – see the examples below. Pie charts are especially versatile, since the circled area they cover than vary according to the size of the data value. So, for example, this would allow not only the number of foresight exercises in each country to be represented, but also the distribution of certain exclusive characteristics, such as territorial scope of exercises, their time horizons and duration, the amounts of money they cost, and so on.



Proportional Symbol Map using Bar Charts



Proportional Symbol Map using Pie Charts

Acknowledgements

This report could not have been completed without the support of so many people and institutions that are members of the European Foresight Monitoring Network. We would also like to thank Calibrum Corporation (http://www.calibrum.com) for providing access to their foresight package – this allowed us to make the co-relational analysis in section 3.2.