Government
Office for Science

The Futures Toolkit

Tools for Futures Thinking and Foresight Across UK Government

Edition 1.0

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Contents

The Futures Toolkit was assembled for GO-Science by Waverley Consultants.

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1.   Introduction

The Government Office for Science (GO-Science) ensures that government policies and decisions are informed by the best scientific evidence and strategic long term thinking. The Futures Toolkit is a key resource that policy professionals can use to embed long term strategic thinking in the policy and strategy process.

The Toolkit is designed primarily as a resource for those who are new to futures thinking but should also prove useful to more experienced practitioners. It provides an introduction to futures thinking and examines some of the important design questions that policy makers need to consider when introducing it into the policy process. The tools are organised according to their primary purpose – gathering intelligence about the future, exploring the dynamics of change, describing what the future might be like and developing and testing policy and strategy – and each procedure is set out in detail. The annexes provide examples of the outputs that different tools generate.

The tools are adaptable and can be customised to meet the needs of most futures projects. To illustrate this, the Toolkit sets out a number of pathways that show various ways the tools can be combined to meet specific business needs.

The Toolkit is practical rather than theoretical and each tool and pathway describes the design and facilitation steps required to deliver the technique. It is based on GO-Science's[1] own experience of running futures work and has been developed in collaboration with other government departments and futures practitioners who use these tools regularly in a wide range of settings.

There are ten chapters:

- **Chapter 1** introduces the Toolkit
- **Chapter 2** provides an introduction to futures thinking
- **Chapter 3** sets out key principles that underpin futures process design
- **Chapter 4** provides a guide to using the Toolkit
- **Chapter 5** describes 7 pathways that combine tools to meet specific business needs
- **Chapters 6 to 9** set out the full suite of tools:
  - Chapter 6 describes tools for gathering intelligence about the future
  - Chapter 7 describes tools for exploring the dynamics of change
  - Chapter 8 describes tools for describing what the future might be like
  - Chapter 9 describes tools for developing and testing policy and strategy
- **Chapter 10** provides guidance on evaluating the impact of using the tools

There are seven annexes:

- Annex 1: Sample futures and foresight material
- Annex 2: Glossary of futures and foresight terms
- Annex 3: Frequently Asked Questions
- Annex 4: Introducing metrics into scenario thinking
- Annex 5: Case studies
- Annex 6: Wider set of futures tools
- Annex 7: References and further resources

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[1] GO-Science conducts its Horizon Scanning activities in conjunction with the Cabinet Office through the jointly run Horizon Scanning Programme Team initiative.

2.   Introduction to futures thinking

Thinking about the future

'Futures' is an approach to identifying the long term issues and challenges shaping the future development of a policy area and to exploring their implications for policy development. It provides a set of research and modelling tools that policy makers can use to support development of policy that is resilient to a range of possible outcomes.

Futures is a flexible approach that can be adapted as required. A new team starting out in a new policy area may find that scenarios are a useful way to structure discussion at an away day to explore the emerging policy context and priorities. They may use the day to brainstorm change drivers, build scenarios and discuss the opportunities and threats each scenario poses. They may decide that the scenario process is a good way to structure the conversation but that there is no need to write up the stories themselves.

Alternatively, the team might decide that they want a detailed set of scenarios to test new policy ideas and that they need an extended process to develop them. They may want to research drivers in detail, to run separate drivers workshops and scenario workshops and to invite a range of external participants to take part in the process. They may want to publish – or at least circulate widely – the scenario narratives to promote discussion amongst an extended stakeholder group. Before they do so, they will want to write detailed scenarios that pick up all the key issues raised during the workshop process.

Although the aims of each exercise are different the same techniques are used in both, adapted to meet the particular requirements of each situation. The purpose of the first exercise is to provide a sandbox for the new team to explore issues and the potential shape of the future they are developing policy for. The scenarios themselves are less important than the conversation. The purpose of the second is to use future thinking to engage stakeholders and to develop a reasoned, robust perspective on possible future developments in the policy area. The output is designed to raise awareness of the issues shaping the future and, perhaps, stimulate debate about what is a desirable policy outcome.

Flexibility makes futures a powerful process that can be applied in a range of ways to help policy makers:

- deepen their understanding of the driving forces affecting future development of the policy or strategy area
- identify gaps in their knowledge and suggest areas of new research required to understand driving forces better
- build consensus amongst a range of stakeholders about the issues and how to tackle them
- identify and make explicit some of the difficult policy choices and trade offs in the future
- create a new strategy that is resilient because it is adaptable to changing external conditions
- mobilise stakeholders to action

Flexibility does, however, mean there is no 'standard' approach to futures that less experienced project owners can simply take off the shelf and deliver. Every project needs to be designed to meet its own particular requirements. This chapter and Chapter 2 set out some of the underpinning principles of futures thinking in detail as an aid to the design process.

Looking ahead

Horizon Scanning is a technique for looking ahead. Its focus is the future rather than the present and its purpose is to identify the strategic issues that will be important. Mostly, these will be different from the issues that are important today.

The Three Horizons model (Figure 1) illustrates how strategic issues change over time.

The present and the near future is defined in the model as **Horizon 1 (H1)**. H1 issues are strategically important now. They are visible and well understood and are generally the issues that government and its stakeholders are already responding to. H1 issues are therefore the focus of current policy and strategy.
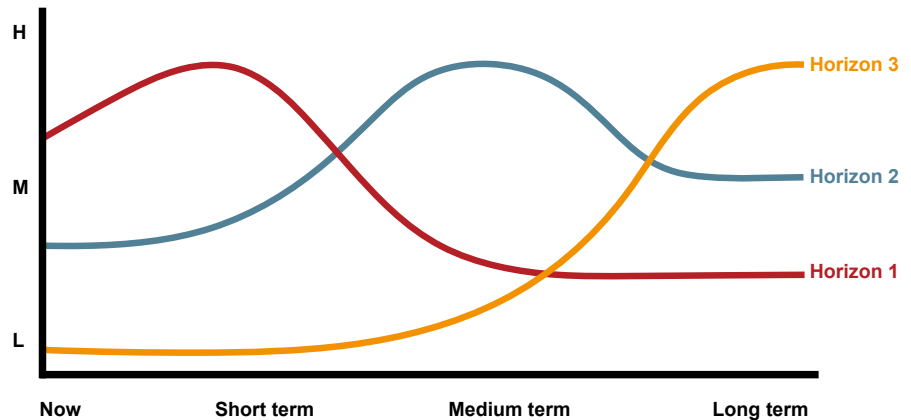

Figure 1: The three horizons model

H1 issues will become less important over time. They may be assimilated into policy or strategy or they may be overtaken by other trends or events that are less important now but will become more important in the medium term – **Horizon 2 (H2)**. Exactly how H2 will develop may not be apparent yet, but many of the key trends and factors – the change drivers – that will define it are already in play. The task for regulators, policy makers and strategists is to look at these issues closely, to explore the possible outcomes and to adapt policy and strategy in anticipation of future need. Ideally, this should be a collaborative process.

In the long term, H2 will give way to **Horizon 3 (H3)** and a new set of policy and strategy challenges will emerge. These, too, will require a response from policy makers, but the change drivers that will shape H3 are difficult to see in the present. It is not clear how H3 factors will develop, how they will interact or whether they will create opportunities or threats for stakeholders in the future. The task for regulators, policy makers and strategists here is therefore to identify and track the drivers that will shape H3. Doing so allows them to develop foresight about the strategic challenges and choices they might face in the long term future and to explore what kind of policy or strategy might be required to sustain success.

The main focus for futures and foresight is therefore the mid to long term: Horizon 2 and Horizon 3. The tools and techniques are designed to help policy makers identify the change drivers, to explore the various ways they might combine to change the future policy environment and to consider what the best policy response might be.

There is no fixed definition of what 'mid to long term' means. Timeframe is defined on a project by project basis, drawing on relevant factors (such as, for example, technology development, market development, consumer uptake and systemic change). For some projects this can mean thinking about a relatively near future – 15 to 20 years, say – and for others it might mean 50 to 60 years.

What to look for

Identifying and mapping change drivers – the key trends and factors shaping the long term development of the policy area – sits at the core of most futures and foresight work. Change drivers are typically characterised as the political, economic, societal, technological, legislative or environmental factors (shortened to the acronym PESTLE).

It is important to look beyond the current policy environment when identifying change drivers (Figure 2). Many of the drivers that will shape development of Horizon 2 and Horizon 3 will emerge from outside the policy area and it is important to think broadly and capture a wide range of drivers. It is always better to identify too many drivers – irrelevant one can be discarded later – than to think too narrowly and miss what could be important for the future.

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Policy delivery space

Policy development space
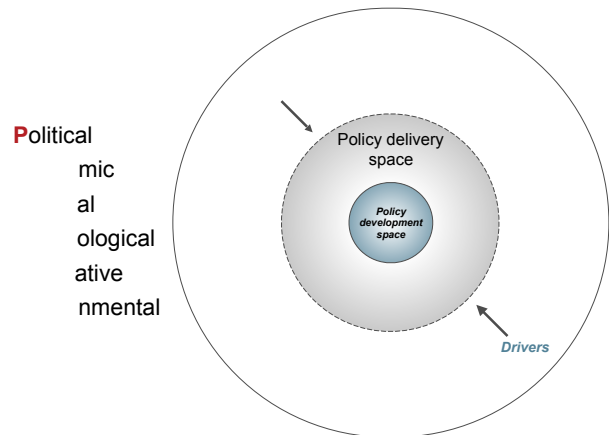
Drivers

Figure 2: Where to look for change drivers

Identifying weak signals

It is often easy to understand what is happening in and around a policy area in the present and near future. Important H1 trends and events stand out against the background and their impacts are clearly signalled to policy makers. The further forward scanners look, however, the weaker these signals become and the harder it can be to spot patterns and make sense of their meaning (Figure 3).

Horizon Scanning (a tool, see Chapter 6) focuses on identifying and making sense of these weak signals. By definition, there is little or no robust evidence associated with them and scanners may find it hard initially to identify exactly what the impact is going to be.

They may find it equally hard to explain why they believe a weak signal is important. That needn't matter. In the absence of robust evidence, scanners should trust their intuition when it tells them a weak signal indicates something that will be strategically important in the future.

H1

H2

H3

Figure 3: Intensity of signal

Linking futures and foresight to the policy and strategy cycle

In its simplest form, a policy cycle can be described as having 5 steps (Figure 4):

- Formulate policy using consultation, research and fit with the wider strategic or policy aims of government to establish relevant goals and targets
- Implement policy by creating and funding appropriate initiatives and policy instruments
- Monitor events to track progress towards goals and targets and to adjust activity if necessary

Formulate policy

Modify objectives

Implement policy

Evaluate Impact

Monitor events
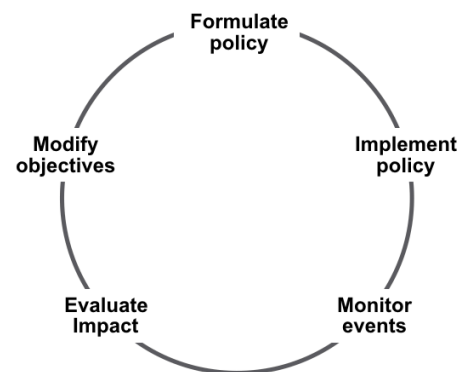
Figure 4: Illustrative policy cycle

- **Evaluate impact** against the project goals and targets and to test contribution to the overall strategy
- **Modify the objectives** if required to increase impact or strategic relevance

Looked at strategically, futures and foresight can be divided into four stages:

- Gathering intelligence about the future
- Exploring the dynamics of change
- Describing what the future might be like
- Developing and testing policy and strategy responses

Futures and foresight's primary input to the policy cycle is at the 'Formulate policy' step (Figure 5). This is where the ideas and insights that emerge from futures work can make their greatest contribution to policy development.

The connection between futures and foresight, and policy cannot, however, be taken for granted and many organisations find it culturally or procedurally difficult to make the link. Where this happens, futures can have less impact than it might otherwise do. Project owners therefore need to be alert to the possibility that their work may not have a guaranteed connection to wider policy and strategy discussions and need to factor that into the project design.
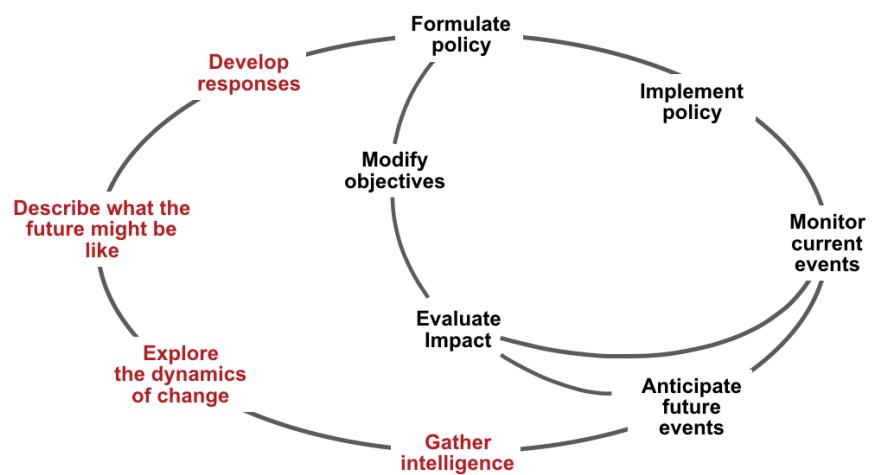
Figure 5: The futures bridge

One way to strengthen the connection is to involve as wide a group of policy makers as possible. Not only will this raise awareness of the project, but gathering intelligence from key stakeholders will build a bridge to current policy and strategy activity (Figure 5). If stakeholders have limited time, for example, they can be invited to contribute one or more scans or to participate in a 7 Questions interview (Chapter 6). If they have more time – or if it is important to engage them more deeply in the futures process – they can be invited to take part in a pathways workshop (Chapter 5) or a more extended project.

3.   Futures process design

Introduction

Every futures project is different. Some are large scale, involving extensive consultation, detailed research and stakeholder workshops to identify and advise on future policy challenges. Others are small scale, perhaps requiring only a single workshop with an internal policy or strategy team to explore what's driving change in the future and what that means for their own plan.

This chapter therefore sets out some of the common design issues that practitioners may encounter at the start of a new futures project and offers guidance on how to address them.

The project aims

Defining the specific aims of a futures project is not necessarily a trivial exercise and can take several rounds of discussion.

The Intelligent Infrastructure Futures project, conducted by GO-Science's Foresight unit, for example, was set up to…explore how future science and technology may be applied over the next 50 years to deliver robust, sustainable, intelligent, responsive and adaptive infrastructure systems.

GO-Science's Foresight project on Future of Food and Farming aimed to…explore the pressures on the global food system between now and 2050 and identify the decisions that policy makers need to take today, and in the years ahead, to ensure that a global population rising to nine billion or more can be fed sustainably and equitably.

These aims are quite distinct. Intelligent Infrastructure set out to explore how emerging science and technology might be applied to deliver a desired outcome. Food and Farming focused on policy decision making to deliver a desired outcome. Both projects considered science and technology, politics and decision making, value and values and the relationship between the future and the present but they approached it in different ways that were informed by the different aims.

Once a project aim is agreed, it can be used to shape process design. Project leaders should not, however, be concerned if they decide to adjust the aims in light of early discussions with stakeholders and others.

Project aims are sometimes captured as a question ('How might future science and technology be applied over the next 50 years to deliver robust, sustainable, intelligent, responsive and adaptive infrastructure systems?'). The question should be framed in broad terms rather than specific ones and should be open and not too focused. A question such as 'How will the design of cities in 50 years' time create social and economic wellbeing?' is likely to lead to a richer conversation than 'How should we design the city of the future?' A broad question helps participants think more widely about the range of factors that (in this case) define the purpose and development of a city and its population rather than focusing solely on physical structure.

Scale

Futures projects can be large or small. They may be delivered primarily in house or they may involve a wide range of external stakeholders. Participants may be familiar with futures and foresight or they may have little knowledge of it.

Intelligent Infrastructure Futures, for example, engaged nearly 300 people at national, regional and local level and commissioned leading researchers to write 18 state of the art research reviews covering areas as diverse as artificial intelligence, data mining, how information affects our choices and the psychology of travel.

At the other end of the scale, the Health and Safety Executive uses futures and foresight to identify new and emerging issues that might affect future workplace health and safety[2]. Five FTEs use a range of tools – Horizon Scanning, 7 Questions, Delphi, Driver Mapping, Axes of Uncertainty, Scenarios, Policy Stress-testing and SWOT Analysis – on a continuing basis to inform specialists and policy colleagues of what the future implications of emerging issues might be.

There is no optimal scale for futures and foresight processes, but processes require some adjustment and project planning if they are to be scaled up – or down – significantly.

Who to involve

Anyone with any kind of interest in – or influence on – the future of the policy or strategy issue can be invited to participate in a futures project. In particular, anyone who is likely to use the project outputs should be involved in their development if possible. If a strategy team is developing scenarios for an executive board, for example, the executive board should be involved in developing the scenarios and not just be given them at the end of a process. This will ensure the knowledge and insights of the executive board are included in the scenarios. It will also ensure the executive have ownership of the scenarios.

It is important to involve key stakeholders and senior decisions makers early in the process in order to build ownership and understanding of the futures approach and its outputs. Invite them to participate in development workshops or contribute to horizon scans. Experts or senior figures who have limited time and can't make the workshop programme should at least be interviewed. International experts should be involved in Delphi to gather their opinion on strategic issues.

Aim to involve as wide a group of stakeholders as possible such as other departments, businesses, third sector organisations and interest groups. A particular benefit of the futures approach is that stakeholders with differing, even conflicting, objectives can work together to develop and explore future scenarios. Bringing individuals with different opinions into Horizon Scanning, interview programmes and scenario workshops facilitates development and sharing of new insights and effective responses to future challenges.

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[2] There is more detail on this project – and others across government – in Annex 4.

4.   Using the toolkit

Introduction

The Toolkit contains 12 tools, organized into four categories and described in detail in the relevant chapter.

There are four tools for gathering intelligence about the future   ⯈ Chapter 6
- Horizon Scanning
- 7 Questions
- The Issues Paper
- Delphi

There are two tools for exploring the dynamics of change   ⯈ Chapter 7
- Driver Mapping
- Axes of Uncertainty

There are three tools for describing what the future might be like   ⯈ Chapter 8
- Scenarios
- Visioning
- SWOT Analysis

There are three tools for developing and testing policy and strategy   ⯈ Chapter 9
- Policy Stress-testing
- Backcasting
- Roadmapping

The tools are summarised in the tables on pages 9 to 12. The relationship between the different categories is presented graphically in the icon map on page 13.

The Toolkit also contains 7 pathways – tools combined in particular ways to meet specific business needs. The pathways are set out in Chapter 5.

The final two sections of this chapter introduce the guidance notes for facilitators and the navigation flags.

Tools for gathering intelligence about the future

Tool	Use it to	Time required
Horizon Scanning is the process of looking for early warning signs of change in the policy and strategy environment	• involve a wide group of people in futures thinking • gather a data bank of ideas about trends and events shaping the future	• run it over a number of weeks as a one off exercise • run it throughout a project to build strategic intelligence about change in the external environment
7 Questions is an interview technique for gathering the strategic insights of a range of internal and external stakeholders	• identify conflicting or challenging views of the future • extract deep information about underlying concerns in a policy area • stimulate individuals' thinking in preparation for a futures workshop	• 60 minutes to conduct each interview • 60 minutes to write up each interview
The Issues Paper presents quotes from the 7 Questions interviews to illustrate the strategic issues and choices around the policy and strategy agenda	• capture different perspectives from the 7 Questions interviews about what success in the future will be like and what needs to be done to achieve it	• allow 20 to 30 minutes to process each of the 7 Questions interview per interview
Delphi is a consultation process used to gather opinion from a wide group of subject experts about the future and to prioritise the issues of strategic importance	• gather opinion from a group of experts • refine thinking on the future • highlight the potential trade offs and choices that policy design will need to address	• varies. Can take several weeks

Tools for exploring the dynamics of change

Tool overview	Use it to	Time required
Driver mapping is used to identify the political, economic, societal, technological, legislative and environmental (PESTLE) drivers shaping the future policy environment	• identify drivers shaping the future • identify which drivers are most important for the future of the policy area or strategic endeavour • distinguish between certain and uncertain outcomes resulting from the action of drivers	• 1.5 to 2 hours in a workshop setting • 45 to 60 minutes for a small team discussion
Axes of uncertainty are used to define the critical uncertainties for the policy area in the future and to frame the scenarios	• characterize the nature of the critical uncertainties facing the policy area in the future • agree which critical uncertainties are most important • create a meaningful and focused scenario matrix	• 90 minutes

Tools for describing what the future might be like

Tool overview	Use it to	Time required
Scenarios are stories that describe alternative ways the external environment might develop in the future. Each scenario explores how different conditions might support or constrain the delivery of policy and strategy objectives	• explore different ways that the policy area might develop in the future • consider how key actors – government, businesses, citizens, competitors – might behave under different conditions • identify the key requirements of policy under different external conditions	• 2 to 3 hours or more (the exact time depends on the size of the group and the specific objectives)
Visioning is used to create a set of common aims and objectives for a project and to describe what the future will be like if they are delivered	• focus groups on what a successful outcome looks like • agree what the current reality is and what needs to be done to deliver success • set out and prioritise the steps required to achieve the vision	• 2 to 3 hours
SWOT Analysis is an analysis of Strengths, Weaknesses, Opportunities and Threats. Strengths and weaknesses are internal factors that need to be taken account of when developing policy or strategy. Opportunities and Threats are external factors that need to be considered.	• identify what needs to be done to capture and build on opportunities • identify what needs to be done to mitigate threats • identify internal priorities and challenges	• 60 minutes

Tools for developing and testing policy and strategy

Tool overview	Use it to	Time required
Policy Stress-testing is a method for testing strategic objectives against a set of scenarios to see how well they stand up against a range of external conditions	• explore how different scenarios might affect strategic objectives • identify which objectives are robust across the full range of scenarios and which will need to be modified if conditions change in the future	• 1.5 to 2 hours
Backcasting is a method for determining the steps that need to be taken to deliver a preferred future	• identify what needs to change between the present and the preferred future • build a timeline that sets out the key changes • determine and address the key internal and external factors that might affect the timing or scale of change	• 4.5 to 5 hours
Roadmapping shows how a range of inputs – research, trends, policy interventions, for example – will combine over time to shape future development of the policy or strategy area of interest	• build a holistic picture of the different elements in a project and how they combine over time • deepen understanding of the connections and relationships between different elements	• 60 to 90 minutes for an initial map • Can be further developed throughout the life of the project if required

The icon map

The relationship between the different tools can be represented schematically by grouping the icons into the 4 categories.

| Gathering intelligence about the future | Exploring the dynamics of change | Describing what the future might be like | Developing and testing policy and strategy |

Figure 6: The icon map
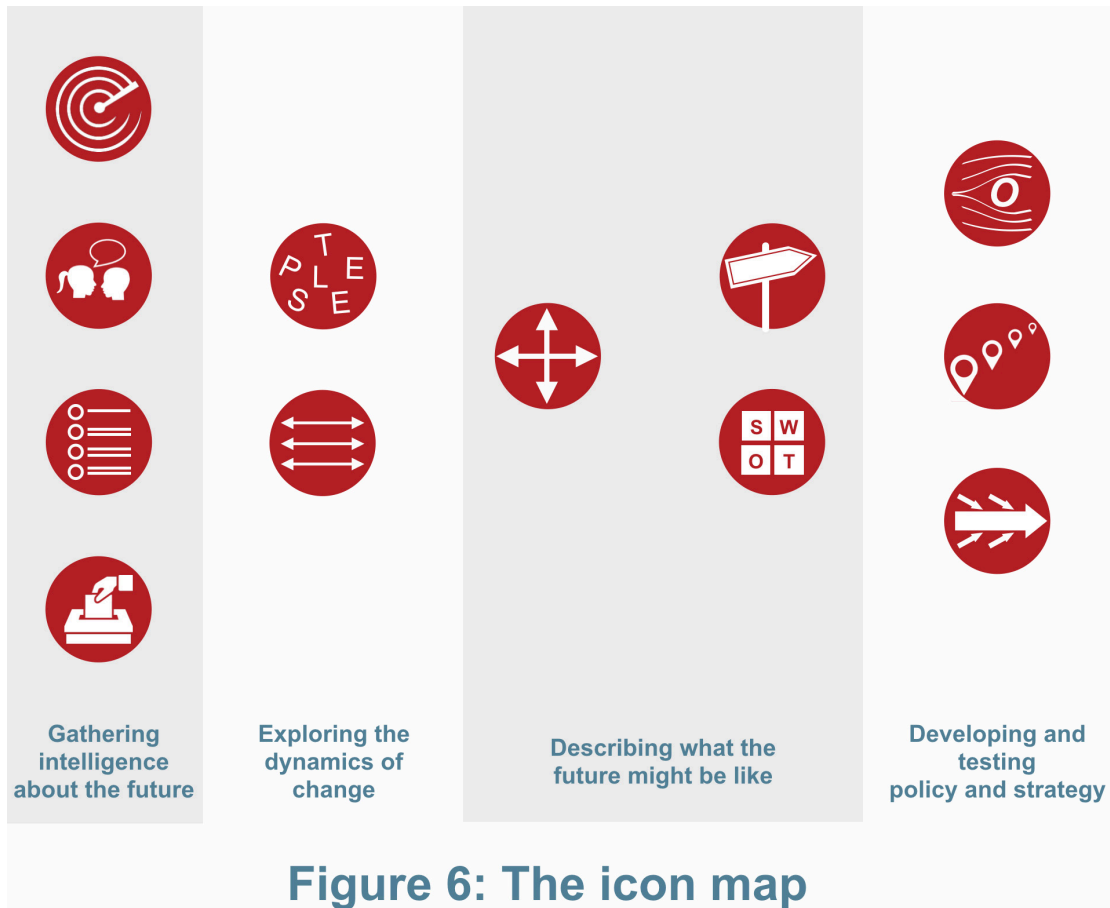
As well as providing a useful visual representation of the different techniques, the icon map helps to define the process relationship between them. Icons on the left of the map represent tools that are generally used before ones on the right. While this is not set in stone – Roadmapping, for example, can be used throughout the project – it is broadly the case.

The icon map is used in two ways. In Chapter 5, where the Toolkit sets out pathways that show how to combine tools in different ways to meet specific business needs, the icon map provides an immediate visual representation of the tools being used. The map for Pathway 5 *(Exploring and communicating the complexity of a situation)*, for example, shows that 6 tools are used:

- Horizon Scanning
- Driver Mapping
- Axes of Uncertainty
- Scenarios
- SWOT Analysis
- Roadmapping

In the rest of the Toolkit, the icon map is used to remind users which techniques relate to each of the 4 different categories.

Guidance for facilitators

Facilitating futures thinking requires both an understanding of individual techniques and a degree of skill in managing groups through a strategic process. Some of the tools and processes included here are relatively straightforward to manage and others require facilitators to think through the process in advance and identify any adjustments that might need to be made.

The tools include facilitation notes that offer practical advice on various aspects of the process. The notes are found in the yellow boxes placed in the margin at the relevant point in the process.

Facilitation notes

Each tool offers some guidance on the degree of facilitation skill required to deliver it. There are three levels:

- Novice, where the tool is straightforward and can be delivered by facilitators with limited experience
- Advanced Beginner, where the tool requires some customisation to fit it to the specific needs of the task
- Experienced, where both the tool and the facilitation approach may need significant customisation

This is not intended to suggest that someone new to futures can only facilitate a Novice level tool; rather, it suggests something about the degree of preparation and design though that is required to run the tool successfully. Someone new to futures can certainly run an Experienced level tool but will need to familiarise themselves with the underlying ideas and think through the steps and facilitation process in more detail than for the other two levels.

Overall, process design is taken care of in the way the tools are described – but facilitators should not hesitate to adjust or customise the process as they need to. Particularly once they feel comfortable with techniques and have some experience of using them, facilitators will want to introduce their own design improvements.

There may be occasions when a team wants to bring in an external facilitator. Externals are useful if they have a particular technical skill that is missing from the in-house team or if the team wishes to use someone who is a neutral independent.

Navigation flags

There are 3 types of navigation flag used in the Toolkit.

Blue boxes are found on the introductory page for each tool and indicate how each tool links to others in the Toolkit.

Links

Blue signposts are found at the end of a number of tools and point towards the case studies (Annex 4) that illustrate how the particular tool is used in practice.

Case studies

Red signposts indicate alternative start points for techniques – if, for example, the facilitator is continuing from a previous technique rather than starting a fresh workshop.

Starting Point

5.   Pathways designed to meet specific business needs

Introduction

The 12 tools are flexible and adaptable and can be customised to meet the needs of most futures projects. To illustrate how to combine tools, this chapter describes 7 pathways designed to meet specific business needs identified by futures practitioners.

There are 7 pathways

Business need:	**Building futures intelligence**
Aim:	To develop a deep understanding of the underlying issues that will shape the policy area in the near, mid and long term
	To use that understanding to scope the policy development process

Primary activities:	Desk research and interviews followed by a workshop to discuss the findings
Tools:	Horizon Scanning, 7 Questions, Issues Paper
Participants:	Internal stakeholders, external stakeholders, subject experts
Number:	No limit
Timing:	Several weeks
The approach:	A project managed round of intelligence gathering and analysis

The main steps are

1. Invite team members plus suitable externals – academics, industry experts, non-government organisations (NGOs) for example – to join the intelligence gathering team.

2. Start 2 strands of activity: Horizon Scanning and 7 Questions interviews. The same people can do both if you choose.

3. Establish a file structure for storing and sharing information

4. Run both strands for a suitable period of time – say 6 to 8 weeks

5. Gather the individual scans into one document, randomly

6. Prepare an Issues Paper

7. Gather the team together for a workshop to

   • examine the horizon scans

   • review the Issues Paper

   • identify emerging issues and themes

   • identify the implications for the policy areas

8. Produce a workshop report that summarises all strands of work and highlights the implications for scoping or defining the policy areas

Output:	A horizon scanning report, an Issues Paper and a workshop report highlighting the implications for scoping or defining the policy areas

Business need:	**Creating a shared ambition for the future**
Aim:	To build a shared aspiration of future success
	To create a shared sense of purpose and understanding of the futures task
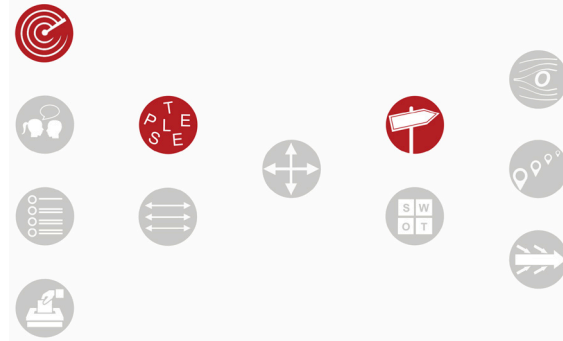
Primary activities:	Desk research leading to a workshop to determine the vision
Tools:	Horizon Scanning, Driver Mapping, Visioning
Participants:	Members of the policy team who are new to futures (experienced team members can participate as well)
Number:	Between 6 and 16
Timing: scanning	5 hour workshop. 4-6 week lead time if participants also carry out
The approach:	The heart of this pathway is a one day workshop where participants use Driver Mapping and Visioning. If there is time, participants should carry out Horizon Scanning before the workshop. If there is no time – and if one is available – participants can read a Horizon Scanning paper instead

The main steps are

1. If there is time, invite participants to carry out Horizon Scanning around the policy area. There is an option to use the tool as an individual learning exercise rather than a shared information gathering exercise if time is limited (i.e., participants do not need to share abstracts). If there is no time for Horizon Scanning, give participants an existing Horizon Scanning paper to review prior to the workshop.

2. Run a workshop where participants

   - brainstorm drivers shaping the policy area in the future
   - map the drivers to identify predetermined elements and critical uncertainties
   - use the mapping exercise to identify key factors for the vision
   - determine the vision
   - determine what need to be done to achieve the vision

3. Produce a report that sets out the conclusions of the workshop and records the consolidated vision. Send it to all participants

Output:	A workshop report which sets out an agreed ambition of the future

Business need:	**Futureproofing policy**
Aim:	To test policy options against a range of future conditions
	To determine whether – and how – policy options should be modified to meet policy objectives in light of the time constraints

Primary activities:	Workshop
Tools:	Policy Stress-testing
Participants:	People with responsibility for the policy or strategy area. Participants will work with scenarios but don't need to have developed them.
Number:	Between 6 and 16
Timing:	1.5 – 2 hours
The approach:	The aim of this pathway is to use a set of scenarios to test policy options.
	The scenarios may have been developed as part of a project to explore the future of this policy area; or policy makers may want to use a generic set of scenarios as a context for the conversation.
	If the latter is the case, the facilitator will need to find a suitable set of existing scenarios and customise them to the needs of the project. Existing scenarios do not need to be specific to the policy area; any (broadly) up to date socio-economic scenarios will work well.
	The steps are set out in the Policy Stress-testing tool. The facilitator should:

1. Introduce the scenarios.

2. Review the policy or strategy objectives being tested

3. Test the objectives against all scenarios

4. Focus in particular on how the time requirement of the project determines robustness and resilience of the outcomes and determines the need for objectives to be modified or adapted

5. Review the findings and discuss the implications for policy

6. Prepare a report following the workshop that records the findings from the workshop and circulate it to all participants.

Output:	A report that records the outcome of the workshop conversations.

Business need:	**Futureproofing policy**
Aim:	To test policy options against a range of future conditions
	To identify which aspects of the policy options are robust across a range of futures and which need modified to ensure the policy is resilient
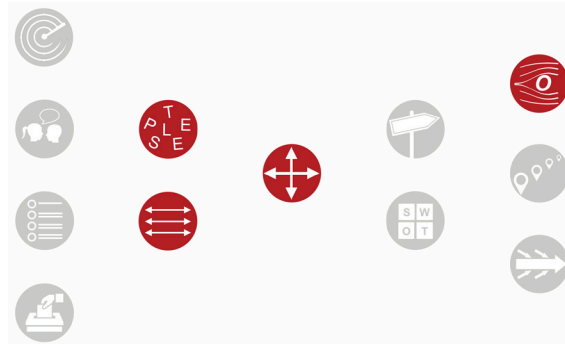
Primary activities:	Workshop
Tools:	Driver Mapping, Axes of Uncertainty, Scenarios, Policy Stress-testing (collectively sometimes referred to as Scenario Building)
Participants:	People with responsibility for the policy or strategy area. Some external experts will add value
Number:	16
Timing:	1.5 days. Can be run as a full day plus half day or as three half days
The approach:	The aim of this pathway is to develop a new set of scenarios that reflect the changing dynamics of the policy area and use them to test policy options.

The main steps are:

1. Brainstorm drivers shaping the policy area in the future

Steps 1 to 3 take half a day

2. Map the drivers to identify predetermined elements and critical uncertainties

3. Focus on the critical uncertainties and identify the main Axes of Uncertainty

Step 4 takes half a day

4. Create a scenario matrix and develop four scenarios

5. Use the scenarios to test the policy options for the new policy area

Step 5 takes 2 hours

6. Produce a workshop report that documents the process, the scenarios and the outcomes of the Policy Stress-testing exercise. Record, in particular, any suggested modifications to the policy options. Circulate the report to all participants

Output:	A set of bespoke scenarios and policy options

Business need:	**Developing knowledge of the dynamics of change and understanding alternative ways that policy might develop**
Aim:	To focus on change that is directly relevant to a policy or strategy area
	To understand what is driving change
	To explore the impact of change on the policy areas
	To build clarity around which change drivers are relevant for the policy area and which are not
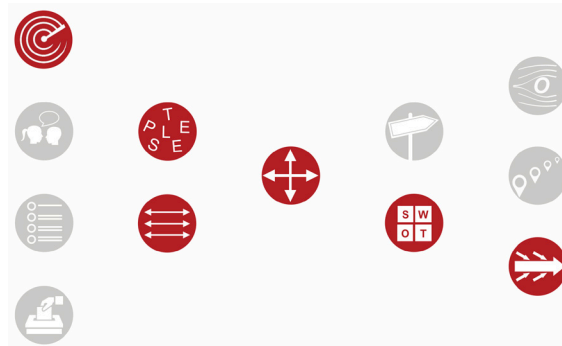
Primary activities:	Desk research, workshops
Tools:	Horizon Scanning, Driver Mapping, Axes of Uncertainty, Scenarios, SWOT Analysis, Roadmapping. Depending on the scale of this pathway, 7 Questions can add value to the process
Participants:	Experts, policy problem holders, those with responsibility for communicating or managing a specific policy area
Number:	As many as required. The pathway can be divided up; different people can participate in different stages. Some may only do Horizon Scanning, some may only develop scenarios or a roadmap
Timing:	As required. Weeks for Horizon Scanning and for building the roadmap. The scenarios can be built in one workshop or over a period of time
The approach:	This pathway is highly customizable to need. It can involve as few or as many people as required. It can be used to build detailed understanding of the dynamics of change in a small group of individuals who then communicate it more widely – or it can be used as a large scale learning exercise to build understanding of, and promote discussion about, the dynamics of change
	If the primary objective is to build detailed understanding of the dynamics of change in a small group of individuals who then communicate it more widely, run the methodology (set out on the next page) with that team.
	If, on the other hand, the primary objective is to manage a large scale learning exercise with a cohort of policy or strategy partners in order to explore and deepen understanding of the dynamics of change, run the methodology with a large group.

The main steps are

1. Build a first draft roadmap with appropriate participants

2. 2. Invite team members plus suitable externals – academics, industry experts, NGOs for example – to do the Horizon Scanning. This might take between 6 and 8 weeks.

3. Establish a file structure for storing and sharing information

4. Gather the individual scans into one document, randomly

5. Gather the team together for a workshop to

   - examine the horizon scans

   - review the Issues Paper

   - identify emerging issues and themes

   - identify the implications for the policy areas

6. Produce a workshop report that summarises all strands of work and highlights the implications for scoping or defining the policy areas

7. Gather appropriate participants together to refine and develop the roadmap. Use the output from the workshop to do this.

Output: Shared understanding of the current and emerging complexity of the policy area, together with an emerging and dynamic roadmap that maps out and helps to explicate some of the complexity involved

Business need:	**To identify gaps in your knowledge about what will be important in the future**
Aim:	To identify 'known unknowns' and 'unknown unknowns'
	To begin formulating hypotheses about future issues
	To shape the future research agenda
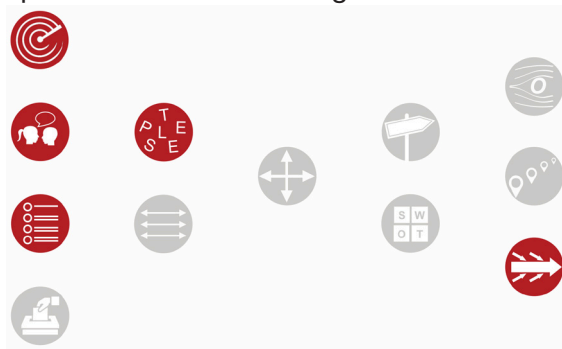
Primary activities:	Desk research, interviews, workshops
Tools:	Horizon Scanning, 7 Questions, the Issues Paper, Driver Mapping, Roadmapping
Participants:	Experts, policy problem holders
Number:	No restriction to participation, but best managed by a small research team
Timing:	Continuing over a number of weeks
The approach:	The pathway is focused on producing a roadmap that draws together emerging trends to highlight the potential future development of the policy area. The roadmap highlights trends and developments to track over time.

The main steps are:

1. Invite team members plus suitable externals – academics, industry experts, NGOs for example – to join the intelligence gathering team

2. Start 2 strands of activity: Horizon Scanning and 7 Questions interviews. The same people can do both strands – or you can run them discretely.

3. Establish a file structure for storing and sharing information

4. Run both strands for a suitable period of time – say 4 - 6 weeks

5. Gather the individual scans into one document, randomly

6. Prepare an Issues Paper

7. Gather the team together for a workshop to

   - examine the horizon scans

   - review the Issues Paper

   - identify emerging issues and themes

   - map *when* the emerging issues and themes are likely to impact on the policy area and *how* they will impact

8. Use the output from the workshop to build a roadmap of the future development of the policy area [you may already have built a roadmap in which case the workshop will develop it further]. Focus in particular on emerging issues and previously unrecognised gaps in knowledge.

Output: An evolving roadmap

Pathway 7
Identifying and prioritising future opportunities and threats for action

Business need:	**Determining short, medium and long term opportunities and threats**
Aim:	To agree future opportunities and threats
	To prioritise areas for action

Primary activities:	Desk research, workshops
Primary tools:	Horizon Scanning, Driver Mapping, SWOT Analysis
Participants:	Subject experts, policy problem holders
Number:	Say 10 to 12 or more for the Horizon Scanning. Policy problem holders in a workshop
Timing:	Weeks for Horizon Scanning, short day workshop
The approach:	The main steps are

1. Invite team members plus (if appropriate) suitable externals – academics, industry experts, NGOs for example – to do the Horizon Scanning.

2. Establish a file structure for storing and sharing information

3. Gather the individual scans into one document, randomly

4. Gather the team together for a workshop to

   - review the horizon scans

   - identify and map drivers.

   - do not identify priority drivers; instead, categorise *all* drivers in the top two quadrants as either threats or opportunities for the policy area

   - for all threats, identify

     o whether the threat will impact on the policy area in the short, medium or long term [define what timescale you mean]

     o the potential outcome and the implication for policy or strategy

     o whether the threat is in your control or not

     o what action you can take directly or indirectly to mitigate the threat

     o who you want to work with or through to deliver that action

- for all opportunities, identify
  - o   whether the opportunity will impact on the policy area in the short, medium or long term [define what timescale you mean]
  - o   the potential outcome and the implication for policy or strategy
  - o   what action you should take directly or indirectly to capture the opportunity or to enhance its additionality
  - o   who you want to work with or through to deliver that action
- produce a workshop report that summarises all conversations, that prioritises opportunities and threats according to urgency and that sets out an action plan to capture opportunities and mitigate threats

Output: Analysis of future threats and opportunities, with priority areas identified and initial plans for action in place.

6.   Tools for gathering intelligence about the future

Horizon Scanning is the process of looking for early warning signs of change in the policy and strategy environment

7 Questions is an interview technique for gathering the strategic insights of a range of internal and external stakeholders

Issues Papers present quotes from the 7 Questions interviews to illustrate the strategic issues and choices around the policy and strategy agenda

Delphi is a consultation process used to gather opinion from a wide group of subject experts about the future and to prioritise the issues of strategic importance

Horizon Scanning

Horizon Scanning is the process of looking for early warning signs of change in the policy and strategy environment

Aims:
⬤ To gather information about emerging trends and developments that could have an impact on the policy or strategy area in the future

⬤ To explore how these trends and developments might combine and what impact they might have

⬤ To involve a range of people in futures thinking and increase their knowledge and insight about the changing policy environment

Approach: Combines desk research and – if required – workshop discussion

Participants: Anyone you want to involve in futures work. Participants can come from inside or outside the team or organization

Number: No restriction

Timing: Best run over several weeks. Can be run throughout the project to build intelligence about the changing external environment

Facilitation: Novice

Output: Individual scans gathered into a horizon scanning report. Scans can be presented by theme or set out randomly

Outcome: Horizon Scanning helps participants read news articles and journals differently and to develop a long term perspective

Good for:
⬤ Engaging people in the futures process
⬤ Gathering a range of opinion

Risk: **Low.** The main risk is not including important or insightful stakeholders, resulting in missed content and lowered credibility

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Get here from…

- Horizon Scanning is the first step in gathering intelligence through desk research

Move on from here to…

- Driver Mapping

Use the output to inform…

- Delphi
- Driver Mapping
- Scenarios
- Visioning

The Approach

Horizon Scanning looks towards the long term (Horizon 2 to 3) but is not focussed exclusively on it; many H3 developments are the long term outcome of a range of factors, some of which are in play already.

Horizon Scanning is an open ended process that can involve as many people as you want. Start with the internal team and then think about inviting externals who have a good knowledge of the policy area. To keep the process manageable, you may wish to start with no more than 10 people. You can expand the network at a later date once you have worked out the logistics of your Horizon Scanning process.

Start by asking each scanner to produce one short article (or 'scan') per week that describes:

- what the scan is about
- how it relates to the policy or strategy area
- why the reader thinks it is important and what thoughts the scan stimulated

The scan can contain links to the original source material and to any other relevant or interesting articles that the scanner is aware of. Ideally, scanners should keep each scan to a single page.

This is a productive process: 10 authors each producing one scan per week will produce 60 scans (or more) over 6 weeks. You will need a project manager to gather the individual scans and to organise them.

Horizon Scanning is relatively straightforward but does rely on intuition and insight – which can feel counterintuitive to those who are more practiced in evidence based strategic thinking. The hardest part for many authors is knowing whether something they have read is interesting or different enough to include in the scan. Scanners should always err on the side of being irrelevant.
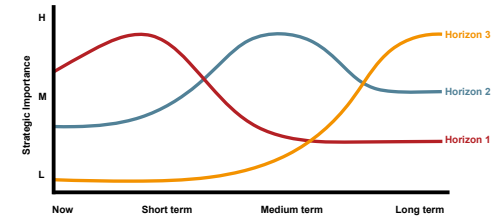
Scans can be organized in the horizon scanning report using the PESTLE framework (see **Driver Mapping**) but it is often more interesting to group them by themes that emerge from the scans themselves

Find sample scans in Annex 1

See the case studies in Annex 5

7 Questions

7 Questions is an interview technique for gathering the strategic insights of a range of internal and external stakeholders.

Aims: ▸ To identify strategic issues that need to be addressed in the futures work programme

▸ To stimulate individuals' thinking in advance of a futures workshop

▸ To involve people who cannot take part in futures workshops

▸ To identify conflicting views of the future

Approach: Confidential interviews. Ideally carried out by 2 people, one to lead the interview and one to take detailed notes

Participants: Anyone you want to involve in futures work. They can come from inside or outside the team or organization

Number: No restriction

Timing: Interviews last approximately 60 minutes
The interview programme is best run at the start of a futures process but can continue throughout

Facilitation: Novice

Output: Different perspectives of what success in the future will be like and what needs to be done to achieve it

Outcome: Engagement in the futures process

Good for: ▸ Building enthusiasm for the futures process

▸ Developing your understanding of the different issues and opinions to be addressed in the project

▸ Extracting deep information about underlying concerns

Risk: **Low.** The main risk is not including important or insightful stakeholders

Get here from…

- 7 Questions is the first step in one approach to gathering intelligence from stakeholders

Move on from here to…

- The Issues Paper

Use the output to inform…

- Visioning
- SWOT Analysis
- Policy Stress-testing

The Approach

The 7 Questions technique was pioneered by Shell in its scenario planning process. It is a powerful tool for gathering opinion from diverse stakeholders on the strategic issues that need to be addressed in a given policy area and for highlighting areas of agreement or conflict about the way forward.

Interviews are conducted under the Chatham House rule – interviewees can be quoted but the quotes must be anonymous – and focus on 7 broad areas:

- The critical issues for the policy or strategy area being considered

- What a favourable outcome is

- What an unfavourable outcome is

- The key operational, structural and cultural changes that need to be made to deliver the favourable outcome

- Lessons from the past

- Decisions which must be prioritised

- What the interviewee would do if (s)he had absolute authority

The questions are open ended: interviewees speak as much or as little as they want, without any prompting from the interviewers. That's not always easy (for either side) but it's important to let the interviewee follow his or her train of thought without interruption. Silence often means interviewees are thinking about issues prompted by the question. Typically, 80% of the strategic issues for the future are uncovered in the first 12 to 15 internal interviews. Further interviews are done to uncover the remaining issues and to include people in the process. Use external stakeholder interviews to get a different perspective on the issue or potential policy response.

There are two commonly used versions of the questionnaire. The first is close to the original used by Shell; the second is broadly similar but less personal in tone. The latter is a better approach to use where asking for a more personal view might be seen as too subjective or might inhibit some interviewees. Both versions are set out on the next page.

> It's best to conduct these interviews face to face; ideally in the interviewee's office or a place of their choosing. If logistics are tricky, interviews can be done over the phone – but expect them to take less time and yield a little less insight

> If you have the resource, take two people to the interview. One should lead the questions, both should capture the response. It's a useful safety net in case one of you misses something that's said

Version 1 (Based on Shell):

1. If you could speak someone from the future who could tell you anything about [this venture], what would you like to ask?

2. What is your vision for success?

3. What are the dangers of not achieving your vision?

4. What needs to change (systems, relationships, decision making processes, culture for example) if your vision is to be realised?

5. Looking back, what are the successes we can build on? The failures we can learn from?

6. What needs to be done now to ensure that your vision becomes a reality?

7. If you had absolute authority and could do anything, is there anything else you would do?

Practice active listening. Try to capture the interviewee's language and turns of phrase in your notes. These add interest –and often insight – to the interview output

Version 2:

1. What would you identify as the critical issue for the future?

2. If things went well, being optimistic but realistic, talk about what you would see as a desirable outcome.

3. If things went wrong, what factors would you worry about?

4. Looking at internal systems, how might these need to be changed to help bring about the desired outcome?

5. Looking back, what would you identify as the significant events which have produced the current situation?

6. Looking forward, what do you see as priority actions which should be carried out soon?

7. If all constraints were removed and you could direct what is done, what more would you wish to include?

Have a few prompts or questions on specific topics ready in case interviewees find the open ended questions difficult

Writing up the interviews

You may want to send a write up of the interview to the interviewee for them to verify – particularly if there are contentious issues or if you are planning on using the interview to produce an issues paper for wider circulation. In this case, having quotes verified can be valuable.

It is rare – but not unknown – for interviewees to amend the write up. Usually this is to clarify a particular perspective that may not have come over as the interviewee wanted; but occasionally (experience suggests 1 interview in 50 or less) it is because the interviewee prefers to – or needs to – be circumspect.

Even if you don't plan to send a copy of the interview to the interviewee, you may still wish to write it up for archive and audit purposes. This is particularly valuable if there are no plans to produce an issues paper from the interview stage.

Find a sample interview in Annex 1

The Issues Paper

The Issues Paper presents quotes from the 7 Questions interviews to illustrate the strategic issues and choices around the policy area

Aims: ➡ To set out the main ideas and issues surrounding the policy area that were identified in the interview programme

➡ To identify the emerging themes that need to be tackled

➡ To highlight conflicting views of the future and expectations of the policy

➡ To highlight the potential trade offs and choices that policy design will need to address

Approach: Select key quote from the interviews and organise them by theme

Participants: The Issues Paper is developed by the project team

Timing: Varies – can take several weeks

Facilitation: Advanced beginner

Output: An Issues Paper (or slides) that capture different perspectives of what success in the future will be like and what needs to be done to achieve it

Outcome: Qualitative analysis of stakeholder perspectives and of the strategic challenges and choices or policy development

Good for: ➡ Providing a snapshot of current thinking and different perspectives

➡ Highlighting areas of agreement and disagreement

➡ Highlighting sensitive issues

Risk: **Medium.** Some issues raised in the interview programme may be politically sensitive and may need to be handled carefully

Get here from…

- 7 Questions

Move on from here to…

- The Issues Paper is the final output from the 7 Questions interviews

Use the output to inform…

- Visioning
- SWOT Analysis
- Policy Stress-testing

The Approach

The issues paper can be developed as the interviews progress.
Once each interview is complete, highlight up to 10 quotes that seem to be most important in each interview. Spot them by:

- using your intuition
- noticing where issues come up repeatedly
- paying attention to comments like – "this one is really key…"

For the first few interviews, simply list the quotes as bullet points. Think about lightly editing the quotes to remove any references that might cause the interviewee to be identified. As the interviews proceed, keep selecting key quotes and add them to the paper.

After four or five interviews, you'll notice some themes appearing and you can begin to group quotes accordingly.

Let the themes evolve – they will almost certainly change as you draw in more interviews. Group quotes together within each theme according to correlation (or opposition) of viewpoints. There's no need to provide any analysis of the quotes as part of the paper; the quotes and how you group them create their own narrative.

The Issues Paper is a powerful analytical tool for the policy and strategy development team. You may also want to circulate the paper more widely to interviewees, to people participating in workshops or to senior stakeholders. Drawing out key quotes at different stages of a workshop conversation (for example) can be a useful way to focus groups on important areas for discussion.

> Think about what you want the issues paper to accomplish before you circulate it widely. There may be contentious or sensitive issues in it and you may wish to explore these further in workshops

> The issues paper focuses primarily on issues internal to the policy or strategy area (or to organisations within it) and on highlighting which aspects of the current situation need to change

> Find a sample issues paper in Annex 1

Delphi

Delphi is a consultation process used to gather opinion from a wide group of subject experts about the future and to prioritise the issues of strategic importance

Aims:
- To gather opinion from a group of experts
- To refine thinking on the future
- To highlight conflicting views of the future and expectations of the policy
- To highlight the potential trade offs and choices that policy design will need to address

Approach: Consultation with experts

Participants: A panel of identified subject experts

Number: 12 to 16

Timing: Varies but can take several weeks

Facilitation: Experienced

Output: A prioritised list of issues for the project to address

Outcome: Engagement of a group of subject experts who can become advocates for the project

Good for:
- Refining the project scope
- Refining the project priorities

Risk: **Medium.** May require some negotiation between experts in the final stages

Get here from…

- Delphi is the first step in gathering intelligence from a panel of external experts

Move on from here to…

- Driver Mapping

Use the output to inform…

- Scenarios
- Policy Stress-testing

The Approach

The Delphi process involves working with an expert panel over several rounds of discussion to identify and prioritise strategically important issues. Responses are anonymous; participants can know who else is involved, but not what they have said. Anonymity ensures that opinions are heard independently without bias and can help to avoid groupthink.

Delphi can be conducted by mail or e-mail, in an online conference or by using specialist software. The latter is efficient and effective, particularly across different time zones.

There are 7 steps:

Step 1: Define the question

Step 2: Appoint a facilitator and engage the panel

Step 3: Gather and consolidate first round responses

Step 4: Identify the most important ideas

Step 5: Rank the most important ideas

Step 6: Review the ranking and identify priority issues for the project

Step 7: Explore the ranking in a workshop with the panel

> If running an online Delphi process, make sure the software can deliver the process you want.

Define the question

The question to explore should point at the broad policy or strategy area. Keep it open and not too focused: a question framed as 'How will the design of cities in 50 years' time create social and economic wellbeing?', for example, is likely to lead to a richer conversation than a question framed as 'How should we design the city of the future?'

Appoint a facilitator and engage the panel

Appoint a facilitator who is experienced in process design and managing group dynamics.

The panel is made up of subject experts who are selected to represent a wide spectrum of opinion. The optimal size is 12 to 18 people. You may want to widen participation in later stages, or even to repeat the exercise with different groups.

> Aim for a mix of experts that includes academics, practitioners in the business area, government and NGOs

Horizon Scanning | 7 Questions | The Issues Paper | Delphi

Gather and consolidate first round responses

The first round is comparable to a brainstorm. Invite panel members to submit their initial responses – say 8 to 10 ideas each – to the project question. This will generate around 150 ideas. Review all the responses and remove any duplicates.

Identify the most important ideas

Send the full set of ideas back to all panel members and ask each one to identify their top 10. Participants shouldn't rank ideas at this stage, they should simply identify them.

Review the responses and identify which ideas appear in the top 10 most often. These are the most important ideas that go forward to the next stage. For example,

Idea	Times selected	% of respondents selecting the idea
1. Everyone has access to ambient global connectivity	18	100
2. Access to superfast global transport links	17	94
3. Cities will create gated creative community zones	12	67
- // -	- // -	- // -
149. Distribution drones will be pervasive	1	6
150. Cities will manage inward migration	1	6

Rank the most important ideas

Send the list of most important ideas back to the panel and now ask them to rank them.

Ranking is done against two factors that you (the facilitator) should identify and that relate to the broad objectives of the project.

So, for illustration, you might ask the panel to rank each idea according to its importance for the UK's future prosperity and how urgently it requires policy intervention. Each panel member therefore assigns a score to each idea that reflects its relative importance (1= least important, 10 = most important) and urgency (1= least urgent, 10 = most urgent).

'Top 10 ideas' means 'Which ideas are most important for the future and for this project to look at?'

There is no hard and fast rule about how many issues to send back… Begin by reviewing the top 25 issues and go from there

Ranking can be chosen to reflect the issues. Scales of 1 to 10 and High, Medium, Low are good contenders

One respondent might, for example, return the following scores:

Idea	Importance for future prosperity	Urgency of policy response required
1. Everyone has access to ambient global connectivity	10	4
2. Access to superfast global transport links	8	7
3. Cities will create gated creative community zones	4	2
- // -	- // -	- // -

The respondent has assigned 'Everyone has access to ambient global technology' a score of 10 (high) for its importance for future prosperity and 4 (low – medium) for the urgency of the policy response acquired. Another respondent might (for example) agree that access to ambient global technology is important, but may assign a score of 10 for urgency.

Review the ranking and identify priority issues for the project

The ranking exercise will highlight some significant differences of opinion about what is most important and what is most urgent. One way to visualise this is to map each issue in a matrix that combines level of agreement with both ranking dimensions.

This might look like the matrix on the right.

The horizontal dimension defines the level of agreement on a given issue; the vertical dimension maps one of the ranking factors (importance for the UK's future prosperity in this example).

Each issue is mapped in the 2x2 according to how it scores. Here, there are 6 issues in the top right quadrant which means the expert group agrees they are all highly important for the UK's future prosperity. These 6 are therefore priority issues for the policy area.
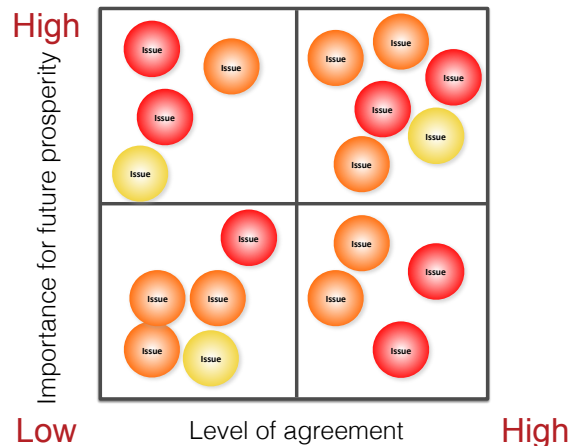
The range of scores for the second ranking factor – how urgently the issue requires policy intervention – is shown in this example by colour coding: red represents a high score in the ranking, yellow represents a low score and orange an intermediate score. Overall, therefore, 2 of the 6 priority issues need to be addressed urgently, 3 need to be addressed soon and 1 is less urgent at the moment.

The distribution of issues in the other quadrants is important. In particular, issues where there is a low level of agreement (wherever they map in the second dimension) may require further research to explore why the differences of opinion exist.

Explore the ranking in a workshop with the panel

Conduct a short workshop with the panel (and/or others) to present the findings (including the matrix) and explore the factors underlying significant differences of opinion can be valuable for generating insight.

The workshop might have three steps

Step 1: Present the outputs of the Delphi process

Step 2: Identify research priorities issues in the High-High box of the matrix

Step 3: Review the areas of low agreement to explore strategic issues

Present the outputs of the Delphi process   30 minutes

Remind the group of the process. Present the outcome of the ranking exercise.

Identify research priorities for issues in the High-High box of the matrix   60 minutes

1. Divide participants into groups of 4 to 6
2. Ask each group to review issues in the High-High box of the matrix and identify:
    • why each issue is important for the future of the policy area
    • why it is urgent
    • what research questions the project should address
3. Review in plenary

> Modify these questions to reflect the ranking factors used in the exercise

Horizon Scanning | 7 Questions | The Issues Paper | Delphi

Review issues research priorities for issues in the Low boxes   75 minutes

1. Ask 2 groups to review the Low-Low quadrant and 2 to review the Low-High quadrants
2. Identify:
   - how each issue might be important for the future of the policy area
   - why there is low agreement about its importance
3. Invite each group to make a case for some issues moving to the High-High box
4. Review in plenary

At the end of the Delphi process, you will have identified a short list of issues which are important for the future of the policy area. Exactly how you proceed from here will depend on how you ranked the issues, but it is likely that you will wish to go into a Driver Mapping exercise or Scenarios exercise to explore how the issues will develop in the future.

> Remember that some participants will advocate the issues they have an interest in and will not necessarily accept a low ranking for them

> Find a sample Drivers map in Annex 1

7.   Tools for exploring the dynamics of change
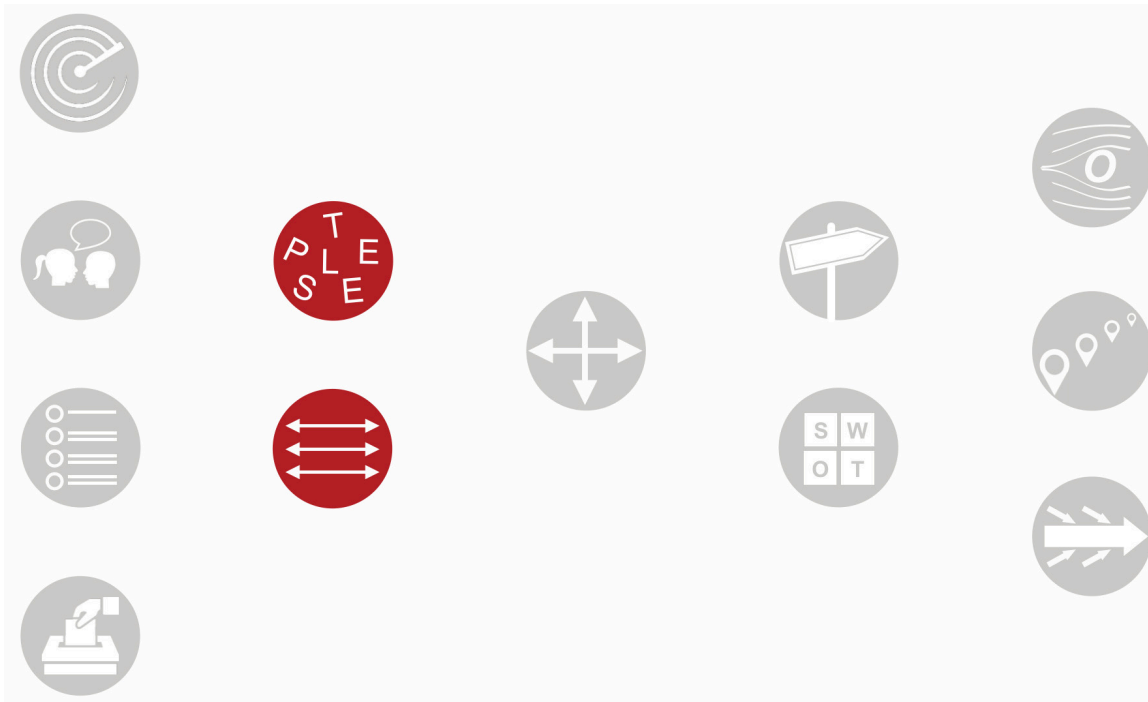
Driver Mapping is used to identify the political, economic, societal, technological, legislative and environmental drivers (PESTLE) shaping the future policy environment

Axes of Uncertainty are used to define the critical uncertainties for the policy area in the future and to frame the scenarios

Driver Mapping

Driver Mapping is used to identify the political, economic, societal, technological, legislative and environmental drivers (PESTLE) shaping the future business environment

Aims: ▶ To identify drivers shaping the future

▶ To identify which drivers are most important for the future of the policy area or strategic endeavour

▶ To distinguish between certain and uncertain outcomes resulting from the action of drivers

Approach: Workshop discussion

Participants: People with an interest in the policy area. This may include external stakeholders

Number: Works best with groups of 12 or more – but can be done with fewer

Timing: 1.5 to 2 hours in a workshop setting

45 to 60 minutes for a small team discussion

Facilitation: Advanced beginner

Output: A list of drivers that need to be acted on, drivers that need to be tracked and drivers that are important for the policy area but that have an uncertain outcome

Outcome: Agreed priorities for action

Good for: ▶ Understanding the dynamics of change

▶ Identifying issues that have a high impact on the policy areas

▶ Distinguishing between drivers with a certain and an uncertain outcome

Risk: **Low-Medium.** The main risk is that participants do not have exposure to a wide range of drivers. Counter this by including subject experts in the exercise or including pre-researched drivers

Get here from…

- Horizon Scanning
- 7 Questions
- Delphi

Move on from here to…

- Axes of Uncertainty
- Scenarios
- Visioning

Use the output to inform…

- SWOT Analysis

Driver Mapping ❯ Axes of Uncertainty

The Approach

This section describes brainstorming and mapping drivers in a workshop setting. The process for a small group conversation is broadly the same but requires less time.

There are three steps:

- **Step 1:** Introduce the workshop and the PESTLE approach
- **Step 2:** Brainstorm the drivers
- **Step 3:** Map the drivers

Introduce the workshop and the PESTLE approach   15 minutes

Introduce the aims of the project if this is a workshop with external stakeholders or participants who are unfamiliar with it.

Introduce the aims and approach of the workshop. It may be useful to explain the 3 Horizons model (Figure 1, page 3) and invite the group to focus on the mid to long term.

Introduce the driver categories (PESTLE) and perhaps offer brief examples of each type.

Brainstorm the drivers   45 minutes

1. Invite participants to work in groups of 6 (or so).
2. Ask groups to identify what's driving change and link it to the project question/policy area. Encourage them to think about drivers in the wider global context (Figure 2, page 4).
3. You can, if you wish, ask each group to focus on one or two driver categories (ask one group to focus on political and economic trends; another to focus on societal and technological trends and so on). This can reduce overlaps and ensure you get coverage across all the categories, but it's not essential.
4. Groups should brainstorm drivers onto Post-it notes (one driver per Post-it). Ensure that the rules of brainstorming – list drivers, build on each other's ideas, don't critique anything at this point – apply. Quantity at this stage is more important than 'quality'.
5. Suggest that groups use different coloured Post-its to record drivers acting in the short term, in the medium term and in the long term.

> The different acronyms used to describe drivers – PESTLE, STEEP, PESTO, STEEPL, for example – are all versions of the same approach. There is no need to be restricted by these typologies. Foresight's Migration and Global Environmental Change project, for example, used Economic, Social, Political, Demographic and Environmental drivers

> If you have researched drivers in advance of the workshop, preprint them on post it notes and miss this step out

> Encourage groups to write a short phrase rather than a single word or two. "Sustained economic growth in China" gives a better sense of change then "The Economy"

Driver Mapping   Axes of Uncertainty

Map the drivers

30 minutes

1. Ask each group to map their drivers on an **importance and certainty matrix** according to their importance for the policy area and how certain the outcome of each one is.

2. Depending on the number of Post-its in each quadrant, groups can cluster them by theme.

3. Ask each group to focus on the top left and top right quadrants and to identify 3 to 5 priority drivers that are *most* important for the policy area. Mark these with a red dot.

More important for
the policy area

The outcome
is certain

The outcome
is uncertain

Less important for the
policy area
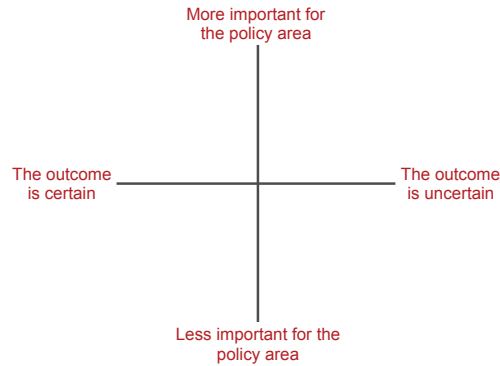
Different groups can go through this exercise at quite different speeds. Don't worry if the fastest group has to wait a while for the slowest group to finish

Next steps

What you do next depends on where Driver Mapping sits in your futures process.

If this is a stand alone workshop…

…one of a series of Driver Mapping exercises you are running with different groups, for example – this is the last stage of the workshop.

The final task is to spend 20 to 30 minutes reviewing the different driver maps in plenary and comparing priority drivers from each group.

Explain to the group how this workshop fits in the wider futures process you are conducting, then close.

If this is the first part of a Scenarios workshop…

…as in Pathway 4, for example, focus on the Post its in the top right quadrant.

Drivers in this quadrant – called critical uncertainties – are strategically important and have a high impact on the policy area but an uncertain outcome.

Use the priority drivers in this quadrant to move into the next stage in the process – **Axes of Uncertainty** (page 46) and to build scenarios that explore alternative ways the policy area might develop.

If this is the first part of a Visioning workshop…

…as in Pathway 2, for example, focus on the Post-its in the top left quadrant.

Drivers in this quadrant – known as predetermined elements – have a high impact on the policy area and a certain outcome. These drivers are already changing the policy environment in clear and predictable way and government must **prioritise and act** on them.

Use Visioning to describe a positive outcome for addressing these drivers.

More important for
the policy area

| Prioritise and act | Scenario plan |

The outcome
is certain

The outcome
is uncertain

| Park | Track |

Less important for the
policy area
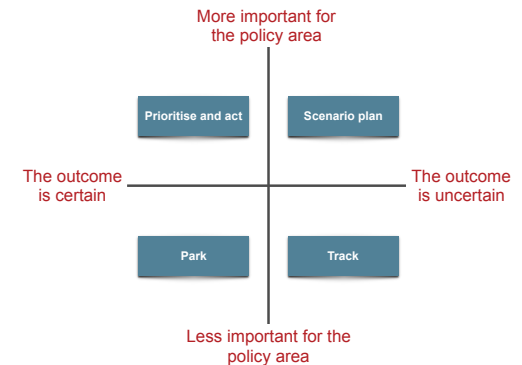
Drivers that have a certain outcome but low impact can be **parked** – that is, they are less relevant or less important for the future. Drivers in the **track** quadrant, however, seem less important at the moment but could have a high impact in the future if they develop in certain ways. It's worth keeping an eye on these drivers in future rounds of Horizon Scanning.

An alternative method to mapping the drivers

If you want to use a different approach in the **Map the drivers** step, ask the group to cluster their drivers rather than map them on the importance and certainty matrix. To do so, groups should

1. Cluster drivers in related themes

2. Name each cluster

3. Identify the driver in each cluster that is (as required) the most important critical uncertainty or the most important predetermined element.

> Use drivers in the **track** quadrant to inform future rounds of horizon scanning

> To take the alternative approach, start here after brainstorming drivers

> Try to put no more than 6 post-its in any one cluster
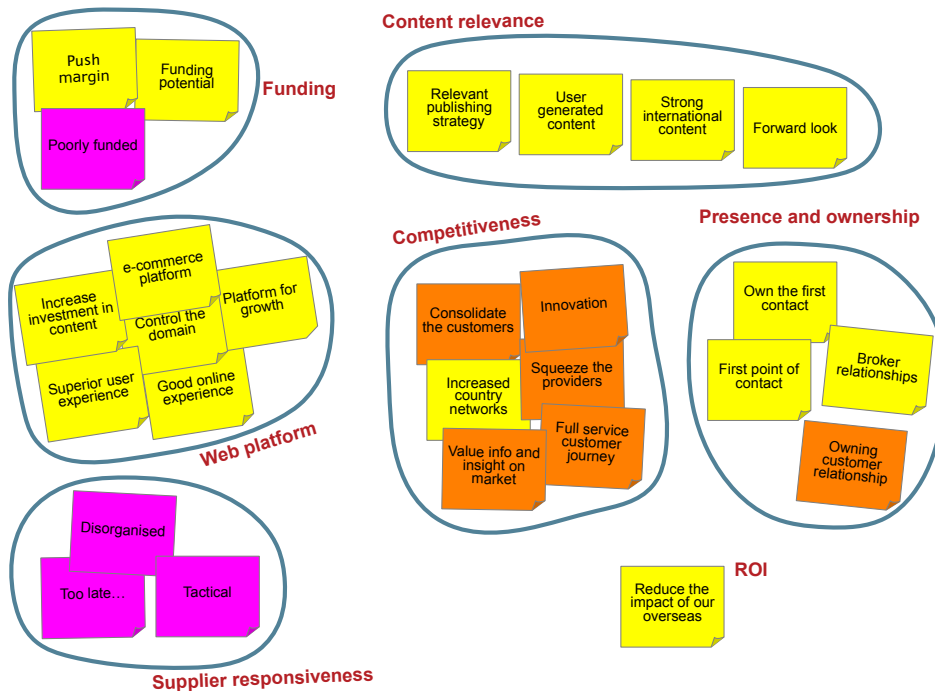
> The Forestry Commission, Natural England and others use driver mapping. See the case studies in Annex 5

Driver Mapping | Axes of Uncertainty

Axes of Uncertainty

Axes of Uncertainty are used to define the critical uncertainties for the policy area in the future and to frame the scenarios

Aims: ⬭ To characterise the nature of the critical uncertainties facing the policy area in the future

⬭ To agree which critical uncertainties are most important

⬭ To create a meaningful and focused scenario matrix

Approach: Workshop discussion

Participants: People with an interest in the policy area

Number: Works best with groups of 12 or more. Can be done with smaller groups

Timing: 90 minutes

Facilitation: Experienced

Output: The scenario matrix

Outcome: A shared model of the future policy space

Good for: ⬭ Making the dynamics of change explicit

⬭ Building shared understanding of the dynamics of change

Risk: **Medium-High.** The output from this exercise is a scenario matrix that will frame the discussion of the future scenarios. It is important to ensure the matrix is meaningful for the policy area and that it will define scenarios that tackle the relevant issues and stretch thinking

Get here from…

- Horizon Scanning
- Driver Mapping

Move on from here to…

- Scenarios

Use the output to inform…

- SWOT Analysis
- Visioning

The Approach

Moving from Driver Mapping to defining Axes of Uncertainty

This tool uses **critical uncertainties** – drivers that are more important for the policy area but which have an uncertain outcome – to define the Axes of Uncertainty that create the scenario matrix.

There are three steps:

Step 1: Develop a long list of axes of uncertainty

Step 2: Draw up the short list of axes of uncertainty

Step 3: Agree a scenario matrix

Develop a long list of axes of uncertainty   40 minutes

1. If you are continuing from the Driver Mapping process (page 42), keep participants working in the same groups of 6 and ask them to work with the critical uncertainties (drivers in the top right quadrant) they prioritised with a red dot. You will not be able to look at all 5 critical uncertainties, so ask the group to prioritise 2 or 3.

2. If this is a separate workshop and you are drawing on critical uncertainties developed in previous drivers workshops, form groups of 6 and give each group 3 critical uncertainties to work with.

3. Groups define an Axis of Uncertainty by describing alternative ways that a critical uncertainty might play out. For example, a group might decide that the uncertainty around a driver written as **'Global security'** is best described as:

<div align="center">

The world is
insecure and
unstable   ⟷   The world is
secure and
stable

</div>

4. Groups should not, however, settle on their first interpretation of the uncertainty but should spend 10 to 15 minutes exploring further interpretations and outcomes.

> It is worth checking with each group what critical uncertainties they are working with. This means you can manage any overlaps

> Try to organize the groups so that you get at least 8-10 axes of uncertainty

> Participants generally find this task easier to understand if you demonstrate how to do it with a randomly selected uncertainty. NB: this means facilitators need to really understand this procedure and to demonstrate it effectively. Practice helps!

Driver Mapping   Axes of Uncertainty

5. So, for example, continued discussion of **'Global security'** might lead a group to come up with a three further interpretations of the Axis of Uncertainty:

The world is insecure and unstable	←——————→	The world is secure and stable
Terrorism is a continuing global issue	←——————→	Nation states work together to tackle terrorism
Nations are closed and protectionist	←——————→	Nations are open
Resource insecurity disrupts UK economic growth	←——————→	Access to resources sustains UK economic growth
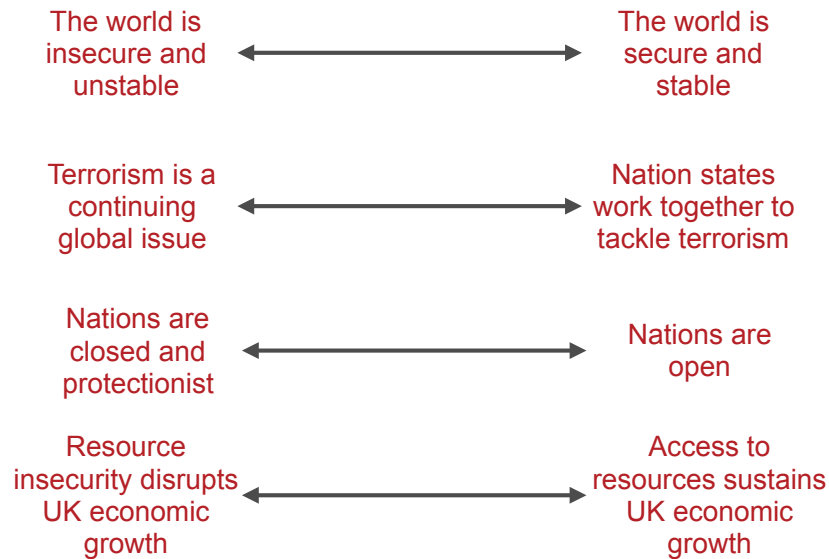
Draw up the short list of Axes of Uncertainty   10 minutes

1. Once all the groups have identified several axes of uncertainty for each of their drivers they should select one axis to put forward to the short list. Thus, the group that discussed **'Global security'** might choose Nations are closed and protectionist ↔ Nations are open for the short list.

2. This group will have discussed a second driver and will therefore have a second axis of uncertainty to put forwards.

3. The final short list will have (approximately) 8 to 10 axes of uncertainty – depending on how many groups are in the workshop.

> Write the short list of axes on a flipchart or put them on a PowerPoint slide

Agree the scenario matrix   **40 minutes**

Facilitate a plenary discussion to agree which 2 axes of uncertainty will create the most interesting or valuable scenario matrix.

The most straightforward way to do this is to invite everyone to vote on which 2 axes they want to use.

It may help the decision to draw up a couple of alternative matrices and briefly explore what the scenarios will look like.

The final scenario matrix will look something like this:

The UK is a leader in innovation

Nations are closed and protectionist   Nations are open

The UK is off the pace in innovation
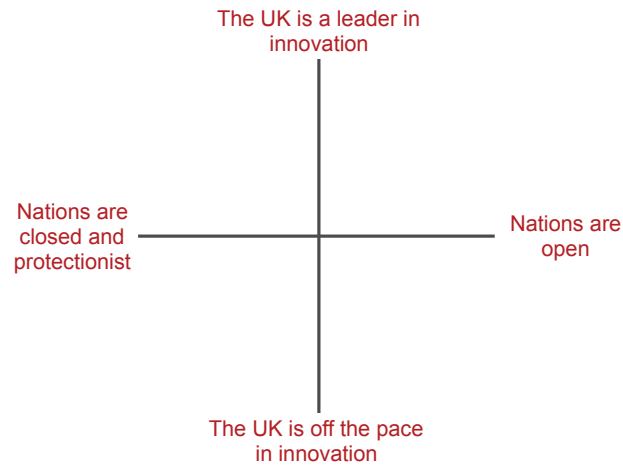
Make sure the final 2 axes are not different versions of the same uncertainty

Run this session before a lunch or coffee break to give yourself time to review the matrix and ensure it is meaningful for the project

Don't discard the axes of uncertainty that didn't make it into the scenario matrix. Use them for research or for developing storylines in the scenarios

Driver Mapping | Axes of Uncertainty

8. Tools for describing what the future might be like

Scenarios are stories that describe alternative ways the external environment might develop in the future. Each scenario explores how different conditions might support or constrain delivery of policy and strategy objectives

Visioning is used to create a set of common aims and objectives for a project and to describe what the future will be like if they are delivered

SWOT Analysis stands for Strengths, Weaknesses, Opportunities and Threats. Strengths and weaknesses are internal factors that need to be taken account of when developing policy or strategy. Opportunities and Threats are external factors that need to be considered

Scenarios

Scenarios are stories that describe alternative ways the external environment might develop in the future. Each scenario explores how different conditions might support or constrain delivery of policy and strategy objectives

Aims: ▶ To explore alternative ways that a particular policy area might develop in the future

▶ To consider how key actors – government, businesses, citizens, competitors – might behave under different conditions

▶ To identify the key requirements of policy under different conditions

Approach: A combination of workshop discussion with additional research to support writing the narratives

Participants: People with an interest in the policy area

Number: Works best with groups of 12 or more

Timing: 2 to 3 hours

Facilitation: Experienced

Output: Scenario narratives

Outcome: A shared understanding of the dynamics of change and the options and choices facing stakeholders under different market conditions

Good for: ▶ Building shared understanding of the dynamics of change

▶ Rehearsing future decisions and trade offs

▶ Gaining insight into opportunities and threats in different futures

Risk: **Medium.** Scenario building allows participants to explore different perspectives. Scenarios do, however, challenge the *status quo* and may need to be communicated carefully

Get here from...

- Axes of Uncertainty

Move on from here to...

- Policy Stress-testing
- Backcasting

Use the output to inform...

- Visioning

Scenarios ▸ Visioning ▸ SWOT Analysis

The Approach

Thinking about uncertainty

The aim of scenario thinking is to identify important strategic uncertainties surrounding the policy area and to explore how they might play out in the future. The scenario stories do this in a way that helps policy makers anticipate how the future might differ from today and how to develop policies that are resilient across a range of possible futures.

Scenarios are not predictions. They are not meant to be 'right' or 'wrong', 'good' or 'bad', but to offer interesting (and in some cases challenging, stretching or controversial) pictures of the future. They provide a safe space – a sand pit – to explore alternative ways the policy area might develop and the choices that various stakeholders might make under different market conditions.

Scenarios should be set a reasonable distance into the future; 10 to 20 years is good for a workshop but groups can be pushed to think further out if you wish.

Scenarios developed in a workshop are necessarily brief but provide insight into the specific challenges and opportunities each future presents for the policy area. The narrative structures can be used to develop and research more detailed stories after the workshop if required.

This tool sets out how to develop scenarios in a workshop[3]. It has 6 steps
> **Step 1:** Describe what the world is like
> **Step 2:** Describe what the UK is like
> **Step 3:** Conduct a SWOT Analysis of the policy or strategy issue in the scenario
> **Step 4:** Create a timeline of events
> **Step 5:** Name the scenario
> **Step 6:** Identify the main recommendations and issues for developing policy or strategy

Groups rarely start a scenario workshop at this particular point; they are more likely to have arrived here after Driver Mapping and Axes of Uncertainty. After detailing the scenario approach, this tool describes how to deliver scenarios as part of a one day workshop.

> If you want groups to think further than 20 years forward, think about staging the conversation – that is, asking groups to describe the world in 20 years and then to describe the opportunities and challenges looking forwards from that point

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[3] There is a discussion on how to develop larger scale scenarios at the end of this section of the Toolkit.

Scenarios ⟩ *Visioning* ⟩ *SWOT Analysis*

The scenario process

Describe what the world is like   25 minutes

Groups describe the world of their scenario in general terms. This might be structured along the following lines.

1. Describe the global economic environment in your scenario
   o What are the main economic drivers in play?
   o Is the global economy growing or flat?
   o Where is the main economic power in the world?
   o How open is the global economy?
   o What are the main trading blocs and economic relationships?
2. Describe environmental issues in your scenario
   o Is energy widely available?
   o Are food and water widely available?
   o What is the impact of climate change?
   o Do societies care about low carbon living?
   o What are the consequences for lifestyles and consumption?
3. Describe international relationships
   o What are the strong international relationships? The weak ones?
   o Where are the tensions and how does the international community manage them?
   o Is the prevailing international mood one of optimism or pessimism? Why?

Describe what the UK is like   25 minutes

4. Describe the social and economic context in your scenario
   o How's the UK economy doing?
   o Is the UK outward looking or insular? Who are its main partners?
   o Is society comfortable with itself? Are there any fault lines?
   o Who are the main winners and losers?
   o What are the UK's main successes? Its challenges?

> Divide workshop participants into four groups and ask each group to develop one scenario. Give each group a worksheet with the questions to record their responses

> The questions set out here work well enough but are rather generic. Spend some time with the problem holder in advance of the workshop to identify more specific or topic related questions to ask when describing the scenarios

> It's a good idea to customise these questions in particular.

Scenarios › *Visioning* › *SWOT Analysis*

Conduct a SWOT Analysis of the policy or strategy issue in the scenario   25 minutes

5. Within the logic of their scenarios
   - o What are the UK's strengths in the policy or strategy area?
   - o What are the UK's weaknesses in the policy or strategy area?
   - o What are the opportunities for the UK that the policy or strategy needs to facilitate?
   - o What are the threats to the UK that the policy or strategy needs to mitigate?

> Remind the group that strengths and weaknesses are internal and opportunities and threats are external

Create a timeline of events   20 minutes

6. Identify the 10 key events that lead from the present day to the future scenario

2020   2025   2030   2035

> Groups can miss this step out if they are short of time – although timelines are particularly useful when writing up scenarios after the workshop

Name the scenario   5 minutes

7. Come up with a name for the scenario that is memorable and that evokes the essence of the narrative.

> The four scenarios for the Intelligent Infrastructure Systems Project were Perpetual Motion, Urban Colonies, Tribal Trading and Good Intentions

Identify recommendations and issues for developing policy or strategy   20 minutes

8. The final question in the exercise provides a bridge between the future scenario and the present policy/strategy challenge. Each group should answer the following question:
   - o Assume this is future that will occur. With that knowledge, and based on this conversation, what three recommendations would you make to The Secretary of State to ensure that (s)he delivers the policy/strategy that the UK needs?

Plenary presentation and discussion   30 minutes

9. Invite each group to give a short (5 minute) presentation of the key points in their scenario. Makes sure they give you the scenario name and the recommendations to the Secretary of State. At the end of the presentations, ask the group for similarities and differences between the scenarios and for key learning points from the overall exercise.

> Draw the scenario matrix on a couple of flip chart sheets and capture the key points of each scenario as groups present

Scenarios ⟩ *Visioning* ⟩ *SWOT Analysis*

Delivering scenarios as part of a one day workshop

You can deliver an effective one day scenario workshop by combining three tools:

- Driver Mapping   90 minutes
- Axes of Uncertainty   90 minutes
- Scenarios   150 minutes

> Find sample slides for introducing scenarios in Annex 1

An illustrative timetable is

9.30   **Introduction**
- Introduce the project aims and objectives
- Introduce the workshop program
- Introduce scenario thinking

9.50   **Conduct Driver Mapping**

11.15   **Coffee**

11.30   **Develop Axes of Uncertainty**

12.30   **Agree the scenario matrix**

1.00   **Lunch**

1.45   **Develop scenarios**

3.45   **Tea**

4.00   **Feedback**

4.30   **Next steps**

4.45   **Close**

Scenarios › *Visioning* › *SWOT Analysis*

Write up the scenario narratives after the workshop

The 1-day scenario workshop described here will generate 4 scenarios, each with a good level of detail. Use the workshop notes to write up four scenarios that are each 600 to 800 words long and that capture the essence of the narratives generated in the workshop. You may wish to structure the scenarios so that they describe (for example) what the world is like in the future, what the UK is like and what the particular policy issues and challenges are.

For an exercise of this type, you may prefer to write end state scenarios: stories that are set in the future you are describing. The alternative – timelines that describe how the scenario developed from the present day – are difficult to write without more detailed research.

The scenarios must be plausible and they must challenge the *status quo*. Use the notes and knowledge from each group discussion to identify emerging technologies and research key trends and events that are important to development of the scenarios. Try to write in an engaging style that evokes something of the future you are describing.

Adding metrics to your scenarios

You may wish to use the scenarios to explore how a number of key metrics – quantitative or qualitative indicators such as GDP, population and quality of life, for example – vary between different futures. You can introduce some basic questions to the scenario workshop discussion ('Is population higher or lower than the current baseline?') or you can combine the scenario logics with existing research to illustrate how different environmental conditions might lead to variation of important indicators. GO-Science used this approach in the Migration and Global Environmental Change Foresight project to build quantitative models.

A note on large scale scenario development

Some futures projects require more extensive scenario work to draw in a range of research and more detailed and extensive scenario exercises. GO-Science's Foresight project on Intelligent Infrastructure Futures scenarios, for example, developed scenarios over 8 months and involved 4 drivers workshops, 8 focus groups and detailed systems mapping.

The scenarios were 3,000 words long and looked forwards 50 years to 2055. Each was set in 3 time points – 2025, 2040 and 2055 – and the narratives drew extensively on research conducted as part of the wider project to explore future developments in infrastructure.

The scale of the Intelligent Infrastructure project meant the scenarios were developed over a series of workshops, each designed to scale up different stages of the scenario process described here. The overall approach described here was at its core.

Draw on Roadmapping and Horizon Scanning to identify future developments that can be written into the scenarios

Find a sample scenario in Annex 1

The FAQs at Annex 3 suggest a range of creative approaches to scenario writing

Go to Annex 4 to find out how to introduce quantitative and qualitative metrics into your scenarios

Health and Safety Executive use scenarios. See the case studies in Annex 5

Scenarios | Visioning | SWOT Analysis

Visioning

Visioning is used to create a set of common aims and objectives for a project and to describe what the future will be like if they are delivered

Aims:
- ▶ To focus groups on what a successful outcome looks like
- ▶ To agree what the current reality is and what therefore needs to be done to deliver success
- ▶ To set out and prioritise the steps required to achieve the vision

Approach: Workshop/group discussion

Participants: Anyone with a stake in the issue

Number: Ideally needs to be 6 or more. There is no real upward limit, since large groups can divide into breakout groups

Timing: 2 to 3 hours as a standalone activity

Facilitation: Advanced beginner

Output: A shared vision and the steps required to achieve it

Outcome: A shared aspiration. Agreement on what needs to be done to achieve it; and, if there are areas of disagreement or uncertainty, these are clearly identified.

Good for:
- ▶ Clarifying expectations
- ▶ Building a shared sense of purpose
- ▶ Highlighting what is important in the short term and what can wait until later
- ▶ Identifying the scale of change required for success

Risk: **Low**

Get here from…
- Horizon Scanning
- Driver Mapping

Move on from here to…
- Roadmapping

Use the output to inform…
- Policy Stress-testing
- Backcasting

The Approach

Visioning is a relatively straightforward process. It can be run as a standalone activity or can be informed by previous work. A particularly good way to connect Visioning to other futures work in a specific workstream is to present the outputs from the earlier activities as a stimulus to the conversation.

One aspect of the technique requires some management of expectations. When participants are describing their vision, encourage them to be aspirational and not held back by the reality of the present. The design intent behind this is to help groups shake off existing practical, policy or market constraints that might be blocking their long term thinking. A potential danger of encouraging this is that groups push the conversation into unrealistic or impractical territory. If this happens, acknowledge it before returning to the current reality and allowing the group to self-correct. There is more benefit in building a demanding – even an unrealistic – vision and then adjusting it than in being too cautious and not setting a stretching aspiration for future success.

The tool has three main steps:

- **Step 1:** (Optional) Present the output from previous relevant work such as Horizon Scanning or 7 Questions
- **Step 2:** Describe the vision of success
- **Step 3:** Agree the current reality and define the steps required to deliver the vision

Present the output from previous relevant work   20 to 30 minutes

This option is useful if you want to build on previous work – such as 7 Questions (which explicitly asks interviewees to express their vision) or Driver Mapping (which identifies drivers shaping the future context for policy or strategy) – in order to stimulate thinking.

The 2 main reasons for presenting previous work are to stimulate group thinking and to highlight issues that they perhaps hadn't thought about. Follow up any presentation with a short discussion about what was interesting and why.

> If you want groups to practice thinking about the future before they start the main exercise, do a warm up where individuals envision their own future success. Invite them to think forward 10 years and to accept that they have achieved their personal and professional aspirations. Ask them to describe (if only to themselves)
>
> - What they do
> - Where they live
> - What they are planning to do for their next holiday
> - What the next week at work holds for them

Describe the vision of success   45 to 60 minutes

Ask groups to imagine they are members of the team that has successfully delivered the policy or strategy being discussed. They should describe what that means to them and what success looks like.

The following trigger questions are generic (but work well) and can be modified as required. Groups should capture their conversation on flip charts or on a crib sheet which they subsequently hand in. This will form the basis for the write up.

The questions are:

1. What have we achieved?

2. Who are our stakeholders? How have they benefited from what we've done?

3. What are we most pleased about?

4. What arrangements (procedures, structures or decision making processes) have we put in place to make sure the project is sustained?

5. How are we measuring progress and success?

6. Is there anything we still need to tackle?

7. What are the challenges we face now?

8. What have we learned from our successes and failures?

Invite groups to feedback   5 minutes per group plus 5 to 10 minutes discussion

Ask groups to present a brief summary of their discussion (but not to read all the bullet points on their sheets).

Facilitate a short discussion to compare and contrast the visions. Do not ignore differences of opinion, but do not over emphasise them either. Identify the areas of broad agreement that will form the core of the vision and acknowledge any differences of emphasis or detail that will need to be considered later.

> Encourage the group to speak in the present tense and to take ownership of the future they have created

> Participants should treat this element of the conversation like a brainstorm – all ideas are valuable and worth including. Differences can be ironed out in the next stage

> Listen in to the conversations. Don't let anyone question whether someone else's aspiration is _possible_ – the point of this discussion is to agree what the _aspiration_ is. Practicalities are dealt with in the next step

> Think about taking a break after the feedback. This will give you space to review the visions and confirm the main elements

Agree the current reality and define the steps to deliver the vision   45 to 60 minutes

The objective of this session is for groups to come back to the current reality and discuss what needs to happen if the vision is to be delivered. Keep participants in the groups they have been working in and to work with the vision they have developed.

These questions are less generic but will still benefit from being modified.

The questions are:

1. How close are we to our vision?
2. What needs to change to achieve the vision?
3. Which changes are in our control? Which aren't?
4. What are the key steps towards achieving the vision? When do we need to achieve them by?
5. What resources do we need? Who will lead the process?
6. Who will be the winners and losers in this change? How do we bring people with us?

Invite groups to feedback   5 minutes per group plus 5 to 10 minutes discussion

As before. Invite groups to give feedback, perhaps focusing on the timeline.

Facilitate a short discussion to compare and contrast what needs to happen now and how change will be resourced. Once again, acknowledge differences of opinion, but do not overplay them.

> Don't worry at this stage if one group has a radically different vision of success. They may modify it during this second round of discussion

> Capture these questions on task sheets. Perhaps ask groups to use post it notes to build a timeline of the key steps

> Gather all the notes and write a composite vision that captures as many of the points as possible

> Find a sample vision in Annex 1

SWOT Analysis

SWOT Analysis identifies the relevant Strengths, Weaknesses, Opportunities and Threats. Strengths and weaknesses are internal factors that need to be taken account of when developing policy or strategy. Opportunities and Threats are external factors that need to be considered

Aims: ➤ To identify what needs to be done to capture and build on opportunities
➤ To identify what needs to be done to mitigate threats
➤ To identify internal priorities and challenges

Approach: Primarily a workshop/group discussion tool, but can support desk research

Participants: Best developed with those involved in developing policy or strategy

Number: 6 or more

Timing: 60 minutes

Facilitation: Novice

Output: Analysis of the issues facing the policy or strategy team going forwards

Outcome: Clear insight into the shifting dynamics in the external environment and what they mean for the policy area

Good for: ➤ Deciding what to prioritise in the policy or strategy area
➤ Identifying barriers to success
➤ Identifying emerging opportunities

Risk: **Low**

Get here from...
- Driver Mapping
- Scenarios

Move on from here to...
- Roadmapping

Use the output to inform...
- Scenarios
- Roadmapping

The Approach

SWOT Analysis is a very practical technique for mapping out the issues that will have an impact on successful delivery of a policy or strategy.

If you are working with a single group, facilitate the conversation and write the group's responses on a flipchart. If you are working with more than one group, ask them to note their discussion on a single flipchart or give them a sheet with the SWOT box already written on it.

Ask groups to identify what fits in each quadrant of the box. Remind them that

- strengths are *internal* factors in the organization or partnership leading policy or strategy implementation that will support the effort to drive the policy or strategy forwards;
- weaknesses are internal factors that might hold implementation back and that will need to be addressed;
- opportunities are *external* factors that will help to achieve the policy or strategy aims and that policy design can build on;
- threats are external factors that may prevent or delay implementation and that need to be characterised and mitigated against.

SWOT Analysis in futures work is mainly used to underpin forward planning. It is also a useful component of a one day scenario development process.

Strengths	Weaknesses
Opportunities	Threats

Health and Safety Executive use SWOT Analysis. See the case studies in Annex 5

9. Tools for developing and testing policy and strategy

Policy Stress-testing is a method for testing policy, strategy or project objectives against a set of scenarios to see how well the objectives stand up to a range of external conditions

Backcasting is a method for determining the steps that need to be taken to deliver a preferred future

Roadmapping shows how a range of inputs – research, trends, policy interventions, for example – will combine over time to shape the future development of the policy or strategy area of interest

Policy Stress-testing

Policy Stress-testing is a method for testing policy, strategy or project objectives against a set of scenarios to see how well the objectives stand up to a range of external conditions

Aims: ◐ To explore how different contextual conditions might affect what different stakeholders want from a policy or strategy

◐ To explore how different contextual conditions might alter the relative importance of elements of a proposed policy or strategy

◐ To identify which objectives are robust across the full range of scenarios and which will need to be modified if conditions change

◐ To identify what external events will trigger modifications and what those modifications are likely to be

Approach: Workshop discussion that builds on the scenarios

Participants: People with responsibility for the policy or strategy area. Participants don't need to have developed the scenarios directly

Number: Up to 16

Timing: 1.5 to 2 hours

Facilitation: Experienced

Output: Feedback on how a new or existing policy, strategy or project might be affected in different scenarios and how it might need to be modified to ensure resilience across a range of future conditions

Outcome: A more resilient policy, strategy or project

Good for: ◐ Focussing participants on policy, strategy or project objectives

◐ Testing the robustness of those objectives

◐ Identifying events that will trigger the need for policy adjustment

Risk: **Low.** Policy Stress-testing is advisory rather than prescriptive

Get here from…
- Scenarios

Move on from here to…
- Backcasting

Use the output to inform…
- Roadmapping
- Policy or strategy development

The Approach

Policy Stress-testing is used to see how well a set of policies or policy objectives stand up to a range of market conditions. These objectives may exist already – in which case this exercise is testing whether they are robust enough to deliver in a range of future market conditions – or policy stress-testing may be part of the process for developing new objectives.

Policy Stress-testing is a flexible technique. It can be done straight after a group has developed scenarios or it can be a stand alone session at a later date. In the latter case, groups need to be introduced to the scenario set, so the narratives need to be written up in bullet form at least.

Groups review each strategic objective against the different market conditions that exist in each one of the scenarios and in each case decide whether the objective is still relevant or whether it is need to be adjusted.

There are four steps:

Step 1: Introduce the scenarios (not necessary if they were developed by the group)

Step 2: Introduce the policy or strategy objectives being considered

Step 3: Test the objectives against all scenarios

Step 4: Review the findings and discuss the implications

Introduce the scenarios   20 minutes

Deliver a short presentation that explains:

- what scenarios are and what they are designed to do
- how this particular set of scenarios was developed
- the scenario matrix
- the broad structure of each scenario and some of the strategic questions each one throws up

> If the purpose of the workshop is to develop new objectives, you need to introduce 'first draft' or 'straw man' objectives for the group to work with

> Produce a one page handout for each scenario that shows the scenario matrix and gives the main characteristics of the scenario in bullet points

Policy Stress-testing > Backcasting > Roadmapping

Introduce the policy or strategy objectives to be tested   10 minutes

Deliver a short presentation that reminds the group of (or introduces them to) the specific policy, strategy or project objectives being tested.

It is worth spending a few minutes at this point having a conversation with the group to ensure they understand the objectives clearly.

Even if the group works in the specific policy or strategy area, do not assume they know the objectives you are testing. Print the full set of objectives out or put them onto a slide

Test the objectives against the set of scenarios   40 to 60 minutes

Divide the group into four and allocate one scenario to each group. Give each group the relevant scenario handout and – if required – the full set of objectives being tested.

Invite people to read the scenario individually and to discuss the relative strengths and weaknesses of the scenario for achieving their policy or strategy goals. **Allow 20 to 30 minutes** for this step.

Invite each group to test the objectives against their scenario. They should

- Imagine that the world is as described in the scenario
- Decide whether – for this world – each objective is
  - o robust
  - o redundant
  - o in need of modification
- Be prepared to explain why they have made their decision

Allow 20 to 30 minutes for this step.

Start here if coming straight from a scenario workshop

Remind groups to work with the logic of their scenario – not try and change it so that it meets the needs of the objectives

Review the findings and discuss the implications   30 minutes

Facilitate this discussion by drawing up a table that lists the range of policy objectives down the side and the scenarios across the top.

Gather feedback from each group and record it all in the table before analysing the results.

Policy Stress-testing ⟩ Backcasting ⟩ Roadmapping

The table may look something like this:

Strategic objective	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Objective 1	🙂	😐	🙂	🙂
Objective 2	😐	😐	☹️	🙂
Objective 3	😐	🙂	🙂	😐
Objective 4	😐	😐	☹️	😐
Objective 5	😐	🙂	🙂	🙂

🙂 means the objective is **robust** in the specified scenario

😐 means the **objective needs modified** in the specified scenario

☹️ means the objective is **redundant** in the specified scenario

Once you have built the table, spend some time discussing it with the group and exploring the implications for the policy.

For example, in the table above (which is a real example taken from a policy workshop):
- objectives 1 and 5 look robust across most futures but may need a slight adjustment depending on the circumstances
- objectives 2 and 4 need to be revisited – and may not be required at all
- objective 3 may need to be reassessed

Don't forget to review the table vertically as well as horizontally

Individual groups will have different perspectives as well. The group assessing scenario 1 will take the view that most of the objectives need to be revisited. So will the group reviewing scenario 2. None of the groups will be confident that the objectives as a whole are robust for the future.

GO-Science's Obesity project used Policy Stress-testing to investigate the robustness of various policies in different scenarios. You can see the results in pages 107 to 108 of the Obesity Report.

Health and Safety Executive use Policy Stress-testing. See the case studies in Annex 5

Backcasting

Backcasting is a method for determining the steps that need to be taken to deliver a preferred future

Aims:
- ◗ To agree a preferred future
- ◗ Identify what needs to change between the present and the preferred future
- ◗ Build a timeline that sets out the key changes
- ◗ Determine and address the key internal and external factors that might affect the timing or scale of change

Approach: Workshop discussion that builds on scenarios or on a vision

Participants: People with responsibility for the policy or strategy area. Participants don't need to have developed the scenarios or vision directly

Number: 16 to 24 is optimal, but the process can be adapted to more or fewer participants

Timing: 4 to 4.5 hours

Facilitation: Experienced

Output: A shared view of the future and a the steps required to deliver it

Outcome: A plan to achieve future success with prioritised steps.

Good for:
- ◗ Building shared purpose
- ◗ Identifying what is in a team's control and what is not
- ◗ Determining who outside the team needs to be involved in making the future happen
- ◗ Creating a realistic picture of the scale of the task ahead

Risk: **Medium.** It's important to be honest about what is in the team's control

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Get here from…
- Scenarios

Move on from here to…
- Use Backcasting to support development of a shared plan

Use the output to inform…
- Roadmapping
- Policy or strategy development

The Approach

Backcasting is an effective way of connecting a given future to the present and identifying what needs to be done to deliver it. The process is similar to the second stage of Visioning – 'Agree the current reality and define the steps to deliver the vision' – but focuses more on the role of external stakeholders in making the future happen.

Participants work backwards from the future and identify the key steps, events and decisions that will make it happen. One particular focus of Backcasting is to identify what lies within the control of the policy and strategy makers – and can therefore be delivered – and what lies outside their control and therefore needs to be managed.

The tool has 6 steps:

Step 1: Introduce the preferred future (not required if it was developed by the group)

Step 2: Identify the key differences between the present and the preferred future

Step 3: Build a timeline that sets out the key changes needed to move from the present reality to the preferred future

Step 4: Identify which changes are in your control and which aren't

Step 5: Identify what you need to do to deliver the steps that are in your control

Step 6: Identify how you can influence or facilitate the steps that are outside your control

Introduce the preferred future   30 minutes

Deliver a short presentation that explains:

- how the future was develop
- who was involved
- its key characteristics and outcomes

> The preferred future may be one of a set of scenarios or it may be a single vision developed in a Visioning workshop

Identify the differences between the present and the preferred future   30 minutes

Invite participants to work in groups of 4 to 6 and to describe the key differences between:

- the policy or strategy area now and in the preferred future
- the global contextual environment (see Figure 2, page 4) now and in the preferred future
- the policy delivery environment (see Figure 2, page 4) now and in the preferred future

> Give participants a handout that describes the key characteristics of the preferred future

Build a timeline that sets out the key changes needed to move   45 to 60 minutes
from the present reality to the preferred future

Continuing in the same small groups, ask participants to:

- describe the key events and steps that need to occur to achieve the preferred future
- map the key events on a timeline
- identify the *critical* events that must occur if the preferred future is to happen

> Ask the groups to write the events on post it notes and then put those on a timeline. Each group can build their own timeline or you can create a single one that everyone contributes to

If you have sufficient time, ask the group to develop the timeline into a fishbone diagram:

- focus on the critical events that must occur
- identify the (say) three or four things that need to happen to ensure they do occur
- develop the timeline into a fishbone diagram

> If you have enough groups, think about about asking each to focus on one category of events: political, economic, societal, technological, legislative or environmental, for example
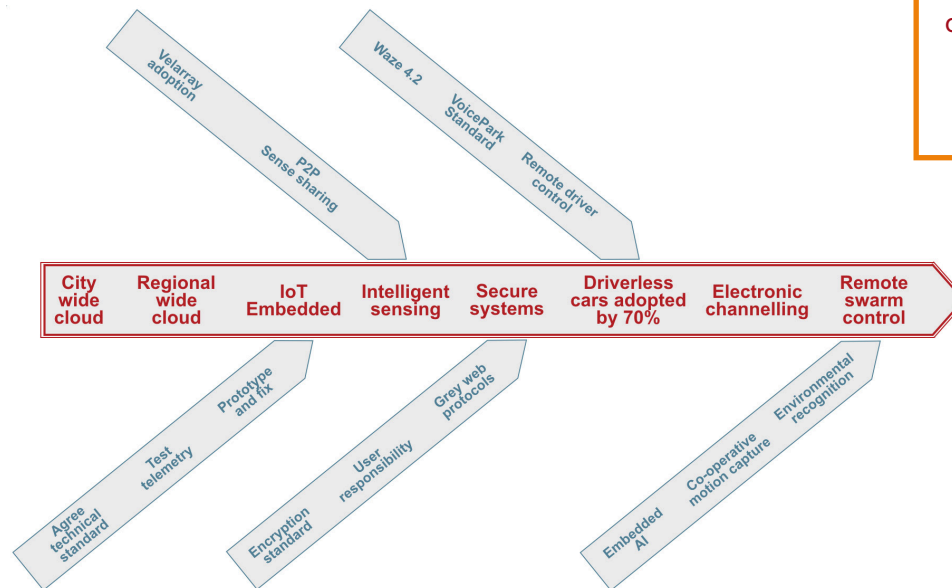
Identify which changes are in your control and which aren't   30 minutes

Score each event on the timeline:

1: this event is wholly in our control

2: this event is partly in our control

3: this event is wholly out of our control

> You can be pragmatic at this point. If there are too many events to score every one, focus on the critical ones

Identify what you need to do to deliver the steps that are in your control   45 minutes

Split each group into two. Ask one group to focus on the critical events on the timeline that are wholly in your control. For each one, identify:

- what impact the event will have on delivering the preferred future
- which stakeholders will benefit from this event happening
- which stakeholders will – or may feel that they are going to – lose out
- how certain it is that the event will happen
- the enablers that will make it easier for you to make the event happen
- the barriers you may have to overcome to make the event happen
- the four (or more) key steps you need to take now

> You may need to vary the timing of this session depending on the number of events and participants

Ask the other group to focus on the critical events that are partly in your control. For each one, identify:

- what impact the event have on delivering the preferred future
- which stakeholders will benefit from this happening
- which stakeholders will – or may feel that they are going to – lose out
- how certain it is that the event will happen
- what you need to do/who you need to work with to ensure the event will occur
- the four (or more) key steps you need to take now

Identify how you can influence the steps outside your control   30 minutes

Focus on the critical events that are out of your control. For each one, identify:

- who or what has control
- the impact of the event not happening
- what you can influence to increase the likelihood that the event will occur

Plenary review and discussion   45 minutes

Review the conversations and focus on next steps

Roadmapping

Roadmaps show how a range of inputs – research, trends, policy interventions, for example – will combine over time to shape future development of the policy or strategy area of interest

Aims:
- To build a holistic picture of the different elements in a project and how they combine over time
- To deepen understanding of the complex connections and relationships between different elements

Participants: As a desk exercise, the issue holder or full project team. As a workshop discussion, key stakeholders and subject experts

Number: In a workshop, can be done with groups of 4 to 6

Timing: Flexible. Can be delivered over the life of the project

Facilitation: Advanced beginner

Output: A roadmap of relevant issues set out over time and connected to related strands of evidence and driver developments

Outcome: More holistic thinking about the policy area and clearer insight into the connections, relationships and causal links between policies and exogenous factors

Good for:
- Creating insight
- Developing a holistic approach to policy
- Preparing for the impact of related – and sometimes unrelated – policies on the policy or strategy areas of interest

Risk: **Medium.** The main risk is that the roadmap can become 'the plan'. The roadmap is as good as the intelligence built into it

Get here from…
- Visioning
- Policy Stress-testing
- SWOT Analysis

Move on from here to…
- If used at the start of the process, move on to most activities

Use the output to inform…
- Policy or strategy development

The Approach

The roadmap is a timeline that visually identifies when and how key exogenous events and decision points – technology adoption, drivers, policy announcements, changes of government and so on – might shape the policy area under consideration.

A particularly useful aspect of Roadmapping is that it combines known (certain) developments with speculative (uncertain) developments. The roadmap does not need to be a single line or be restricted only to the core issue; it can be expanded to include developments in related policy areas that may impact on the central project question.

There are 6 steps:

Step 1: Agree the scope

Step 2: Build a 'first draft' roadmap

Step 3: Gather research

Step 4: Refine and develop the timeline(s) in the roadmap

Step 5: Validate the roadmap

Step 6: Create an action plan

> Of all the techniques in this Toolkit, roadmapping is the most flexible and – crucially – the most emergent. Use this section to get a sense of how it's done and then try it out and create your own roadmap and your own process

Agree the scope

Agree the core issue under investigation and consider related policy areas that may have an impact on it. Agree the planning horizon (how far into the future to look), where to look (maybe from Horizon Scanning) and who to involve.

Build a 'first draft' roadmap

Do this quickly, to get the key events out. The roadmap is going to evolve so don't worry about missing things out at this point. You can build it with the project team or widen discussion by running a short workshop with subject experts to build a map using post it notes to capture events.

> Start building the roadmap on a whiteboard to allow for plenty of rubbing out and redrawing

Review the map at the end of the conversation to identify what you need to clarify, what you want to find out more about and what might need to be added in later iterations of the map.

Policy Stress-testing ⟩ Backcasting ⟩ *Roadmapping*

Gather research

Research the specific areas identified in the scoping stage. Use research journals and Horizon Scanning to identify possible emerging issues. Interview topic experts using 7 Questions and identify key trends and developments (PESTLE) that might have an impact on the roadmap. Uncover key drivers that underpin the topics to build a detailed picture.

Refine and develop the timeline(s) in the roadmap

As your knowledge grows, modify and develop the roadmap. Look at different strands of research and consider how they connect to – and influence development of – events further along the timeline.

Keep developing the roadmap as your research knowledge grows. Change the map constantly
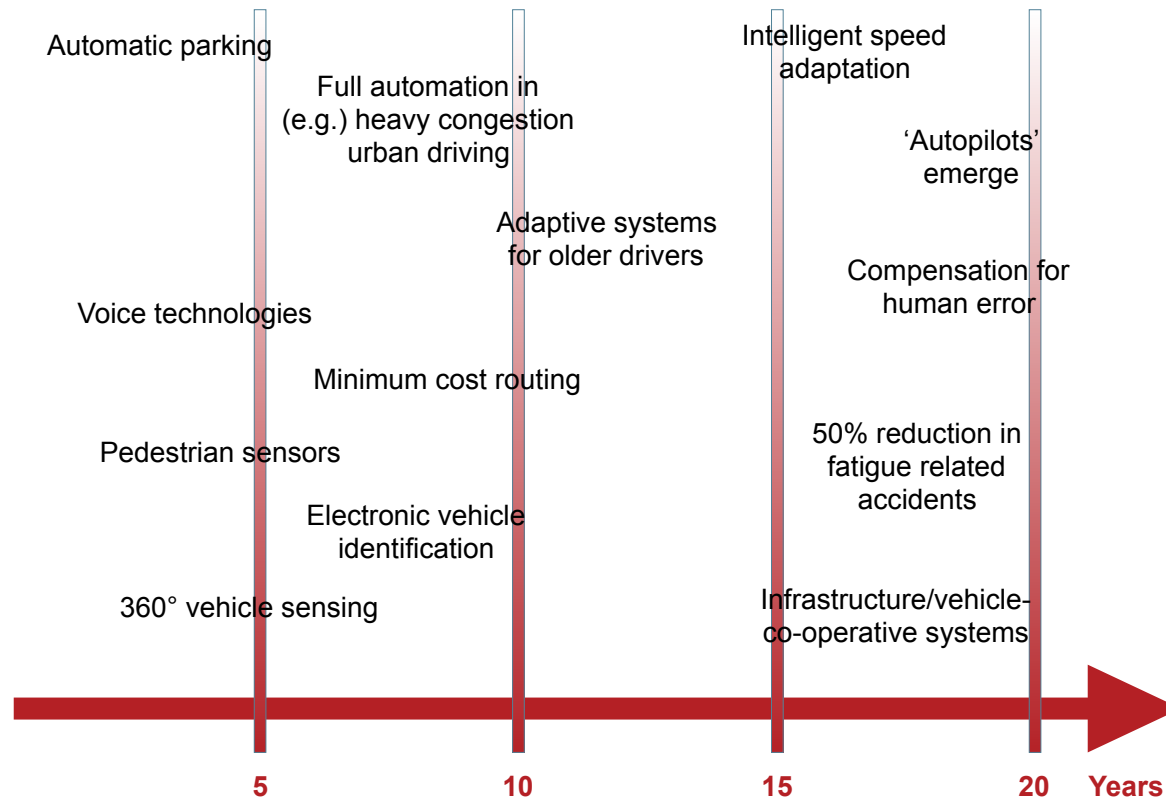
This roadmap is from Foresight's Intelligent Infrastructure Futures project. You can find it in the project's Technology Forward Look paper

Automatic parking

Full automation in (e.g.) heavy congestion urban driving

Intelligent speed adaptation

'Autopilots' emerge

Adaptive systems for older drivers

Compensation for human error

Voice technologies

Minimum cost routing

Pedestrian sensors

50% reduction in fatigue related accidents

Electronic vehicle identification

360° vehicle sensing

Infrastructure/vehicle-co-operative systems

5   10   15   20   **Years**

Validate the roadmap

At a suitable point, consider presenting and reviewing the timeline with subject experts and other policy makers to present and validate the timelines. Do this 1:1 or in a short workshop.

Create an action plan

The action plan illustrates key objectives that are necessary for success within this environment. Thereafter, the action plan identifies clear routes for achieving these objectives.

> Refining and developing timelines are an ideal way to engage subject experts in a workshop

10. Evaluating the impact of using a particular tool

Each of the tools and pathways in the Toolkit describes a purpose, a set of aims[4] and an output. The most straightforward way to evaluate the impact of any given tool or pathway is therefore to determine the extent to which it met that purpose, achieved the aims and delivered the output.

It is worth remembering, however, that purpose, aims and outputs are described at a generic level in the Toolkit and you may want to understand the project team's specific requirements in advance of working with them. Section 3 provides guidance on the general questions to explore with the project team to build this understanding.

Futures processes generally deliver qualitative outcomes – shared models, agreed priorities, shared understanding of the choices that need to be made – rather than quantitative ones. These can be harder to measure than quantitative outcomes and generally involve some degree of judgment; but don't underestimate the importance of a group enjoying and being intellectually challenged by a particular conversation.

More subtly, perhaps, a futures process may aim to challenge existing mental models and suggest new ways of doing things. A scenario workshop, for example, might prove quite challenging for some stakeholders who find that the scenarios conflict with their own view of the future and, consequently, their own purpose and strategic priorities. Where this happens, it usually means the scenario process is doing exactly what is required of it – examining how robust a set of strategic objectives are – but some participants may find some lines of conversation threatening and suggest that the process itself is not valuable.

This can lead to the process owner and participants having a different view of the success of a particular conversation. In general, it is the process owner's evaluation that is important.

Time has an effect on evaluating the success of a particular tool as well. By the end of a workshop, participants – and the process owner – may be tired and unsure of the full range of benefits that have come out of the process. They will have a much clearer perspective next day, so it is worth checking in with them at that time.

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[4] Defined as the business need in each pathway

Annex 1: Sample futures and foresight material

Introduction

This annex contains sample outputs from a number of futures processes. They are included to illustrate what the outputs can look like and to help design your own futures activity. They are not definitive.

The following pages contain:

- two horizon scans in different formats
- an example of a 7 Questions interview
- an extract from an issues paper
- a drivers map
- sample slides for introducing scenarios
- one scenario from a group of four
- a vision
- a SWOT analysis

Some of the context is taken from recent projects, some from projects delivered further back. Text has been lightly amended or redacted in some cases to protect confidentiality. The samples are taken from a mix of or organisations in government, higher education and business.

Two horizon scanning formats

Two formats – long and short – are set out to show the options.

The Internet of Things	▶ H3

The Internet of Things (IoT) – also described as Industry 4.0 or the fourth industrial revolution – is the network of physical objects embedded with electronics, software, sensors, and network connectivity which can collect and exchange data. At its core, IoT is simple: it's about connecting devices over the internet and letting them communicate with users, with each other and with applications. Its implications are more profound. IoT will change production – processes, practices, CRM – as much as the development of social media will change consumption.

IoT has been waiting in the wings for a couple of years but is now expected to take off. Accenture has published research suggesting IoT could be the biggest driver of productivity and growth between now and 2031, adding an estimated $14 trillion to the global economy. It is currently expected to be worth half a trillion dollars to the UK. While these figures can be treated with some caution – actual value will depend on momentum, scale of roll out and unforeseen shifts in the market – the big issue in 2031 is likely to be which industries and institutions are ahead of the game because they took the risks.

IoT is not simply going to fall into the world's lap. Rather than incremental change to business models, IoT will challenge organisations to conduct a fundamental review of practice and instigate significant transformation, quickly. Like other technologies, IoT will make some jobs redundant but it will create new jobs and demand for new skills. Businesses and economies are still moving slowly, trying to understand the significant investment they need to make to develop the right processes and skills but they will soon require education, training and skills development on a significant scale. Flexibility and adaptability are likely to determine economic success for everyone.

Broad implications

Speaking at Davos, Professor Alice Gast, President of Imperial College London said that university research will be at the heart of the fourth industrial revolution – but only if fundamental research is embedded at its core. Private sector R&D cannot drive it alone because of business's focus for short and medium-term applications so, she said, 'Universities [will] provide the crucible for completely new areas of science and technology to emerge, like biomedical engineering, data science and synthetic biology; and the business opportunities will follow."

Universities are clearly drivers of the new technologies that underpin the fourth industrial revolution, but they are only one part of the equation – it is the combination and application of these technologies in commercial settings that will drive Industry 4.0 forward. Here, therefore, effective collaborations and commercial ventures will be critical to individual institutions' success.

Flexibility and adaptability are likely to determine economic success in Industry 4.0 and high skill labour (scientists, engineers, lawyers, for example) will need to be able to adapt their skills to the world of extreme automation and connectivity that will shape future economic structures. Being skilled in change, as well as being qualified professionally will be crucial for success in Industry 4.0 and will need to be taught.

Implications for [policy area]

[REDACTED]

Political

▸ BIS underestimating value of student loans that won't be repaid

Key words: student loans, debt, BIS, government policy
Last updated: 14 February 2014

Impact on the business ★★★☆
Certainty ★★★★
Timescale short   medium   long

Baseline measure: unrecoverable student debt currently stands at £18 billion

Student experience: 🔴   **University plan:** 🟠   **Flexibility and efficiency:** 🟠

Summary: The Public Accounts Committee (PAC) report published on 14th February 2014 highlights that government consistently over-estimates annual repayments on student loans and consistently under-estimates the debt that will never be repaid.

Implications for [Client University]: Government efforts to tighten administration of loans might lead to student numbers reducing or to higher student numbers staying at home. Perhaps more likely, students will want to make their money go even further. They may wish significant differentiation of services or increased choice at the budget end; they may seek higher flexibility in accommodation packages or in accommodation bundled together with other services.

Technological

▸ Crowdsourcing energy

Key words: energy saving, user community, crowdsourcing
Last updated: 19 February 2014

Impact on the business ★★★★
Certainty ★☆☆☆
Timescale short   medium   long

Baseline measure: Guage interest and progress by following EnergyDeck on twitter: @EnergyDeck

Student experience: 🟢   **University plan:** 🟠   **Flexibility and efficiency:** 🟢

Summary: EnergyDeck is a community-based platform that helps organisations and individuals save resource costs. The driving idea behind EnergyDeck is to leverage the collective intelligence of its users in order to provide relevant benchmarks and help identify the most suitable savings opportunities via an easily accessed web platform.

Implications for [Client University]: EnergyDeck allows property owners and managers to track the impact of energy usage across individual buildings and portfolio, Benchmark buildings performance across an entire portfolio, against other buildings or industry standards, provide clear and consistent data provided to tenants to better understand energy usage and track the benefits of energy efficiency investment. Furthermore, by doing this, it increases trust with tenants.

An example of a 7 Questions interview

Interview with the Chair of a Professional Services Association

If you could speak to someone from 2025 who could tell you about the Association and what it is doing, what would you ask?

How is it funded? Does it receive money from the EU?

Is there free mobility of [profession] around the EU?

Are the members active? How do they promote the Association internally and to others? Has [professional] education been developed and qualified?

What is your vision for the Association?

My vision is that the Association works across the industry to develop a shared strategy for change and to develop the education and training resources it will need. I'd like to see lots of activities and drive – both from individual members and organization members.

I'd also like to see fewer talking shops and less documentation being produced.

This is not only important from a professional practice point of view. There's going to be a lot of calls from regulators across the EU for cost-benefit evidence and for increased focus on quality of service. I want the Association to be an acknowledged leader in practice and partnership.

What are the consequences for the Association if your vision is not realised?

It may slowly get obsolete. We may see a drop in the number of members if they perceive we are irrelevant and not delivering for them.

What needs to change (membership, relationships, structure, for example) to make your vision a reality?

We need to have a strategy for the Association itself and for how we can lead change across the profession. We need a strategy for helping both individual members and organization members and to support the network at a global level.

We urgently need to address our information gathering and how we translate it into knowledge and better practice. One way is to systematise evidence based practice. We need to gather and manage evidence urgently – our customers are already several steps ahead of us in their practice and they are noticing that we're lagging.

We need to engage the individual members. They don't see the broad agenda and we have to help them engage with it and drive practice forwards.

Looking back, are there particular lessons – successes, failures – from the last 10 years that we can learn from?

Our annual conferences always seem successful, but we should do an evaluation to see how they actually make a difference to working practice.

We could learn a lot more if we followed up on the site visits to see what has actually happened with regard to quality improvement.

We have to be better at showing the value in what we do.

We need to support networking and the promotion of the Association.

What needs to be done now to make sure your vision is realised?

This is a challenging question.

We have to work on different levels and to learn from experience to make sure [our practice] improves [customer experience]. How can we evaluate the sustained impact of [practice] on behalf of our customer base?

Research has highlighted new ideas about [practice] that can help us think about what we do. Some [members of the profession] are still old fashioned in the way they deliver services and a challenge for us is to develop a stronger customer-centered approach across all our membership.

We need to continue to work with the EU so that they can see the benefits of the work we are doing. However, we also need to be open to and learn from good practice globally.

We need tools to encourage members to take responsibility for practice. We need to share good practice more – I'm not sure we have a good enough strategy at sharing.

If you had the power to make anything happen, is there anything else you would do?

I would like a physical centre where all members could be welcome and could come for advice on strategic action planning, for networking, for learning evidence based-practice and where we promote quality and life-long learning.

I would like to have very direct contact with governments and legislators – and given the chance to be a part of strategic decision making.

An extract from an issues paper

The bullet points on this page and the next are quotes extracted from a series of interviews with senior managers in a multinational manufacturing business.

Growth

- The business is not growing as fast as it could. Product line 1 is growing, but it is organic growth – about 5 or 6% a year. With Product line 2, there is much more opportunity to grow faster, an increase of 10 to 15%.

- If we do not continuously grow, then we will lose who we are. If we don't deliver this continuous growth we will spiral downwards and it will be hard for the business to survive. It may not be the mega growth of the technology sector, but if we can't deliver a steady 2% growth, we won't continue as a business.

- If we keep doing what we've done well for the last 6 or 7 years – which has been very aggressive – I believe we'll have a very good future. But it all depends on the strategy for growth. If we stop growing, I believe we'll be threatened by our competitors. We have to be big, strong to compete.

- Investment in major acquisitions is something we're not good at. We pay over the odds for businesses; they're purchased on the basis of being available rather than if they can grow; we had an aggressive strategy to double size of company in a short time, but it didn't work… So how do we grow in future – boring steady rate, no acquisitions for 2 years?

- What's our expectation for Asia? We should grow the business by 10% over the next 5 to 8 years. That's a very different proposition from Europe and the US. Our business growth is not aggressive enough today. It's not very exciting. Getting from 4% to 10% is the difficult bit…

- We've had problems with organic growth – so I'd like to see faster growth in the emerging markets.

Customers

- Put customers in the middle of our circle. We don't do that now.

- We have to develop relationships with customers that are more concrete than today, rather than looking at this and that in emerging markets without a clear plan to move forwards.

- We should periodically meet customers – whether big and global or small and local – to talk about performance and ask what their vision for their market is. The more we can communicate, the more we understand each other and can build relationships.

- Are we really focusing on and increasing the satisfaction of customers, increasing our quality in great manufacturing plants?

- We are very concentrated on a few customers – and they are able to negotiate strongly.

Culture

- We reinvent the wheel because we lost the people and the expertise. We love initiatives! The flavour of the year was innovation, now its balanced scorecard. By the nature of my job, I love initiatives, but I find even I'm saying 'here we go again!' Do we have initiative fatigue?

- There are still parts of the business, particularly where it is unionised where the allegiance is more to the union than it is to the company.

- The majority feel appreciated by the business, but there are still too many "living in the past" who make it difficult for us to move forward.

- We must make sure our employees are really satisfied so that every day they wake up and want to come to work, that they love working at the business. Are we good at these things or not?

- Corporate people don't have such a good reputation, they point out problems. They have to work in a different way – proactively – and find ways to help the plant deliver. They have to be part of the solution rather than saying 'just do it' and then going back to corporate.

- We are too micro managed and it needs to be macro; leaders should not be involved in the day to day operations but lead by task, objective and example (so they can focus on the long term and strategy).

Creating value

- Markets will be very, very connected in the future and our customers will demand sustainable solutions. We have to think very hard about this, all the way along the value chain.

- We need to try and develop new products with our customers in a more collaborative way. Many of the projects we have developed here have come from good experiences in Europe – but it is always our customers who have seen something they like in Europe and who ask us to copy it. It is reactive. We have to be more integrated within their supply chain and manufacturing process. This is how we will create value – if we end up competing only on cost, we will find it very tough.

- We can maximise quality and minimise cost by working more closely with the customer to understand their requirements in more detail.

- We should choose the business areas carefully. Innovation will be essential to meet the tight margins – especially so the customer can see how we create value.

- Product line 2 is good at working with clients, at creating new ideas to put on the table. They have good processes, lots of ideas, meet customer demand. We should investigate this for the Product line 1 side of the business. I don't know the process, but it would be good to develop relationships with Product line 2 to see how they do it.

Sample drivers map

Taken from a stakeholder workshop exploring resource futures.

Important

Certain Outcome

Uncertain Outcome

Not important

Climate Change

Sustainability

Social attitudes

Social unrest

Developing world affluence

Independence (little Hitler)

What is the world super power?

Are we still in the G8?

Embracing GM

GMO acceptance

Outcome of skilled labour shortage

Land values

Crop production increase by 50% by 2050 without extra land

Will EU still be a union?

Eurozone crisis – single farm payment/CAP?

Eurozone crisis – debt issues

More regulations around borrowing

Public debt

Political influence

Westernisation

Cultural differences

BRIC countries forcing smaller players into more niche markets

Arab influence

Trade tariffs

Technology

Water availability

Infinite resources

Energy security

Water in rest of world affecting markets etc

Ageing population

Population growth: increased demand for energy and food demand

Population growth

Consumption

Where will Scotland fit in a world production environment?

Large countries ring fencing agriculture in third world countries causing conflict

Future trade conflicts?

Land availability

Threat of invasion

Will wars be fought because of food and water?

Unemployment super power

Supply and demand

Global ability to pay

Restructure planning process (disproportionate voice)

Urban spread

Food scare

Scenarios…?

- Stories that describe how the world might look in the future
    - What's different from today
    - what we need to do to be successful

- Based on an analysis of drivers

- …and on looking at critical uncertainties and predetermined elements

- Not predictions or forecasts

- Help you imagine how the conditions for success might vary in the future

- …and anticipate some of the important decisions you might need to make about policy, resources and key activities

- Simplify some of the apparent complexity in the world

Political
Economic
Societal
Technological
Legislative
Environmental

Wider (global) context

Drivers

Policy delivery space

Policy development space
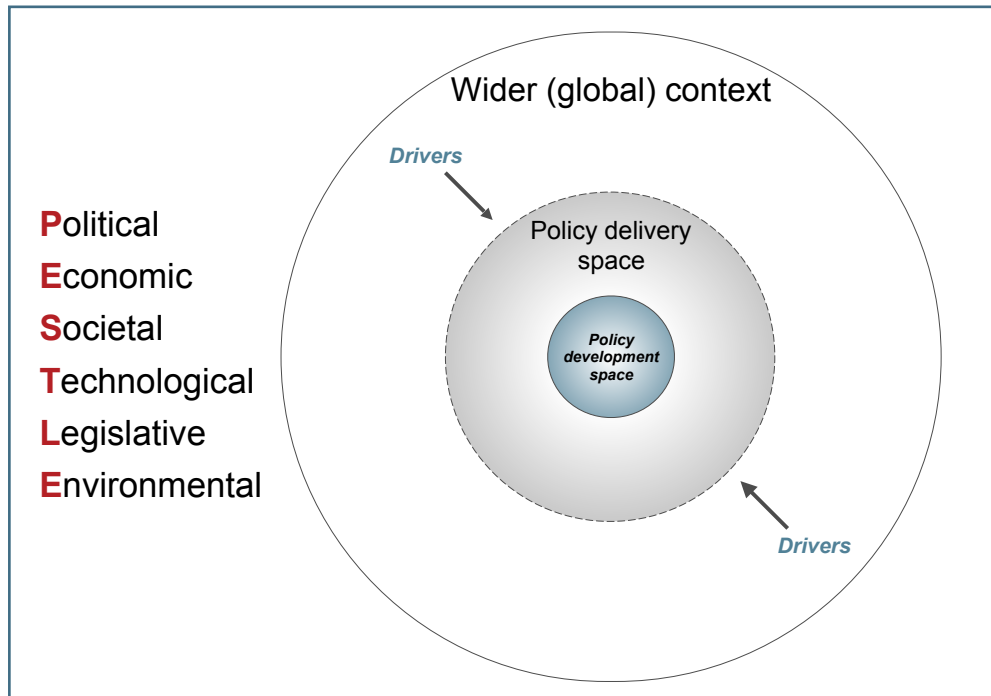
Drivers

A 5 step process

1. Identify change drivers

2. Decide which change drivers are critical and uncertain for the future of [the policy area]

3. Construct a scenario matrix

4. Develop storylines that explore what the future might be like

5. Explore the implications for policy and strategy making
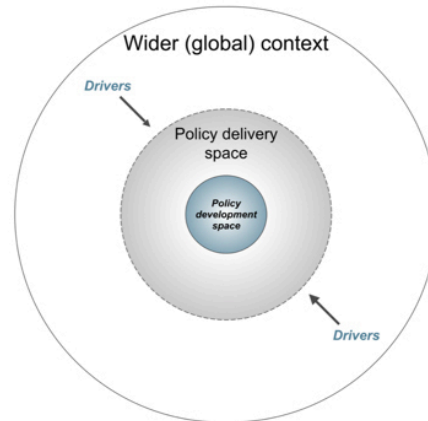
A sample scenario (one from a group of four)

The main characteristics of this scenario were developed in a half day scenario workshop. The narrative was written drawing on that conversation and on interviews with senior internal and external stakeholders.

The scenario – **Trading Places** – describes a future where economic power has shifted to the eastern economies and where markets and cultures are open to each other.

The global economy

Global economic growth averages 4% per annum. China, with growth of 7%, has steamed past the US and is now the world's leading economy. India is lying in third place.

China's current success is built on the introduction of market based competition and efficient allocation of capital to firms. This has unlocked entrepreneurial potential and allowed wealth to flow throughout the economy.

State run enterprises have fallen away and the banking system has become regulated, open and trustworthy. The state remains watchful, but for the right reasons, and has withdrawn from direct intervention in most aspects of the economy.

Infrastructure and environmental protection are two exceptions, mainly because of the financial risks and the need for sustained effort. It's now almost a decade since ASEAN 2020, when the Southeast Asian Nations launched their 15 year programme to achieve growth within environmental limits. They have made strong progress, committing to the innovation and investment needed to develop a renewable energy infrastructure and to clean up industrial production. The next wave of development will focus on access to clean water and on stimulating local resource ownership and local food production as far as possible.

The rest of the world is following Asia's lead, recognising that continued global wellbeing requires a co-ordinated approach to all its challenges – not just global warming, but poverty, resource scarcity and increased security threats from fundamentalist and criminal agencies.

The US economy has steadied, buoyed by China's support for US government bonds and by the globally open approach to trade. It has been encouraged by China which now provides a large and increasing share of US imports. Growth is slow and unemployment remains high, but government support for start-ups is slowly bringing more of the labour force back to work.

While Europe cannot quite be described as resurgent, the early and widespread adoption of circular economy practices has released innovation and created employment. Regulation is strict – businesses and individuals are taxed on resource use as well as on earnings and all goods and services must openly present their environmental footprint – but compliance is high. Assigning economic value to natural resources is changing perceptions of wealth and prosperity. Communities are becoming locally focused and planning regimes across the EU are working hard to rebalance economies and distribute jobs more widely.

Technology helps. Increasing numbers of people work locally for increasing periods of time. Many employers have cut their physical space. Transport infrastructure still creaks, but less so.

China today is the new 'New World', attracting migrants from the west and other parts of the southern hemisphere. Scientists, technologists and other highly skilled individuals are particularly in demand – either in person or through collaborations – and many are keen to take up the opportunity. It's not quite a western brain drain, but money talks. China has it.
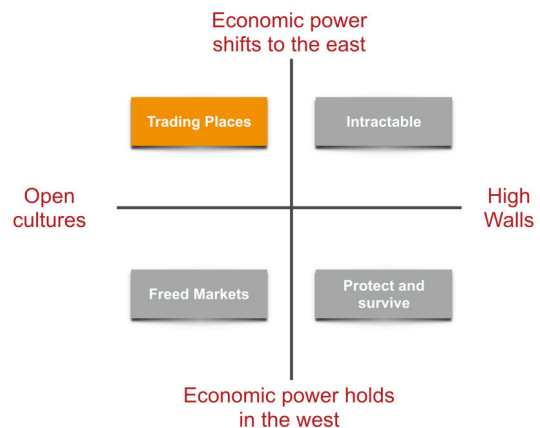
Britain

Many people thought that the UK was in deep trouble when the financial services sector relocated large chunks to Dublin, Paris and Frankfurt after the UK's 'passport' was revoked – but they were wrong. The last decade has seen the former UK replace financial services with environmental services, effectively swapping out one wealth creation process with another – albeit with different measures of success. 'Old' economy industries such as gaming and medical technologies remain strong in Britain, but the real opportunities are in circular economic development and environmental protection.

It has been a fortunate transition – socially as well as economically – and one which the UK government would like to claim credit for. But they can't. Credit goes instead to the innovative partnership formed by environmental businesses, by the UK's young, talented and compassionate workforce and by an education system that has nurtured them and provided the skills they need to create a sustainable future.

A partnership, of course, that reflects the new reality of Britain and who really runs it.

Perhaps that is why people in Britain smile so much – because they have taken control and are now working hard to deliver what they value and care about. No-one seems that bothered that the economy is still flat rather than growing or that taxation is relatively high and people are less well off financially than a decade ago. Perhaps that's because anything is better than the drawn out and deep recession that cost Britain so much pain post Brexit.

Britain's geography is changing as farms scale up and land is rezoned to achieve optimal productive efficiency. Part of that productive capacity is allocated to food crops (although carbon intensive natural meat has been reduced) and part to energy crops. Ethical biotechnology has increased crop yields and reduced damage to soils.

One continuing challenge is how to tackle the environmental challenges in Britain's major cities quickly and with limited disruption. Electric vehicles and carbon rationing help but continued population growth – particularly in London – is placing huge strains on water availability and contributing to wider environmental stress. Some wonder if cities are about to change fundamentally. Certainly, distributed networks and remote working mean that concentrated population is no longer absolutely required for success and, many would now say, has gone way past what is sustainable.

Local communities are strong. Government reforms have led to decentralised decision making as far as possible. Public services still have some way to go to achieve the level of integration and efficiency that citizens demand, but the new crop of people coming into local politics have a high sense of responsibility and are making good progress.

A vision

This sample is the output from a Visioning workshop with senior members of a UK business.

In 2025…

Protecting the environment is a key concern across UK society

Environmental protection is a key concern to consumers and society. Government policy is focused on ensuring the UK is resilient in the face of emerging resource security and scarcity. Business practices are designed to reduce waste and drive greater resource productivity. Compliance is tightly managed.

[The business] has adapted well

[The business] has adapted efficiently and effectively. This reflects **a creative and forward looking approach** to operations that has led to **new partnerships and increased collaboration** with others in the sector. **Innovation** drives profitability up and initiatives such as [deleted] drive costs down. Sharing best practice is commonplace. The use of recycled materials has increased.

Technology has reduced the size of the workforce, but those who remain – particularly apprentices and graduate recruits – have access to **education and professional development** and to structured career path planning on a par with competitors in industries such as [deleted], [deleted] and [deleted]. Salaries are competitive with those industries too. Productivity is high.

Greater flexibility in working hours and high job satisfaction scores mean **the sector overall has little problem attracting new workers** from both domestic and overseas labour markets. The number of young people entering and staying in [the business] has increased significantly. There are more women at all levels of the workforce.

Industry standards are high in areas of practice ranging from health and safety through quality to [deleted].

[The business] has strengthened its relationships with local communities

The business has **strengthened its relationships with local communities**. We are open about our activities and can demonstrate how they support both infrastructure development and the environment. Public understanding of what we do is high and our reputation is positive.

We have achieved this by being open with communities and sharing [section deleted]. Our **community investment programme** provides [section deleted].

[The business] remains confident in the face of continuing strategic challenges

[The business] remains confident despite continuing strategic challenges, supported by **a shared vision that defines a co-ordinated approach** to long term change and development.

Challenges for the future include the continuing loss of experience through retirement; the continuing pace of technological change; the need to sustain investment in people, equipment and processes; the threats posed by global warming and security of energy supply; and overseas competitors who continue to eye the UK sector enthusiastically.

Our approach to understanding these challenges involves **building our market intelligence** and using it to support out investment and project decisions.

A SWOT Analysis

This table was produced by one of three groups in a strategy workshop.

Strengths	Weaknesses
• reputation of faculty for being agile and customer focused • underpinning of [subject] portfolio by research activity • breadth of activity (subject; UG/PG, PT/FT; FD to PhD) • strength of partnerships across [Faculty] • high numbers of part-time students – richness & diversity to student body • leaders in education in field of [Subject area]	• perceived Reputation of University • degree to which research underpins [Subject area] professions portfolio • staff structure required to deliver broad portfolio • financial reliance on professions education (c 70% of int & ext income) • lack of appropriate systems and level of resource needed to support large & diverse student body
Opportunities	**Threats**
• changes to policy may offer opportunities to expand provision • changes in systems & structures of [professions] drive CPD requirements the Faculty can exploit • high levels of employability linked to portfolio, which may be more attractive in a self-funding (through debt) HE market. • pressures on [professional] organisations' staffing – driving demand for different models of delivery for education • expansion of the market could generate a new opportunity • current climate causing an increase in people seeking good quality advice, debt, housing etc	• changes to policy may result in provision moving to competitors • changes in professional education commissioning means some programmes cease to be viable • public spending cuts reducing the amount available for CPD • focus of research funding into Russell Group • future funding models and viability of some portfolio on a self-funding (through debt) model • strength of the regional competitors in CPD market • decline in graduate opportunities

Annex 2: Glossary of futures and foresight terms

7 Questions: an interview technique for gathering the strategic insights of a range of internal and external stakeholders

Actors: individuals and organisations – government, businesses, citizens, for example – that are active in the policy or strategy area

Axes of Uncertainty: used to define the critical uncertainties for the policy or strategy area in the future and to frame the scenarios

Backcasting: determining the steps that need to be taken to deliver a preferred future

Brainstorm: a process used in workshops or conversations to develop a long list of issues, drivers or ideas. Participants add to the list by building on each other's ideas. The ideas are evaluated after the brainstorm is complete

Critical uncertainty: a driver or issue that is important for a given policy or strategy area but which has an uncertain outcome

Delphi: a consultation process used to gather opinion about the future from a wide group of subject experts and to prioritise strategic issues

'Day in the life of': a 'day in the life of' narrative (sometimes shortened to DILO) is a used to illustrate how the conditions in a given scenario might shape the life of a individual stakeholder or a range of different stakeholders. DILOs can be used alongside scenario narratives to add detail and interest or they can form the central narrative itself. GO-Science used DILOS (called 'personas') in the Future Identities report (boxes 3.1 and following)

Driver Mapping: used to identify the political, economic, societal, technological, legislative and environmental (PESTLE) drivers shaping the future policy environment

Driver: a current or emerging trend that is likely to shape (have an impact on) development of the policy or strategy area

Event: something of significance in the policy or strategy space that suggests the world is moving in a particular direction

Facilitator(s): the individual(s) with responsibility for designing, managing and delivering the futures workshop

Futures: an approach or way of thinking about the possible, probable, and preferable futures and the underlying structures that could give rise to particular future characteristics, events, and behaviour

Foresight: a process by which one comes to a fuller understanding of the forces shaping the long-term future which should be taken into account in policy formulation, planning and decision making (from Coates, J.F., 1985. Foresight in federal government policy making. *Research Futures Quarterly* 1, 29–53.)

Groupthink: the practice of thinking or making decisions as a group, typically resulting in unchallenged and poor-quality decision-making

Horizon Scanning: the process of looking for early warning signs of change in the policy and strategy environment

Internally consistent: scenario narratives that contain reinforcing messages about the future and do not include events that cannot happen within the scenario logic

Intuition:	the belief that something is going to be strategically important in the future, even when there is insufficient evidence to prove that it will be
Issues Paper:	a paper that presents quotes from the interviews to illustrate the strategic issues and choices around the policy and strategy agenda
Pathway:	a combination of tools designed to meet a particular business need
PESTLE:	a generic term for the drivers shaping the future policy environment. PESTLE is an acronym which stands for **P**olitical, **E**conomic, **S**ocietal, **T**echnological, **L**egislative and **E**nvironmental drivers. There are a number of common variants which describe the same drivers or a subset of them – PEST, STEP, STEEP, STEEPL – and some (PESTO, PESTOLE, for example, where the O stand for Organisational) which introduce additional drivers.
Policy Stress-testing:	a method for testing strategic objectives against a set of scenarios to see how well they stand up against a range of external conditions. Sometimes called 'Windtunnelling'
Predetermined element:	a driver or issue which has both a high impact on the given policy or strategy area and a certain outcome
Roadmapping:	shows how a range of inputs – research, trends, policy interventions, for example – will combine over time to shape future development of the policy or strategy area of interest
Scan:	*(noun)* an article, usually part of a Horizon Scanning process, that describes an external event or emerging trend that points towards change in the policy and strategy environment
	(verb) to look for articles that describes an external event or emerging trend that points towards change in the policy and strategy environment
Scanner:	an individual who scans, usually as part of a structured process
Scenarios:	stories that describe alternative ways the external environment might develop in the future and how different market conditions might support or constrain the delivery of policy and strategy objectives
Scenario matrix:	a 2x2 matrix that is constructed by juxtaposing two priority axes of uncertainty and that defines the parameters of a set of scenarios
Stakeholder:	any group or individual who has an interest in or an influence on the policy or strategy area
SWOT Analysis:	identifying the relevant Strengths, Weaknesses, Opportunities and Threats. Strengths and weaknesses are internal factors that need to be taken account of when developing policy or strategy. Opportunities and Threats are external factors that need to be considered
Timeline:	a method for presenting a series of events leading to a scenario or a vision that orders those events relative to each other and to time
Trend:	a visible – or emerging – pattern of events that suggest change. In futures thinking, a 'trend' becomes a 'driver' when it acts on the policy or strategy area of interest
Visioning:	creating a set of common aims and objectives for a project and describing what the future will be like (the vision) if they are delivered

Annex 3: Frequently Asked Questions

Q: Why should I embark on a Foresight exercise?

A: Foresight offers a range of benefits. In particular, use it to

- develop and refine new policy or strategy by testing the assumptions underlying the policy or strategy question
- generate new ideas and approaches to a policy or strategy area and explore innovative ways of responding to policy challenges
- show or attain 'thought leadership' on a given topic
- shift the focus of senior leader/management dialogue towards the long term
- help improve the culture of strategic thinking in your part of the organisation, so that it is more agile, adaptive, proactive and future-facing

Q: Is there a set way to do futures thinking?

A: No. A particular strength of futures work is that it is highly flexible, so there is plenty of scope for creative approaches and for customizing the tools to your own particular requirement. The Toolkit will help you design the process you need to meet your particular objectives.

Q: What should I do when starting work on developing a strategy or a new piece of policy?

A: A good way to start is by gathering intelligence about the future and then exploring the dynamics of change.

There are four tools for gathering intelligence about the future: Horizon Scanning, 7 Questions (and the Issues Paper) and Delphi. Pathway 1 – 'Exploring underlying issues or causes in scoping or defining the policy area' – sets out how to use three of them in combination.

Think about inviting some external stakeholders to contribute scans.

To explore the dynamics of change, run a drivers workshop once you have done Horizon Scanning. You may wish to do some initial drivers research. Invite external stakeholders to the workshop.

Q: Given how uncertain the world is at the moment, are there different approaches which are more relevant? (eg should I pay more attention to game changers as opposed to predictable trends)?

A: Game changers are events that have a profound effect on the policy environment. While their *impact* may unpredictable, their *emergence* may not be. Game changers can therefore be anticipated, even when it seems unlikely that they will occur.

Timing can be the key. Donald Trump's presidency (for example) was wholly unexpected before June 2015, considered wholly unlikely in the second half of 2015 and was still seen as highly unlikely by mid 2016. The appropriate futures response to Donald Trump at that time was not "will he or won't he become President of the USA?" but "what are the broad implications for [for example] the global economy if Donald Trump does become President?"

At times of higher uncertainty, it therefore makes sense to invest more time in exploring the nature of uncertainty and its possible outcomes. To do this, focus more on the techniques for exploring the dynamics of change and describing what the future might be like.

Q: Do I have to use the pathways?

A: No. The pathways are there to provide a guide for common business needs. You may prefer to design your own solution.

Q: What's the difference between a trend and a driver?

A: Relevance to the policy or strategy area.

A trend is a visible – or emerging – pattern of events that suggest something new. In futures thinking, a 'trend' becomes a 'driver' when it acts on the policy or strategy area of interest.

Q: How do I work to identify the broadest range of drivers for change and, in particular, to get beyond those drivers which are within my direct circle of influence or understanding?

A: Our natural tendency is to look for things that we perceive to be important and that reinforce our mental model of the world and how it works. The three ways to counter this in Horizon Scanning are (1) to be aware of it, (2) to push past it and be open to drivers of change that are beyond our own areas of interest and (3) to involve others in Horizon Scanning who have a different range of interests to our own.

Most policy teams are made up of people who have (broadly) similar educational and cultural experience and who therefore see the world in (broadly) the same way. To get beyond your circle of understanding, involve a mix of people – different age, ethnicity, background, professional discipline and aspiration, for example – in your Horizon Scanning. If you can't directly involve (for example) 21 year old non-graduates who work in software development, try to understand what their perspectives are on the world and bring those in to the scanning process. Look at the chat forums they spend time on to understand their values, hopes and concerns; look at magazines they read. Interview some if at all possible.

Don't forget, too, to look for articles in places you don't normally look. Visit international news websites such as Economist.com, China Daily, San Francisco Chronicle, Wall Street Journal, Der Spiegel and so on.

When gathering drivers, review what you have according to the PESTLE model to ensure you have a wide and representative spread of issues. Make sure, too, you are looking towards Horizon 3 for everything.

Q: How do I access understanding about the potential future relevance of developments in technology (in an understandable language!)?

A: Popular websites such as New Scientist, Science, The BBC's Science Focus and the World Economic Forum are good sources.

Many universities have knowledge exchange programmes and science/technology communicators. Contact relevant institutions and research bodies to gather their opinion.

7 Questions works well for gathering detailed technological knowledge. Identify people working in the particular subject areas of interest to you and invite them to be interviewed.

Delphi is a powerful technique for gathering the opinion of a range of technology experts and using it to refine the technology issues around the project.

Consider engaging a technology journalist, a recent graduate or a technology specialist to produce some horizon scans for the project. Ensure they use the same structure you are using in the rest of your scans and that they don't produce technical reviews.

Q: When facilitating my own futures workshops, where are the problem spots which can potentially derail a conversation?

A: The hardest parts of a workshop often occur when you are moving from one technique to another. Be honest with yourself about which elements of the workshop seem straightforward to you and which you feel less confident about facilitating. Rehearse these latter elements in advance.

In general, keep an eye on participants' energy levels. These can drop quite suddenly after the group has been working for 90 minutes or more.

Think carefully about how you explain tasks and always check that the group understands what you are asking them to do and that they understand the technical futures language you are using. Three common – and particularly important – examples of this occur around Driver Mapping, Axes of Uncertainty and Scenarios.

In **Driver Mapping**, you may find that, when asking a group to map drivers on an importance and certainty matrix (page 44), some participants will interpret 'importance' as 'impact'. The distinction is critical: 'importance' has two dimensions – high and low – whereas 'impact' has four dimensions – high and low, positive and negative. You may choose to use impact in certain cases but you must ensure participants are clear about which one you want in a given exercise.

You may also find that a group is not clear about 'Certainty' in this matrix. Certainty relates to the outcome of a given driver – what the impact will be – not to the probability that a driver is in play.

When agreeing the scenario matrix using **Axes of Uncertainty** (page 46) you may find it useful to run that specific conversation before a lunch or coffee break to give yourself time to review the matrix and ensure it is meaningful for the project.

In **Scenarios** it is important that workshop participants use the axes of uncertainty that form their scenario quadrant to build an internally consistent and coherent narrative that reflects how the key drivers of change will shape the future. This can sometimes feel challenging for participants who may not like the scenario space or who may find it clashes with their personal or professional values.

These three areas are particularly important, but all the techniques have points that you need to anticipate when facilitating. Thinking through the procedure will highlight any uncertainties and allow you to prepare for them.

Q: When should I consider bringing in an external facilitator?

A: Bring in an external facilitator when there is no internal facilitator available or when they

- want to be part of the group discussion
- are perceived to have an interest in a particular outcome
- are not going to be impartial
- do not feel confident that they have the skills required for the particular process
- have to manage a group of internal senior decision makers who may be difficult to challenge

Q: When discussing the future, should people focus on what will be or what should be?

A: This varies by technique. In Visioning, groups create an aspirational vision and define the path towards making it happen. In scenarios, groups explore what might be in order to practice different responses.

Groups don't always make the distinction immediately so it is always worth ensuring people are clear about the task; but, of course, even when you explain it, people do not always hear the point. When facilitating, therefore, listen out for contextual words and phrases that participants use and gently correct as needed. 'What should happen is… What I'd like to see… What needs to happen…' could all be examples where you might want participants to use definitive words such as 'will' instead of 'should', 'like' or 'need'.

Q: Will people enjoy the process?

A: Almost certainly, the answer is yes. People are not typically asked to think about the future on a day-to-day basis and more often than not, they really enjoy it. You can enhance their experience by helping them to recognise how others (whom they know and work with regularly) might see/frame the world differently to them.

Q: How do I creatively present the findings?

A: There is a whole range of ways to present scenarios, depending on the audience, scale of the exercise and its potential. The following techniques have all been used in Government in the recent past. There is no need to settle on one approach; you can mix and match:

- stories set in the future (endstate narratives)
- timelines that describe how the world moves from the present to the future
- newspaper headlines or images of the future that capture key stories or events
- short films or dramatised versions of the future, perhaps focussed around one or more characters or organisations
- PowerPoint presentations that set out the key drivers, axes of uncertainty and main headings of the scenario narratives
- charts and graphs that illustrate strategically important metrics in the scenarios
- day in the life of narratives ('DILOs')
- interactive websites that gather together a range of elements about the future

There is only one rule: make the scenarios (or other futures outputs) engaging, credible and compelling. Otherwise, customise the presentation to your audience.

Q: What is the best way to present scenarios to an audience that hasn't seen them before?

A: It depends on who the audience is and why you are presenting them. If it is a workshop (to conduct Policy Stress-testing, for example), use a PowerPoint presentation to explain where the scenarios have come from and either present the key elements as bullet points on slides, as handouts or give the group the whole scenario text (if it is short and you have time). If it is a wider group of stakeholders, think about using more engaging storytelling techniques.

Q: I've heard some quotes about Futures and Foresight in the past – what are some good ones to use that encapsulate all or some of the process?

A: Common quotes are

- "The future is already here, it's just not very evenly distributed." William Gibson, author
- "The purpose of looking at the future is to disturb the present." Gaston Berger, philosopher
- "Scenarios create memories of the future that can help organisations detect the early signs of unlikely change and be better equipped to respond to it." Arie De Gues, Shell Scenario Planner and author

Q: How do I ensure action afterwards?

A: It is important to consider what you want from the process at the start and to design what happens afterwards accordingly.

For the immediate term, be sure to connect your foresight activity to a form of action planning such as (1) Next steps (2) 100 day plan (3) Roadmap (4) Start, Stop, Continue or (more exhaustively) Strategic Review.

For longer-term action, it is always best for a given foresight activity to fit within existing planning, strategic and decision-making processes and cycles. Look at the section in Chapter 3 on how to link futures thinking and foresight to the policy and strategy cycle.

Annex 4: Introducing metrics into scenario thinking

You may wish to use the scenarios to explore how a number of key metrics – quantitative or qualitative indicators such as GDP, population and quality of life, for example – vary between different futures. You can introduce some basic questions to the scenario workshop discussion ('Is population higher or lower than the current baseline?') or you can combine the scenario logics with existing research to illustrate how different environmental conditions might lead to variation of important indicators.

Discuss the range of indicators with the process owner and think about how to introduce them into the scenarios. In general, workshop participants find it hard to be specific about metrics and, in general, you should limit conversation in the workshop to two or three key indicators of strategic importance to the policy area.

You can explore metrics in more detail once the scenarios are written. You may decide to develop the metrics as part of the scenario writing process or you may wish to present the scenarios to subject experts in a short workshop and explore how different scenario conditions might affect identified strategic indicators.

There is a range of ways to present indicators. Some exercises use numbers:

	Current	Perpetual Motion 2025	Perpetual Motion 2050	Urban Colonies 2025	Urban Colonies 2050	Tribal Trading 2025	Tribal Trading 2050	Good Intentions 2025	Good Intentions 2050
Energy price	106	140	45	140	150	300	400	140	175
World GDP	3.8%	4.0%	5.0%	3.5%	2.5%	1.5%	1.0%	4.0%	2.0%
UK GDP	2.4%	2.8%	3.0%	2.4%	1.8%	1.0%	1.0%	2.5%	1.3%
UK Population (mn)	60.6	68.0	79.0	68.0	79.0	62.0	57.0	67.0	80.0
Unemployment (UK)	5.4%	6%	<5%	6%	7%	15%	<5%	6%	10%
C emissions (MtC)		150	80	151	110	120	60	151	130

Some exercises suggest relative change:

	Current	Scenario 1 2035	Scenario 1 2060	Scenario 2 2035	Scenario 2 2060	Scenario 3 2035	Scenario 3 2060
World GDP Growth	3.8%	↓↓	↓↓	↓↓	↓↓	↓	↓
UK GDP Growth	2.4%	↑	↑↑	↓	↓	↘	↓↓
World population (mns)	6,705	↑	↑↑	↑	↑↑	↑	↑↑
UK population (mns)	61.3	↑	↑↑	↑	↑↑	↑	↑↑
% of UK energy imported	21%	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
% of UK food imported	25	↘	↘	↗	↘	↗	↑

Both of the tables on page 99 show quantitative metrics. Qualitative metrics can also be used to illustrate change in the scenarios. The table below shows a range of attitudinal indicators that were used to illustrate the Intelligent Infrastructure Futures scenarios:

	PM	UC	TT	GI
Reduced personal freedoms and choice prevail over increased societal obligations and constraints (social capital/civic participation)	↓	↓	↑	↑
Tolerance of others in society/ value diversity/ reduced fear/ desire for reduced inequality prevails over increased individualism	→	↑	↑ (local) ↓ (national)	↗
Respect for family structures (increased H/H size/ reduced social and geographical mobility)	↓	↑	↑	↑
Active ageing and respect for older people	↓	↑	↑	↑
Less desire for personal space prevails over communal living and travelling	↓	↑	↓	↘
Respect for Government and key institutions / enfranchised	↑	↑ (local) ↓ (national)	↑ (local) ↓ (national)	↓
Trust in science and technology	↑	↓	↓	↘
Willingness to give up privacy and take risks	↑	→	↓	→
Positives around role of media in society – influential	↑	↗	↓	↗
Throw away culture prevails over concerns about environmental waste	↑	↓	↓	↓
Concern about climate change	↓	↑	↑	↑

The tables shown here were developed in consultation with key stakeholders in the scenario process. You may also choose to work with research institutes to develop more detailed data to quantify the scenario narratives as GO-Science did in its Migration and Global Environmental Change scenarios Foresight project. Here, GO-Science used the scenarios to create assumed data sets for each of the scenarios through cross-referencing to existing projections from a range of related studies (IPCC projections for climate change, IIASA for the population projections and World Bank for economic forecasts, for example).

The scenarios were then used for a range of quantitative and qualitative analyses – such as expected numbers of people living in urban flood zones by 2060.

Figure 4.2: People Living in Urban Flood Zones in 2060

Explanatory note: Scenario B is lowest and Scenario C is highest, therefore representing the full range from these scenarios.
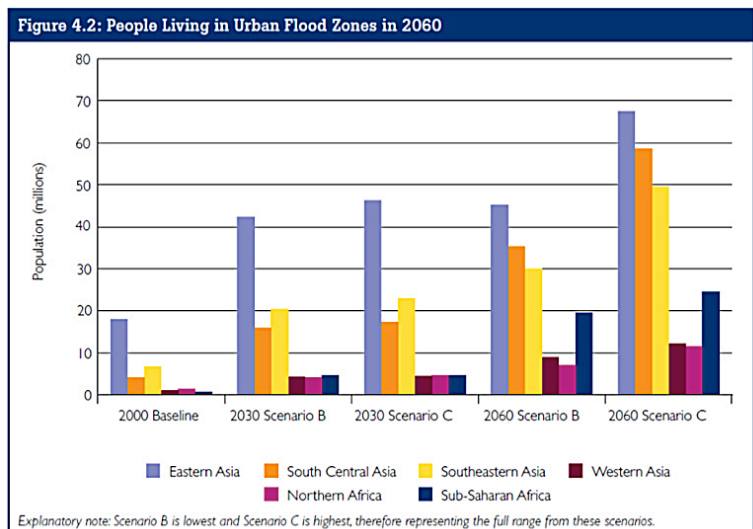
Annex 5: Case Studies

Introduction

This Annex contains examples of futures practice drawn from across government departments and agencies. There are seven:

- Defence Science and Technology Laboratory
- Environment Agency
- Forestry Commission England
- Health and Safety Executive
- Health Education England
- HMRC
- Natural England

Each case study sets out:

- the purpose of the futures work
- the tools used
- the resources required
- the sponsor of the work
- the outputs
- the successes of the work
- the challenges

[Defence Science and Technology Laboratory](#)

Executive Agency of the MOD

Purpose: To better inform stakeholders and research leads as to the potential uses of emerging novel technologies, the timeframes over which these might occur, and the advisory stances stakeholders may wish to adopt

Tools: Emerging Technology Matrix (ETM)

Resources: Part of the Defence & Security Implications of Emerging Technologies (DIET) Programme. Comprises ~1FTE led by a technology manager and Horizon Scanning specialist, with support from 3 dedicated staff and a distributed, informal network across the organisation

Sponsors: Chief Scientist

Outputs: The current (developmental) incarnation of the Matrix is in a testing phase (as at April 2017). This comprises a comprehensive 'back-end' database with extended abstracts detailing the applications of the technologies, their level of maturity, and the degree of 'certainty' with which the analysis was made. At the 'front-end' is an intuitive graphic user interface that allows users to search or browse the database, setting user defined parameters such as the 'time to impact' relevance to particular domains (currently defence related) and stance (lead, follow, watch, counter) preferences. The ETM is being evaluated by a representative testing panel, both on standalone machines and on MODs D-Cloud network with a view to rolling out more broadly.

Input sources are various, including internal alerts (ie through specialist networks), open-source S&T aggregators, meta-analyses of data from eg TTCP, NATO, DARPA etc, and bespoke external contracts with RAND and Shaping Tomorrow. Outputs from the latter are socialised via Dstl's internal Wiki-based platform. Staff involved in such data mining and harvesting are aware that weak signals and wildcards are significant to this process

Successes: Networking across Dstl /MOD and more widely across OGDs to share data.

The uptake of the Horizon Scanning process by the Front Line Commands and their endorsement through further funding for maintenance and further development.

Utilisation of tools developed as part of this process in analysing cross-departmental data sets to produce heat maps etc (as part of the Emerging Technologies Community of Interest function etc).

Challenges: Externalisation of the final product (i.e., due to server hosting and software compliance factors).

Sufficient subject matter expert resources to review findings and compile abstracts.

Environment Agency

Non Departmental Public Body

Purpose: To provide the Environment Agency with an evidence base of potential risks and opportunities in order to help inform strategy, provoke discussion and shape thinking

Tools: Horizon Scanning & Cluster Analysis

Resources: Ongoing internal programme, using approximately 3FTE, with input from subject specialists as required

Sponsors: Director of Research Assessment & Evaluation

Outputs: Quarterly scans (typically based on 80 to 100 insights) with clusters of change, emerging issues and wildcards. These are mapped against evidence action plans. Outputs are shared across the Defra futures partnership – Defra, Natural England, Environment Agency, Welsh Government and Food Standards Agency.

Delphi based reporting, including and annual exercise on issues of importance to incident management, and an ad hoc piece on workforce planning. This is run by the Horizon Scanning team, using 15 to 20 specialists from across the organisation who supply and prioritise issues for consideration at business board level

Successes: The Environment Agency has a bespoke horizon scanning database that can be shared with other organisations. The Horizon Scanning team participates in an annual Horizon Scan of Global Conservation Issues run by Cambridge University, and has had a number of topics featured in the paper. We are an active contributor to cross team working and have a good exchange of futures evidence with Natural England, a key partner.

Challenges: Limited resources has meant the Horizon scanning team has been unable to further develop the in house database as they would wish

Forestry Commission England

Non Ministerial Government Department

Purpose: To provide the Forestry Commission with insight into possible short to long term changes affecting externalities to the operating environment, e.g. markets, skills, business development, climate, technology and the organisation's internal responses via three to five year business planning. Essentially: What? So what? Now what?

Tools: Horizon Scanning (PESTLE)

Resources: Internal programme on an approximately 6 month cycle to link to business planning. Managed by a Policy Adviser as a part of their Forward Job Plan and primarily involving the Policy and Advice team and engaging Senior Managers and the Forest Services Board

Sponsors: Head of Policy and Strategy, Forest Services

Outputs: Bi-annual scans with a high level 'headline' precis for reference by senior management

Successes: A process is being established that engages senior staff across the organisation and links to the aims and objectives of the organisation. The process has intrinsically helped widen people's understanding of the drivers that will influence the PESTLE context for the Forestry Commission over the coming years and helped people look up from their 'day jobs' to consider the bigger picture. Involvement in the HoHS group has helped promote the relevance, scope and value of Horizon Scanning

Challenges: Recent developments e.g. EU Exit have focused people's energies very much on the short term and away from the longer and wider operating context. Risk of 'engagement fatigue/ friction' with and differentiation between other processes having longer time frames, e.g. forestry sector and other elements of the Forestry Commission's e.g. Forest Research involvement in the Science and Innovation Strategy (SIS) review process

Health and Safety Executive

Non Departmental Public Body

Purpose: To provide a foresight capability to the Health and Safety Executive (HSE) to identify new and emerging issues in order to inform specialists and policy colleagues of potential future workplace health and safety risks

To offer a foresight service to external bodies

Tools: Horizon Scanning; Driver Mapping; Delphi; Axes of Uncertainty; 7 Questions; Scenarios; Policy Stress-testing; SWOT Analysis

Resources: A dedicated team of about 5.1 FTE futures and knowledge management staff in the Foresight Centre

Sponsors: HSE's Chief Scientific Adviser

Outputs: Internal reports, external customer reports, workshops, peer reviewed and other publications, presentations, annual report, website pages and intranet community, targeted and general scanning

Successes: Influence HSE research programmes and divisional plans; short reports on selected topics; Horizon Scanning for external government customer; scenario project for European Union customer

Challenges: Identifying and reaching internal customers; convincing senior colleagues of the importance of findings and informing people of the issues that they are not aware of

Executive non-departmental public body of the Department of Health

Purpose:	To provide Health Education England (HEE) with the evidence it needs to underpin its workforce development strategies and long-term investment decisions
Tools:	Horizon Scanning; Evidence Base Development; Demand Driver Mapping
Resources:	Ongoing internal programme with approximately 2 FTE, although this varies as staff members have other responsibilities. Some access to analytical staff to support specific work programmes
Sponsors:	Director of Strategy; Director of Workforce Intelligence
Outputs:	HEE's Strategic Framework
	Internal Horizon Scanning Bulletin (produced bi-monthly shared across HEE's national and local offices)
	Weekly Alert Scanning (currently shared within Strategy Team to identify areas for further investigation)
	Evidence Base (ongoing development for reference purposes)
Successes:	Development and adoption of HEE's Strategic Framework (see above) with excellent national and international feedback.
	Production and dissemination of HEE's internal Horizon Scanning Bulletin with excellent feedback
Challenges:	Difficult to get people to lift their heads from firefighting current issues in order to focus on future opportunities
	Finding sufficient robust quantitative research to build into our analysis
	Turning the vision of the Strategic Framework into practical steps to implementation
	Resourcing – staff consistently being pulled off strategic and Horizon Scanning work to deal with operational issues
	Accessing training on tools and models for Horizon Scanning

HMRC Futures Team

Purpose: To engage HMRC policy, strategy and operational colleagues; informing them of relevant projected changes in the external environment and embedding this in operational decision making, strategy/policy development and risk mitigation activities

Tools: Horizon Scanning

Resources: The team is a dedicated unit of 5 full time staff

Sponsors: The team was initially set-up with the support of ExCom level sponsors. Changes in the external environment is now an ExCom level risk, so it overseen at a senior level through this risk

Outputs: HMRC 'mega-trends' is our key product. They are the 23 key trends/drivers with the potential to impact on HMRC now and in the future (i.e. automation, ageing population, changing business structures). Information and projections for each trend is included in 'mega-trend foresight packs' which are developed through engagement with internal stakeholders and research

Successes: Creation of an HMRC Horizon Scanning network with stakeholders from across the department

 ExCom level risk co-managed by our team to mitigate against HMRC not recognising/addressing changes in the external environment

 Partnership with HMRC intelligence services to offer tools and techniques for Horizon Scanning to help assure policy/strategy development within HMRC. E.g. with small business and hidden economy

 Series of workshops with internal stakeholders on the future of sectors (e.g. retail) and what impact this will have on tax collection

 Working with business planners to upskill their knowledge of external trends/drivers. This will ensure they can become 'intelligent customers' to policy/strategy colleagues when developing the annual business plan

 Provide Horizon Scanning training, so business areas can develop without our support

Challenges: Engagement with internal stakeholders. The team has been in existence for 2½ years and a real challenge has been engaging policy/strategy/ operational colleagues to ensure they understand the value of Horizon Scanning work. This is especially difficult in a political environment where colleagues are requested to come up with short-term solutions in a quick time period. We have overcome this by presenting and engaging colleagues to demonstrate value over a longer time period and by tailoring our mega-trends to include trends in evidence now (e.g. changing working patterns), which has made it easier to understand. This continues to be a challenge

The other challenge is that HMRC is a huge department, regularly changing staff/organisation. As a small team we can only target a finite numbers of business areas, and it can be a challenge to ensure we are targeting the right areas/processes.

Natural England

Non Departmental Public Body

Purpose: To provide Natural England with an evidence base of short-medium change relevant to the natural environment, to identify risks and opportunities and the external context within which we need to deliver our Conservation Strategy 21

Tools: Horizon Scanning & Driver Mapping

Resources: Ongoing internal programme, using approximately 0.5FTE, led by Futures specialist with input from 3 colleagues at the analysis stage. Insights gathered via a team of 100+ environmental, economic and social science specialists. Insights are captured in a simple metadata table in a word document and stored on a SharePoint page

Sponsors: Director of Specialist Services Programme team and Chief Scientist

Outputs: Quarterly scans (typically based on 70 to 80 insights) with clusters of change, smaller themes and an annex to map against high-level priorities in our Conservation Strategy 21. Outputs are shared across the Defra futures partnership – Defra, Natural England, Environment Agency, Welsh Government and Food Standards Agency

Successes: Gathering insights from within the organisation with no outside costs, upskilling specialist staff, producing regular outputs which have been used at Director and Board level. Quarterly scans leading to internal commissions for topic scans on specific issues. Widely used example of effective cross team working and a good exchange of futures evidence with the Environment Agency, a key partner

Challenges: Without access to a horizon scanning database the work to capture and record insights is labour intensive. It has taken 6 months to get a regular flow of insights from specialists. In looking 'beyond the horizon' our Futures specialist has joined the Association of Professional Futurists, subscribes to the Shaping Tomorrow newsletters and participates in an annual Horizon Scan of Global Conservation Issues run by Cambridge University

Annex 6: Wider set of futures tools

Introduction

This Annex offers a brief description of some additional futures tools that practitioners may wish to research further and use. There are 5:

- Causal Layered Analysis
- Dialogue
- Futures Wheel
- Gaming
- Morphological Analysis

Causal Layered Analysis

Causal Layered Analysis is particularly useful for exploring deep structure in a policy areas and for identifying how to co-ordinate policy responses to achieve the desired outcome.

Causal Layered Analysis (CLA) identifies the driving forces and worldviews underpinning diverse perspectives about the future and what it means to different groups through discussion and deconstruction of conventional thinking. Based on that, CLA is able to produce a shared view of possible future outcomes that can break existing paradigms of thinking and operating. It is particularly useful when different groups hold different perspectives on the future of the policy area.

CLA explores issues at four levels – Litany, Social Causes, World View and Metaphor. This layered approach increases meaning and results in a wider realm of possible change for the participants. The technique combines the nature of past, present and future in its investigation.

After defining the issue to be explored, conduct brainstorms on it at each of the four CLA levels, in sequence. Capture the brainstorms on Post-it notes and allow time for discussion. Cluster these into themes where appropriate.

Once complete, begin a new scenario by selecting/creating an alternative myth. Then, work in reverse order, upwards, through the layers to create the scenario with more brainstorming. In this way, the myth, world view and causes build a litany and set of 'events' to fulfil the scenario.

In summary:

1. Layer 1: Analyse the litany of current events, trends and conditions.
2. Layer 2: Analyse the causes, such as STEEP factors, the intent of government, relationships and systems.
3. Layer 3: Explore the world view. These will be deeper matters of discourse, values and cultural structures.
4. Layer 4: Explore metaphor, or myths. These are emotive, less-specific, heart-felt issues and archetypes.

See The Causal Layered Analysis Reader (2004)

Dialogue

Dialogue is an open space technique where participants work together to explore whatever aspects of the futures issue are important to them. It is particularly useful for exploring what stakeholders believe to be the priority issues for the policy area.

Dialogue is an inquisitive review of a topic. It is, practically speaking, an intelligent exchange of ideas. To encourage personal insights, dialogue should incorporate open-ended questions, observations, good listening skills and a focus on contextual information. One key output of dialogue is the establishment of topic structures and areas for further investigation. Dialogue is a stand-alone futures tool. It is also one solid way to 'join up' a number of futures activities taking place and a powerful way to encourage engagement with a futures project team.

There are 6 steps:

1. State the topic to be discussed and allow time for the participants to explore it as individuals.
2. Ask one participant, or an external, to prepare and to briefly present one aspect of the topic.
3. Hold an open-ended discussion. This can be done in small groups. Ask one member of the group to record the key points.
4. At midpoint, check for clarity and ask for key learnings from each group.
5. Identify sub-topics on these key learnings. Frame the remaining discussion around the sub-topics. Invite participants to move groups if they wish to focus on one particular topic. Ask one participant to record the key points.
6. Use the records of key points discussed to prepare a final report.

See Future Cities Dialogue, Forum for the Future (2012)

Futures Wheel

The Futures Wheel is a form of structured brainstorming that helps participants visualize how important trends or events might impact on the policy or strategy area in question. It is particularly useful for identifying and mapping connections and causalities.

A strategically important trend or event – Brexit, for example – is placed at the centre of the futures wheel. Participants build the 'spokes' of the wheel by identifying the direct ('first order') consequences of that event. The first order consequences for Brexit might be 'the UK pursues increased trade with countries outside Europe', 'migration falls' and 'foreign national health professionals and research staff move to mainland Europe'.

The group continues to build out along the spokes of the wheel. A second order consequence for 'foreign national health professionals and research staff move to mainland Europe' might be that 'universities increase recruitment to medical school.' A second order consequence for 'the UK pursues increased trade with countries outside Europe' might be that 'the UK strengthens export agency presence in strategic territories.'

Three, or maybe four, orders of consequence are normally enough for one trend or event. Participants should look for cross connections between 'spokes' as well.

See Clearer Thinking (2015)
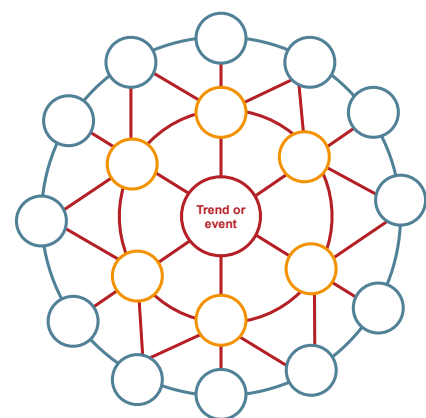
Gaming

Gaming invites workshop participants to role play different stakeholder groups in different scenarios to understand how those groups will respond in the future. It is particularly effective in helping policy makers gain insight into the challenges faced by stakeholders.

Gaming involves getting participants to use information to make decisions about the future, in a controlled, risk-free environment. It can be used to develop alternative perspectives of the future, or to test the strengths and weaknesses of policy or strategy against a future vision or scenario set.

The technique is particularly effective if participants role play – that is, if government staff play the role of businesses, if business play the role of third sector and if third sector participants play the role of government (for example).

There are 6 steps:

1. Introduce an existing scenario to participants.
2. Assign roles to groups or individuals. Assign overall aims for each role (if desired).
3. Each group reviews the strengths and weaknesses of the scenario from the perspective of their stakeholder group.
4. Each group then identifies how their stakeholder group will respond to the scenario (making strategic choices that are relevant to the objectives of the policy area).
5. Make recommendations for policy based on the conversation.
6. Repeat with other scenarios as required.

See GO-Sciences Foresight report on [Cyber Trust and Crime Prevention: Gaining Insight for Three Different Futures](#) (2004)

Morphological Analysis

Morphological Analysis is a technique for building understanding of the deep structure and relationships between different domains in the project area.

The approach involves breaking a complex problem down into its main component parts and looking for ways to combine them to create innovative approaches or solve existing challenges. Some combinations may already exist and others may not be possible or appropriate; but the remaining ones may represent new ideas for tackling the problem.

There are 6 steps:

1. Agree the problem to be analysed.
2. Identify and define the relevant issues (parameters) involved.
3. For each parameter, identify the key component parts.
4. Create a series of grids that juxtapose the component parts of one parameter horizontally against the component parts of a second parameter vertically.
5. Use the grid to combine component parts.
6. 6.   Identify the combinations that create new opportunities and new approaches.

See [General Morphological Analysis](#) (2013)

Annex 7: Further reading

Perhaps the single most useful source of further reading is GO-Science's [Foresight Projects Page](#) which lists past Foresight projects. Most of the techniques included in the Toolkit are to be found amongst them.

There is a growing body of literature on the theory, application and impact of futures thinking and foresight and there are links here to some key resources. There are also links to some sources of trends analysis, although it is worth noting that trends analysis is most effective when done on a project by project basis.

Trends analysis

[Global Strategic Trends out to 2045](#), Development, Concepts and Doctrine Centre, Ministry of Defence (2014):

[Global Megatrends](#), European Environment Agency (2017)

[Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy](#) OECD (2016)

[Global Trends: Challenges and Opportunities in the Implementation of the Sustainable Development Goals](#) (UNDP, 2017)

GO-Science: Internal Horizon Scanning (2017)

Books on scenario thinking

[Learnings from the Long View](#), Peter Schwartz (2011)

[Thinking about the Future: Guidelines for Strategic Foresight](#), Andy Hines and Peter Bishop (2015)

[Transformative Scenario Planning: Working Together to Change the Future](#), Adam Kahane and Kees van der Heijden (2012)

Books on Facilitation

[Unlocking the Magic of Facilitation: 11 Key Concepts You Didn't Know You Didn't Know](#), Sam Killerman and Meg Bolger (2016)

[The Skilled Facilitator: A Comprehensive Resource for Consultants, Facilitators, Coaches, and Trainers](#), Roger M Schwartz (2016)

Case studies from applying Futures Thinking and Foresight techniques

[Models of Horizon Scanning: How to integrate Horizon Scanning into European Research and Innovation policies](#), Fraunhofer Institute for Systems and Innovation (2015)

[A 2017 Horizon Scan of Emerging Issues for Global Conservation and Biological Diversity](#) Sutherand *et al* (2017)

[Horizon Scanning: Enhancing Strategic Insight for National Security policy making](#), David Connery, (2013) Security Challenges, Vol 9, pp 11-30

Futures techniques

An Introduction to Corporate Foresight, Arup

Foresight, The Manual UNDP Global Centre for Public Excellence