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 (ie 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 80-100 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 15-20 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 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; Windtunnelling; 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

Health Education England

Executive non-departmental public body of the Department of Health

Purpose:	To provide Health Education England with the evidence it needs to underpin its workforce development strategies and long-term investment decisions
Tools:	Horizon Scanning; Evidence Base Development; Demand Driver Analysis
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 horizon scanning tools and techniques 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 Analysis

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 70-80 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 5: 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 fulfill the scenario.

In summary

1. Level 1: Analyse the litany of current events, trends and conditions.
2. Level 2: Analyse the causes, such as STEEP factors, the intent of government, relationships and systems.
3. Level 3: Explore the world view. These will be deeper matters of discourse, values and cultural structures.
4. Level 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.

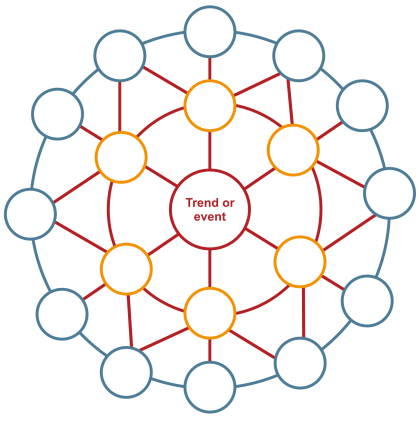
There are 6 steps:

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 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. Identify the combinations that create new opportunities and new approaches

See General Morphological Analysis (2013)