# Horizon Scanning in Government

## Concept, Country Experiences, and Models for Switzerland

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# List of Abbreviations

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|---|---|
| BERR | Department for Business, Enterprise and Regulatory Reform (UK) |
| CENS | Centre of Excellence for National Security (Singapore) |
| COS | Commission for Consultation of Sector Councils (Netherlands) |
| DDPS | Department of Defence, Civil Protection and Sport (Switzerland) |
| DIUS | Department for Innovation, Universities and Skills (UK) |
| FAN | Futures Analysts' Network |
| FOCP | Federal Office for Civil Protection (Switzerland) |
| GCSA | Government Chief Scientific Advisor (UK) |
| GDP | Gross Domestic Product |
| HSC | Horizon Scanning Centre (UK, Singapore) |
| JCTC | Joint Counter Terrorism Center (Singapore) |
| NGO | Non-Governmental Organization |
| NSCC | National Security Coordination Centre (Singapore) |
| NSCS | National Security Coordination Secretariat (Singapore) |
| OECD | Organisation for Economic Co-operation and Development |
| OSINT | Open Source Intelligence |
| OST | Office of Science and Technology (UK) |
| R&D | Research and Development |
| RAHS | Risk Assessment and Horizon Scanning (Singapore) |
| REC | RAHS Experimentation Centre (Singapore) |
| SARS | Severe Acute Respiratory Syndrome |
| S&T | Science and Technology |
| SOA | Service Oriented Architecture (Singapore) |
| STEEP | Social, Technological, Economic, Ecological, Political |
| UK | United Kingdom |
| US | United States of America |

# Executive Summary

This report outlines the concept and purpose of horizon scanning, reviews the experiences of the United Kingdom, Singapore, and the Netherlands, and develops perspectives for the establishment of horizon scanning in Switzerland.

## 1. The contribution of horizon scanning to policymaking

The concept of horizon scanning is ill-defined and used differently by various actors. In a narrow sense, it refers to a *policy tool* that systematically gathers a broad range of information about emerging issues and trends in an organization's political, economic, social, technological, or ecological environment. More generally, it is also used as a synonym for a variety of so-called *foresight activities* that aim to develop the capabilities of organizations to deal better with an uncertain and complex future. Two key functions for policymaking emerge:

→ *Information function:* Horizon scanning informs policy-makers about emerging trends and developments in an organization's external environment. Its main products are strategic scans that cover a broad range of issues and are disseminated in the form of policy briefs, reports, or scenarios.

→ *Policy development function:* Horizon scanning refers to a process that supports the envisioning of desired futures and emphasizes the creation of networks and knowledge flows between people and organizations. Intensified interactions across professional and policy communities stimulate the emergence of shared understandings and thus facilitate the development of innovative policies.

## 2. Country experiences: United Kingdom, Singapore, and the Netherlands

The three reviewed countries demonstrate the multifaceted nature of horizon scanning and the manifold objectives it serves. Although it must always be adapted to an organization's particular needs, some common ideas and principles emerge from the reviewed country experiences:

- The programs grew out of different policy areas and are institutionally attached to different governmental bodies, but they all aim to be wide in scope and to *mainstream horizon scanning* throughout all policy areas and government departments.
- The programs want to *support different government agencies in establishing their own horizon scanning activities* and to provide a higher-level strategic context to all respective government initiatives.
- The programs aim to build *networks across professional communities* and are dedicated to extending their activities toward other professional communities, particularly private businesses, think-tanks, and academia.
- The programs want to connect and closely collaborate with the academic world in order to guarantee that their *activities are informed by real expert knowledge* and to safeguard their credibility and longer-term reputation.
- The programs need *broad political support* because horizon scanning is directed at generating new ideas, which are often found at the margins of current thinking and may challenge conventional wisdom. Without strong backing from senior policy-makers, new insights will not translate into novel policies.

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- The programs should ensure that their *results and recommendations have an impact on decisionmaking processes,* as not only the government, but also all other involved stakeholders will otherwise soon lose interest.
- The programs should be *regularly repeated and stand on a solid (institutional) footing*, as horizon scanning not only takes time to understand in terms of its purposes and methods, but is by definition an activity that only pays off in the longer term.

## 3. The prospects for horizon scanning in Switzerland

In Switzerland, horizon scanning that cuts across policy areas and government departments is not yet deeply anchored in the political and administrative system. However, the Forward Planning Staff of the Federal Chancellery and the "Risks Switzerland" project of the FOCP could serve as institutional starting points for Swiss horizon scanning activities. Based on the reviewed country experiences, the study conceives three models of how this could be realized:

- Model 1 presents a *project-oriented approach* to detect and evaluate future trends and issues relevant to Switzerland across policy areas in the form of a broad strategic scan.
- Model 2 targets the idea of a *Swiss horizon scanning center of excellence* that primarily provides methodical and strategic support to the federal offices to help them establish their own horizon scanning capacities.
- Model 3 focuses on issues that are particularly *relevant to Swiss national security*. It connects experts and groups of interests across policy domains – including those without established links to the traditional security policy community – in order to prepare for emerging threats.

The various features of these models may be assembled in many ways to meet the needs of the government and the administration. Three recommendations may stimulate the discussion on the next steps required to develop horizon scanning in Switzerland:

- A *stakeholders' needs assessment* should be conducted to identify the needs, concerns, and wishes of stakeholders within and – later – beyond the federal administration.
- An *inventory of topical, methodical, and process experts* should be prepared and facilitated by establishing *working communities* to make expertise easily and rapidly accessible.
- The idea and benefits of horizon scanning must be *actively communicated, promoted, and disseminated* to win (political) support in government, parliament, and the public.

# 1 Introduction

Governments are confronted with an increasingly interconnected and dynamically changing world. Although more information from more sources is available and better accessible than ever before, information overload may, paradoxically, also contribute to the perception that political, economic, and social environments are complex and hardly controllable. The abundance of information may lead to a deficiency of attention that complicates the process of filtering out the critical signals from the distracting noise. Acquiring reliable information is a major challenge for analysts and decision-makers, and their key task therefore is to take active notice of facts and data (not only to observe them passively) and to develop new ways of thinking ahead and planning strategically to cope better with uncertain future threats and opportunities. This task requires developing long-term, focused, and sustainable policies:

- *Long-term policies* are required to tackle many of today's most pressing challenges, whose (negative) consequences may only be felt in the (distant) future. Nevertheless, day-to-day politics is often dominated by short-term considerations, and decision-makers frequently fail to look ahead and act beyond the current day.[1] In turn, they are often under intense pressure, e.g., from the media or powerful interest groups, to produce perceptible results rapidly, and may face difficult choices between (personal) short-term objectives and policies that are commensurate to the long-term nature of many risks.
- *Focused policies* target the most important issues in order to expend scarce resources in the most effective way. The question "which issue is most relevant?" can only be answered if there is agreement on the goals to be pursued. While the corporate world follows the fairly specific goal of increasing a company's value, divergent values and interests frequently prevent consensus on overarching goals in politics. Despite the obvious difficulties, ranking and prioritizing the issues that are relevant to our societies in a sensible manner remains a critical task.
- *Sustainable policies* acknowledge that quick fixes and hasty solutions rarely solve complex problems. Instead, policies that are evidence-based, adequately balanced between (conflicting) objectives, and have consistent political and financial support from those bearing political responsibility are indispensable for future-oriented policymaking.

1 Kreibich (2006), p. 10.

The apparent lack of strategically oriented policies in many countries as well as at the regional and global levels may become even more accentuated in the future if complexity and the dynamics of change continue to increase. Having said that, however, some governments have started to acknowledge these shortcomings and explore new ways and means to facilitate better governance. This study presents the concept of horizon scanning as one particular approach that has recently gained more prominence in this context. It is based on the premise that a sporadic assessment of the political, economic, technological, or ecological environment, based on the intuition of those in charge as has been the practice in the past, does not suffice anymore. Instead, this study proposes alternative ways to strengthen the ability of governments to deal systematically and comprehensively with uncertainties and to help policy-makers to envisage and realize the policies they desire.

In order to explore the opportunities of horizon scanning, the Swiss Federal Office for Civil Protection tasked the Center for Security Studies at ETH Zurich with producing this study. The study was conducted between July and December 2008 and covers, in accordance with the mandate, the following issues:

1. It outlines the concept and purpose of horizon scanning (*chapter two*),
2. It pursues a review of three countries that have already gained experiences with horizon scanning in order to show how it can be implemented in practice and identify the salient features and success factors (*chapter three*),
3. It describes the situation in Switzerland and develops three models – based on the country experiences – of how horizon scanning could be implemented in the Swiss federal administration (*chapter four*).

Methodologically, the study draws on research literature, relevant government documents, and conference reports (see the appendices for further details). In addition, external experts were consulted to provide feedback and to ensure that the country reviews correctly reflect the respective programs and activities.[2]

2 The author would like to thank the following persons for their valuable feedback: Calvin Chong and Patrick Nathan (National Security Coordination Centre, Singapore), Alun Rhydderch (UK Foresight Programme and Horizon Scanning Centre, Department for Innovation, Universities and Skills, London), and Bernard Verlaan (Dutch Ministry of Education, Culture and Science, The Hague). Preliminary results of this study were

# 2 The Concept of Horizon Scanning

The concept of horizon scanning is only vaguely defined and is used differently by various actors. Generally, it refers to two broad meanings:

- In a narrow sense, it stands for a *policy tool* that aims to gather systematically a broad range of information and evidence about upcoming issues, trends, advancements, ideas, and events in an organization's political, economic, social, technological, or ecological environment.
- In a wider sense, it is used as a collective term for a multitude of so-called *foresight activities* that aim to improve the capabilities of organizations to deal with an uncertain and complex future.

This study refers to both meanings: It initially characterizes horizon scanning as a policy tool for detecting emerging issues and trends that may deviate from existing developments. Such a limited understanding, however, would not generate the envisaged strategic capabilities and only be of limited use to government policy. In order to unfold its entire strengths, horizon scanning must be embedded into a more comprehensive foresight process that builds networks across professional communities, enables broad-based social learning processes, and feeds the results into the policy process. In other words: This study first covers horizon scanning in a more instrumental sense (chapter 2.1) before it puts it in the context of a comprehensive foresight process (chapter 2.2).

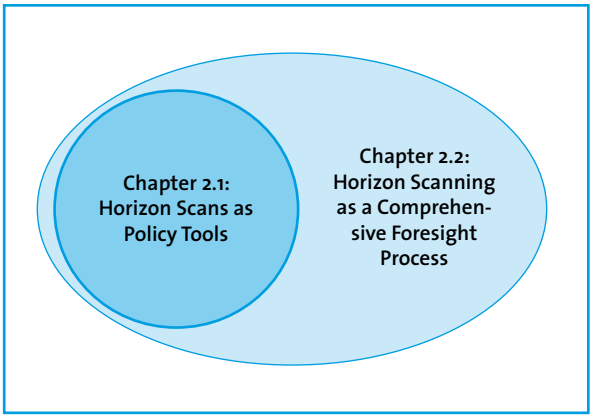


*Figure 1: The two meanings of horizon scanning*

discussed with representatives of the Federal Office for Civil Protection, the Federal Chancellery (Section Planning and Strategy and Federal Crisis Management Training), and the armasuisse defense procurement agency at a workshop in Berne on 28 October 2008. The author would like to thank all participants for their most helpful comments and ideas.

## 2.1 Horizon scans as policy tools

Horizon scanning as a policy tool aims to broadly explore information about novel and unexpected issues and trends as well as persistent problems in an organization's external environment.[3] Horizon scans facilitate a systematic and structured evidence-gathering process and provide an understanding what is happening and why in an organization's environments, what processes produce and support change, the relations between these processes, the main actors and their objectives, the anticipation of change, and the required capacities and resources.[4]

**Horizon scanning**

- conceptually encompasses different modes of scanning,
- covers various external environments of an organization,
- is usually a long-term and continuous process,
- draws on an eclectic range of sources,
- and systematically collects and documents the detected evidence.

*Box 1: Characteristics of horizon scanning*

*In conceptual terms, horizon scanning includes both the rather passive mode of looking at information (viewing) and the more active mode of looking for information (searching)* according to the complexity that is adapted to an organization's particular needs.[5] Passively scanning the environment is ongoing at an almost unconscious level by exposing individuals to large amounts of information for no specific purpose and without specifications or criteria for the selection of sources. It may sensitize individuals to emerging trends and support organizations in developing peripheral vision, but the key signals of change are probably omitted. When the mode of scanning turns to active searching, by contrast, the sources are scanned for specific purposes, and concrete questions concerning the relevance and the possible impact of particular issues are asked. While scanning may initially be performed in a relatively limited and unstructured way, it may later

3 Aguilar (1967); Choo (2001); for the following, see also the definitions of UK foresight practitioners referring to the UK Chief Scientific Advisers Committee.

4 For studies on horizon scanning, cf. for instance Aguilar (1967), Choo (2002, 1999), Lang (1995), or Morrison (1992).

5 Choo (2002), p. 84.

turn into a more deliberate and planned effort to acquire more information about the main features and potential impacts of a given issue.

*Horizon scanning covers various external environments of an organization.* Each organization has an immediate environment that relates directly to its activities and is shaped by individual circumstances and organizational specifics; but it is also embedded into a larger macro-environment where changes may directly or indirectly affect the organization. The changes within this macro-environment may originate from a multitude of areas such as technological advancements, economic trends, or political developments. Consequently, the issues are often classified according to basic taxonomies[6] to facilitate the scanning process and to improve the integration of the results into subsequent policy development.

*Horizon scanning goes beyond the usual timeframes of planning activities.* Although some scanning activities are driven by immediate concerns of an emerging threat, the time horizon of scanning usually refers to a mid- or long-term perspective, as it aims to provide early indications of prospective future developments before they actually appear on the agenda of policy-makers.[7] Also, with regard to frequency, horizon scanning is typically a continuous process that regularly covers the entire macro-environment. Although there are irregular scans, for example those instituted in reaction to a crisis, or periodic scans, for example in the form of an annual review, horizon scanning is most suitable for discovering unexpected and emerging trends and issues if it is executed on an ongoing basis.

*The user of horizon scanning wants to focus on the margins of current thinking and is therefore eclectic in terms of choosing sources.* An excellent starting point to detect information is to capitalize on personal contacts and networks. People working in the same area often have similar interests and share in-depth knowledge of their relevant fields. This approach may also have its drawbacks, however, as subject-matter experts may tend to confirm each other in their opinions and may not be well prepared for recognizing emerging issues that transcend their known reference areas. Experience shows that change often starts outside of established circles and at the interface of (scientific) disciplines; it is therefore essential to listen to the thoughts and ideas of outsiders and lateral thinkers and to establish a diverse, multidisciplinary, and international network of experts. Another source of information is the systematic evaluation and monitoring of media products of any kind: newspapers, periodicals, scholarly journals, books, conference papers, specialized magazines of industry or professional associations, radio, television, photographs, etc. Furthermore, many sources of information that were previously very difficult to track are now available in electronic format on the internet and in online databases (containing, for example, scholarly or statistical information) and can easily be exploited. Overall, it is crucial to refer to a very diverse set of sources in order to avoid a situation where the only information to be considered is self-referential or confirms pre-existing assumptions.

*Teams of scanners collect and systematically document the detected data and information from the scanned sources and make them available to other analysts and decision-makers.* The most common methodical approach is to create databases or – more recently – web-based applications that allow the analyst to assemble facts and information about the identified trends and issues in a standardized format. This procedure allows large numbers of people to simultaneously feed in information about potential trends and developments, while the collected data can instantly be evaluated, assessed, and visualized by the people in charge of conducting the horizon scans. The country reports in chapter three will point to examples of how this process of collecting, documenting, and disseminating information takes place in practice.[8]

6 A commonly known analytical tool is STEEP, which is used to structure the identified environmental factors systematically along the analytical categories of societal, technological, economic, ecological, or political factors.

7 In futures studies, a mid-term time horizon corresponds to about five to 20 years; "long-term" means 20 to 50 years.

8 A lot can be learnt from studying the structures and procedures for the early detection of issues in corporations; for an in-depth overview of companies in the insurance business, see Käslin (2008); see also Krystek and Müller-Stewens (1999), pp. 509–13.

## 2.2 Horizon scanning as part of a comprehensive foresight process

Horizon scans to detect and collect evidence about an organization's external environment constitute only one (yet important) part of a comprehensive foresight process, which the following paragraphs describe in more detail. Foresight is defined as a deliberate attempt to broaden the "boundaries of perception":[9] It expands the awareness of emerging issues and situations and supports strategic thinking by developing a range of possible ways of how the future could unfold.[10] A foresight process can be roughly divided into three phases:[11]

- The *early detection* of emerging issues by using horizon scans as presented in chapter 2.1,
- the *generation of foresight* by undertaking futures projects,
- and the *development of policy options* by applying scenario techniques.

The following figure 2 is a graphical representation of the three phases, describing the essential idea of each phase, the main policy tool, and how information is transformed into knowledge that ultimately leads to new insights and political action.

*Early detection (phase 1) addresses the identification and continuous monitoring of all relevant issues and developments in an organization's external environment.* The conceptual idea is to establish an information-gathering system that detects discontinuities in trends hitherto perceived as stable and unchanging.[12] These discontinuities are usually foreshadowed in the form of "weak signals"[13] that indicate changes long before they become general knowledge and come to the attention of policy-makers. Methodically, it builds on horizon scans as introduced in the chapter 2.1 and rests on the assumption that the continuing accumulation of information allows the observer to extract more explicit evidence. Early detection is expected to improve the flexibility of governance as it reduces "surprise effects" and increases the room for maneuver by giving decision-makers sufficient lead time to take the appropriate countermeasures against emerging threats.

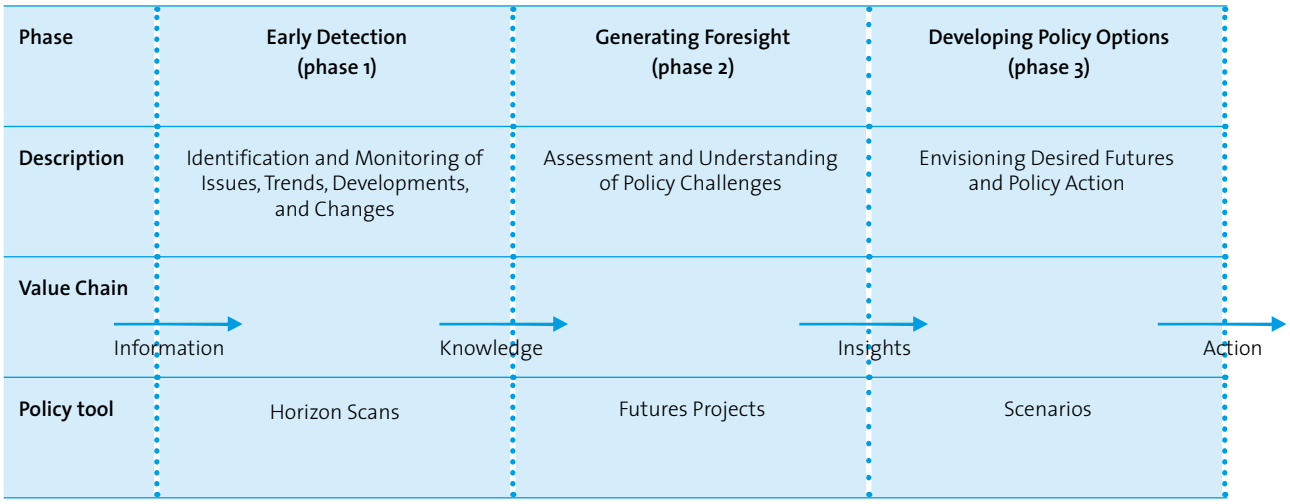


*Figure 2: Three phases of a comprehensive foresight process (own illustration based on Schultz (2006) and Horton (1999)).*

9 Major et al. (2001), p. 93.

10 Voros (2003), p. 12; Horton (1999), p. 5; Slaughter (1995), p. xvii. An extended conceptualization and definition of (strategic) foresight can be found in Müller (2008), pp. 17–26.

11 This process is adapted from Schultz (2006), pp. 5f.; Voros (2003), pp. 14ff.; Major et al. (2001), pp. 92f.; and Horton (1999), pp. 6ff. Müller (2008), p. 42, underlines that a foresight process can be conceptualized and implemented in various manners; however, based on an extensive literature review, he eventually concludes that the majority of scholars follows an uniform logic, which distinguishes between the three described process phases (p. 59f.). This is obviously a simplified version of a foresight process; if it were to be introduced in an organization, a more differentiated approach would be needed.

12 Krystek and Müller-Stewens (1999), pp. 501–6; see also Aguilar (1967).

13 Ansoff (1975).

*The generation of foresight (phase 2) addresses the assessment and understanding of selected policy challenges.* After information is scanned, collected, filtered, and processed, the gathered evidence is interpreted to tease out "the implications of the various possible future views for a particular organization".[14] Specific issues that may become more important in the future are selected and studied comprehensively. The selection of issues is based on specific criteria: they should, for example, have a high potential impact on society and the economy, they may be triggered by new technologies, or they may represent areas where change is complex and rapid and future developments highly uncertain.[15] Another commonly found important selection criterion is the political support provided by the government and other important decision-makers to ensure that new insights will later lead to political action. Such "futures projects" must be based on the best available scientific and other evidence and try to capture a particular issue in all its relevant dimensions. Several futures projects may be ongoing simultaneously and they may address a broad range of policy areas. Their ultimate aim is to draw a realistic picture of the "present implications of possible future events".[16]

*The insights generated through futures projects lead to the development of policy options (phase 3).* As there is no such thing as *the* future, a variety of potential futures is explored, because under conditions of "heightened uncertainty", the best course of action is to look forward purposefully and to present "alternative scenarios".[17] Scenarios may distinguish between possible, plausible, probable, and preferable futures as captured by the "futures cone" (see figure 3 below):[18]

- *Possible futures* include everything we can imagine, regardless of how unlikely it may be, and may involve the results of knowledge that we do not yet have, but that may be available in the future.
- *Plausible futures* have a reasonable probability of occurring, as they are in line with the current general knowledge and understanding of how the world operates.
- *Probable futures* are likely to happen, as they are largely extrapolations of the present and the past into the future.
- Finally, in contrast to the previously described futures, the *preferable futures* are not a product of (non-) existing knowledge, but are based on subjective judgments and values, as they describe the outcomes desired by individuals or organizations.

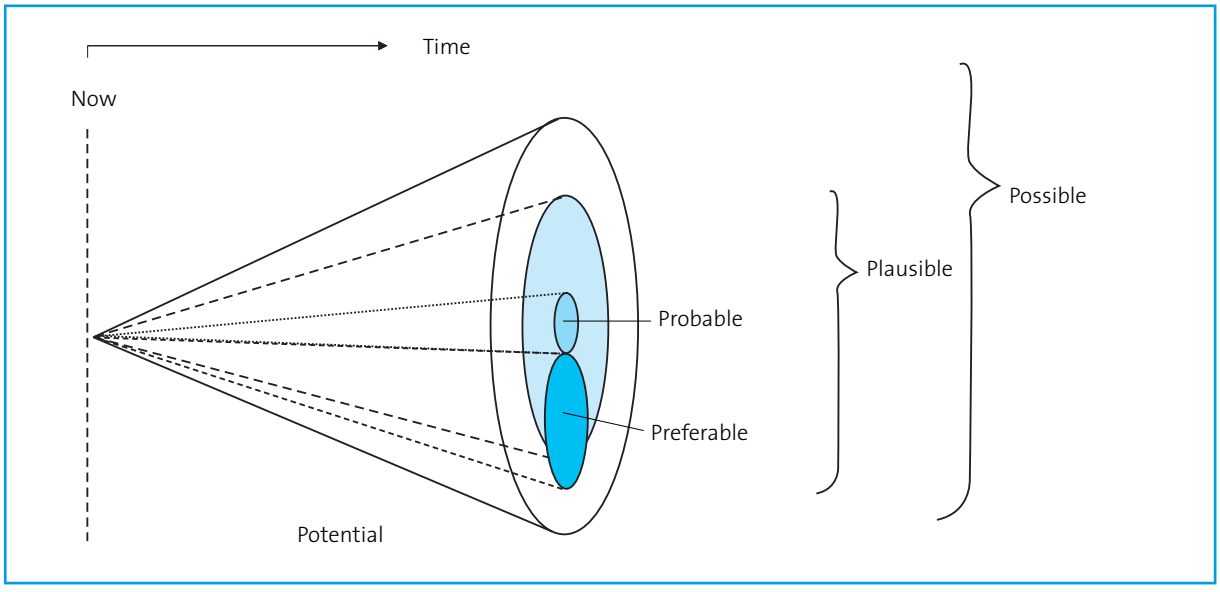


***Figure 3: The "futures cone" (illustration taken from Voros (2003), p. 16)***

14 Horton (1999), p. 7.

15 The country reports on the UK Foresight Programme and the Netherlands Horizon Scan Project will illustrate how this process works in practice.

16 Slaughter (1995), p. 48.

17 Nye (1994), pp. 88 and 93.

18 See for this distinction Voros (2003), pp. 16f., with further reading.

Preferable futures are envisioned by crafting normative scenarios that explore aspects of desired policies. However, formulating a broadly shared consensus on such preferred futures is rarely feasible in public policy, because deliberations among many stakeholders with very diverse interests and values almost inevitably lead to contradictory recommendations.[19] Consequently, the construction of normative scenarios should be understood as an open discourse that enables interaction and communication among participants and eventually leads to a mutual understanding of each other's notions of a preferable future.

## 2.3 Key insights and messages

What are the more general practical contributions of horizon scanning and foresight to policymaking? The process described above results implicitly in two functions, which are linked to the two different meanings of horizon scanning.[20]

*The first function is to inform policy by providing knowledge and new ideas that result in a tangible output such as reports, policy briefs, or scenarios about emerging issues.* At its heart are horizon scans as they were introduced in chapter 2.1: the analytical task of systematically gathering and documenting data and facts about potentially relevant trends and developments in the perceptible political, economic, social, or technological environments of an organization. These abstract terms become clearer in the context of a closer examination of the government scans described in the next chapter – for example, the Delta and Sigma Scans performed by the United Kingdom Foresight Programme. While such a *product-oriented* approach has long been considered the core purpose of horizon scanning, it has increasingly been criticized as being too static and not contributing sufficiently to a social learning process that enables the generation of future-oriented policies.

*Consequently, the focus has now shifted to a second function of foresight that facilitates the development of innovative policies*. Foresight is conceived as a learning process that supports the envisioning of desired futures. It is claimed that the creation of linkages, networks, or knowledge flows between people and organizations accounts for the real strengths of foresight. In other words: Policymaking can be improved not only through concrete products, but also through enhanced communication, extended networks, coordinated preferences, and changes in thinking. Such improvements allow policy-makers to make better informed choices, to improve the political responsiveness, and to facilitate policy development. This *process-oriented* perspective on horizon scanning is captured by the comprehensive foresight process as it was described in chapter 2.2; the following country reviews give substantive insights into how the different phases are connected in practice.

The potential *benefits* of horizon scanning and foresight are therefore twofold: The traditional product-oriented focus on the "delivery of information on future developments as a basis for priority-setting" on the one hand, and the focus on an innovative reflexive mutual learning process among policy-makers that stimulates "the emergence of common visions" on the other hand.[21]

19 See Hideg (2007), pp. 41f.

20 These are the two core functions identified by the FOR-LEARN project, which aims to develop foresight theory and practice in Europe and is financed by the Directorate General for Research (C4) of the European Commission. Cf. Da Costa et al. (2008), pp. 372ff. and 376f.; see also Müller (2008), pp. 42–5 and Voros (2003), p. 15.

21 Da Costa et al. (2008), pp. 373 and 376.

# 3 Review of Country Experiences

Horizon scanning that deliberately cuts across government departments and policy areas is a quite recent phenomenon. Traditionally, such activities were rather focused on a particular policy field and institutionally attached to the respective government departments.[22] Past horizon scanning and foresight projects were strongly focused on issues related to science, technology, and innovation policy. A survey of the International Council for Science, for instance, gives an overview of foresight exercises in more than 20 industrialized, transition, and developing countries since 1995;[23] similarly, a recent report of the Swiss Center for Science and Technology Studies provides an overview of foresight studies in 39 countries worldwide.[24] These surveys show that countries have applied quite different conceptions of foresight, particularly in terms of how broadly the policy areas to be covered are conceived: while most studies have a narrow focus on science and technology, some have begun to integrate societal or economic issues and developments – a trend that is likely to firm up in the future.

Apart from science and technology, many countries – including Australia, Canada, Finland, France, Japan, New Zealand, or the UK – also focus on other policy areas such as public health,[25] national security,[26] or the environment.[27] Furthermore, initiatives on the international level try to combine national-level experiences (for example, the pilot project "Joint Horizon" conducted by the ForSociety ERA-Net[28]) and international organizations such as the Organisation for Economic Co-operation and Development (OECD) have initiated projects to explore innovations in country risk management.[29]

Only recently, however, have some governments explicitly started to experiment with cross-cutting horizon scanning to respond to the requirements of an increasingly interconnected and complex world. Because there are only few contemporary challenges that can be confined to one policy area, governments have realized that a single-issue focus is in many instances not appropriate anymore. In the following, the report concentrates on three countries that have been at the forefront of this trend:

- the United Kingdom (UK) Foresight Programme started in 2004,
- the Singapore Risk Assessment and Horizon Scanning system initiated in 2005,
- and the Netherlands Horizon Scan Project that began the same year.

The following sections will review their experiences by outlining how the programs evolved, how they are institutionally anchored in the respective administrative structures, what they do and what they deliver. After having reviewed these cases, we will draw some preliminary conclusions by connecting the information and highlighting some of the salient features of horizon scanning that might also be considered success factors.

## 3.1 United Kingdom Foresight Programme

The UK Foresight Programme is a good example of the use of strategic scans as policy tools and illustrates what a comprehensive foresight process could look like. The Programme is widely considered to be effective in influencing policymaking, and its staff are regularly consulted to provide support in establishing similar programs abroad. It aims to bridge the gap between the long and the short term by employing the tools and methods of futures analysis. Based on (scientific) evidence from a multidisciplinary perspective, it develops robust and resilient strategies to meet major public policy challenges.

22 For an overview, see ERA-Net (2007), p. 3f.

23 The International Council for Science (2002). Specific examples include the French project on key technologies (http://www.lsi.industrie.gouv.fr/observat/innov/carrefour/so_exer.htm) or the Japanese NISTEP-project (http://www.nistep.go.jp).

24 Center for Science and Technology Studies (2007a); see also the Annex to the report: Center for Science and Technology Studies (2007b.)

25 Examples are the joint project of the governments of Australia and New Zealand to assess the potential impact of emerging technologies on public health systems (http://www.horizonscanning.gov.au) or the similar activities in Canada (http://www.cadth.ca/index.php/en/hta/programs/horizon-scanning).

26 Examples in the domain of national security include the "DCDC Global Strategic Trends Programme 2007-2036" of the United Kingdom Ministry of Defence (2007) or the report "Securely into the Future – Ministry of Defence Strategy 2025" of the Finnish Ministry of Defence (2006).

27 See, for example, the horizon scanning activities of the UK Government Department for Environment, Food and Rural Affairs: http://horizonscanning.defra.gov.uk.

28 See the website of the ForSociety ERA-Net: http://www.eranet-forsociety.net.

29 See the website of the OECD International Futures Programme, particularly the projects on risk management: http://www.oecd.org/department/0,3355,en_2649_35014780_1_1_1_1_1,00.html.

### 3.1.1 Evolution and institutional arrangements

The early roots of the Foresight Programme go back to the 1960s, when a new focus on science and technology (S&T) policy addressed the widely recognized innovation problem in the UK. The emergence of information technology and the growing awareness that demands for increased investments in research and development are growing year by year forced policy-makers to make choices between competing demands and to set the right priorities in light of the country's economic requirements.[30] In the early 1990s, an interdepartmental working group commissioned four academic and private institutions to develop methodologies to identify and prioritize emerging technologies of importance to the UK. The resulting vision of "key technologies" was reported to the newly established Office of Science and Technology (OST, located in the UK Cabinet Office) and the Department of Trade and Industry and paved the way to what in 1994 became the UK Foresight Programme.[31]

The Foresight Programme is often described as having evolved through three different cycles. The first cycle explored emerging opportunities in different areas of the economy and, subsequently, focused on trends and foresight projects on specific topics.[32] The program had a substantial input on S&T policy as it informed priorities and action taken by a wide range of government bodies, universities, and private companies. Furthermore, the program also had important strengths in shaping process-related developments by forging new networks and inclusive partnerships through wide and high levels of stakeholder participation.[33]

The Programme entered its second cycle in April 1999, when it introduced thematic panels to tackle broad issues with implications for S&T policy across sectoral boundaries. It also furthered the networking element by involving even larger numbers of people. However, the resulting reports did not facilitate the extraction of coherent messages and identifying critical actions. The successful priority-setting elements of the first cycle had become less evident. Overall, the objectives were not sufficiently focused, and a lack of consistent research and methodological rigor resulted in a lack of impact.[34]

The third cycle, initiated in 2002, turned the focus of the Foresight Programme away from covering the whole range of emerging technologies and narrowed it down on a few specific areas. Consequently, it was no longer directed at priority-setting, but aimed to inform policy-makers about important topics to increase the UK's overall exploitation of science.[35] This development widened the Programme's scope by lifting the restriction to S&T policy and envisaged a proper balance between more technology-oriented projects and projects where innovation entails opportunities to tackle societal, environmental, or other problems. Finally, in July 2004, the UK Treasury published the "Science and Innovation Investment Framework 2004–2014", which specifically called for the establishment of a center of excellence in horizon scanning:[36]

> All Government departments will be using sophisticated scientific horizon-scanning techniques, linked both to their own policy horizon scanning, that of other departments, and to the OST horizon-scanning centre. […] the Government's Chief Scientific Adviser […] will build up a single centre of excellence in science and technology horizon scanning. This will be co-ordinated by OST's Foresight Directorate and will bring together high calibre individuals provided and resourced by other Government Departments, Research Councils and the private sector.

The UK Horizon Scanning Centre (HSC) began work in December 2004 and aims to "feed directly into cross-government priority setting and strategy formation, improving Government's capacity to deal with cross-departmental and multi-disciplinary challenges".[37]

Horizon scanning and foresight activities are widespread in the UK government. A variety of departments have established their own programs and several have included horizon scans, such as the Ministry of Defence, the Department of Environment, Food, and Rural Affairs, the Department of Health, the National Health Service, and the Department for Business, Enterprise and Regulatory Reform (BERR). Some such as BERR, the Home Office, the Civil Contingencies Secretariat, and the Ministry of Justice have used the support of the newly established HSC to initiate respective projects.[38] The government requires all departments to "ensure that adequate horizon scanning procedures are in place […] and horizon scanning evidence is appropriately considered and, where necessary, acted upon".[39] Consequently, the HSC is not

30 Miles (2005), pp. 2–6.

31 Miles (2005), p. 7.

32 Schultz (2006), pp. 3f.

33 Miles (2005), pp. 9–12.

34 Miles (2005), pp. 13–6.

35 Miles (2005), pp. 16f.

36 United Kingdom HM Treasury (2004), pp. 115 and 117.

37 United Kingdom HM Treasury (2004), p. 15.

38 Schultz (2006), p. 4.

39 United Kingdom (2005), p. 4.

intended to replace horizon scanning in departments, but rather to "provide a higher-level strategic context to those other activities, interacting with and informing them".[40]

The UK Foresight Programme is part of the Government Office of Science, which is located in the recently created Department for Innovation, Universities and Skills (DIUS).[41] It is headed by the Government Chief Scientific Adviser (GCSA).[42] The GCSA is responsible to the prime minister and cabinet for the overall quality of scientific advice within government and for providing personal advice to them on scientific and science policy issues. The GCSA oversees the Foresight Programme and secures coordination and exchange between the departmental chief scientific advisors.

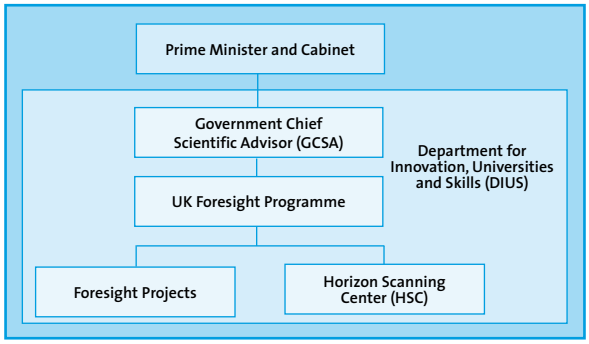


*Figure 4: Institutional anchoring of the UK Foresight Programme*

An Advisory Board for Foresight was established in December 2007 to advise the GCSA on the strategic direction of the Foresight Programme. It is composed of representatives of the public, private, and academic sectors and meets twice a year to discuss future projects and the further development of the HSC. The Foresight Programme itself is under the leadership of a director and – in addition to its permanent staff of 27 – works mainly with commissioned external experts who bring in the high level of expertise on either topical issues or futures techniques that is required for most activities. Its annual budget is approximately £3m, of which about £1m goes to the HSC.[43]

40 United Kingdom HM Treasury (2004), p. 117.

41 For more information on the DIUS, see the following website: http://www.dius.gov.uk.

42 The current GCSA (since 1 January 2008) is Professor John Beddington.

43 For more information on the Foresight Programme, see the following website: http://www.foresight.gov.uk. The current Director is Professor Sandy Thomas.

### 3.1.2 Program and activities

The activities of the Foresight Programme can be broadly grouped into two categories: on the one hand, the Foresight projects cover specific topics of wide interest; on the other hand, the HSC covers a range of activities to analyze emerging risks and opportunities throughout government.

***Foresight projects***

A rolling program of three or four foresight projects at a time was established in the third cycle. They correspond to what was termed "futures projects" in chapter 2.2 and illustrate how foresight may be generated. The aim is to create high-quality overviews of a given issue and to develop a vision of how the UK can meet the challenges that are raised. Each project lasts between 18 and 24 months, yet it should have a longer-term impact by raising awareness, offering policy recommendations, and establishing networks among professionals within and outside of government who can translate the recommendations into policy.[44]

A potential foresight project must either deal with some important current issue that science, technology, the social sciences, and economics could help address, or a current aspect of science or technology that is likely to have wider potential in the future.[45] In each topic, prognosis covers a range of at least ten years in areas where the future direction of change is rapid, current trends are uncertain, or different trends may converge. A topic must not duplicate work taking place elsewhere, must have potential outcomes that can lead to specific actions, must be multidisciplinary, and must be backed by a commitment from the potential beneficiaries to ensure that they want to hear the results and act on them.[46] The project selection is carried out in a wide and inclusive consultative process. On the one hand, the foresight team posts a short list of topics on its website for comments and consults scientists, government departments, and corporations. On the other hand, each project needs a sponsoring minister to ensure high-level political backing and is only started when support from all relevant stakeholders is guaranteed.

44 Miles (2005), p. 17.

45 See for the following King and Thomas (2007), p. 1701.

46 Eleven projects have so far been selected, of which eight have been completed, namely Detection and Identification of Infectious Diseases, Intelligent Infrastructure Systems, Brain Science, Addiction and Drugs, Cyber Trust and Crime Prevention, Exploiting the Electromagnetic Spectrum, Cognitive Systems, Flood and Coastal Defence, and Tackling Obesities: Future Choices. Three projects are currently under investigation: Land Use Futures; Mental Capital and Well Being; and Sustainable Energy Management and the Built Environment.

A high-level stakeholder group oversees each project. It is chaired by the minister of the lead department, is led at a senior level by the GCSA, and comprises senior decision-makers from relevant departments, research bodies, and other organizations. A project team of civil servants and up to six external leading experts invites between 90 and 120 scientists from different disciplines to join the project in order to review the scientific literature extensively and to participate in workshops or seminars. The ultimate objective is to produce a set of clear, comprehensive, and comprehensible science reports, often rewritten by specialized science writers to make them accessible to all the interdisciplinary team members. A range of techniques (such as scenario building or technology roadmapping) enables analysts to trace different possible futures and to describe likely outcomes for alternative visions.[47]

It is a primary aim of foresight projects to influence both policy and funding decisions made by government. If nobody has committed to listening, it is futile to produce scientific reports. Therefore, the project report is complemented by an action plan to which the ministerial sponsor must agree. This plan is widely circulated to stakeholders and made publicly available to ensure that the findings effectively feed into the policy process. Furthermore, each project has a follow-up meeting a year after the results are published to assess whether and how the project findings are being addressed and are having an impact.

***Horizon Scanning Centre***

The Foresight projects are complemented by a range of activities to identify and analyze emerging risks under the umbrella of the HSC. The HSC spreads good practice by supporting individual departments to create their own horizon scanning activities; and it has established strategic horizon scans to underpin existing activities in government and elsewhere.

*The HSC advises government departments on the use of horizon scanning and supports them in creating their own horizon scanning capacity and projects.* While the latter are smaller and tailored to the departments' specific needs, they may nonetheless feed back into the Foresight Programme by identifying topics worthy of more in-depth attention.[48] More generally, the HSC advises departments on how to use tools of futures analysis and to integrate them into strategic policy development. For this purpose, a toolkit has been developed that introduces a broad range of methods and describes how they can be applied to improve decisionmaking.[49] Besides facilitating cross-governmental horizon scanning, the HSC also ensures a broad public outreach and builds networks of futures thinkers and practitioners in the public, private, academic, and other sectors. It established the Futures Analysts' Network (FAN Club) as a forum where those who have an interest in horizon scanning and futures analysis can meet to exchange new ideas, innovative thinking, and good practice. Its meetings are devoted to topics as diverse as "The Role of Futures Thinking in Government Strategy", "Britain's Future Abroad", or "Education and Skills Futures". Speakers from different professional communities give presentations, lead workshop sessions, or present case studies with the goal of stimulating discussion, educating participants on the use of futures techniques, and adding value to the Foresight Programme by capitalizing on public input.

*The second essential activity of the HSC is the oversight of two complementary strategic scans, the Delta Scan and the Sigma Scan*. These ongoing scans, which are good examples for the policy tool of horizon scanning as developed in chapter 2.1, look ahead over a range of up to 50 years to provide an intersectoral informational basis for all foresight activities across government and to uncover "contradictions and ambiguities in mapping the turbulence of change".[50] The results are presented in so-called *issue papers* that briefly describe the identified trends and how they may unfold in the future. Each issue paper is classified according to a hierarchical system, starting from the classic STEEP categories (e.g., environment) to a domain (e.g., climate change) to a sub-domain (e.g., ozone layer). They provide an abstract of the issue, address possible implications, identify early indicators, drivers, and inhibitors, reveal parallels to previous events, and provide further links and sources. Furthermore, each paper is labeled with a number of so-called *issue markers* that provide indicative information about the possible likelihood, impact, distribution, severity, and development time of each issue. Finally, the papers are classified into a number of *genres*, according to whether an issue paper represents rather a weak signal, a forecast, a key driver, a scenario, or a wildcard, in order to indicate what sort of critical thinking should be applied by reading the paper. These scans are part of the first phase of a comprehensive foresight process and provide input for a more in-depth treatment in subsequent phases, for instance by identifying topics for foresight projects or encouraging policy-makers and strategy teams to develop scenarios of potential futures.

47 King and Thomas (2007), pp. 1701f.; see also the Foresight Programme's website.

48 King and Thomas (2007), p. 1701.

49 This toolkit "Exploring the Future: Tools for Strategic Thinking" is available online at http://hsctoolkit.tribalctad.co.uk/.

50 Schultz (2006), p. 5.

- The Delta Scan (www.deltascan.org) is an overview of future S&T issues that aim to identify potentially evolving future trends. Over 250 S&T experts have contributed to the Delta Scan.
- The Sigma Scan (www.sigmascan.org) is a synthesis of other horizon scanning sources and may be characterized as a "scan of scans". It does not focus exclusively on S&T issues, but covers trends across the full public policy agenda. It draws its information from think-tanks, corporate foresight, governments, academia, NGOs, blogs, mainstream media, or music, depicting the diversity of potential information sources in horizon scanning.[51]

*Box 2: The UK Horizon Scanning Center's Delta and Sigma Scan*

### 3.1.3 Conclusions

Foresight and horizon scanning have established themselves as accepted methods and tools informing strategic policymaking in the UK government. While the Foresight Programme was initially centered on S&T policy – and still places a strong emphasis on these issues –, it has continually broadened its scope (particularly with the creation of the HSC) and today provides policy-makers with a perspective on the full public policy agenda. However, the Foresight Programme cannot answer all policy questions itself, as its staff evidently lacks the necessary topical knowledge. Consequently, each government department is obliged to implement its own research and horizon scanning structures. The centralized Foresight Programme only works on projects of cross-governmental interest, while the HSC encourages departments to engage in horizon scanning as part of their own research activity. The institutional link to the GCSA emphasizes that foresight is based on scientific evidence and has nothing to do with crystal ball gazing. In fact, it is an instrument that links the available expert knowledge to a long-term perspective and employs sophisticated techniques of futures analysis to raise the government's strategic policymaking capabilities.

51 Both scans were developed by external contractors: the Delta Scan by the non-profit research center Institute for the Future (http://www.iftf.org), the Sigma Scan by the consultancies Outsights (http://www.outsights.co.uk) and Ipsos MORI (http://extranet.ipsos-mori.com/horizons/case.shtml). Both scans are currently being revised.

## 3.2 Singapore's Risk Assessment and Horizon Scanning

After being affected by a number of strategic surprises over the last decade, the government of Singapore decided to develop risk assessment and horizon scanning capacities to be better prepared for emerging threats and to deal with them in a more systematic and coherent way. Singapore's risk assessment and horizon scanning system targets a horizon of two to five years and is focused on issues of national security, although it may be extended to other areas of public policy in the future. It aims to facilitate inter-agency collaboration and pulls together all potentially relevant information from within government as well as from external sources to enable effective information- and perspective-sharing across government. The risk assessment and horizon scanning system is to generate added value as it becomes an essential part of the government's strategic planning process.[52] It encourages diversity, is conceived as a long-term investment, and is conceptualized as a process of discovery that may evolve in parallel with the improved understanding of what works best in Singapore's particular context.

### 3.2.1 Evolution and institutional arrangements

The shortcomings of the Singapore government's approach to governmental foresight became apparent around the turn of the new millennium, when the country – and many other governments in the region – was affected by a number of strategic surprises. It already had experimented with scenario planning since the 1980s and had, for example, developed scenarios dealing with possible economic shocks.[53] However, events such as the terrorist attacks on the United States (US) in 2001, the plot to attack the embassies of the US, the UK, and Israel based in Singapore by the radical Islamic organization Gema'ah Islamiyah uncovered in December 2001, and, most importantly, the outbreak of the SARS epidemic in the first half of 2003 showed that scenario planning on its own could not help anticipate strategic surprises in an increasingly complex environment.[54]

52 See the speech of Professor S. Jayakumar, Coordinating Minister for National Security, at the opening of the International Risk Assessment and Horizon Scanning Symposium 2007 at the following website: http://enterpriseinnovator.com/index.php?articleID=10910&sectionID=25.

53 As a result, Singapore reacted faster and more effectively than other governments in the region to the Asian financial crisis of the late 1990s. Its GDP growth was less affected than was the case in neighboring economies such as Malaysia, Thailand, and Indonesia. See United Kingdom Government Cabinet Office (2002), p. 53.

54 Singapore National Security Coordination Secretariat (2006), p. 66.

The government reacted by conducting a comprehensive review of the national security structures, processes, and measures, which culminated in the release of a new strategic framework for national security in July 2004. This framework established a networked and coordinated approach to address national security issues and focused in particular on the emergent threat of transnational terrorism. One of the proposed measures was the establishment of a risk assessment and horizon scanning capacity.[55] Such a system ought to have two key objectives: First, to empower government in effectively detecting weak signals and indicators of exogenous shocks; and second, to encourage inter-agency collaboration and to foster informed analysis.[56]

Singapore's Risk Assessment and Horizon Scanning (RAHS) system is not affiliated with a particular government department, but is part of the National Security Coordination Secretariat (NSCS) within the prime minister's office. NSCS is under the leadership of a deputy prime minister who is concurrently the coordinating minister for national security.[57]

It is structured into two main branches: the Joint Counter Terrorism Centre (JCTC), which provides strategic analysis on terrorist threats and aids in building the counter-terrorism capacities of its partner agencies; and the National Security Coordination Centre (NSCC) with the triple role of national security planning, policy coordination, and anticipating strategic threats.[58]

The NSCC itself is composed of three sub-units or groups that are led by deputy directors: The Policy and International Relations Group has the lead in national security planning and policy formulation, national security relations and cooperation with other countries, and the development of public education plans; the Plans and Resource Group assists local security communities in capacity-building and monitors strategic capability development; and the Risk Assessment and Horizon Scanning group provides the overall coordination and management of the RAHS system. The RAHS group is the focal point for all horizon scanning and foresight activities: it is the home of the Horizon Scanning Centre (HSC, see below) and coordinates the various other institutions that contribute to risk assessment and horizon scanning. About 22 people work on the RAHS program as analysts at the HSC, engineers at the RAHS Experimentation Centre (see below), or program managers.[59]

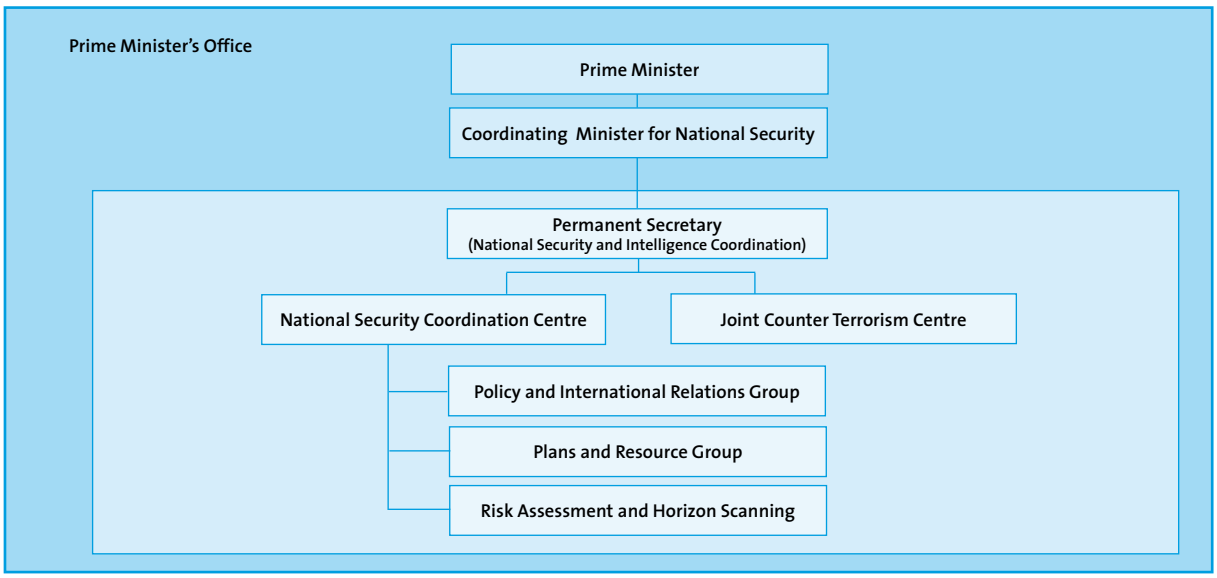


*Figure 5: Structure of policy coordination in the NSCS (Source: own picture based on Singapore National Security Coordination Secretariat (2006), p. 57, and the following website: http://app-stg.nscc.gov.sg/frmaboutus.asp)*

55 Singapore National Security Coordination Centre (2004), pp. 39f.

56 According to a presentation by Ambassador Lam Chuang Leong, entitled "Networked Government for Whole-of-Nation Security: Singapore's Risk Assessment and Horizon Scanning Programme", at the European Futurists Conference, Lucerne, 19–21 November 2007.

57 The current Coordinating Minister for National Security (since September 2005) is Professor S. Jayakumar.

58 Singapore National Security Coordination Secretariat (2006), p. 58. For more information on the NSCC, see the following website: http://app-stg.nscc.gov.sg. Directors of JCTC and NSCC report to Permanent Secretary for National Security and Intelligence Coordination Peter Ho.

59 For more information on the RAHS, see the following website: http://www.rahs.org.sg.

### 3.2.2 Programs and activities

The RAHS system was initially developed with the support of internal and external contractors[60] and has continuously evolved since its inception in July 2005. NSCC spearheads the development of the conceptual and methodological frameworks that underpin the RAHS system. It conducts research on concepts and methods with regard to risk assessment and horizon scanning, works with other partner agencies within the Singapore government such as the Strategic Policy Office and the Civil Service College, and draws on the expertise of other domains such as academia and private sector initiatives.[61] NSCC helps oversee the graduate-level Futures Studies program based in Nanyang Technological University and is involved in organizing seminars and workshops, bringing in method experts and other speakers to expand the breadth and depth of future-oriented thinking within the Singapore government.[62]

Besides NSCS, the RAHS program relies on two other institutional pillars: the Horizon Scanning Centre and the RAHS Experimentation Centre, both supporting RAHS in complementary ways.

***Horizon Scanning Centre***

The Horizon Scanning Centre (HSC) serves as the operational hub of the RAHS system. It coordinates a *government-wide information network* of 20 agencies covering counter-terrorism intelligence, bio-medical and cyber-surveillance, maritime security, and energy security. Information-sharing within the network is facilitated by a Service Oriented Architecture (SOA), which is a good example of how the results of strategic scans are documented in a technologically advanced way. This government-wide network, which is in the process of being connected, is built on a node-to-node philosophy: Each agency participates through an exchange of data with other agencies and thereby contributes to the creation of an interoperable collaborative environment. It allows the data and tools of different agencies to be treated and exploited as web services that are discoverable and sharable. Each agency thus feeds the system with information, collected from own scans as well as from open sources, and profits from the data provided by others.

The system helps users to process large amounts of information, to search for articles within its repository, and to perform a variety of analyses in order to quickly extract the needed information. It also allows users to meta-tag and comment on incoming and existing data sets and to visua-lize them in order to amplify data outliers. Furthermore, data structuring services enable the building of system maps with associated consistency matrices and the performing of morphological analyses.[63] It is important to note that the system incorporates concepts, such as systems thinking and complexity analysis, that have previously been applied in workshop settings. The main challenge was therefore to translate them into software functions that can be easily used by all users in their daily operations even if they do not entirely understand the underlying theories and concepts. In addition, HSC supports government agencies with expertise in methodology, if necessary, and explores the longer-term prospects for the participating agencies to incorporate these methods into their own working processes.[64]

The system is run on two separate networks – a classified, or closed, network and an unclassified, or open, network. NSCC maintains separate RAHS portals for each network, and each portal acts as a one-stop destination for a host of products generated by the RAHS system. Furthermore, an *outreach strategy* was developed to extend RAHS to agencies outside of government:

- *First*, it envisages involving Singapore universities in order to get feedback on the system and support in building models that apply across the political, social, or economic domains.[65] In these engagements, the RAHS system is made available for research purposes, which simultaneously facilitates the adoption of the concepts and methods of horizon scanning by younger Singaporeans.

60 Singapore's Defense Science and Technology Agency (http://www.dsta.gov.sg), DSO National Laboratories (http://www.dso.org.sg), which is Singapore's national defense R&D organization, the Arlington Institute (http://www.arlingtoninstitute.org), and the consultancy Cognitive Edge (http://www.cognitive-edge.com).

61 The RAHS system entertains close relations with the Centre of Excellence for National Security (CENS), an academic research unit of the S. Rajaratnam School of International Studies at Singapore's Nanyang Technological University. CENS is devoted to policy-relevant analysis of a range of security issues, and one of its three research clusters focuses on risk assessment and horizon scanning. More information is available at the following website: http://www.rsis.edu.sg/cens.

62 One major conference is the annual International Risk Assessment and Horizon Scanning Symposium. More information is available at the following website: http://www.rahs.org.sg/t2_irahss08_ats.html.

63 For this and additional information on SOA and its technical features, see Singapore National Security Coordination Centre (2007).

64 Singapore National Security Coordination Centre (2007), p. 25.

65 Examples include engagements with undergraduate classes from Singapore Management University (2006) and the National University of Singapore (2007), as well as a Strategic Foresight Masters course in Nanyang Technological University (2008).

- *Second*, the outreach program seeks to establish a trusted network of domain experts in the private sector in order to draw on their expertise and wisdom.
- *Third*, in the longer term, the outreach strategy aims to extend horizon scanning beyond Singapore's borders by developing exchange programs with international partners.[66]

***RAHS Experimentation Centre***

The RAHS Experimentation Centre (REC) was launched in October 2007 with a technology-oriented focus on exploration, experimentation, and enhancement of the RAHS system.[67] REC is managed by Singapore's Defense Science and Technology Agency and has *two main goals*:

- It functions as a technology scanning and innovation center. It provides a focal point for cooperation with other government agencies, academic institutions, and the private sector to explore and experiment with new and emerging technology tools related to RAHS.
- It ensures that RAHS undergoes continuous technological development and introduces novel concepts and technologies that expand the capabilities of the RAHS system. It is interested in concepts or technologies that demonstrate potential for application in risk assessment and horizon scanning, such as social computing, modeling and simulation, computational linguistics, data analysis, and information visualization.

REC pursues *two main activities*:

- It conducts experiments to seed novel concepts and technologies in operational contexts and to determine, together with policy analysts, the usefulness of risk assessment and horizon scanning.[68]
- It participates in case studies with government agencies on complex problems in order to demonstrate how RAHS can help to solve them. A notable example is the case study to explore scenarios about the importation of avian influenza into Singapore and to assess the threat level of outbreaks occurring in the region.

66 S. Rajaratnam School of International Studies (2008), p. 22.

67 For more information on the REC, see the following website: http://www.rahs.org.sg/t3_aboutRahs_rp_rg_rec.html.

68 Examples include a proof of concept on data anonymization, a project on situational awareness of maritime security threats, or the testing of the applicability of RAHS in the detection of threats in operations other than war. See National Security Coordination Secretariat (2007), p. 22.

### 3.2.3 Conclusions

Singapore's government invests in tools and processes to avoid future strategic surprises. Among the many interesting characteristics of its Risk Assessment and Horizon Scanning program, three are particularly important in this study's context:

- The program is anchored in concerns about national security and is targeted at the respective issues. While it distinguishes itself from the UK Foresight Programme in this respect, it also cultivates a broad perspective of the issues to be considered security-relevant and envisages expanding its future scope to a broad public policy agenda.
- A second noteworthy feature is its innovative government-wide network based on an open-system architecture that creates an interoperable working environment without establishing centralized databases, allowing each agency to participate on equal terms.
- Finally, in addition to its activities reaching out towards universities and the business world, the program emphasizes the technological side of horizon scanning and promotes the exploration and development of technologies that may support future activities in this area.

## 3.3 The Netherlands Horizon Scan Project

The Netherlands recently started to create horizon scanning capacities in order to broaden the government's view on future threats and opportunities. The goal is enhance its ability to anticipate trends and developments and to support the government in creating future-oriented policies in areas that are relevant to the Dutch society. The following paragraphs exemplify how a broad strategic scan provides input that may ultimately lead to decisions about policy priorities and agendas.

### 3.3.1 Evolution and institutional arrangements

In contrast to the permanent horizon scanning systems of the UK and Singapore, the Netherlands Horizon Scan 2007 was a single project carried out by a specially established team under the responsibility of the Commission for Consultation of Sector Councils (COS),[69] a platform for consultation and collaboration of independent commissions consisting of representatives from research, society, industry, government, and think-tanks. On the basis of futures studies, it formulates priorities for society-oriented research, focusing in particular on those experts dealing with cross-sector subjects at the interface of policy domains and scientific disciplines.

Based on a 2004 evaluation indicating a need for foresight studies of a broader nature, COS initiated a horizon scan project at the end of 2005. When the final report was published in 2007,[70] the project was no longer expected to remain a one-time measure: In February 2008, the tasks of the COS were transferred to the Knowledge Directorate of the Netherlands Ministry of Education, Culture and Science, which functions as a provisional facility for the continuation of the national scan and the Dutch involvement in European horizon scanning activities.[71] It is foreseen that in spring 2009, a permanent facility will be created outside the ministry in order to establish horizon scanning on a permanent and institutionalized basis.

69 Commission for Consultation of Sector Councils (2008), p. 7.

70 "Netherlands horizon scan", presentation by Prof. Dr. Roel in 't Veld and Victor van Rij at the preparation meeting on joint activities, ForSociety, The Hague, 19 March 2007, http://www.toekomstverkennen.nl/doc/2007/Presentation%20NL%20horizon%20Scan%2019march2007.pdf, accessed 9 September 2008.

71 A prominent example is the Dutch participation in the "ForSociety ERA-Net" (http://www.eranet-forsociety.net), a project initiated under the 6th European Research Framework Programme, which fosters coordination among the national foresight programs of 15 countries.

### 3.3.2 Programs and activities

The Horizon Scan 2007 aimed to raise the awareness in the Netherlands about future threats and opportunities and their impact on society. For this purpose, the project intended to identify and prioritize the topics of foresight studies and other activities of the sector councils, to detect knowledge gaps and topics for further study, and to feed the results into strategic discussions in ministries, research organizations, societal organizations, and the business world.

The process extended over two years and was structured in several phases:[72] In the *first phase*, a list of opportunities and threats was constructed, based on an extended literature review and according to a set of selection criteria, namely the likelihood and impact of potential future events.[73] The list was then divided into previously determined categories[74] and extended and refined throughout the entire project in interactions with so-called sounding boards, composed of Dutch and foreign specialists of different professional communities. Finally, the list was validated by comparing it with the outcome of the UK horizon scans.

In the *second phase*, the general public and the sounding boards members evaluated the list, which identified some 150 problems and opportunities.[75] This process stimulated discussions and was executed through a public website as well as personal consultations. The *third phase* linked the identified threats and opportunities with one another and ordered them into trans-domain and trans-disciplinary clusters that revealed links between expected developments with potentially major social consequences. Again, sounding board meetings were held to discuss or reconstitute clusters and to start the selection of approximately ten clusters of fundamental threats and opportunities.[76] Finally, a specifically developed card game, which

72 For a detailed description, see Commission for Consultation of Sector Councils (2008), pp. 10–16.

73 The resulting bibliography is available in Commission for Consultation of Sector Councils (2008), pp. 69–81.

74 These categories were attributed to the physical (atmosphere; geosphere; biosphere; hydrosphere; space; the universe) and the human environment (basic services; science, technology, and education; social domain; economic and financial domain; political, administrative, and judicial domain).

75 The full list is available in Commission for Consultation of Sector Councils (2008), pp. 83–126.

76 The ten clusters covered by the Horizon Scan Project are: 'Infrastructure for the future'; 'Changing economic and political world order'; 'A global approach to dangerous infectious diseases'; 'Work and education in a new context'; 'Opportunities for robotics and inter-connectivity'; 'Two related transitions: creat-

facilitates open discussion by training participants to provide creative answers to challenging tasks and hypotheses, helped participants to discover (surprising) interactions between subjects within and across clusters.[77]

In the *fourth phase*, the cluster descriptions were presented to a number of scientists, journalists, and politicians who were asked to write essays about possible future developments and to present their views of core issues.[78] Based on the essays, the list of opportunities and threats, the cluster descriptions, and the uncovered relations among them, the project team drafted an alternative "State of the Nation" address. The goal was to raise awareness in the Netherlands about issues that require a perspective reaching further into the future than is the case in the address that is regularly delivered by the queen. The challenge was to provide an outlook on emerging policy challenges that simultaneously makes an interesting read, points to dilemmas, generates questions, and inspires public involvement.[79] Finally, the *last phase* involved the drafting of the final report and marked the start of an intense dialog on the results and their implications within and across government.

### 3.3.3 Conclusions

The Netherlands Horizon Scan 2007 shows that a broad strategic scan provides input for policy-making by identifying, assessing, and clustering future trends, issues, and developments.[80] However, the topics raised in the course of such a project are only of sustained value if they initiate a comprehensive foresight process that transforms the identified knowledge (and the knowledge gaps) into insights for strategic decision-making. While the cluster descriptions and essays are first steps in this direction, the planned institutionalization of the horizon scanning process on a regular basis will accentuate the initiation of such a systematic foresight process. Two important conclusions can be drawn from the Horizon Scan 2007:

- If horizon scans are to make a permanent contribution to discussions about the future, it its imperative to repeat them on a regular basis.
- Many of the issues noted in this project are not unique to the Netherlands; therefore, international cooperation in the area of horizon scanning could be profitable, not only in the interest of more efficient data gathering and methods development, but also for creating common images and perceptions of topics that require a transnational or even global approach.

ing and utilizing space'; 'Handling conflicts and security policy constructively'; 'The engineerable and self-mutating human'; 'Accelerating the development of new energy sources'; and 'What does 'the graying of society' mean?'.

77 See Commission for Consultation of Sector Councils (2008), p. 40.

78 The essays were published in In't Veld, van der Veen, and Basten (2006).

79 The address was published in the daily newspaper NRC Handelsblad on 16 September 2006, see Commission for Consultation of Sector Councils (2008), p. 36; see also the reprint on pp. 153–8.

80 See for the following Commission for Consultation of Sector Councils (2008), pp. 43-48.

## 3.4 Key insights and messages

The reviewed country experiences of the UK, Singapore, and the Netherlands demonstrate the multifaceted character of foresight and horizon scanning. Although they have many aspects in common, each case also reveals particularities that set it apart from the other programs. In the following, we will highlight some of the key messages.

- *Mainstreaming horizon scanning and foresight throughout government:* As regards the policy areas covered, the programs grew out of different policy areas, but all aim to be wide in scope and intend to mainstream horizon scanning throughout the full public policy agenda. Nevertheless, the "historical roots" of the programs are easy to recognize: In the UK, for instance, the Foresight Programme clearly grew out of S&T policy both in terms of the contents of the foresight projects as well as in its institutional attachment to the Department of Innovation, Universities and Skills. Similarly, the integration of Singapore's RAHS into the National Security Coordination Secretariat emphasizes the focus on national security issues. Therefore, historical legacies and decisions about institutional entrenchment of the coordinating bodies of government-wide horizon scanning have significant impact in terms of priority-setting and how the programs are perceived within and outside of government. Still, if horizon scanning is to provide a cross-governmental perspective that complements the horizon scans of individual departments, it is essential to pursue a holistic perspective and to focus on a broad policy perspective.

- *Supporting horizon scanning across government:* The programs usually aim to be centers of excellence for horizon scanning, but do not intend to provide topical expertise on all potential future issues as they lack the required knowledge. Instead, their task is to support others in implementing their own foresight and horizon scanning structures (as is mandatory for the departments of the UK government) and to provide a higher-level strategic context for the respective government initiatives. However, it is a challenging task to hard-wire different agencies for addressing interdisciplinary and cross-cutting issues under the responsibility of more than one department and to create an interoperable working environment. Individual departments are usually protective of their own areas of action, and even if an enthusiastic minister sponsors a foresight project, it may not get support from colleagues elsewhere.[81] To sum up, the proponents of cross-cutting horizon scanning strive to find the right balance between centralization in terms of their support and coordination roles, and decentralization with respect to the topical analysis performed by a variety of competent bodies across government.

- *Building networks across professional communities:* In today's dynamic environment, where the challenges transcend geographic and sectoral boundaries, even an inclusive cross-governmental process may not be sufficient anymore. Consequently, all programs are dedicated to extending their activities toward other professional communities, particularly private businesses, think-tanks, and the academic sector. The participants realize that a multi-stakeholder approach, drawing on a multitude of internal as well as external sources of knowledge, is preferable to a process that is exclusively centered on experts from within government. At the same time, the Singapore example illustrates how an academic outreach program offers opportunities for both sides: The government wins feedback from critical minds on its methods and concepts; it acquires scientific insights into the latest state-of-the-art of various academic disciplines; and it exposes the next generation of students and citizens to the practice of horizon scanning. The universities, on the other hand, profit from access to online resources containing data and information that is valuable for research and might not be easily retrievable elsewhere. Finally, recent developments indicate a trend towards linking several national scans in a joint horizon scanning. Such a combined scan is expected to reveal issues that are overlooked in the separate national scans and may serve as a tool to create a common understanding and shared awareness of futures issues.[82]

- *Guaranteeing the inflow of expert knowledge:* Horizon scanning and foresight must be based on the best available scientific and other evidence. This message is strongly emphasized by the British government, which regards close links and collaboration with universities, think-tanks, and research institutes as essential. The UK Foresight Programme comes under the responsibility of the Government's Chief Scientific Advisor so as to guarantee that real expert knowledge flows into the project work. This determination safeguards

81 King and Thomas (2007), p. 1702.

82 Van Rij (2008), pp. 2 and 6.

the credibility and longer-term reputation of the program. Should the impression arise that horizon scanning lacks analytical rigor and (academic) seriousness, it will become difficult to translate the results and implications into trustworthy and generally acknowledged policy recommendations.

- *Securing broad political support:* Horizon scanning and foresight are directed at generating insights and ideas for senior decision-makers. However, these insights may often be situated on the margins of current thinking and may challenge conventional wisdom. Without clear support and backing from senior policy-makers, it is difficult for lower-level professionals to implement and pursue new or altered policies.
- *Ensuring policy impact:* Policy impact can only be achieved if there is a mutual understanding among all concerned stakeholders and the foresight project team of the needs and goals of the other respective parties.[83] The UK government states bluntly that if there is no one willing to listen, no scientific reports are needed. Consequently, they only embark on the unexplored territory of a new project if it is supported by all relevant stakeholders. Furthermore, each project is chaired by a minister who guarantees political backing and who is responsible for promoting the policy recommendations.[84] Overall, it is critical that the results and recommendations be used to inform a decisionmaking process in an effective fashion. If the reports are shelved without further action as soon as they are published, interest in participating in such exercises will rapidly vanish not only in the government, but also among all other involved groups and individuals.
- *Establishing horizon scanning as a permanent process:* Horizon scanning needs to be regularly repeated and must stand on a solid (institutional) footing. Since only few people really understand what horizon scanning and foresight is about, a good level of education is required in order to de-mystify these approaches, in terms of both the potential benefits and the limits.[85] The experience of the Netherlands shows that it may be a good idea to start on a project basis in order to display the positive impact of the process to a number of different stakeholders. However, long-term sustainable effects may only occur if the process is firmly established – which is exactly what the Dutch government is now doing.

83 Da Costa et al. (2008), p. 380.

84 King and Thomas (2007), p. 1702, also refer to the problems arising when ministers are transferred to other portfolios and support for a project and its action plans may not be sustained.

85 See Voros (2003), p. 11.

# 4 Horizon Scanning in Switzerland

Horizon scanning that cuts across policy areas and government departments is not instituted in the Swiss government. However, some federal departments and offices are trying to detect and assess future issues and developments within the policy areas that come under their responsibility. A recent report published by the Center for Security Studies at ETH Zurich, for instance, explores how the federal administration develops and uses scenarios to prepare for upcoming threats and crisis situations.[86] Furthermore, a survey conducted by the Center for Science and Technology Studies concludes that a certain foresight culture exists in Switzerland; however, activities are uncoordinated and dispersed across the administration, universities, and companies, and projects of the administration are usually focused on specific issue areas such as energy, environmental, or landscape and agricultural policy.[87]

Therefore, Switzerland has not implemented programs or activities that refer to the cross-government function of horizon scanning as described above for the UK, Singapore, and the Netherlands. Nonetheless, there are two projects that may be considered in a wider sense to be pointing in such a direction and may form a starting base for future action.

- *The first project is the Risks Switzerland project ("Risiken Schweiz")*, launched in the early 1990s and located under the auspices of the Federal Office for Civil Protection (FOCP). It serves to collect and assess existential risks that affect Switzerland. An important milestone was the unpublished "Risk Profile Switzerland" report of 1999, which predicted probabilities and damage potentials for a number of risk scenarios through the analytical prism of non-military security issues across the public policy agenda. However, this report was perceived as not being politically expedient at the time; its approach was a rather technocratic one that was biased towards quantifiable factors and neglected integration with the political decisionmaking level.[88] Although the entire project has suffered setbacks over the past few years, it is still active, and its future work program includes, among other aspects, the collection and evaluation of scenarios of relevance to security policy.[89]
- *The second cross-government project is the Forward Planning Staff of the federal administration*, which is located in the Federal Chancellery as the staff office of the Federal Council. It consists of representatives from about 30 federal offices and prepares a quadrennial overview of potential future trends and issues facing the federal administration. Its most recent report, entitled "Challenges 2007–2011", serves various government actors as an interpretive document and reference work; in particular, the report is taken into account by the Federal Council in its legislature planning.[90] The report looks forward to the next legislative period, and its individual chapters cover the full range of policy areas. The chapters are drafted by the government offices in charge, so that the report can be regarded as a compilation of the official positions within the administration. Therefore, it is not elaborated in intense consultation with external subject-matter and foresight experts, does not provide a cross-issue perspective, and refrains from making judgments in terms of policy priorities.

Both projects have the potential to contribute to a more future-oriented perspective in federal policy. At the same time, they are not consistently directed toward generating foresight knowledge: One may criticize, for instance, that they do not sufficiently draw on outside expertise, that (scientific) evidence is considered selectively, that the methods, tools, and instruments of foresight are rarely used, or that there is a lack of political backing that impedes the process of feeding the results in the policy process. Both projects also illustrate the difficulties of establishing a cross-cutting project within a federal administration that tends towards compartmentalization and coordinating the respective activities even within individual departments. Although the need for long-term perspectives and a coordinated approach is recognized across the administration, it is difficult to implement them in practice.

What options do exist to establish horizon scanning in a Swiss context? In the following, the study conceives a few options of how it could be implemented in the federal administration. The developed models are based on the country reviews presented in the previous chapter and should be understood as draft approaches that blend the knowledge gained from experiences of other countries with an in-depth understanding of the Swiss political and

86 Center for Security Studies (2008).

87 Center for Science and Technology Studies (2007a), p. 21. The report refers, for instance, to the Energy Perspectives for 2035 project by the Federal Office of Energy (www.energy-perspectives.ch).

88 Habegger (2008).

89 Federal Office for Civil Protection (2008), p. 16.

90 See for the latest report Federal Chancellery (2007).

administrative system. This paper by no means aims to propose definite solutions, but serves as a basis for discussing the need and possible ways to create more future-oriented and strategically informed approaches to federal policymaking.

Each model ties in with one of the described country experiences: model one relates to the Dutch example, model two to the British one, and model three to the Singapore experience. Each model is briefly described in terms of its mission and purpose, the products and services it can deliver, the potential institutional framework in which it might be embedded, and a rough estimate of the required resources.

### 4.1 Model 1: Horizon Scanning Switzerland Project

The purpose of a Horizon Scanning Switzerland project is to detect and evaluate future trends and issues relevant to Switzerland. It cuts across all policy fields and includes all federal departments as well as stakeholders from academia, think-tanks, businesses, and civil society. A key objective is to determine whether and how horizon scanning can be applied in government, what purposes it serves, and what products and services it can deliver. In particular, such a project assesses the acceptance of horizon scanning in the Swiss context, especially within the federal administration, the support it receives from political decision-makers in parliament as well as at the cantonal and municipal levels, and the reaction of the media and the general public.

In terms of products and services, the project could follow the Dutch example and carry out a broad strategic scan that identifies a list of the most important future trends and issues and categorizes them into a select number of clusters. These may be further assessed to derive strategic lessons for future policy priorities. The process would be driven by expert networks that comprise many stakeholders from both within and outside the federal administration who would meet in a series of conferences or smaller workshops. It would extend to two groups of networks: on the one hand, subject-matter experts that can bring in the necessary topical knowledge to address specific issues; on the other hand, experts in horizon scanning and foresight methods who know how to develop and execute such processes. The results of the strategic scans, the assessments, and the dynamics of expert interactions would be disseminated through essays, policy briefs, or public presentations. Innovative approaches for promoting the horizon scanning project, for instance an alternative speech on the occasion of the swiss national holiday that looks further into the future than the traditional one delivered by the president, would create public awareness and might help to evaluate the project's overall prospect of success.

As a test case, the project would be limited in time (e.g., to 24 months) with clear milestones in terms of time schedule and deliverables. If it is positively evaluated after the test period, it might be extended or established on a permanent basis. The project could be managed by a small project team and integrated, for example, into the Federal Chancellery, e.g., to the secretariat of the Forward Planning Staff, which would ensure that the project is not associated with a single policy area and thus stands on a more "neutral" ground than if it were attached to a particular department. The required resources largely

| | Horizon Scanning Switzerland-Project |
|---|---|
| **Role model** | Netherlands Horizon Scanning Project |
| **Mission and purpose** | To detect and evaluate future trends and issues relevant to Switzerland across the public policy agenda, to determine whether and how horizon scanning can be used in government, and to assess its acceptance in parliament, the federal administration, and the general public |
| **Covered policy areas** | No particular focus; the strategic scan would cut across all public policy areas |
| **Products and services** | • A strategic scan to identify the most important trends and issues for Switzerland<br>• Creation of expert networks<br>• Broad dissemination of results through, inter alia, essays, policy briefs, public presentations |
| **Institutional framework** | • The project is limited in time<br>• It could be run by a small internal project team, or by a project team of a external partner organization |
| **Estimated resources** | • In-house team with a workload of approximately 150 to 250 per cent<br>• External project team as an alternative option<br>• Financial resources for workshops, reports, and promotional activities |

*Table 1: Model 1 – Horizon Scanning Switzerland Project*

depend on the overall scope of the project. Not counting the work by external experts and by other employees from within the administration, the project would require a full-time project director, ideally a scientific collaborator, and some administrative support (approximately a total workload of 150 to 250 per cent). Furthermore, it would need some financial resources for organizing the workshops, for disseminating the results, and for promotional activities.

### 4.2 Model 2: Swiss Horizon Scanning Center of Excellence

Modeled on the UK Foresight Programme, a second option is to establish a Swiss horizon scanning center of excellence to provide the administration with the necessary methodical and strategic support to establish horizon scanning and foresight in federal departments and offices. It would possess the methodological and procedural knowledge to help others to conduct scans and futures projects, but would not perform them itself. However, in addition to its support and education function, the center of excellence would still initiate selected scans and futures projects on issues that are relevant across various policy areas and are of interest to numerous internal and external stakeholders (e.g., to the business world in the domain of innovation policy).

The horizon scanning center would support the federal administration in creating horizon scanning capacities. As it may not be possible to provide all the required know-how from in-house sources, the center of excellence would rely on external expertise. It could also initiate a "Swiss Futures Analysts' Network", based on the UK example, in order to bring together experts who share their knowledge. Additional products could be strategic scans, such as the Delta or Sigma scans carried out by the UK horizon scanning centre, or selected cross-government futures projects that may have an impact on a wide range of government functions and policy fields.

It is evident that a full-fledged center of excellence requires significant planning, a long-term strategy, and sustained financial investments. In the beginning, however, a small nucleus of what may later grow into a more encompassing horizon scanning center could be established quite rapidly: It would provide support and may be useful for organizing the design and implementation of strategic scans. In institutional terms, an existing section (for example in the Federal Chancellery) could be extended and tasked with the development of a business plan, or a new section could be installed, in analogy to the UK – for example, in a future government department for education and innovation policy. Even in its infant stage, the center of excellence would need considerable financial resources, particularly for involving external experts and the development of scans. The initial team should consist of a project director, two or three scientific collaborators with substantial methodical and policy experience as well as some administrative support (approximate total workload of 350 to 500 per cent).

| | Swiss Horizon Scanning Center of Excellence |
|---|---|
| **Role model** | UK Foresight Programme |
| **Mission and purpose** | To provide the federal administration with the necessary methodical, procedural, and strategic support to establish horizon scanning and foresight in government departments and offices |
| **Covered policy areas** | No particular focus; support function across all public policy areas |
| **Products and services** | • Support and education function for the federal administration<br>• Expert networks and "Swiss future's analysts club"<br>• Strategic scans and selected futures projects possible |
| **Institutional framework** | • An internal competence center needs to be created: a) attached to an existing section (e.g. in the Federal Chancellery) or a new section is established (e.g. in a future Department for Education)<br>• In a start-up phase, external consultants could be tasked to develop a business plan and an outline of key activities |
| **Estimated resources** | • In-house team with a workload of approximately 350 to 500 per cent at minimum<br>• For the start-up phase: external team possible<br>• Considerable financial resources for involving external experts as well as developing expertise and strategic scans |

*Table 2: Model 2 – Swiss Horizon Scanning Center of Excellence*

### 4.3 Model 3: Horizon Scanning for Swiss National Security

The third model has a more targeted policy focus, as it serves to detect and assess issues that are particularly relevant to Swiss national security. It would connect a variety of experts and groups of interests across policy domains to support the government in preparing for emerging threats. Similar to the risk assessment and horizon scanning in Singapore, an open system architecture links federal offices and external stakeholders (e.g., in the business world) who deal in some way with security-relevant issues. In particular, it includes stakeholders for whom security aspects are not primary concerns, and provides a platform that encourages the participation of those stakeholders who are not integrated into the traditional security-policy community and are at times reluctant in this respect. Such a network among federal offices (and later possibly extended to other stakeholders) allows knowledge about security-relevant issues to be collected, shared, and discovered. The exemplar in Singapore also provides an institutional hub to develop public outreach to the academic world and the business community, and helps to forge more intense international contacts.

The focus on national security suggests that this program be established within the Federal Department of Defence, Civil Protection and Sport (DDPS), where a variety of possible institutional options are conceivable: On the one hand, it might be integrated into the Directorate for Security Policy; on the other hand, it could be linked to the Risks Switzerland project within the FOCP. This project requires considerable financial resources: To begin with, it would require a team of professionals experienced in both security policy and horizon scanning, consisting of a project director, one or two scientific collaborators, and some administrative support (an approximate total workload of 300 to 400 per cent); the development of a web-based service oriented architecture and the involvement of external subject-matter and technology; and the project needs communication efforts to overcome concerns by government bodies outside the security policy community.

### 4.4 Linkages to ongoing projects and key questions

The outlined models present a range of options of how to integrate horizon scanning in the Swiss federal administration. While each model stands for a particular integrated approach, it also allows specific features of one model to be combined with features of another model. For example, if horizon scanning should be limited to issues related to national security and should first be tested in the form of a project that is limited in time, features of model 1 and model 3 could be combined; or, the service-oriented architecture as proposed in model 3 may also serve to connect government agencies beyond the domain of national security and could be useful in establishing a horizon scanning center as suggested by model 2. The models and their different features thus constitute a range of resources that may be assembled in many ways to be adapted to the federal administration's particular needs. It is the task of the federal authorities to further discuss what might be most useful to them and to develop – possibly with the support of external consultants – a model that is best suited to their needs and interests.

| | Horizon Scanning System for Swiss National Security |
|---|---|
| **Role model** | Singapore Risk Assessment and Horizon Scanning Programme |
| **Mission and purpose** | To detect and assess issues that are particularly relevant to Swiss national security and to link for this purpose all federal offices (later including external stakeholders ) that deal with security-relevant issues |
| **Covered policy areas** | Security policy or any issues that are (in a broader or narrower sense) relevant to security policy |
| **Products and networks** | • Creation of a platform to collect and share knowledge across government (and later with external stakeholders)<br>• Extensive outreach to the academic world, the business sector as well as forging extensive international contacts |
| **Institutional framework** | • Department of Defence, Civil Protection and Sport: a) in the Directorate for Security Policy or b) in the FOCP<br>• Linkage to the "Comprehensive Risk Analysis Switzerland"-project |
| **Estimated resources** | • In-house team with a workload of approximately 300 to 400 per cent<br>• For the start-up phase: external team possible<br>• Financial resources for developing an open service architecture and for involving external subject-matter and technology experts |

*Table 3: Model 3 – Horizon Scanning System for Swiss National Security*

To start from scratch is always difficult. Fortunately, however, some institutional arrangements for linking up with already existing or envisaged projects within the federal administration already exist:

- *First*, the *Forward Planning Staff* of the federal administration is due to prepare another report in view of the next legislative period 2011–15. As a permanent and already well-established process, the Forward Planning Staff may provide a good starting point to bring in a more strategically and future-oriented perspective into the federal administration. Attached to the Federal Chancellery, it is well-positioned to provide a perspective that cuts across policy areas and government departments and could be the right place to create a horizon scanning project that tests the value of the proposed project for the Swiss government and its acceptance among senior decision-makers.
- *Second*, if the focus of horizon scanning should be centered on issues related to national security, the *Risks Switzerland project* may be the right place to attach it. This project has recourse to an established network of individuals and government bodies that have already been involved in past activities. However, some efforts are needed to anchor it more broadly within the federal administration. Furthermore, the attachment to a particular government agency, the FOCP, requires a clear political mandate to ensure that it has the necessary legitimacy to reach out not only to the security policy community within and beyond the DDPS, but to establish a "whole of government" approach in detecting and assessing risks and threats.[91]
- *Third*, the eclectic use of an extensive range of information sources make horizon scanning an excellent starting point for professionalizing *government-wide information and knowledge management*. For example, in the domain of open source intelligence (OSINT), an interdepartmental working group is currently exploring possible synergies between government agencies, and an OSINT working group has been established within DDPS.[92] While a national OSINT strategy to coordinate these activities at the political level is still lacking, OSINT – and knowledge management more generally – may provide another linkage point to promote horizon scanning throughout government.
- *Fourth*, the combination of a technology-oriented focus and issues related to national security – as it is expressed, for example, in the Singapore RAHS Experimentation Centre – offers an excellent link to a *strategic technology monitoring* as conducted by armasuisse, which is the federal competence center for the procurement of technologically complex systems and materials in the defense sector.[93] However, such technology monitoring need not be restricted to the defense sector; it might be extended to other policy areas as well. At the same time, this example once again underlines the different potential shapes of horizon scanning activities and the variety of objectives they may serve.

These existing projects offer a valuable fundament on which the idea and maybe even the concrete composition of a Swiss horizon scanning program could be built. However, in view of the key messages of the country reviews as reported in chapter 3.4, a set of questions relating to the topical and procedural framework must first be answered:

- How broad should the policy focus be? Should it cover the whole public policy agenda, or should it have a narrower focus on, for instance, issues related to national security?
- How can the individual departments and federal offices be connected in order to facilitate inter-agency collaboration? What technological means should be developed, what roles should the coordinating bodies have, and how can mutual trust between different agencies and policy-makers be strengthened?
- How can the federal administration ensure an effective outreach to different stakeholders and professional communities in order to establish working relationships? What role should the business sector play, how can the program capitalize on expert input from think-tanks and academia, and how should international cooperation be established and strengthened?
- What measures are required to ensure the necessary analytical rigor and academic seriousness to guarantee that horizon scanning may lead to evidence-based policy recommendations that are adapted to the Swiss context?
- What are the best options to convince decision-makers in government, parliament, and other communities of the potential benefits of horizon

91 See also the recommendations in Center for Security Studies (2008).

92 Pallaris (2008).

93 For more information on armasuisse's Science and Technology program, see the following web page: http://www.ar.admin.ch/internet/armasuisse/en/home/themen/wissenschaft.html.

scanning for Swiss society and for more long-term, focused, and sustainable policymaking? What specific incentives should Swiss leaders be offered to secure their support, participation, and willingness to feed the results into the policy process?

The design and establishment of a Swiss horizon scanning capacity is an ambitious endeavor that requires critical reflections and careful planning. It demands political support, the willingness to listen to unconventional ideas, to learn and to change old habits, and – not least – the willingness to provide sustained financial resources over a certain period of time. In view of these requirements, it might be a good idea to start with a limited project to test the benefits and the acceptance of such an innovative approach to strategic policymaking, before further steps in the form of a more solid institutional anchoring in the Swiss political and administrative context are envisaged.

# 5 Summary and Next Steps

Horizon scanning and foresight have two main functions: providing information to policy-makers about emerging trends and developments, and facilitating policy development. Both functions could be identified in the country reviews of the UK, Singapore, and the Netherlands. They showed that concrete products in the form of strategic scans provide information and ideas for subsequent political action. They are crucial for success because concrete outcomes and benefits help to legitimize the financial expenditures towards the broader public, parliament, and government in general.

A more in-depth analysis, however, must conclude that the most significant benefits of horizon scanning lie in the second function of foresight: the learning processes that it initiates and the networks and knowledge flows that it creates between individuals and organizations from different policy areas within and beyond professional communities. The intensified interactions among experts from different fields in government, business, academia, and civil society stimulate the emergence of shared understandings of interests and values and facilitate the development of innovative policies. The processes of designing futures projects (UK), cooperating on a government-wide information network (Singapore), or conducting a broad strategic scan on the country level (Netherlands) are examples of how new networks among subject-matter experts and foresight professionals may emerge.

A future Swiss horizon scanning capacity must keep three success factors in mind:[94] the development of topical, methodical, and process expertise; the promotion of creativity and "out of the box" thinking to generate ideas and visions about emerging issues; and the establishment of intense interactions among stakeholders and senior policy-makers to win their commitment and support. The following recommendations are aimed at stimulating the discussion about the required next steps:

- *Recommendation 1 – Conducting a stakeholders' needs assessment:* Before horizon scanning and foresight activities and projects are envisaged, the needs and concerns of all involved and relevant stakeholders within and outside the federal administration must be clarified. If the idea and purpose of horizon scanning cannot be conveyed in a clear message and if there is no interest among the parties concerned, it would be futile to initiate such projects. It is advised, therefore, to prepare an inventory of key stakeholders – primarily within the federal administration – in order to assess their needs and interests critically. Based on such an assessment, it will be possible to respond to key questions such as: What should the policy focus of horizon scanning be? What incentives are needed to integrate all relevant stakeholders? What is the best way to connect different government bodies and agencies?
- *Recommendation 2 – Identifying experts and building of expert communities:* Topical, methodical, and process expertise is a key requirement for successful horizon scanning. While the topical expertise of the federal administration is excellent across policy areas, the methodical expertise of tools and instruments to organize and conduct horizon scanning exercises, as well as the process expertise of how to effectively link the results to a strategic policy process, are much less developed. In order to guarantee that comprehensive expert knowledge is readily available and can easily be accessed, the assembly of specialized expert communities is recommended. This task first requires identifying the significant experts within and outside the administration – including universities, think-tanks, civil society organizations, or companies – in order to prepare an inventory of experts. Second, the construction of an expert community should be facilitated by platforms – conferences, workshops, or virtual spaces – where experts can meet to exchange ideas and to share experiences and practices.
- *Recommendation 3 – Actively communicating and winning stakeholder support:* Horizon scanning is not only an analytical task of collecting information, but is supposed to stimulate the sharing of evidence, perspectives, and visions among a multitude of stakeholders. These tasks demand active, open, and continuous communication. Furthermore, empirical studies on foresight in companies have shown that the critical factor usually lies neither in the topical nor in the methodical domain, but in the appropriate procedural embedding and organizational implementation.[95] To win the support not only of senior policy-makers, but of all concerned stakeholders, requires that they be informed about the benefits of horizon scanning and its impact on policymaking. If ho-

94 Van der Meulen (1999), pp. 18f.; CEST (2007a), pp. 5f.; Müller (2008), pp. 21f.

95 Müller (2008), p. 2.

rizon scanning is perceived as being useful, it will enjoy (political) backing in parliament, government, the administration, and the general public. This will also allow the outcomes of horizon scanning exercises to be integrated into the policy process. It is therefore advised to start promoting the idea of horizon scanning and to disseminate these insights in the form of reports, presentations, and personal discussions.

This report has highlighted the multifaceted nature of horizon scanning and the broad variety of potential objectives it serves. The reviewed country experiences also showed that it is a flexible concept that can and should be adapted to an organization's particular needs and to the political and cultural characteristics of a country. It is likely that the Swiss government would also benefit from a more future-oriented approach to policy-making. This report has offered an overview of activities in other countries, presented some models on how they could be imitated in Switzerland, and provided recommendations on what might be needed in order to approach the next steps.

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The **Center for Security Studies (CSS) at ETH Zurich** specializes in research, teaching, and information services in the fields of international relations and security policy. The CSS also acts as a consultant to various political bodies and the general public. The Center is engaged in research projects with a number of Swiss and international partners, focusing on new risks, European and transatlantic security, strategy and doctrine, state failure and state building, and Swiss foreign and security policy.

Confronted with an increasingly interconnected and dynamically changing world, governments are developing new ways of thinking ahead and planning strategically to cope better with future threats and opportunities. This report on **Horizon Scanning in Government** presents an innovative approach to support governments in dealing with uncertainties and in envisaging and realizing the policies they desire. It outlines the concept and purpose of horizon scanning, reviews the experiences of the United Kingdom, Singapore, and the Netherlands, and develops perspectives for the establishment of horizon scanning in Switzerland.