vorher nicht bekannte Tatsachen korrigiert, sie ist den Erwartungen der Bevölkerung angepasst. Jene wiederum, durch Einsicht in wissenschaftliche sowohl als politische Zusammenhänge, konkretisieren sich von bloßen Wünschbarkeiten zu vertretbaren Forderungen“ (S. 51).

Ein Klassiker bemisst sich auch daran, dass die in ihm formulierten Gedanken, auch nach Jahren und Jahrzehnten Bestand haben. Krauchs „Forschungsprioritäten“ kann man durchaus als „blueprint“ für die heutige, so genannte dritte Foresight-Generation ansehen. Dieses Buch, auch nach über 30 Jahren wieder zu lesen, ist auf jeden Fall lohnend.

Anmerkung

1) Der Band enthält noch die folgenden weiteren Beiträge: Einige Probleme der Anwendung der Entscheidungstheorie auf die Planung von Forschung und technischer Entwicklung (Krauch und H. Feger); Simulation gesellschaftlicher Realität (J. D. Saltzmann); Ernährung im Jahre 2000 (Krauch), die hier nicht behandelt werden.

Literatur

Krauch, H., 1970: Die organisierte Forschung. Neuwied, Berlin: Luchterhand (Sammlung Luchterhand 2)

Krauch, H., 1970: Prioritäten für die Forschungspolitik. München: Hanser (Umweltforschung 3).

Krauch, H., 1971: Priorities for research and technological development. In: Research Policy 1(1971/1972)1, S. 28-39

Krauch, H.; Kunz, W.; Rittel, H.; u. a., 1966: Forschungsplanung: Eine Studie über Ziele und Strukturen amerikanischer Forschungsinstitute. München, Wien: Oldenbourg

Speer, J., 1971: Vorwort. In: Deutsche Forschungsgemeinschaft (Hrsg.): Kolloquium über Forschungsplanung. Wiesbaden: Steiner, S. 7-9

Kontakt

Dipl.-Soz. Ulrich Riehm
Forschungszentrum Karlsruhe GmbH
Institut für Technikfolgenabschätzung und Systemanalyse (ITAS)
Postfach 3640, 76021 Karlsruhe
Tel.: +49 (0) 72 47 / 82 - 39 68
Fax: +49 (0) 72 47 / 82 - 48 06
E-Mail: riehm@itas.fzk.de
Internet: http://www.itas.fzk.de

«

Two and a Half Cycles of Foresight in the UK[1]

by Ian Miles and Mike Keenan, University of Manchester, UK

The UK national Foresight programme is managed by the Office of Science and Technology (OST). Initially announced in 1993, it is now in its third cycle. Over the last decade it has produced more than one hundred reports, involved tens of thousands of people, and had substantial impacts at home and abroad. But it has also undergone significant changes: however foresightful its planners were, they would not have anticipated many of these developments. The main achievements and problems of the process are outlined here.

1 From Futures to Fully-Fledged Foresight

There is a long history in the UK of efforts to improve decision-making and public debate by examining longer-term trends, and the long-term implications of short-term decisions. This tradition is apparent in political economy, philosophy, economics and speculative fiction (indeed, H.G. Wells wrote about the need for professors of foresight in one of his essays. But – possibly reflecting the crisis of confidence following the Second World War – the UK tended to stand back from the global phenomenon that was “futures studies” in the 1960s. Perhaps the only academic centre to consider long-term technological trends and to pay attention to futures studies was the Science Policy Research Unit (SPRU) at the University of Sussex. SPRU had a worldwide impact in the early 1970s with its critique of the Limits to Growth world model (Cole et al. 1973), and went on to produce major contributions to the debate about the future of world development (Freeman, Jahoda 1978). In the next decade, SPRU researchers (John Irvine and Ben Martin) (Irvine, Martin 1984) conducted reviews of Technology Foresight activities around the world. These were influential in the shaping of the UK Technology Foresight programme, as well as activities in other countries.

SPRU had also played a major role in establishing the view that the UK’s economic

problems were not so much a matter of entrenched trade unions and worker militancy, but more related to weaknesses of the innovation system, including poor linkages between scientific research and industry. After some false starts, a working group was set up in the early '90s across government departments, to identify methodologies that could identify and prioritise *emerging technologies* of importance to the UK.

Four teams (including ones at PREST and SPRU) were commissioned by the UK Government's recently established Office of Science and Technology (OST) and Department of Trade and Industry (DTI) to develop such methodologies together. The scoping study (PA Consulting et al. 1992) proposed an appropriate methodology sounding much like the eventual first cycle of Foresight, combining the use of expert panels, a Delphi, and a prioritisation process to identify emerging generic technologies. Ben Martin of SPRU reviewed existing research foresight practices again, developing recommendations for a national UK Technology Foresight exercise. The 1993 White Paper on Science and Technology Policy, "Realising Our Potential", officially announced such a UK Technology Foresight Programme.

This announcement made it clear that Foresight was to set priorities and inform the research policies of government and government-funded bodies. It was to provide information for, and draw on inputs from, a wider community whose decisions influenced R&D and investment in emerging technologies. Practitioners and researchers in industry needed to be consulted, because it was recognised that much of their critical knowledge was not possessed by civil servants, nor even by leading academic scientists. Knowledge was to be shared, and Foresight should help improve the UK innovation system by fostering "a new working partnership between scientists and industrialists best placed to assess emerging market opportunities and technological trends".

Foresight, as it emerged in the mid-90s, shared with earlier "futures studies" efforts to provide broad-brush, but systematic, analysis of a wide range of trends and possibilities. But Foresight programmes tended to associate such long-term prospective analysis closely to specific decision-making agendas, with the engagement of influential actors in these agendas. Foresight programmes also tended to draw on wider social networks as sources of knowledge, of ideas for visions, and as agents for diffusing visions and implementing the actions to be based on them. "Fully-Fledged Foresight" combines these elements of long-term and holistic analysis, tied to decision-making, and engaging wide participation. The term "Foresight" has come to be appropriated to cover all sorts of narrower activities, with much simple technology forecasting being rebranded as Foresight. "Fully-Fledged Foresight" involves networking of key agents of change and sources of knowledge, around the development of *strategic visions* based on *anticipatory intelligence*. Improved networks among the agents concerned should allow for enhanced awareness of their knowledge resources and strategic orientations. Typically the process yields formal outputs that can help policy-making – for example, scenarios, action plans, priority lists – and helps establish a shared sense of commitment to these.

2 UK Foresight – the First Cycle

The UK Foresight programme is currently described by its sponsors as having evolved through three cycles.[2] The first cycle of the UK programme involved a number of overlapping stages of work (Georghiou 1996). Following the 1993 White Paper, a Steering Group, chaired by the Government's Chief Scientific Advisor, was established to oversee the running of the Programme. Methodological principles for the programme were established. Consultation seminars were held round the UK; a conomination analysis was undertaken (around 800 people were involved). Eventually, fifteen "sector panels" were established, with experts and stakeholders from business, government and academia appointed as panel members. These Panels were central to the Foresight exercise – to a greater extent than in most other national exercises. They were charged with identifying key trends and drivers (with the help of a questionnaire survey and consultations), benchmarking their sectors, developing scenarios, consulting widely with their communities through a Delphi and workshops, and constructing priorities and recommendations for action. They remained important in the dissemination and implementation stages of the cycle,

which would have been far less effective without the proactive stand taken by many Panels.

Each Panel was provided with a facilitator (trained in the aims and methods of Foresight) and a member of the civil services as a technical secretary (each of whom was shared between two Panels). Some panels set up sub-groups. There was limited coordination across Panels – it was left for the Steering Group to integrate the material they produced – and very limited resources by way of a general common framework of statistical indicators. Panels had modest funds for consultancy or such uses as Delphi analysis, journalistic reworking of their reports, etc. Though following a common methodological framework, the Panels had considerable freedom to interpret its details. They were under very heavy pressure of time – so that in practice some activities (like construction of scenarios) were neglected. Other things, like the two surveys, were much more standardised.

Preparation of questions for a Delphi survey was a major task, and one that proved quite contentious. The survey was instituted in 1994. It was intended to allow Panels to engage a broad base of expertise – questionnaires were sent to almost 10,000 people, and almost 3,000 responses were received. Each Panel had prepared its own survey within a common framework, and this process was very time-consuming – though valuable for focusing the activity of these groups. The heavy time pressures on the exercise meant that the quantitative results of the surveys were only fed back to Panels at a very late stage, when they had practically completed their reports towards the end of the year. Many Panellists were inclined to feel that the Delphi had been a waste of effort – though the Steering Committee was able to draw on it heavily (not least for purposes of comparison across Panels), and the eventual report of its results was very heavily used. It is also apparent that the task of preparing questions provided an important structure and focus for some of the Panels,

Between 1994 and 1999, over 600 Foresight events were held and 130,000 copies of the Foresight panel recommendations distributed. The Panels played an important role as the 'hubs' of dissemination and implementation of Foresight. They continued to meet regularly into 1999, in order to coordinate and/or catalyse follow-up actions on their priorities. Some Panels developed explicit implementation strategies of their own, with various Panel members taking roles in ensuring that relevant government departments were responsive to their messages.

Immediately after the panel reports were published in 1995, £ 30 million of Government funding went into the Foresight Challenge Awards, supporting twenty-four research consortia. In 1997, the initiative was re-labelled as the Foresight LINK Awards, which have since led to projects worth a total of £152 million. With several other initiatives, it is thought that several hundred million pounds of research funds were 'aligned' with Foresight priorities and recommendations – how far these were completely new efforts, how far activities were reshaped, and how far existing activities were relabelled, is a matter of opinion – there has never been a thorough evaluation of the first cycle – but the view that large effects were achieved is widespread among informed observers. Other public bodies including Research Councils and government departments prepared their responses to the exercise – and one research council (NERC) had already launched its own "miniForesight". Other organisations have gone on to conduct their own studies since 1995. Private Industry's responses are harder to assess fully, but considerable interest was displayed in the results, with bids being made to Foresight Challenge, and some firms and industry associations launching their own smaller scale Foresight exercises.

The first cycle of Foresight was launched in the last years of a long period of Conservative government, but the Programme won all-party support. In a late phase of this government's life, the OST moved from the Prime Minister's own Cabinet Office, to be based in the Department of Trade and Industry (DTI). In some ways this made sense, though the decisions reflected political ambitions and infighting more than long-term strategy. The OST and Foresight have important bearing on innovation processes and other DTI responsibilities.

3 The Second Cycle

A consultation process took into account discussions and surveys of participants in the first cycle of Foresight, a review by the Parliamentary Office of Science and Technology, and

other inputs. The existing programme was seen as a rare success that should be built upon. A new cycle was to update and refine the "findings" of the first cycle – and, arguably, be more visionary and better integrated. The perception was that the high time pressures of the first round restricted the outputs in these ways – that better statistical and other information support could have been provided, that scenarios could have been systematically developed, that more challenging and "out of the box" thinking could have been encouraged.

Two major changes reflected the change in government, and the lessons learned from the first cycle. *First*, there was to be no Delphi – opposition to the method was strong from some of the Panellists who had found the work involved to result in few outputs that they could use effectively. A new integrating device, a sophisticated website called the *Knowledge Pool*, was to serve as the main information gateway for national Foresight. It was to provide general Programme information, access to scenarios and views about the future, and management information and working notes for Foresight panels. While an excellent resource for those familiar with Foresight – this proved daunting and difficult to use for newcomers. Panels were still to be at the heart of the Programme, and were to be encouraged to "think globally", identifying the challenges and opportunities that the UK was likely to face over the coming 10-20 years and beyond. But there was to be more interaction both across Panels, and more widely. The networking function grew in importance, while the priority-setting elements of Foresight were diminished.

Second, the second cycle sought to move beyond the technology focus of the first cycle to examine the opportunities that arose from the interaction of innovations in science and technology with wider social and market trends. It was decided to raise the profile of "quality of life" issues; the second cycle should include a wider variety of participants – more representatives of Small and Medium Sized Enterprises (SME), voluntary and public sector workers, etc. This made it a much wider Foresight exercise – but fitted uneasily with the core concerns of the OST.

Following consultation, new Foresight Panels were established and the second cycle of Foresight began in April 1999. The intention was that the Panels should publish their consolidated reports in November 2000. After this the Panels were to pursue more detailed work and to stimulate action on their recommendations, while a third cycle of Foresight was planned. This agenda was roughly followed, though events did not unfold exactly as planned.

Three thematic and ten sector panels were established. Some of the new panels were application-oriented – for example, in the place of the science-driven Health and Life Sciences Panel, the new cycle offered a Healthcare Panel. The introduction of thematic panels reflects the difficulties of effectively organising cross-panel activities in the first cycle. They addressed broad issues with cross-cutting implications for science and technology – "Ageing Population", "Crime Prevention" (funded by the Home Office, which is responsible for policing) and "Manufacturing in 2020". All panels were also asked to consider the implications of their findings for another set of thematic issues – education, skills and training and sustainable development – topics seen as so generic that they required embedding within each panel.

There was no common framework for data production and reporting, and for consultation with a wider community. Each Panel was to develop its own consultation arrangements, setting these out in an Action Plan in summer 1999. Most opted for the preparation and circulation of consultation documents (both paper-based reports and material in the Knowledge Pool). Panels were encouraged to host regional workshops and seminars. Alongside the Panels were to be *Task Forces* that would examine specific issues or address specific problems. These would be typically short-lived, and could enlist a broader constituency of stakeholders into the Programme, and promote the Foresight agenda during later implementation phases. As many as 65 Task Forces were documented, but it is unclear how many were really effective. Associate Programmes were also introduced. These were undertaken by other organisations (mainly professional institutions and research and technology organisations) to support the central programme,

but without Government funding, by looking at specific topics from particular viewpoints.

Over five hundred people were involved in this round of the programme as members of panels and/or task forces. Around 160 seminars and workshops (excluding internal Panel and Task Force meetings) and around 52 Regional Seminars were reportedly held during the second cycle. 103 papers and reports were published, including the final Panel reports in December 2000. These were intended to be followed by a synthesis report from the Foresight Steering Group, after which the emphasis of Panels, and the Programme as a whole, was to be on implementation of recommendations.

Most second cycle panels and task forces have completed their work. A few remain active under new ownership, and there is also evidence that some Associate Programmes have successor activities. Among the achievements of the second cycle is the involvement of SMEs. While SMEs showed little interest in the first cycle of Foresight, this situation could be improved. The support materials developed for SMEs were extended in the second cycle, with a *Foresight Toolkit for use with SMEs* and, in 2001, five Foresight Training Centres were appointed to train facilitators and to monitor quality in delivery. At the regional level of dissemination, *Regional Foresight Coordinators* were initially set up to enable Foresight Panel recommendations to be integrated into regional innovation, economic and cluster strategies and five of these are still continuing their work. The *Young Foresight* initiative, a partnership between the Department for Education and Science and OST Foresight, is another promising outcome of the second cycle.

OST Foresight was not the only sustained action in the area. Under the Labour government, the Cabinet Office developed its own focus on long-term issues. Its Performance and Innovation Unit (PIU) was renamed the *Strategy Unit*. Reviews of Foresight and futures practice were undertaken, and the Unit became responsible for encouraging long-term perspectives across the UK public sector.

The national Foresight programme was coming under criticism, however, as being too diffuse and overambitious. Senior figures in UK science policy concluded, after reviewing Panel reports, that something was going wrong in Foresight. Some of the reports were openly criticised by the Science Minister. A review was established, leading to a decision to abandon the second cycle. The wider agenda of Foresight meant that "ownership" by the OST was lost – topics of limited concern to science policy were addressed, and there was a lack of clear linkages to policy timetables and levers. Without a common methodology and integrative mechanisms there was no "big bang" of priority recommendations, and quality control became harder to ensure. The Knowledge Pool failed to achieve its purposes. Ahead of its time, it was oversophisticated for many of the people it was intended to attract, and some of the facilities planned for it could never be realised (mainly due to social issues, e.g. Intellectual Property Rights and other problems associated with allowing Foresight participants to post documents on a government-sponsored site). Associate Programmes needed other sorts of support, and were less successful than hoped.

4 The Third Cycle

A much scaled-down third cycle was launched in 2002, after the review of the second cycle. The aim of Foresight was delimited "to increase UK exploitation of science".[3] The aim is that at any time there will be three or four projects underway, at different stages of development. They are to balance demand-pull and science-push issues: the starting point for a project can be a key issue where science holds the promise of solutions; or an area of cutting edge science where the potential applications and technologies have yet to be considered and/or articulated more broadly. The first two projects, launched in 2002, are flood and coastal defence and cognitive systems; two more were launched in spring 2003.

The projects are defined through consultation with "the science base, government departments, research councils, devolved administrations and others"; the 2003 round reportedly involved "the largest ever scientific horizon scanning exercise in the UK" with 12 ideas generated during an intensive workshop with senior scientists, and used in Web consultation and in meetings with scientific institutes and Science Fiction authors. Consultations continue, with a further tranche of shortlisted projects already being considered. The two new projects involve,

again, one focusing more on looking for solutions to a problem, and one looking for uses of emerging scientific knowledge.

Each project has a dedicated project team in the Foresight Directorate who are assisted by scientific experts. These OST teams can draw on inputs and insights from a network of external experts. The projects are expected to evolve in different ways, reflecting the different types of problems they deal with. Thus there is not a common organisational model. Each project should examine relevant developments in science and technology in the UK and the world, and deliver analysis and recommendations for action by research funding agencies, business, Government and others. The projects do not span more than a small range of topics, of course, and thus they cannot offer overall priority-setting. Their focus on identifying actions in specific areas is to be complemented by the creation of networks of relevant actors – again the details will vary by project type.

Project 1: Cognitive Systems

Cognitive systems are defined as both biological and artificial systems that "respond to their environment, learn, reason, and make their own decisions". As this implies, there are strands of research coming from life sciences (neurology, cognitive studies, etc.) and from IT and physical sciences (learning systems, speech recognition, etc.). Experts have prepared state of the art summaries on the future prospects for various themes here.

The project aims "to provide a vision of future developments of cognitive systems through an exploration of recent advances in life sciences, physical science and related fields and their potential for interaction". Specifically, its objectives are to:

- Examine recent progress in these two major areas of research, encourage those active in these fields and their applications to network together and develop a common language.
- Scope likely developments in these fields over the next 10-20 years (in particular progress in capabilities to build artificial cognitive systems), and prepare forward looking documents.
- Articulate significant conclusions to a wider audience.
- "Help create the political, regulatory and business environment that will best position the UK to take advantage of developments in this area".

The Director General of the Research Councils (DGRC) is responsible for this project, with two senior professors supplying access to the scientific communities and a science writer helping to prepare documentation. The Minister for Science runs an advisory stakeholder group. Various workshops are currently underway, with a major conference planned for September 2003 before the final report is published.

Project 2: Flood and Coastal Defence

It is estimated that some 1.7 million homes in England and Wales are potentially at risk of flooding, and over £200 billion of assets are at risk from flooding and coastal erosion. This project aims to produce "a long term vision for the future of flood and coastal defence to inform policy … how big the future problem of flooding might be; assess if existing policies can cope; and consider new and radical responses to meet the future challenge". It is chaired by the government's Chief Scientific Advisor. The project began by drawing together leading scientists to advise on the factors that may impact on future levels of flooding (e.g. changes in land use, demographic shifts, climate change, science and technology…), which will need to be combined to produce a set of flooding scenarios for the UK up to 100 years into the future. An analytical framework has been developed and key policy stakeholders brought on board. (Reflecting the nature of the problem, the project works with a very large number of stakeholders in industry, regional and central government, NGOs, and so on.). The coming phases of work will involve further analysis of the key factors that impact on flood risk; identification of the implications of the scenarios and consider the responses to flood risk; communication of results in a final report and other forms, and mobilising stakeholders to implement recommendations.

Two more projects were launched in spring 2003. The projects are defined through a process of consultation with "the science base, govern

ment departments, research councils, devolved administrations and others".

Project 3: Cyber Trust and Crime Prevention

This aims to explore the application and implications of next generation IT in areas such as identity and authenticity, surveillance, system robustness, security and information assurance and the basis for effective interaction and trust between people and machines. As well as producing reviews of the state-of-the-art in relevant areas of science, and providing futures studies (visions of alternative futures, analyses of drivers, opportunities, threats, barriers, models for decision-making), the project aims to establish networks of scientists, business people and policy makers who can influence the future in the light of key challenges and potentials identified in these studies.

Project 4: Exploiting the Electromagnetic Spectrum

Focussed cross-disciplinary efforts are expected to lead to new applications of the spectrum well beyond those we are now familiar with. The aim here is to provoke new thinking and insights and locate key fields for progress. This means providing a vision for the future exploitation of the electromagnetic spectrum. Again, state of the art reviews, visions for the future; and steps to that future are to be produced, for the key areas.

The website is now visually a more modest affair than that of the second cycle. Much of the material available before still remains on site, and can be located fairly readily – earlier Panel reports, etc. Meeting notes and similar material are now removed, however – and the scenarios that are available are actually ones developed with a specific environmental agenda in mind. While we know that they have proved very useful in environment-related activities, it is less obvious that they should be appropriate to many other situations where scenario analysis is required.

The OST Foresight Programme, in its third cycle, continues to be an important and illuminating exercise. It continues to provide the wider community with a useful body of documents and experience on Foresight in various fields. But it is less ambitious than Fully-Fledged Foresight, as outlined earlier. It has reduced the networking elements of the earlier exercises to a considerable extent, and is focusing on specific areas of technological opportunity rather than seeking to establish priorities across the board.

5 Wider Foresight in the UK

Despite the problems of the second cycle of Foresight, and some reaction against the term "Foresight" in some quarters (while in others – e.g. environmental policy and the regions – it is growing in influence), Foresight practice is actually continuing to diffuse and develop in the UK.

In part this is because the three cycles of the UK Foresight Programme have generated much wider awareness of the aims, methods, and utility of various forms of strategic analysis and action. Whereas "futures studies" was always a very marginal activity, Foresight of one form or another seems to be well embedded in much of the UK system. There are academics, as well as consultants, who are applying the lessons of Foresight to companies and government organisations. Various parts of the UK government system are promoting long-term thinking too. As noted, the Strategy Unit of the Cabinet Office has prepared and published studies of best practice in the field and promotes this sort of strategic analysis widely across the political system. All government departments have been asked to adopt long-term strategic perspectives. More generally in government, there has been a (highly uneven) institutionalisation of the notions of "evidence-based policy", and of more deliberative and participatory modes of governance, and much emphasis on strategic partnerships between public, private and voluntary agents. These developments reinforce and are reinforced by Foresight approaches.

Finally, the first cycle of Foresight was very influential around the world, and helped to build European Union interest in Foresight. And now the EU's Foresight orientation has led to projects on regional Foresight and IT-related Foresight, for example, being extended into the UK (in some cases helping to network UK actors who were previously isolated).

The result is that elements of Foresight practice are now used commonly by Government ministries and agencies, Regional Devel

opment Agencies, learned societies, and industry associations. Some of this is very remotely connected to Technology Foresight, but several lines of work are highly technology-focused. For instance, the Department of the Environment, Food and Rural Affairs (DEFRA) has been involved in Foresight-related activities at least since the first cycle of OST foresight. As the Panel work in Foresight grappled with a perceived resistance to change of the sector, so the Department took a lead role in initiating *CRISP*, a forum for innovation and long term-related work in the industry. This is one of the enduring activities from the first cycle.

Another initiative is a direct response by DEFRA to external drivers such as the OST's Scientific Advice and Policy Making Guidelines (2000), and to a Strategy Unit report on risk and uncertainty. It is designed to support the Chief Scientific Advisor's role in Science in DEFRA. It also reflects the deep unease generated by the BSE crisis and subsequent inquiry into the policy failures here, that demonstrated how easily government can be caught off guard by emerging developments, and be unable to rapidly mobilise and adequately use relevant expertise. "Horizon scanning" is intended to improve DEFRA's capacity to assess the importance of a wide variety of developments and trends to its science and policy – to enhance anticipatory capabilities, and guide the Department in shaping "the day after tomorrow". The activity goes beyond trend-watching, and uses internal and external resources to undertake new research, the establishment of systems for evidence-based policy, SWOT-type analyses at DEFRA, aims to identify both risks and opportunities. This may be called "horizon scanning", but the stated aims are close to those of Foresight.

Other initiatives are also undertaken by, for example, the *Environment Agency*, which is the body with responsibilities for pollution control, water quality, flood defence, etc. This is of course associated with the relevant Panel of the third cycle of Foresight, but key staff were also active in the first and second cycles, having a considerable impact on the main line of scenario development undertaken then. The scenarios developed by a SPRU team have been used constructively by the Agency in its dealings with the now-privatised Water Companies, allowing it to examine the robustness of their projections against different trends. The Agency's *Centre for Risk and Forecasting* is centrally concerned with (sometimes very) long-term analyses, e.g. modelling the impacts of prospective changes in agricultural practices on water quality. The Agency is currently examining how to take forward its production and use of scenarios, internally and in liaison with other parties.

In addition, in the last few years scenario workshops have been applied to informing science policy decisions in the UK. For instance, the ESRC (Economic and Social Research Council) commissioned the Centre for Research on Innovation and Competition (CRIC) and the Institute for Alternative Futures to run such a workshop in January 2002. This was to inform its decision-making process concerning priorities for social research on genomics, and the selection of a centre to conduct such research. The methods used were fairly familiar ones in the business futures field, supported by computer groupware that "captured" a good deal of material in real time.[4] The results influenced ESRC decision-making so that a new structure for the work on genomics was created, as well as the content of existing structures being elaborated. Several other workshops were linked to the DGRC (Director General of Research Councils), with CRIC, PREST and other groups working to inform decisions about public expenditure on biotechnology, information technology, and nanotechnology areas – and not least to justify expenditure to the Treasury. A "success scenario" methodology was developed that allowed for the workshops to elaborate a vision of a desirable and feasible aspirational scenario, and to identify targets, action points, and other elements to manage the movement toward such a scenario.[5] The scenario development typically examined 5-10 year scenarios (the genomics workshop was longer-term). But if the long-term focus is slightly less, the links to policy have been very strong. The output of the third workshop, with very little additional elaboration, formed the core of the DTI's policy document in the field "New Dimensions for Manufacturing: A UK Strategy for Nanotechnology" (Advisory Group on Nanotechnology 2002), and is believed to have informed policy statements before this. The methodology has

also been employed in other contexts, for example to examine the future of university-industry links in North West England.

6 Conclusions

Foresight is embedded in the UK as never before. It looks to be an enduring feature of the political and industrial, the scientific and cultural landscapes. We have outlined only a few examples of Technology-related Foresight-type activities above: the full range of activities constitutes a very rich and diverse environment. But it is an environment that is no longer dominated by the towering national OST Programme. Different activities of a "foresightful" nature are underway on a very wide basis, even if many do not employ the term "Foresight". And not everything labelled Foresight is Fully-Fledged Foresight.

We can expect considerable ferment as a result of all this activity. One result is liable to be much more "codification" of the methods and approaches of futures studies, turning the crafts here into something more reproducible and subject to quality control. The results of application of such methods are likely to become more widely available – which may lead to some interesting political debates as very different visions are contrasted. There is liable to be much development of various sorts of computer and communications systems which can support development, visualisation, and interactivity, and probably also consensus-building and prioritisation techniques. Foresight professions and specialisms, and possibly new institutions, are liable to arise. New challenges associated with, for example, security, hazards, social innovations, are liable to arise and be taken on board.

The lessons of UK Foresight continue to be relevant for other parties. The uneven development of the national programme has been shaped by the degree of linkage with policy sponsors, and the dangers of overly loose linkage is very apparent. It is important to retain "organisational memory", so that staff who have gained experience in Foresight are not moved on to other things too rapidly. And there can be real benefits from establishing mechanisms to carry the Foresight message around to different parts of the system. The experience showed that there can be a strong latent demand for Foresight-type activities, and considerable willingness to contribute to them. But there must be a feeling that efforts are not being wasted, that they feed into decision-making in one way or other; and it is important to carefully manage conflicts that may arise between, for example, different parts of government who may resent the intrusion of "outsiders" into their fields of responsibility.

Notes

1) This is an abridged and edited version of a paper by the authors prepared for NISTEP's Second International Conference on Technology Foresight, Tokyo, February 2003
2) More information on the UK Foresight exercise is available at "Facts on Foresight" – http://www.foresight.gov.uk
3) Quotations are reproduced from unpublished OST documentation that I was kindly allowed to examine in preparing this note.
4) Full reports of the workshop are provided on the CRIC (http://les1.man.ac.uk/cric) and IAF (http://www.altfutures.com) websites.
5) The ICT and biotechnology scenario reports are reported on the CRIC (http://les1.man.ac.uk/cric) and DTI (http://www.ost.gov.uk/policy/futures/ict/intro.htm websites.

Literature

Advisory Group On Nanotechnology, 2002: New Dimensions for Manufacturing: A UK Strategy for Nanotechnology London::DTI, http://www.dti.gov.uk/innovation/nanotechnologyreport.pdf

Cole, H.S.D.; Freeman, C.; Jahoda, M.; Pavitt, K.L.R., 1973: Thinking about the Future. London: Chatto & Windus; also published as Models of Doom New York: Universe Books

Freeman, C.; Jahoda, M. (eds.), 1978: World Futures: the Great Debate. London: Martin Robertson

Georghiou, L., 1996: The UK Technology Foresight Programme. Futures, Vol. 28 No. 4, pp. 359-377

Irvine J.; Martin, B., 1984: Foresight in Science. London: Frances Pinter

Contact

Professor Ian Miles
PREST
The University of Manchester
Manchester M13 9PL, United Kingdom
Tel.: +44 - 161 - 275 – 59 21
Fax: +44 - 161 - 273 - 11 23
Email: Ian.Miles@man.ac.uk
Internet: http://les1.man.ac.uk/cric/Ian_miles

http://les1.man.ac.uk/prest

»

Foresight Concepts in the European Commission

by Werner Wobbe, European Commission[1], DG Research, Brussels, Belgium

Foresight activities have been run by the Services of the European Commission in different programmes and locations for more than twenty years. The Research Directorate-General (DG) has always carried out the most prominent part. Now a specific unit is dealing with foresight issues and it will establish a "Foresight Knowledge-Sharing platform" that is to benefit the whole foresight community in its role either as producers of foresight knowledge or as users of that knowledge. In this way foresight contributes to new governance concepts suggested by the Commission. The European foresight activities are also geared to the European Research Area as well as to innovation.

1 Introduction

Foresight is understood in the European Commission as a tool for policy design and shaping. It has a strategic intelligence function for Community or European Union policies. Foresight contributes to orientations and priorities of EU policies. Usually, these contributions are introduced by research carried out by independent experts. Commission officials synthesise the results or reformulate recommendations that emerge from contract research.

Europe's specificity is its diversity and European level activities are mainly a blend of national policies, national cultures and traditions. European policies as well as European administrative behaviour have different national points of departure and origin and may be transformed or blended by other national ingredients. As often observed, the French administration initially had a strong influence on the Commission. The influential French tradition of prospectivists probably was a reason why foresight was accepted early in the Commission. Later, British consultants gained influence and as the UK Foresight Programme was launched in the mid-nineties it left its trace on the Commission activities. One of these traces was the