

# UK eyes social goals for next Foresight

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**Scientists met industry to discuss the technology of the future under the previous government — and it worked. The Labour government is launching a second phase, reflecting lessons learnt and its own social concerns.**

[LONDON] Britain's then Conservative government gave its backing five years ago to a broad national initiative designed to get scientists and industry thinking together about how science can help deliver the technologies, products and services of the future. It was known as Technology Foresight.

Despite the reservations of many academics at the prospect of outside interference in their research agendas, the Labour Party enthusiastically backed the idea when in opposition. Now, exactly one year into government, it has confirmed this commitment by launching a national consultation for Foresight's second phase.

The new exercise is due to start in October this year, and will last until November 2000. There are significant changes in both substance and presentation. In part, these reflect lessons learned over the past five years. But they also reflect the changed social priorities of the new government.

On substance, the widely criticized Delphi exercises of the first round, which asked respondents to fill out lengthy questionnaires predicting the technology priorities of the future, have been shelved. As for presentation, the word 'technology' has been erased; the programme will in future be known simply as 'Foresight'.

Perhaps most significant is the fact that the new Foresight exercise seeks to redress what some believe has been an imbalance between the attention previously given to its two goals — enhancing wealth creation and the quality of life respectively — by explicitly seeking to address social policy priorities.

Six themes are being provisionally suggested by the government: ageing, the future of cities, crime control, social cohesion, education and training, and sustainable development. The panels for each sector may be combined to help focus on the themes. For example, the Health and Life Sciences panels could become simply Healthcare. And the separate Energy, Natural Resources and Environment could become a single panel: Energy and Environment.

The composition of the steering committee has been radically altered, partly to reflect this shift; scientists and industrialists have been largely replaced by heads of trade bodies and social policy experts. The committee will, however, continue to be chaired by the

government's chief scientist, Sir Robert May.

By most accounts, Foresight has been a success. Sixteen panels of scientists and industrialists, covering almost the entire economy from food and drink to defence and aerospace, came up with 360 recommendations on how science might benefit each sector.

Individuals whose paths would probably have never crossed are now busy setting up collaborative ventures. Projects worth £100 million (US\$167 million) have been set up as a direct result of such interactions, with one-third of funding coming from government and the rest from industry.

"I attended all the meetings of the food-and-drink panel," says Derek Burke, then vice-chancellor of the University of East Anglia and a member of the first Foresight steering group. "Academics and people from

this industry had never talked before."

If Technology Foresight has encouraged industry to take science-based innovation more seriously, its impact on thinking in research laboratories has been even more significant. Britain's six research councils now direct virtually all their 'targeted' research funds towards Foresight priorities. Anecdotal evidence suggests that even unsolicited 'response mode' research proposals increasingly reflect Foresight themes (see box).

There has also been wide international interest. Technology forecasting is not a new phenomenon. Indeed, British Foresight was influenced by Japan, one of the world's most enthusiastic users of foresight methods. But the scale and profile of the British exercise has filtered through to many countries, particularly those with ties to Britain such as India, New Zealand and South Africa.

## Switch in emphasis

Because of its perceived success, many of the changes embodied in the new Foresight are largely in emphasis rather than methodology. For example, while scientists will continue to talk to industrialists, they will focus their collaborations more on enhancing the quality of life than merely increasing wealth creation.

But some lessons from the first exercise have been taken on board. For example, most panel members felt the Delphi exercise was

## The changing culture of British science

[LONDON] An underlying goal of Britain's Technology Foresight programme has been to change the culture of British science while protecting the basic research base.

Many believe that the programme has succeeded on both counts. Foresight has certainly altered the British scientific landscape. And the programme has also benefited science itself. Having learnt to talk to business, scientists have found an alternative source of income, useful at a time of ever-tightening government budgets.

Foresight priorities are now guiding many of the funding decisions of all six of Britain's research councils. Two in particular that have used Foresight to increase significantly their involvement with industry are the Engineering and Physical Sciences (EPSRC) and Biotechnology and Biological

Sciences Research Councils. Seventy per cent of EPSRC's research spending is now aligned with priorities identified by Foresight.

Others, such as the Natural Environment Research Council, have realigned many of their 'directed' research programmes to follow Foresight-style priorities. For example, the council recently launched a multidisciplinary Urban Regeneration and the Environment initiative to investigate how environmental and ecological research can be harnessed for urban regeneration.

The Particle Physics and Astronomy Research Council, despite a tightly defined research agenda, is also enthusiastic about the possibilities of widening the applications of particle physics and astronomy-related technologies.

Indeed, whatever their initial reservations, many

senior staff from the research councils now believe that the success of Foresight has played an important role in helping the Office of Science and Technology to protect their budgets against major cuts, and that it may also help to persuade the government to increase funding for science in its forthcoming Comprehensive Spending Review.

Each research council says that decisions on 'response mode' funding remain untouched by the Foresight culture. And many researchers remain wary of their research becoming targeted towards specific social goals.

But few deny that university scientists in Britain increasingly feel that high-quality grant applications tilted towards wealth creation and the quality of life have a better chance of being funded than those that are simply good science. **E.M.**

largely a waste of time. "It didn't tell us anything we already didn't know," says Oliver Sparrow of the Royal Institute of International Affairs in London, a member of the first Foresight steering group.

Other shortcomings of the Delphi approach have also become clear. For example, the materials panel failed to highlight nanotechnology as a focus for future research and investment.

More spectacularly, perhaps, the Information Technology panel failed to forecast what is perhaps the technological development of the decade: the Internet. The panel's report from 1995 recommends the need to exploit "the information superhighway initiative". But there is no mention of the World Wide Web and other ways in which the Internet has developed.

Another relative weakness of Technology Foresight has been its failure to reach the crucial one million-strong small to medium sized business sector, where the potential for innovation and growth tends to be higher than in larger companies.

"Foresight got to lots of big, blue-chip companies," says Paul Ormerod, programme director of the Centre for Exploitation of Science and Technology in London. "But smaller companies are usually too busy trying to stay alive to worry about the longer term." Ormerod has written a guide to foresight for small businesses, which will be launched by the government this summer.

There has also been criticism of the inability of panels to look beyond their own sector and contribute towards solving wider problems. Geoff Findlay, director of corporate affairs at the Particle Physics and Astronomy Research Council, is among those who believe that this is among Foresight's biggest failings. "It did not encourage lateral thinking," he says.

Under old Foresight, for example, ideas on a low-carbon-emitting car would have been restricted to the 'transport' panel. In contrast, in the new exercise, every relevant panel will be expected to contribute ideas to such goals. In addition to the obvious ones such as 'materials' and 'chemicals', it might include others such as 'defence and aerospace'.

Using scientific research to address social as well as economic issues ties in well with the political commitments of the Labour government. But the shift in emphasis also received overwhelming backing from respondents to a consultation on the effectiveness of the first exercise, according to the government's Office of Science and Technology (OST), which acts as the Foresight secretariat.

Many panel members, too, appear to be in favour of the idea — up to a point. "There was little point in sitting down all over again and talking about the technologies of the future," says Paul Leonard, head of research and innovation at the Chemical Industries Association, and a member of Foresight's



**New priority: how technology can help the aged is one goal of the second Foresight exercise.**

chemicals panel. "We'd done that, and needed to move on."

The benefits may extend beyond the practical. Linking Foresight to themes such as ageing and the future of cities could boost the public image of science by illustrating how it can be used to improve people's lives, suggests Burke. Such a task is important, he says, given the negative images from science following episodes such as BSE and the public response to cloning and genetically modified food.

### Boardroom appeal

Dropping the word 'technology' is another attempt to widen Foresight's constituency. Ben Martin, director of the Science Policy Research Unit at the University of Sussex, and one of the originators of the British Foresight programme, says: "There was a feeling that with technology in the title, it would be more difficult to interest the accountants and lawyers who sit in boardrooms."

Martin, one of the few survivors from the original steering group, admits he is slightly nervous about playing down the technology dimension. Those voicing similar concerns include Ian Taylor, minister of state for science and technology in the previous Conservative government, as well as many scientists and industrialists — and even some representatives of consumer groups.

Some fear that the new emphasis on social themes may turn out to be at the expense of technology and wealth creation. There is a feeling that edging out the scientists and industrialists who were critical to the first phase could risk the whole enterprise.

OST officials justify the new make-up of the steering group on the grounds that, to succeed, the next phase of Foresight needs to influence the heads of society's high-pow-

ered institutions. And that there is no better way of doing this than to co-opt them onto the steering group. But the shift worries Taylor. "It is important that we don't lose the backing of science and technology," he says.

Taylor says he has always seen the social agenda as an important part of Foresight, pointing out that there was a previous move to give Foresight a social dimension — the decision to launch the Extending Quality Life (EQUAL) initiative.

But he says too much "fuzzy thinking" should not be allowed to dominate the exercise. Harnessing science and technology for wealth creation, Taylor believes, is more important, "because without this, quality of life cannot improve".

Such concerns are shared by several panel chairmen, including in particular John Beacham of the chemicals panel, who retired last week as group research manager and chief scientist at ICI, and John Taylor, head of the Information Technology, Electronics and Communications panel and director of Hewlett Packard's European research laboratories in Bristol.

John Taylor predicts that Foresight will "evaporate if it loses its major emphasis on wealth creation". He disagrees with those who say that it is time to "move on", arguing that Foresight has "only just begun to scratch the surface of wealth creation". The first round of Foresight was too rushed and underfunded, he says. "It's important to have continuity and follow through. There's still a lot we can learn."

The consumer sector is also concerned — but for different reasons. Sheila McKechnie, director of the Consumers' Association and an observer on the food panel, says it is too soon to allow Foresight to refocus on "big, stratospheric issues".

McKechnie feels that scientists still need to be closely involved, particularly in the food and drink sector where research is critical to issues such as nutrition and food safety. "The food industry is in a state of enormous upheaval," she says. "We need research to tell us how to eliminate scrapie and salmonella, and whether using antibiotic markers in grain is a good or a bad thing."

The level of scientific involvement is clearly a controversial issue, cutting to the heart of the new Foresight exercise. But Diane Coyle, economics editor of Britain's daily national newspaper *The Independent* and newly appointed member of the Foresight steering committee, thinks that having fewer scientists on the steering group is probably a good thing.

"Scientists tend to be quite deterministic about things. They don't always understand the links between science and society," she says. Given that the purpose of Foresight is to make an impact on business, the economy and society, Coyle feels it important to involve individuals from those sectors directly. □