European Foundation for the Improvement of Living and Working Conditions

Ireland and the knowledge society

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Introduction

This report was prepared as a contribution to discussions about Knowledge Society Foresight (KSF) in the Republic of Ireland. It draws on earlier work completed for the EUFORIA project by the European Foundation for the Improvement of Living and Working Conditions (the Foundation).

'Foresight' is a term that has been introduced in recent years. One of the key features of this activity is that it goes beyond the prospective mapping of futures that characterises other studies. As outlined in a number of recent reports and studies, foresight programmes and exercises have mainly focused on technology and innovation policy issues, although there has been some focus on regional activity too.[1] These activities have been aimed at informing long-term policy decisions, and developing prospective analyses that draw on a wider pool of expertise, to help inform specific decisions.

KSF goes further than typical technology foresight, since it is designed to inform a wide range of policies relevant to social and organisational innovation, as well as technological innovation.[2] Moreover, the expertise and stakeholders in this wider area differ considerably from those characteristic of technological and strategic research and technological innovation processes, and the relations between research and practical action are often very different here. Thus, the form taken by a foresight exercise is liable to need some modification. The EUFORIA project was designed to investigate how far the methods used in technology foresight exercises could be applied to KSF.

This report draws on the experience derived from the EUFORIA project, in which three pilot KSF exercises were undertaken for Finland, Germany and Greece. It outlines the steps taken in this project that could be used to inform an Irish project, and explores options for further development of the approach in an Irish context. One of the lessons of EUFORIA is, indeed, the importance of the 'localisation' of KSF.

KSF represents an attempt to apply foresight approaches to questions more focused on issues of socioeconomic change. Technology foresight (TF) exercises, on the other hand, typically relate to mainly technical and related expertise and stakeholders, and start with prospective analyses of technological opportunities. It has been frequently found, however, that TF programmes have had to contend with a range of social issues, for which they were not very well-equipped to deal with (in terms of expertise, working methods, etc). There is also a sense that TF will inherently tend to favour technological solutions for social problems, whereas in some cases, social innovations may be more appropriate.

While technology is highly globalised, and technological expertise is linked more to international communities, knowledge of social and economic issues confronting specific countries is much more localised. Even in TF, it is important to draw on local expertise in identifying themes to pursue, questions to address, and so on. This is even more relevant for KSF. A team of external consultants could undertake a futures study for a country or organisation, although they would have to draw on local knowledge to go beyond what would already be reported in the press. KSF work, however, needs to be much more embedded in the country or organisation involved.

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[1] See for instance: H. Acheson et al, 2002, *Practical guide to regional foresight in Ireland*; L. Georghiou, 2000, *Third generation foresight: Integrating the socio-economic dimension*; 'Proceedings of the International Conference on Technology Foresight', Tokyo, March 7/8 2000; H. Grupp & H. Linstone,1999, 'National technology foresight activities around the globe: Resurrection and new paradigms', *Technological forecasting and social change* 60, pp. 85–94; B.R. Martin & R. Johnston, 1999, 'Technology foresight for wiring up the national innovation system', *Technological forecasting and social change* 60, pp. 37–5; and the *International Journal of Foresight and Innovation Policy*.

[2] See M. Keenan, I. Miles, J Koi-Ova, 2003, Handbook of knowledge society foresight, European Foundation, Dublin; see also other documents on the Foundation website.

This is because foresight, as mentioned, involves both a link to action and wider participation. The link to action means that the timing of and precise questions addressed by a foresight activity need to be related to evolving policies and decisions, rather than being an isolated piece of work that has no links with a user community. The archetypal TF programmes, for example, examined a wide range of trends and possibilities, with the aim of helping to establish priorities in funding research (and related technology policies, such as training and regulatory development). These programmes were typically policy-oriented. In fact, they were often explicitly intended to inform major policies and timed to fit into the rhythms of policymaking. They were sponsored by influential policy actors, rather than being independent or external analyses, although they usually set out to involve outsider views and enlist the participation of a much wider pool of knowledgeable stakeholders.

This participative orientation of foresight reflects several goals, namely:

- enlarging the knowledge base, since no single body encompasses all the knowledge required to understand and to seize future opportunities;
- engaging a wider range of stakeholders to provide a more democratic basis for future visions, lending foresight processes and recommendations more legitimacy;
- enlisting and mobilising the different actors involved in the process, to embed the messages of the programme into their own organisations and practices.

Any KSF study on Ireland, therefore, needs to take place within Ireland. It should be welcomed by Irish sponsors, who in turn should apply the information to inform their own decision-making processes. It should be designed to appeal to local stakeholders, who should also be included in foresight activities. It will also need to engage local expertise. Luckily, Ireland already possesses a strong base of researchers who are familiar with foresight approaches, and who would be able to design and implement such an activity. In the case of EUFORIA, a national team was set up in each country to implement the KSF exercise. Similarly, in Ireland there needs to be a team assigned to undertake the work and, unless the Foundation or similar parties can take on this role, a national steering group or advisory committee may also be necessary.[3]

[3] For a detailed discussion of the roles of panels, management processes, steering committees, etc, in foresight activities, see: Keenan, Miles, Koi-Ova (see note 2) and H. Acheson et al, 2002 (see note 1).

Elements of knowledge society foresight

Understanding the knowledge society

So, what exactly is the 'knowledge society' (KS)? Although the term has an extensive history[4], there is still considerable debate about its meaning; as a result, a position paper was prepared for EUFORIA participants early on in the study, to provide some clarification. This was used as one of the background documents in some of the national workshops held during the course of the study, and also served as a major input to the discussion about KS indicators. The document is reproduced in Box 1 below.

In its KSF study, EUFORIA set out to examine:

- the current and future 'drivers' and 'shapers' that are leading to the emergence of the KS (and specific forms of the KS), and that are giving rise to the wider socioeconomic implications of the new social formation. This should not only be examined in general and for the EU as a whole, but also for certain countries;
- national paths to KS, which aimed to produce foresight studies and reports dealing with national circumstances and future prospects in respect of KS and its implications for living conditions, working conditions and industrial relations in each of the three countries (Finland, Germany and Greece).

EUFORIA was designed to measure thinking about the implications of the knowledge society for the future of the three core concerns of the Foundation, which are:

- living conditions – includes issues such as the relationship between the family and employment, the development of digital divides and broader social participation; broader implications for the quality of life and social cohesion;
- working conditions – employment structures (related to industry, occupation, and demographic variables); employment security; skills; learning and use of technology at work; stress and responsibility at the workplace; health, safety and general quality of working life issues;
- industrial relations – trends in unionisation and the use of other methods of participation and exercise of 'voice' in industrial affairs; industrial relations processes and modes of conflict resolution; law, regulation and the role of government.

[4] For example, the work of Nico Stehr on this topic goes back to the 1980s: G. Bohme & N. Stehr (eds.), 1986, The Knowledge Society: The growing impact of scientific knowledge on social relations; N. Stehr, 1994, Knowledge Societies. Earlier still are the pioneering studies of Fritz Machlup, for instance: F. Machlup, 1973, The production and distribution of knowledge in the United States, Princeton University Press, which sought to bring together many indicators relevant to knowledge activities.

Box 1

What is the knowledge society?

'Knowledge society' is a term that has been introduced in attempts to characterise some of the main developments in industrial societies in the late 20th and early 21st century. Some commentators dislike these terms for various reasons. For example, some argue that they imply that current changes are revolutionary, whereas they should be thought of more as evolutionary trends. Some argue that since all human societies have relied on knowledge and information, the terms are implicitly discounting the capabilities of earlier societies and privileging the sorts of knowledge and information that our societies particularly prioritise. These criticisms have some merit, and it is suggested that a more useful way of thinking about the knowledge society (KS) should involve the intersection of several related trends. These are:

1. the development of 'information societies' based on the large-scale diffusion and utilisation of new information technologies (IT), which have allowed for unprecedented capabilities in capturing, processing, storing, and communicating data and information;
2. more generally, the increasing importance of innovation (especially technological, but also organisational) as an element in corporate and national competitiveness, and in strategies to increase the efficiency and effectiveness of organisations of all types;
3. the development of 'service economies', in which the bulk of economic activity, employment, and output is taking place in service sectors of the economy, in which 'service' is an important management principle in organisations in all sectors, and where specialised services (especially knowledge-intensive business services) are providing critical inputs to organisations in all sectors on a vastly increased scale;
4. knowledge management, particularly as organisations seek to apply formal techniques and new information systems, to help them make more effective use of their data resources (e.g. data mining), information assets (e.g. enterprise resource systems) and expertise (e.g. human resource development, groupware and collaborative systems);
5. other important developments related to the points above, including globalisation, changes in demographic structures and in cultural practices, and environmental affairs.

What about knowledge itself?

Knowledge is a term that attracts considerable controversy and argument. The literature on KS contains several quite distinct lines of analysis. Many commentators follow Polanyi's distinction between tacit and codified knowledge, the former being poorly articulated in words but expressed in all sorts of practice (the classic example being riding a bicycle), and the latter being formalised in texts and other representations. Others argue that what is codified is information, and that knowledge is possessed by knowing agents (human beings, until such time as we develop true artificial intelligence, encounter aliens, or decide that research into the psychology of apes or cetaceans supports claims as to their intellectual capabilities). From this perspective, information is organised data, while knowledge is the ability to use information effectively, to give it meaning within cognitive structures that are able to guide action.

Many KS trends clearly demonstrate the growth of information resources in the modern world, and this information is produced on an ever-increasing scale and distributed more widely than ever before. The growth of knowledge is implied by the effort put into research, by the documentation of the achievements of research in effecting more understanding through its codified outputs, and through the large numbers of people undertaking advanced training and achieving professional and scientific qualifications. Cultural critics argue that the production of ever-expanding volumes of information does not mean that we live in a better-informed society - the claim is that we could be suffering information overload, that it is harder to find the valuable information, that attention-grabbing trivia tends to drive out more serious

Box 1 (cont.)

material. Some go on to argue that the growing numbers of qualified specialists also involves a high degree of compartmentalisation of knowledge, so that much expertise concentrates on very narrow topics and is poorly related to broader concerns Different knowledge societies may indeed be characterised by different patterns of media activity, informed public opinion, socially responsible experts, and generalist capabilities.

These debates are reflected in arguments about the purpose and functioning of educational systems, mass media and the governance of freedom of information and the like.

A very different sort of issue concerns knowledge management, which has arisen as a specific issue in KS. It arises as organisations seek to apply formal techniques and new information systems to help them make more effective use of their data resources (e.g. data mining), information assets (e.g. enterprise resource systems) and expertise (e.g. groupware and collaborative systems). Organisational learning and emphasis on human resources and intangible assets of all sorts has also become more of a central concern, with management tools being developed to help effective choice and improvement of systems.

Can knowledge society developments be measured?

There has been a great deal of attention paid to measuring information society developments. Many efforts have been made to develop new statistics and systems of indicators, to measure the diffusion of new IT in business and the community, and to examine levels of use and even styles of use (for example, more or less active ways of implementing e-commerce). These efforts are ongoing and provide valuable material with which to compare different countries and regions, and even social groups and industrial sectors. There have also been many efforts to measure ‘information activities’, ranging from simple headcounts of information occupations to much more elaborate maps of information industries.

Other features of KS have also attracted a great deal of attention. In some respects, they are less challenging than assessing developments connected with new technologies because official statistics are always going to lag behind innovations, and statistics are more likely to capture simple diffusion and expenditures, rather than actual usage patterns. However, developments involving service activities have also long been neglected relative to those in the manufacturing industry and tangible production processes. The level of detail available on services is much more limited than for manufacturing, whether one is interested in economic sectors or occupations. Despite much effort to improve the statistical base, much of the most interesting activity in services is classified away in ‘not elsewhere specified’ and similar categories.

Looking at the major reports on the ‘knowledge economy’, one can see that these feature numerous indicators. They are usually introduced as evidence for the emergence of KS, and sometimes also for purposes of international benchmarking. Such indicators are often cited as:

- data on availability of and access to telecommunications and the Internet;
- data on use of PCs and the web by businesses of various types, for e-business and e-commerce;
- data on educational qualifications;
- patterns of work, employment and skills;
- use of new technologies in e-government and public services such as health.

Box 1 (cont.)

How does the knowledge society relate to social change?

The various features of KS, outlined above, have considerable implications for the shape of future societies. Consider first the information society issues. New IT is diffusing into businesses and everyday life (into people's homes and – in the cases of mobile phones and personal organisers – their pockets). New technologies offer new capabilities for achieving things in the world; people and organisations use these capabilities in different ways to achieve their goals. They may allow for existing practices to be conducted more efficiently and effectively, or the result may be the development of quite new practices. We may simply substitute a new technology for an old one (e.g. CD players for vinyl record players), or we may develop quite novel ways of living and working round the use of new capabilities (making new friends through the Internet, teleworking). IT is pervasive – because information processing is involved in all social activities, IT can in theory be applied effectively everywhere. This has the potential for more or less change to be effected in a vast range of social activities. Such changes should, however, not be seen as 'impacts' of new IT. Rather, they are the result of people's choices about using the new technological capabilities (which also depend on their access to and understanding of these capabilities), and their reactions to other people's choices.

In terms of other dimensions of KS, it is expected that social change will be the subject of considerable attention from specialised knowledge activities (which, of course, are often facilitated by the application of new IT). There are, for example, many specialised services attempting to monitor and affect social change: market research, marketing, and public relations, for instance, may be working for commercial firms, public services, or voluntary organisations. They may be trying to measure or change attitudes and behaviours. Alongside these are more social-scientific activities, and of course the knowledge development by public services such as police, education, employment and health services. The knowledge yielded by such activities informs organisational practice and may influence the quality of life of those who interact with the organisations.

Additionally, the shifts in demand for skills and the rise of new occupational categories and working practices may be expected to have widespread effects on working life and training, and on the balance between employment and leisure time/family life. These changes also imply shifts in the demands put upon the social partners in the industrial relations system, with new challenges, opportunities and strategies emerging.

There are, of course, major social changes underway that will also shape the forms of KS. The ageing of the population, for example, will have cultural impacts, as well as challenging systems of social welfare and provision (in particular, how social care of the elderly – and pensions – will be paid for). Migration across the world and within Europe, and the enlargement of the EU itself, will impact European knowledge societies, shifting value, and a range of other social developments will be responded to and incorporated into KS. Strategies for the KS, and thus foresight exercises, will need to cast their nets wide in examining social, environmental and other trends.

Box 2 contains a copy of the text prepared for project participants on the implications of KS for the three domains – working conditions, industrial relations, and living conditions. It was not intended as a definitive statement, more as a pointer to the sorts of issues that might be taken up in the exercise.

Box 2

What does the knowledge society mean for working conditions?

Employment levels and work quality were an early concern with the development of new IT – where it was believed that the automation of office work could lead to displacement of white-collar workers and deskilling of work. On the whole, the current consensus is that new skills tend to be required to create and introduce new IT-based applications, while the preponderance of work around such applications is relatively higher skilled than previous jobs.

Two reservations should be registered against the belief that this can be uncritically assumed to apply into the future. First, new technologies are not all alike, and it is by no means guaranteed that the virtuous circles between product and process innovation, skill requirements, and demand growth will continue to be sustained. Second, the implications of technological change – and of KS developments more generally – are as much a matter of institutional structures and social choices as they are a result of the features of new technologies per se. It could be that the 'productivity paradox' of new IT and the low impacts on employment both reflect the tendency to fit technology into established structures, rather than to develop completely new business processes that make fuller use of the new technological potentials. However, structures can themselves be innovated, and firms' interest in new forms of organisation has been growing. The implications of de-layered and hollow corporations, of telework and other forms of distance working, and of coordination by means of telecommunications rather than proximity, have yet to become clear: they may reinforce or conflict with accepted trends. Some commentators have, for example, suggested that polarisation of the workforce may be happening, or that middle-level jobs (and the opportunities for upward mobility they offer) are diminishing.

Related concerns have often been raised concerning the growth of the service economy. Service jobs have often been viewed as low-skilled and involving routine work. While there has been substantial expansion in some types of service work of this kind (e.g. in the fast food sector), on balance, service-sector and white-collar jobs again appear to have higher skill requirements than those in declining sectors. Again, the trend results from complex interrelations between job design, market demand, and organisational strategies, and cannot be assumed to automatically extend into the future.

In addition to the matters of skill and responsibility mentioned above, the issues to be explored need to include factors such as:

- health and safety issues at work – although new technologies are generally less physically demanding and dangerous than many industrial technologies, there may be unanticipated problems, such as those associated with chemical or radiation emissions from new equipment, repetitive strain injuries, etc. Some groups of workers may be particularly at risk here (as outlined in the following topics);
- stress at work – this may be associated with new responsibilities (for example, those associated with the 'delayering' of organisations), with work intensification, with the challenges of coping with changing technologies and work practices;
- issues connected with privacy, surveillance and civil liberties – new technologies have allowed for new patterns of communication, and organisations have been challenged to adopt appropriate rules governing the content of emails and web access, the confidentiality of information, etc. With increased scope for monitoring employee behaviour, location, etc, there is also the possibility of tighter control over how the working day is organised;
- new working practices which may impose conditions that are stressful, not only for employees, but also for the family. Mobile working may keep family members apart; home-based working may create conflicts in the use of personal space. Beyond the family, they may disrupt the social relations that characterised traditional workplaces, leaving the employee with reduced social contacts and work-based friendships, and isolated from the social networking so important for career development and organisational learning. These forms of work may also effectively shift responsibility for maintaining healthy working conditions from the management to the individual employees; and they may create costs for employees under some rules for things like financing and taxing domestic arrangements.

Box 2 (cont.)

What does the knowledge society mean for industrial relations?

Changes in living and working conditions almost by necessity imply changes in industrial relations (IR). While the specificities will vary considerably from country to country and from time to time, a number of common features of KS developments are liable to have considerable implications for IR. Among these are:

- changes in the workforce composition. Some of the key elements here are: (1) the growth of professional work and white-collar work in general, (2) the decline in traditional manual blue-collar work, especially unskilled labour in manufacturing establishments, (3) the growth in some categories of low-skill service employment. The second of these groups was the core of much traditional trade unionism (together with other diminishing groups, such as coalminers and seafarers). Professional workers have often banded together in professional associations rather than trade unions, whose recruitment of such workers tends to be most prevalent in the public sector;
- changes in the workplace. There has been some decline in establishment size (in manufacturing, if not necessarily in areas like retail), reducing the prospects of bringing large numbers of employees together, affecting, for example, both the substance of industrial agreements and the forms that union meetings (or consultations with management) can take;
- changes in forms of work. Developments like home-based telework and mobile working reduce the scope for face-to-face contact between workers, on the one hand, and employers and union representatives, on the other;
- contractual changes. Developments like outsourcing – which sometimes entails ex-employees becoming self-employed people, carrying out a very similar job for the firm that originally employed them – mean that it may become harder to determine who is the employer and who the representative of individual workers. It is not unknown for employees of several different organisations to be working on the same site – e.g. one of the UK's privatised railway lines, or one of the world's major airport construction activities;
- new areas for negotiation. Organisational change has meant that different issues have risen up the agenda for negotiation between employers and employees. In the 1980s, it was new technology agreements, in the 1990s, flexibility in terms of work arrangements and responsibilities. Current controversies surround such topics as the privacy of emails, the ownership of intellectual assets generated at work, and ways of coping with the move to lifelong learning;
- the use of new IT by managers, employees, and unions – and also by other stakeholders such as community and consumer groups – to communicate about issues of importance, to communicate their positions, share concerns, attempt to shape actions and decisions.

What does the knowledge society mean for living conditions?

The implications of technological and organisational change can be substantial for living conditions. As already noted, it is anticipated that changes in working life are liable to place new demands on family life, for example, concerning the use of the home for teleworking, or the need to define a new 'work-life balance'.

New technologies may also influence living conditions, whether used for work or as consumer products. Widespread use of motor cars and lorries has changed the levels of noise and pollution in urban environments, and in many locations, changed parents' views of the safety of streets as a place for children to play, for example. The mobility offered by the car has enabled new ways of life to be developed: for instance, there has been an increase in suburban living, and the emergence of out-of-town shopping centres (and decline of high street facilities) in many countries. Furthermore, 'privatisation' of transport activity has had impacts on many public train and bus services and, arguably, contributed to social exclusion. Television is another 20th century technology that facilitated major changes in the use of leisure time and in family activities. Both innovations are controversial, with strong proponents and detractors.

Box 2 (cont.)

Many commentators would doubt that consumer IT could be as important as cars and television. However, there is certainly scope for a vast range of new consumer products to continue emerging, and it is risky to assume that the capabilities they offer will not, in some cases, lead to changing patterns of behaviour. Mobile telephony and Internet access may already be used in such ways, and both have given rise to concerns about the use of new freedoms for pornography and criminal activity, as well as for education, entertainment and teleshopping. Other consumer applications are emerging in health and lifestyle monitoring and advice (from digital thermometers to home security systems) and in providing aids to domestic work (through home automation systems). There could also be challenges to many established public services, as medical, psychological and educational aids are provided online.

Among the concerns most frequently raised regarding changes in living conditions are those in relation to:

- the possibility that time pressures are growing for people in their everyday lives, as well as at work – perhaps because of the scope for demands to be made on people via mobile phones etc, or perhaps because people's leisure time is so full of competing activities and possibilities;
- privacy issues – some of these concern unauthorised access to personal data, whether this is collected by public agencies or appropriated from individuals' own IT systems; other issues arise around the increasing surveillance of public spaces by CCTV security cameras, etc;
- social fragmentation and privatism: the idea here is that new media may foster the growth of subcultures who talk only to themselves, or that if individuals pursue their own interests in isolation from others, they may lose social skills and the social networks and socialisation resulting from shared activities. On the other hand, new social movements and interest groups might emerge, using new media for contact, mobilisation, and lobbying – and what would this imply for the democratic process? How will 'e-government' fit into living conditions, what are the implications of the KS for participation with a more informed citizenry?;
- problems of information inequalities and digital divides. Some groups – typically, poorer people, older people, specific ethnic groups, people away from metropolitan centres, and women in some regions – are socially excluded from the new capabilities. Even though, as new technologies and services become mature and diffused, these inequalities may diminish, continuing innovation means that there are always new things to be excluded from. Some of these new things may confer significant social advantages, beyond being mere status symbols. They may provide means to improve education, health or living conditions. Inequalities may thus continue to be important issues.

The focus on living and working conditions, and on industrial relations, are a reflection of the Foundation's core concerns. Other approaches to KSF could be designed to accommodate different sets of key interests. For example, general health issues were ruled out of the scope in EUFORIA, but they could be central to another set of organisational concerns. Of course, the interests specifically relevant to an Irish KSF exercise need to be defined by Irish stakeholders. Some pointers from discussions that have already been conducted in Ireland can be drawn upon, however, to provide more guidance for the present report.

These discussions reflect many of the arguments that have been set out above. For instance, it has been stressed that: 'the global information society is more about the importance of new ways of doing things, and less about technology itself. Shaped by innovation-driven growth, it is defined by creativity as its key resource, and the network as its key form of organisation. It should be understood as a 'post-industrial' dynamic, rather than an 'ICT-centric' one. A knowledge-based society will be characterised by the emergence of knowledge-intensive communities as key agents of progressive development.' These points helpfully elaborate on the points made above about KS, and they are linked to the suggestion that public policy should 'support the emergence of such collaborative networks (through bridging expert intelligence

with key stakeholders), and link these networks effectively with policy-making processes', and that this means 'a new level of support for knowledge-intensive networking processes through which stakeholders can deepen their understanding of changing challenges and opportunities, developing shared commitment to longer-term objectives. A parallel can be drawn with the idea of open innovation networks, and open-source problem solving generally'.[5]

An exploratory workshop, which was held in June 2003[6] to consider the issues facing Irish KSF, defined a range of key issues that need to underpin any such exercise. They are:

- 'recognition of the more intense competitive environment presented by an increasingly networked global economy, where production and application of knowledge has become the critical success factor, an associated acceleration in the rate of innovation and change, and a new mobility of industrial and service activities within Europe in an enlarged EU';
- 'a sense of imperative about the need for more structured engagement, while supporting the improved productivity necessary to underpin the development of a successful and prosperous society in this environment of intensified competitiveness';
- 'the increasing dependence of high-value economic activity on quality of life issues, and creating attractive conditions for high-skilled knowledge workers, pointing to new complexities and inter-dependencies in public policy development';
- 'recognition of the wide range of activities underway across the public policy process, consistent with supporting enhanced innovation capacity, and qualified by a sense that they might be more coherently aligned and underpinned by a deeper understanding of their contribution to national objectives, in the context of overall priority setting and resource mobilisation';
- 'concern at the pace of movement from policy to implementation, across a range of key areas including broadband infrastructure, levels of investment in R&D, commercialisation of publicly funded research, education sector reform, lifelong learning, and public sector modernisation';
- 'the broad societal foundations that underpin the national system of innovation, with the capacity to learn (and unlearn) increasingly being the key determinant of the relative success of individuals, firms, regions and national economies';
- 'the dependence of innovation capacity on the institutional arrangements in place to optimise participation in appropriate forms of education and training, to support adjustment to accelerated change, including pedagogy and curriculum reform issues at primary and secondary levels';
- 'the consequent need to widen social ownership of the challenges associated with shaping the national system of innovation, informed by an overarching focus on the development and distribution of appropriate learning capabilities';
- 'the evidence that there is no international convergence to a single model of development that should be replicated here, but rather that Ireland's future course will have its own unique trajectory shaped by the formulation of policy responses that are appropriate to domestic circumstances';

[5] A. Hall, 2004, *Learning to innovate: Re-perceiving the global information society*, Mimeo, Draft discussion document, Department of the Taoiseach, Dublin.

[6] A. Hall, 2004, *Knowledge society foresight: Next steps?*, Mimeo, Draft discussion document, Department of the Taoiseach, Dublin.

- 'the role of competition as a primary driving force behind technological and managerial innovation, delivering improved productivity and organisational performance';
- 'the need for attention to creating appropriate behavioural incentives for both individuals and firms, including having regard for unintended consequences of existing fiscal, regulatory and other policy frameworks';
- 'the disruptive nature of innovation and change, and the need for policy responses that appropriately address the displacement associated with shifts to higher-value economic activity, and manage a transparent and equitable distribution of attendant costs and benefits';
- 'an enthusiasm for the potential of foresight activity to enhance engagement with these new policy complexities, building on a complementarity with the strengths of the social partnership process in creating shared visions and mobilising collective strategic actions'.

Why KSF?

The discussions above suggest that the social, economic and organisational changes associated with the evolution of KS (or whatever other terminology is used to characterise the emerging state of advanced societies) are extremely wide-ranging ones, affecting practically all spheres of life. They are also liable to involve profound change in many of these spheres.

It is much easier to talk about the extent of change that is likely to happen – or that is needed to happen if KS is a goal – than it is to be confident about precisely what is likely to happen. Not only are the time horizons and details of change uncertain, but (as Box 2 implies), in some instances there is controversy as to the fundamental directions of change.

The combination of importance and uncertainty is the underlying rationale for more systematic, reasoned examination of the longer-term future. These issues are of such significance that this type of examination should be of widespread interest. The range of issues addressed and the complexity of relationships between different themes are such that it would be important to involve a diverse set of people in such an examination, even if this was not a standard feature of foresight exercises. This is not a matter of merely forecasting what is inevitably going to happen. There is liable to be considerable scope for shaping the KS and its social implications, and wide social participation in envisaging alternative possibilities and defining the steps needed to achieve more desirable outcomes is considered highly appropriate.

EUFORIA was set up to explore these issues by means of a number of pilot foresight studies. Following the logic outlined above, this required involving a wider range of expertise and stakeholder participation than has typically been employed in addressing these issues in the past. The exercise also aimed to relate its work to decision-making processes, by involving policymakers in the study, and by helping them and a wider audience to:

- examine alternative future possibilities;
- consider what successful (and feasible) paths of development might be;
- identify and support methods of achieving positive paths and of avoiding negative ones;
- consider how progress towards these ends can be affected and monitored.

In the Irish context, as will be discussed in greater detail later, there are liable to be specific interests in pursuing KSF. For instance, it has been suggested that a creatively designed national foresight exercise could be positioned to play a pivotal developmental role in three key respects relevant to Ireland's Sustaining Progress partnership, namely:

- strengthening agreement around the key strategic conditions necessary to support and sustain innovation-driven wealth creation and growth;
- deepening understanding of the dislocation associated with the innovation process (this refers to the 'disruptive' element of innovations that displace established ways of doing things);
- securing the consensus necessary to support a distribution of the costs and benefits flowing from this growth and dislocation, in a manner that is equitable and sustainable over the longer term.[7]

Structure of KSF study

The EUFORIA project provides an example of what can be accomplished in KSF studies. This is not to say that the study was without flaws; however, many of the approaches used are generic to foresight work, and many of the issues raised are relevant to KSF more generally.

EUFORIA worked with three very different EU countries, selected on the basis of a preliminary set of indicators (of information society development, compiled for the SIBIS project). Overall, there was a relatively high correlation between many of these indicators: performance on one of the dimensions tended to be strongly linked to that of other dimensions. Two countries that appeared to be at the extremes of development, and one in a roughly average position, were chosen: Finland (high on most indicators), Germany (roughly average within the EU on most) and Greece (relatively low on most). Partner organisations in each country were recruited to run the national case studies.

The case studies followed the same basic steps, although, reflecting the participatory nature of foresight, many details were defined interactively with the national centres and with local 'users' of the study. The key elements of the study are displayed in Box 3.

This type of framework is one that could be applied (completely or selectively) within an Irish KSF. In the following section, the various stages of the framework are outlined, and suggestions are made in relation to specific themes that could be pursued, or modifications that could be adopted, in the Irish context. In doing so, many valuable inputs from Irish colleagues in the course of EUFORIA can be drawn upon.[8]

However, it should be stressed that the whole purpose of KSF is to provide knowledge resources that can engage with policy processes. It is critical that the exercise secures high-level sponsorship within the policymaking apparatus. The particular decisions that are reached in relation to the KSF study design will be informed by this.

It should also be noted that there was much discussion during the EUFORIA project concerning how far the issues, seen as central in other EU countries, were at the core of Ireland's dilemmas in moving towards a knowledge society. The Irish Republic has pursued a distinctive economic strategy within the EU, and succeeded in attaining high levels of growth, largely on the basis of high levels of inward investment in high-tech industries. For many Irish commentators, the big question is whether this strategy can be sustained in the face of the availability of high-skill, low-wage labour in the new Member States of the EU. Are new measures necessary in order to continue attracting foreign direct investment

[7] A. Hall, 2004, *Learning to innovate: Re-perceiving the global information society*, Mimeo, Draft discussion document, Department of the Taoiseach, Dublin.

[8] With particular thanks to Aedan Hall of the Taoiseach's Department.

(FDI), is there sufficient spill-over from FDI into the domestic economy and innovation system, and does a new trajectory of growth lie ahead? These are the types of questions that have been hotly debated, and which, some Irish colleagues at least, would like to see at the heart of an Irish KSF. This would therefore render much of the detail of the Irish approach rather different from that pursued in the three pilot countries, and this is reflected below.

Designing and managing KSF

Scoping

There are many strategic decisions to be made in the design and delivery of foresight activities. For example, scoping is required to:

- review and perhaps pilot foresight options;
- assess current and past arrangements – what has been already accomplished, what are its strengths and shortcomings?;
- best match requirements against capabilities, to formulate the exercise so that it takes account of existing opportunities and (resource) limitations;
- establish the need for any new structures or arrangements that will have to be put in place to support the participatory and creative environments demanded by foresight;
- generate a flexible blueprint for the exercise that uses the most appropriate methods – the plan needs to be responsive to changing conditions;
- make the case for foresight – the plan should convince stakeholders of the merits (and costs) of the exercise, and stimulate early participation in designing the process.

Box 4 presents 15 different elements around which foresight can be scoped.

Management issues

As with any foresight activity, a structure for KSF will need to be established. This has various functions, including the division of labour and systems of management in the process. Thus, roles must be assigned to different parties such as working groups, panels, committees, sponsoring agencies, trainers, etc. It is common for a steering committee and management team to be established at the outset.

The steering committee will, typically, have overall responsibility for ensuring that the activity is oriented to the purposes for which it has been set up. This means formulating or approving the objectives, focus, methodology, work programme, strategy and tools for communication and promotion of results. It will monitor progress and provide quality assurance, frame assessment criteria, and review the deliverables. It may play important roles in raising awareness, mobilising experts and nominating members of various panels. While critical details of the foresight exercise have to be decided on by the steering committee and management team, there is much scope for wider consultation about the key themes and methods of the process.

The steering committee members are typically high-level people with knowledge of the policy issues at stake and of foresight processes. As high-level people, they are liable to be busy, and thus a project team will usually be required to manage the project on a day-to-day basis. This team will be responsible for maintaining regular contacts with stakeholders and the steering committee, to ensure that the project direction is maintained. It will have ‘administrative’ tasks such as keeping accurate records of costs, resources and time scales for the project, and monitoring whether or not the project is maintaining its technical objectives. It will have more ‘political’ tasks such as ensuring that the project maintains its relevance to wider activities, initiatives and policies. It will have ‘intellectual’ tasks such as ensuring integration of management reports and their presentation to the steering committee.

Box 3

Key elements of EUFORIA foresight exercise

- Common background analyses: A variety of types of background analysis are commonly used in foresight, for example, roadmapping, SWOT (strengths, weaknesses, opportunities, threats) analysis, and interviews with small expert pools. In this study, 'advancement indicators' were the main common background material. Several rounds of elaboration of empirica's initial set of advancement indicators were undertaken, including dialogue among the partners, feedback from national workshops and a series of advisory committee and other meetings. Consideration of alternative indicators also helped the debate about what exactly constitutes a KS.
- Cross-national analysis: The indicators provided for some 'benchmarking' of individual countries against each other, and in the course of the exercise, there was much discussion about how the three countries differed and what lay behind the most obvious divergences. A cross-national workshop was also organised, in which methods of small-group working were employed (within a wider conference setting), to gain a preliminary assessment of major drivers of a European KS, and the associated impacts on living conditions, working conditions and industrial relations (the Foundation's core concerns).
- National workshops: Two rounds of national workshops were held with local experts in each of the three countries. The initial workshops considered, in particular, the initial indicator data and the interpretation of national characteristics, and reflected on the drivers and shapers of KS. They also made proposals regarding useful Delphi questions. The second set of workshops was able to make some use of preliminary Delphi results, and concentrated particularly on developing scenarios for the KS in the respective countries. The scenarios developed by the national workshops were assessed by the teams responsible and further analysed in the preparation of the final project report and national reports.
- Elicitation of dispersed expert knowledge: In contrast to workshops that bring together small sets of people for intensive exchange, it is also common in foresight work to use methods of sampling opinion and information on a wider basis. Consultative workshops held in different regions or sectors are one such approach, but it is also common to use postal or electronic surveys. In EUFORIA, an online Delphi study was used. This covered a range of topics concerning the KS; it drew on ideas developed through discussion at national workshops, among the teams and with the Foundation.
- Reporting: Results were presented at a number of meetings, and a synthesis report was prepared and published (alongside a series of more specific reports, e.g. on the Delphi survey, the national case studies).

Box 4

The 15 scoping elements of foresight

1. *Rationales:* What are the arguments for conducting KSF project? These will be dependent upon the organisations (especially the sponsor) and communities involved. Rationales will tend to emphasise how things can be better achieved with the help of foresight. They may also point to other places or areas where foresight has been successfully deployed and which can be used as exemplars.
2. *Objectives:* What will KSF achieve and by when? Objectives tend to exist at several levels, for instance, an immediate objective of those managing a foresight exercise is its smooth execution. However, there will also be higher-level objectives that relate to the rationales offered for conducting foresight, so formal objectives tend to be dictated by the organisations and communities involved. Of course, objectives may shift over time and it is not unusual for different actors to envisage different objectives for a foresight exercise.
3. *Review existing strategic arrangements*: How will KSF complement or challenge these arrangements? KSF can be carried out as a relatively stand-alone activity, which can be particularly useful if the aim is to challenge a consensual order. However, there is the risk here that foresight will simply be ignored and dismissed as irrelevant. For this reason, foresight is often embedded in existing strategic processes where it feeds into players' strategies.

Box 4 (cont.)

4. *Orientation:* What will the focus of KSF be? Foresight can have any number of orientations, but common ones over the last decade have included science and technology, business dynamics, territorial (e.g. urban and regional) visions, and societal problems. Orientation is closely tied to the rationales and objectives of an exercise and is therefore dependent upon similar factors, i.e. the agendas of organisations and communities involved.

5. *Level:* At what political/economic/social institutional level is KSF to be carried out? Foresight is practised at many levels, including national, supra- and sub-national, city, organisational (e.g. company, NGO), industrial sector, and issue area, to name but a few. The institutional level at which an exercise is conducted will have a significant bearing on many of the other elements outlined here. In particular, KSF's objectives and orientation are limited/enabled by an exercise's position and location.

6. *Time horizon:* The average time horizon for national foresight exercises seems to be about 10–15 years, although it may be as long as over 30 years or as short as five years. There is some evidence that the time horizons adopted tend to be related to foresight's objectives and orientation. Of course, this is not to say that foresight does not have consequences for the present – as has been argued earlier, a distinguishing feature of foresight is its emphasis on action in the present. Moreover, foresight takes account of existing strengths and weaknesses and of historical trends. In this sense, foresight is as much concerned with the past and the present as it is with the future.

7. *Coverage:* What sectors/issues/problems will KSF aim to cover? Irrespective of an exercise's orientation, it is usually necessary to select the various sectors/issues/problems to be covered by foresight, largely because of resource constraints and the need to organise exercises of manageable proportions.

8. *Participation:* What should be the extent of actor involvement in KSF? Deciding who should participate in a foresight exercise is a central concern of managers, not least because of a perceived need to produce results that are widely considered to be legitimate, robust, and relevant, in addition to the process benefits associated with foresight. Choosing participants also depends on other elements of foresight's scope, including objectives, orientation, the themes/sectors covered, and the intended audience. Some exercises are quite limited in their breadth of participation, both in terms of actual numbers and the types of actors engaged. Others, on the other hand, have set out to directly involve widely disparate groups, including members of the public.

9. *Consultation:* What should be the depth of actor engagement in KSF? This question can be considered along two dimensions: frequency and reach. In relation to frequency, it is often thought that the issue of consultation is associated with only the elicitation of expert/stakeholder views on the future, for example, through Delphi or scenario workshops. However, there are a number of points in a foresight exercise where views might be elicited, for example, during the scoping process, during deliberation on the implications of foresight's results, etc. These can often be the most significant (yet often largely ignored) consultation points, since they allow participants to make strategic choices about an exercise, which, in theory, should engender greater ownership of the process and its outputs. Deciding who is to be consulted at each round of consultation relates to the second dimension – reach. This is linked to the earlier discussion on participation, although it is unlikely that reach will be to the same extent for each and every consultation. In this respect, reach can be considered to be either 'widespread' or 'narrow'. Although there are no specific rules for selecting any particular consultation approach, the choices made have implications for the credibility of a foresight exercise's outcome, for the time needed for its completion, and for its eventual cost.

10. Duration and cost: How long does a foresight exercise last and how much does it cost? There are a number of elements involved here. If, for instance, many areas are to be covered and hundreds, if not thousands of people are actively engaged, an exercise is likely to be expensive and time-consuming. More modest exercises are the norm, taking no more than one or two years to complete and costing approximately €100,000–€250,000. These can be described as 'punctual' exercises, as they are carried out at a fixed point in time. Such exercises might be repeated at a later stage. There are also exercises that are ongoing and these are described as 'continuous'.

Box 4 (cont.)

11. *Methods:* What methods are to be used at the various stages of an exercise? As the handbook argues, foresight methodology is not confined to consideration of approaches for thinking about the future (see chapters 4–6). Rather, foresight methodology is far broader, taking into account the important tasks of coalition building, scoping, organisation and management, implementation, etc. Different methods can be used to address these tasks, many of which are outlined throughout this handbook.

12. *Organisation and management:* How can KSF be organised and managed? Again, this is heavily dependent upon the choices made with regard to the other scoping elements outlined. Yet, all too often, organisational models are 'borrowed' uncritically from elsewhere, with insufficient account taken of these other scoping elements. Partly for this reason, there are some common features of foresight exercises, including the use of steering committees and panels of experts and stakeholders.

13. *Dissemination:* How are the results of KSF to be diffused beyond those immediate actors who took part in the exercise? After all, it is usually impossible to involve everyone in the foresight process, to act on its results. This is not a trivial task, and requires the 'translation' of results into palatable messages for consumption, often by a variety of groups. One can imagine that KSF results applied to the areas of working conditions and industrial relations would generate results applicable to business, government, and trades unions. Different messages may need to be conveyed to each of these groups. Of greater certainty is that the 'medium' through which messages will need to be diffused will vary between these groups (as well as within them). Project managers need to be aware of this at an early stage and to design their dissemination strategies accordingly.

14. *Implementation:* How are the results of KSF to be followed up with action? This tends to be a neglected consideration, with project managers often overly preoccupied with getting the foresight process right. Getting it right can, of course, increase the chances of successful follow-up action, but political awareness of the possibilities for follow-up action should ideally be considered from the outset. In most instances, successful implementation involves follow-up action by actors who may not have been directly involved in an exercise. This is particularly challenging, and it is probably wise to ensure that these actors have some sort of involvement in the process at some stage.

15. *Evaluation*: How can the outcomes of KSF be assessed? Measurements should be put in place to obtain some indication of whether the exercise has met its objectives – a process known as 'summative evaluation'. However, the uniqueness of KSF, particularly as applied to the areas of living conditions, working conditions, and industrial relations, means that some formative evaluation may also be useful. The latter is not as concerned with outputs and outcomes as it is with processes. A better understanding of these can be used to improve the conduct of future exercises.

Source: ***Handbook of Knowledge Society Foresight***

Monitoring

Monitoring a KSF project consists of continuously observing and ensuring that the resources foreseen for each project step are used effectively, as defined in the blueprint, and that work schedules are respected, and outputs are materialised. It will help the project team to control and focus the implementation of the project. Ongoing monitoring involves: (1) Observing the activities undertaken during the implementation of each step in the project, in order to compare them to the targets that have been set; (2) Continuously adapting the project plan to its environment, as new knowledge is gained and stakeholders are activated, or as the political environment changes. Monitoring indicators can provide relevant actors with specific and topical data that allow them to follow the course of the project.

Expert work

This type of work is more often than not organised around expert panels and/or working groups. Experts are required to access and process relevant information and knowledge, and to generate new insights and creative views and strategies

for the future. They too can play important roles in the diffusion of the KSF process and results to much wider audiences and in follow-up action.

High-level political support

Political support is required for an exercise to be considered more than just an academic study. In the Irish case, the Sustaining Progress partnership agreement contains a commitment to progressing a KSF exercise under the aegis of the Information Society Commission (ISC), with appropriate participation by the social partners. This framework provides a basis for such high-level support. A workshop involving an ad hoc group of social partners was convened in government buildings on 5 April 2004. It was chaired by Dermot McCarthy, Secretary General to the Department of the Taoiseach, and facilitated by Dr Rory O'Donnell in his capacity as Chief Officer of NESDO (National Economic and Social Development Office). Agreement was reached on a number of key areas:

- broad-based agreement around the need to deepen shared understanding of the innovation challenge;
- a high level of enthusiasm for the role of a new national foresight exercise in responding to this challenge;
- clear recognition of the synergies that can be developed between this exercise and the strengths of the social partnership process.[9]

An earlier exploratory workshop involving an ad hoc group of social partners was held at the Foundation premises in June 2003. The significant themes emerging from that initial discussion, presented in Section 2.1 above, are far-reaching. Subsequently, the ISC Secretariat was asked to liaise closely with the National Economic and Social Council (NESC), Forfás and the Higher Education Authority (HEA), to design the next stages of the process. A small working group was also set up, and this proposed a framework (reproduced in Table 1) that was welcomed by a cross-section of senior personnel in government departments and in public agencies, at a meeting held on 8 January 2004.[10]

[9] Source: A. Hall, 2004, *Knowledge society foresight: Next steps?*, Mimeo, Draft discussion document, Department of the Taoiseach, Dublin.

[10] A. Hall, 2004, *Knowledge society foresight: Next steps?*, Mimeo, Draft discussion document, Department of the Taoiseach, Dublin. The timetable has been slightly revised in: Information Society Commission (ISC), 2004, *Learning to innovate: Reperceiving the global information society*, Report to the Irish Government (December 2004), and it is this revised version that is reproduced here. It should be noted that the latter report contains not only a valuable discussion of knowledge society issues, but also provides some updated statistics on information society trends in Ireland.

Table 1: *An outline structure for Irish KSF*

Stage	Purpose	Timing
Step –2	Building momentum: *Mobilise engagement of key stakeholders*	Complete
Step –1	Political commitment: *Ensure a mandate that is anchored in govern ance structures (i.e. action-oriented) and supported by an appropriate resource commitment*	Early 2005
Step 0	Process design: *A high-level project group is formed with the standing necessary to define and shape a successful exercise: setting clearly defined goals; agreeing key processes; appropriately supported by an expert, international advisory panel*	Early 2005 About 8 weeks
Step 1	Intelligence gathering: *Best available global expertise is leveraged to establish the knowledge base necessary to support collaborative engagement, with the objectives and processes identified by the project group*	Early 2005 About 8–12 weeks
Step 2	Collaborative learning networks: *The core processes get underway, typically in the form of appropriately constituted expert panels*	2005/6 About 12–18 months
Step 3	Synthesis and conclusion: *The key learning from the exercise is synthesized and appropriately disseminated*	Before end of 2006 About 8–12 weeks

The following design process is in line with the recommendations outlined above. The remainder of this report will focus on issues of methodology that might be employed in Irish KSF, which should contribute to Step 0 of Table 1.

Background analyses

Background analyses are vital for ensuring that important information is shared among project participants. Typically, material will be presented in the form of sets of notes and other inputs, to inform participants prior to their attending meetings and workshops. There will often be some presentation of the key points of such material during the meetings, offering a chance for discussion.

There have been a significant number of studies on Ireland's economic transformation and its future prospects, and quite a volume of work on Ireland as an information society. Much of this work is of high quality and will need to be taken into account by anyone performing a KSF study. The broad conclusions and data cited in these studies should be used to construct a shared knowledge base for those taking part in workshops and other activities in the context of the exercise. EUFORIA also carried out work using a set of 'advancement indicators'. The following section focuses on the relevance of these data for Ireland.

A statistical snapshot

In the course of the EUFORIA project on KS developments, a set of indicators was developed by empirica to investigate paths and degrees of development in different EU countries. It should be stressed that these indicators were developed from cross-EU work – not tailored specifically to suit the Irish policy context. They are outlined here purely to demonstrate the types of issues raised by indicator analysis.

Figure 1 displays Ireland's situation within the concise set of indicators that were supplied. The bar chart compares the situation of Ireland against the average for the EU15 (which has been normalised to a score of 100). This represents an 'at a glance' approach for determining the comparative location of one country in the EU context. Such profiles have proved very effective in stirring debate in both national and cross-national contexts. Controversy may erupt as to interpretation of indicators as well as in relation to the selection of a set of indicators. However, they can provide a common basis for discussion and enable comparative analysis and benchmarking to a degree: discussion can focus on why the results take the form they do, for example, whether any surprise results are due to inappropriate indicators, an incomplete range of indicators, or whether they constitute real challenges.

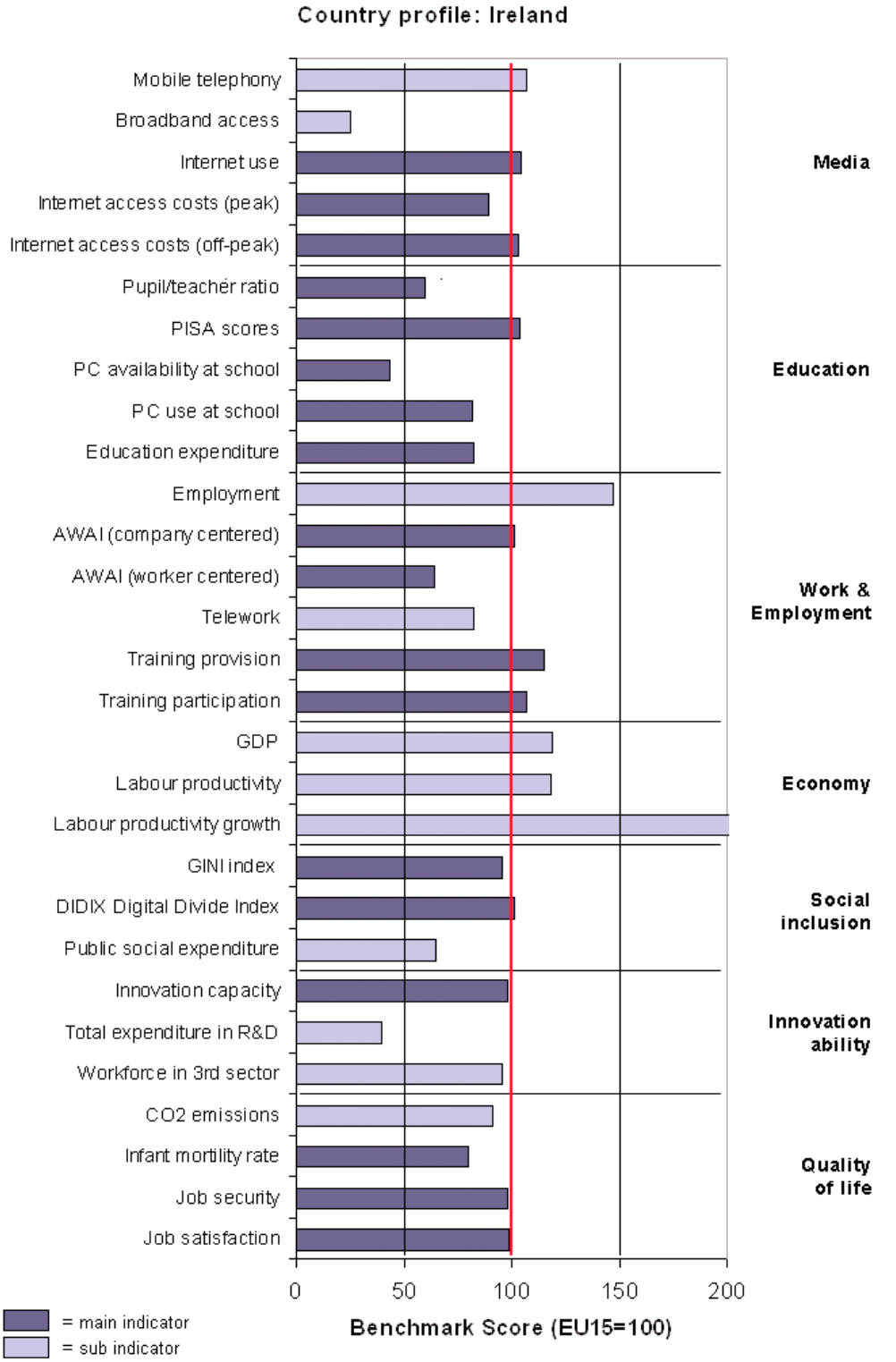
In many respects, Ireland is close to the EU15 average in terms of certain indicators. For example, empirica selected Ireland as the 'average' performer in its analysis of 'media' indicators.

Ireland is strikingly above the EU15 average in terms of a number of economic indicators. Not only is its per capita GDP and labour productivity high, but labour productivity growth is exceptionally so. Employment is high, and scores on training indicators are good. Levels of telework are relatively low, and while company-oriented work flexibility is average, worker-oriented flexibility is low.

The country is near-average in terms of most indicators of quality of life, though infant mortality is relatively high. Social inclusion measures are generally average (level of inequality and digital divide), though public social expenditure is below what might be expected.

Education displays a very mixed picture, with relatively poor pupil-teacher ratios, access to IT at school, and education expenditure.

Figure 1: *Advancement indicators for Ireland*



Source: *Werner Korte, Advancement of the knowledge society in the European Union (USA and Japan), Comparative statistical data on the advancement of the knowledge society, EUFORIA project report, empirica, 2003*

Although points such as these are easily ascertainable from the data, it should be noted that the data relate to a particular point in time and that it is aggregated at the country level. In many respects, however, the regional variations across Europe are particularly striking, with many 'average' countries in reality featuring a mixture of leading and lagging regions. Nevertheless, full interpretation of the meaning of the indicators in the Irish context is best undertaken by Irish experts. EUFORIA used its national workshops as a way of determining the views of country experts concerning the full significance of the data, and this would be a viable approach to adopt in an Irish KSF study.

The empirica analysis also experimented with other indicators and with presenting data in different ways, such as 'radar plots' of sets of indicators' relevance to specific areas of interest. Figure 2 illustrates this with an instance where Ireland appears to be a fairly average performer (though low in terms of one parameter). Figure 3 provides more detail on pupil-teacher ratio indicators, and Figure 4 on training indicators. In all cases, empirica's commentary on cross-national comparisons is reproduced.

One limitation of these indicator analyses was the lack of trend data available on many of the parameters. It is important to complement 'snapshots' with some idea of how the trend is developing and what relative progress might be.

Figure 2: *Indicators on information and communications technology use*

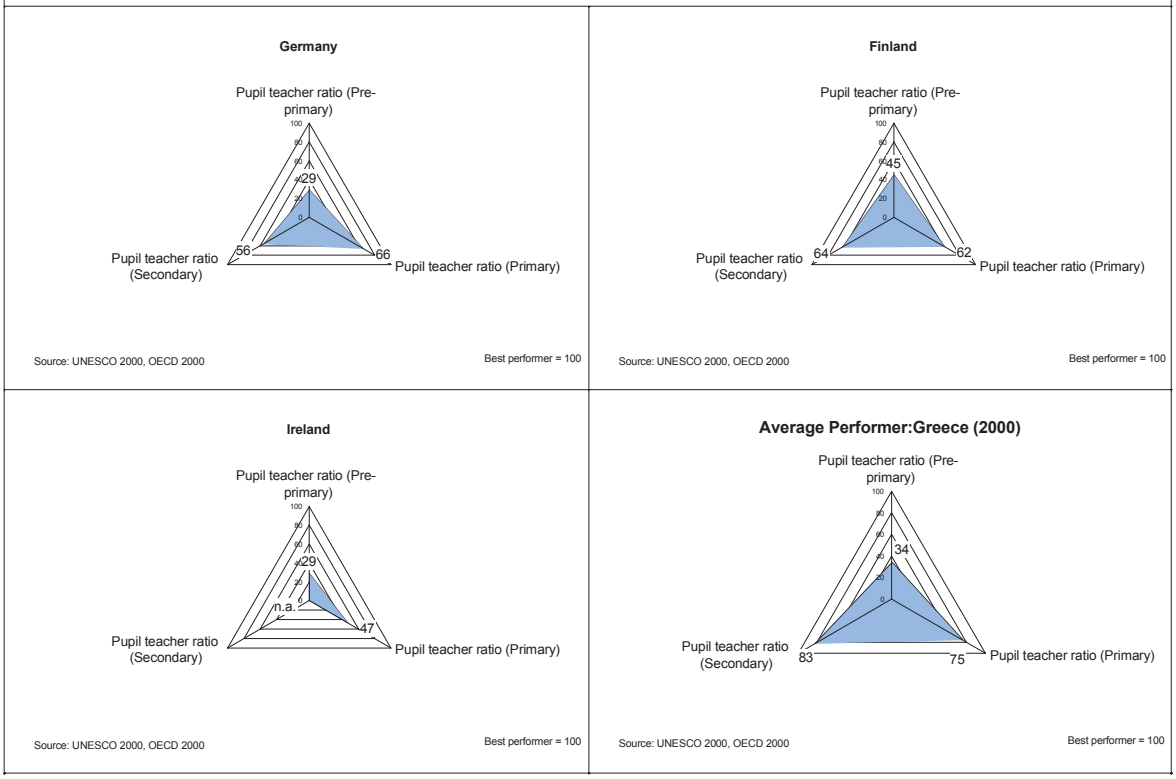
All new EU Member States, except Slovenia, still lag behind the Member States with the poorest performance on these indicators.

'Internet hosts' was used as an indicator for country and language-specific content provision. It does not come as a surprise that the USA is leading the field. Interestingly, the European Internet frontrunners still exceed the figures on Internet hosts in the UK.

Source: *Werner Korte, Advancement of the knowledge society in the European Union (USA and Japan), Comparative statistical data on the advancement of the knowledge society, EUFORIA project report, empirica, 2003*

Figure 3: *Comparison of pupil-teacher ratio indicators*

Denmark takes the European lead, maintaining a maximum attendance of 10 pupils per teacher, while Italy, Spain, Greece and Austria also provide a good education infrastructure with good ratios. In pre-primary and secondary schools, the United Kingdom has t he highest pupil/teacher -ratio within the EU. Germany is slightly below the average ratio, improving with rising level of education. With regard to pre-primary education, Finland may be the second-best performer in Europe, but the ratios for primary and secondary education cannot keep the promise, leaving Finland in a slightly better than average position. With 23 pupils per teacher, Ireland shows the worst performance of all researched countries in primary education.

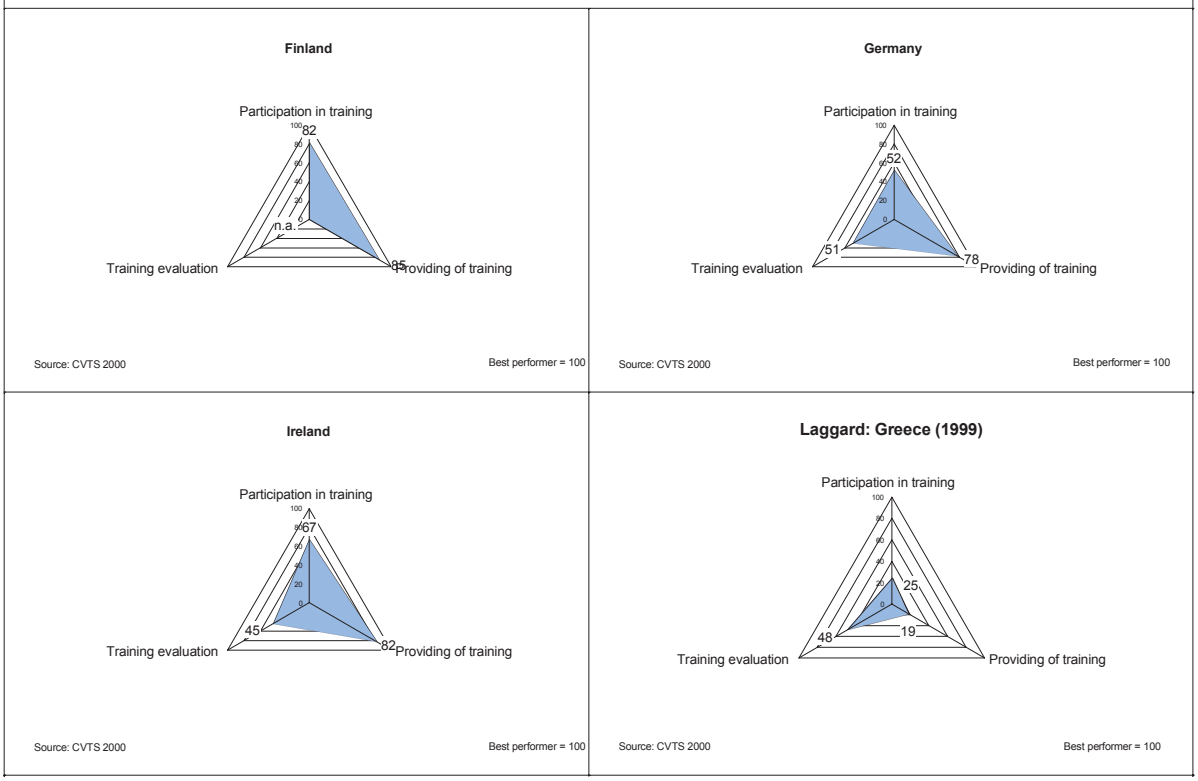


Source: *Werner Korte, Advancement of the knowledge society in the European Union (USA and Japan) – Comparative statistical data on the advancement of the knowledge society EUFORIA project report, empirica, 2003*

Figure 4: *Training indicators*

Comparing the 1993 and 1999 figures, it can be seen that training provision and participation among all employees have increased, but the provision/participation ratio itself remains constant, i.e. training provision and use has reached higher levels in ab solute terms but not in relation to each other.

The ratio is lower than the EU average in most new member states and candidate countries. However, training provision levels fall within the EU range. The Czech Republic even reaches upper EU provision and participation standards. In Romania, employee education is so exceptional that almost each training activity is evaluated and its usefulness controlled. Together with Romania, Luxembourg, Hungary, Portugal and Spain can be seen as the European frontrunners in training evaluation. Training provision and participation are among the highest in Finland, which ranks third in Europe. Germany and Ireland both score notably above the EU average mainly due to the high provision rate (Germany) and high provision and participation rate (Ireland).



Source: *Werner Korte, Advancement of the knowledge society in the European Union (USA and Japan) – Comparative statistical data on the advancement of the knowledge society, EUFORIA project report, empirica, 2003*

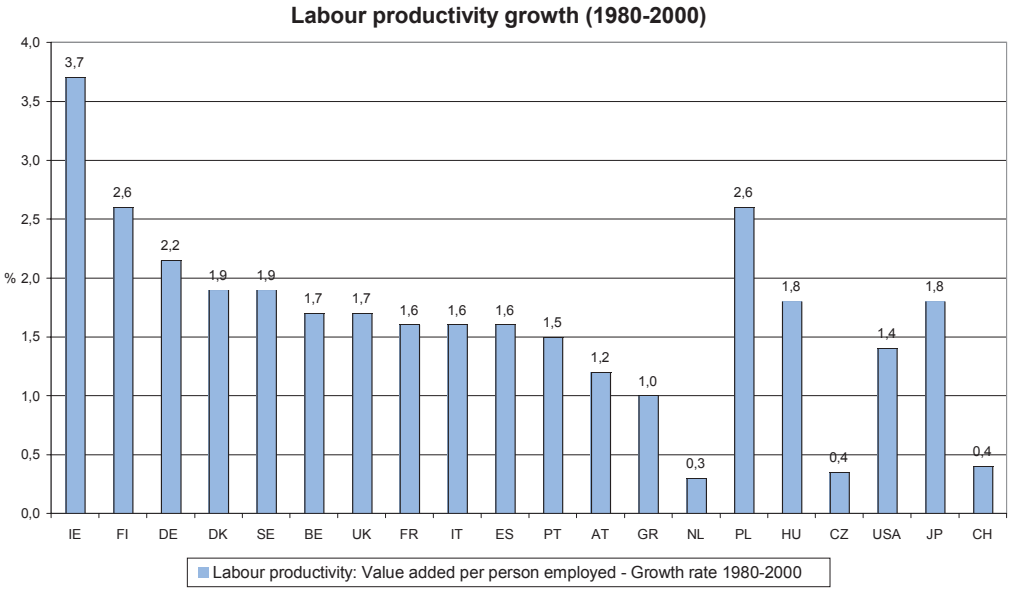
What about indicators that bear closely on the specific Irish concerns about FDI-driven growth? Empirica presents data on some relevant indicators, such as patent applications (where Germany takes the lead) and labour productivity growth, where Ireland's strong performance (Figure 5) is seen as being mainly due to significant capital inflows, since investments in R&D and patent applications are low. The latter suggests that there is little investment originated locally in innovation or appropriation of inventions, at least those that are captured in R&D and patent data – which are known to exclude many service activities. It is also notable that Ireland's scores on flexibility of working arrangements are rather low (Figure 6).

Empirica developed two indicators of flexibility, differentiating between company-centred flexibility (enabling companies to adapt their labour input to changes in the production process) and worker-centred flexibility (a working environment which is adaptable to the needs of the workers). One group of countries, including the UK and Ireland, score higher on the company-centred index than on the worker-centred index. Here, labour market flexibility seems to benefit mainly employers. The UK is well ahead of Ireland on this indicator, however. On the other hand, in countries like Austria, Italy and Luxembourg, flexibility seems to be more oriented in favour of workers. The Nordic countries and

the Netherlands stand out as scoring high on both indices, while Spain, Greece and Portugal are well below EU average levels of labour market flexibility and adaptability.

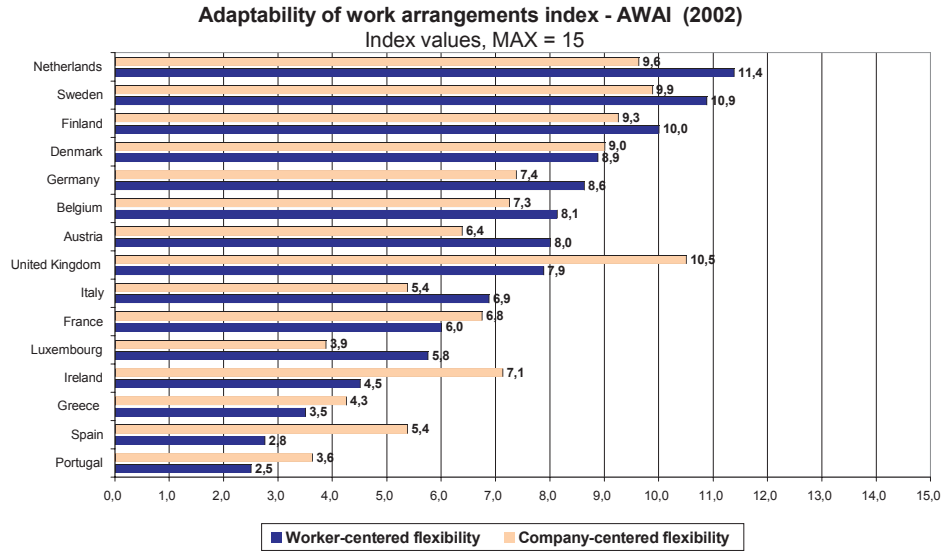
There are many more data available pertaining to the Irish situation, and some particularly revealing statistics are currently being released by Eurostat in its series Statistics in focus: Science and technology. Reports in this series look in detail at issues such as trade, value added, productivity growth, and high-skill employment in sectors like knowledge-intensive services and high-tech manufacturing and services. Such data could make a very useful contribution to the background information required for an Irish KSF.

Figure 5: *Data on labour productivity growth for EU15 countries*



Source: ILO KILM 2001-2002

Figure 6: *Data on labour flexible work arrangements for EU15 countries*



Source: Empirica 2002

Diagnosis of Irish situation

The results of an earlier workshop on Irish KSF have been outlined in section 2.1 above and do not need to be replicated here. Suffice to say that it is widely recognised that the growth pattern responsible for Ireland's remarkable economic performance over recent decades is thrown into question by geopolitical changes, especially the accession of new Member States into the EU, and the 'offshoring' of many activities to lower-wage regions of the world.

Benchmarking and other studies undertaken by the Economic and Social Research Institute (ESRI) have been used to provide more detailed analyses of current Irish circumstances and to forecast likely future developments. Such material should also be part of the background information fed into the KSF process.[11]

Other relevant information can be found in the earlier Irish Technology Foresight (TF) study.[12] In March 1998, the Minister for Science, Technology & Commerce requested the Irish Council for Science, Technology and Innovation (ICSTI) to develop and undertake a technology foresight exercise in Ireland. This would contribute to the National Development Plan (2000–2006) that was already being prepared. It reflected recognition that sustaining Irish economic growth in the future would require some strategic change, and since public finances were in a healthy state, there was more scope for investment and other action. The exercise was completed in 12 months, in order to maintain a high level of industry involvement and to provide timely results, even if this meant that some depth and detail would have to be sacrificed.

A time horizon of 15 years was adopted and eight sectoral panels established: chemicals and pharmaceuticals; information and communication technologies; natural resources; energy; materials and manufacturing processes; transport and logistics; health and life sciences; construction and infrastructure. Such a 'sectoral' orientation is typical of technology foresight programmes. The ICSTI task force that managed the programme comprised the chairpersons of the panels, and there was an effort to secure strong industrial participation in the exercise, since industry was seen as the main potential user of its results. Overall, the TF programme was well received and in 2000, the government established a technology foresight fund of approximately €700 million[13], to be administered by a new organisation called Science Foundation Ireland. The aim of this fund is to develop world-class research capabilities in niche areas of biotechnology and information and communication technologies. Government departments utilising the findings include the Department of Public Enterprise and the Department of Agriculture and Food.

[11] For example, J. Fitzgerald, 2004, ***Prospects for Irish Economy: 2004–2010***.

[12] These paragraphs are based on the discussion in H. Acheson et al, 2002, *Practical guide to regional foresight in Ireland*.

[13] Part of €2.5 billion investment in the National Development Plan, aimed at research, technology and innovation activities.

Cross-national workshops

EUFORIA conducted a cross-national workshop, which discussed the drivers and implications of KS, and which was able to identify a range of common issues that could subsequently be taken up in national studies.[14] It provided a qualitative analysis which complemented the quantitative indicators' analysis, and acted as an early dissemination event that explored the notion of KSF. The workshop involved participants who wished to identify and analyse drivers of change and important factors influencing the KS, and featured a discussion and systematisation of the implications of these drivers (focusing on the Foundation's three primary areas of concern). The structured process yielded results in the form of lists of factors and topics, as well as suggestions regarding issues that should be examined. Methods used in the workshop encouraged participants to share knowledge, by using alternative ways of presenting and absorbing inputs. Overall, the workshop gave participants an insight into how methods applied in foresight studies can be used to better understand interrelationships between different elements of the KS.

A number of difficulties were encountered, however. The meeting was logistically difficult (accommodating a large number of people in a flexible manner) and linguistically difficult (it was conducted in English since support for multiple languages would have been too expensive). Mixing a dissemination event with a workshop also proved confusing to some participants.

Is there a role for a cross-national workshop in the context of an Irish KSF? In a sense, the 2004 Presidency conference on foresight (significantly entitled 'Foresight for Innovation') could be seen as a basic cross-national workshop. It was organised in a highly interactive fashion, with participants sharing experiences from their own countries. The subgroups on 'Sustainable Spatial Development', 'the Learning Society' and 'Entrepreneurial and Innovative Economy' clearly reflect the sorts of topics prioritised by Irish policymakers concerned with KSF, moving on from those discussed in the EUFORIA workshop. A case could be made for further cross-national work. The Irish KSF exercise could be coordinated with other new exercises in European countries. The advent of the new Member States changes the situation considerably, compared to that addressed in the EUFORIA workshop. For example, some of these Member States are likely to be competing with Ireland in terms of seeking direct foreign investment for economic growth. Also, there are some European countries that are likely to have more in common with the Irish Republic than the three featured in EUFORIA (i.e. Finland, Germany, Greece). A cross-national workshop could be designed to allow several countries to interrogate the results derived from the sorts of indicators outlined above: benchmarking could be enhanced by allowing for such cross-national dialogue. The ForSociety network is the obvious place to explore such possibilities at a governmental level. It engages the managers of national foresight programmes and is intended to support cross-national activities.

[14] A detailed account of the conference and summary of presentations is provided in: T. Kauppinen, 2002, *European Knowledge Society Foresight: The missing link between technology foresight and the Lisbon objective?*, Dublin, Foundation Conference Report (mimeo). The workshop methods are described in chapter 12 of that report, by I. Miles and R. Popper: 'Important trends, drivers and impacts of the knowledge society: The Euforia cross-national workshop results'.

National workshops

This section provides a brief overview of the procedure followed by EUFORIA in setting up a national workshop; possible directions for Irish workshops are subsequently discussed.

EUFORIA workshops

In EUFORIA, each national team drew up a list of experts to invite to the workshops, to achieve a balance between foresight researchers, academics, policymakers, and representatives of employees and employer organisations. The target was to gather about 15–20 experts covering all the fields of interest (industrial relations, working and living conditions). Documents describing the exercise, explaining the concept of the knowledge society and introducing the indicator data were distributed to the participants several days before the workshop.

The first workshop

This workshop aimed to provide national perspectives on drivers of the KS relating to living conditions, working conditions and industrial relations. It also provided a list of recommended topics for inclusion in the Delphi survey. The precise methods employed were defined by the national teams, according to local circumstances and logistic issues. It was proposed that methods such as STEEPV analysis should be employed to assess drivers and that teams draw on the results of the cross-national workshop and early indicator reports. The discussions involved activities such as brainstorming, formulating ideas, grouping them, and identifying their level importance.

The workshop began with a brief presentation of general concepts and terminology that should be agreed among the participants before any real discussion was initiated. A discussion of major trends for the EU and the particular country followed, and resulted in a list of trends and their impacts. The participants were presented with Delphi examples and general rules concerning the formulation of Delphi statements, and were asked to suggest topics for Delphi statements appropriate to KSF. EUFORIA participants were requested to draw up three to five Delphi statements focusing on their own country. These inputs went into the preparation of Delphi statements by the coordinators.

Following the workshop, results and an evaluation form about the workshop were sent to participants. The results included a revised theoretical framework, the trend analyses and the Delphi statements (Greek and European). Comments were requested from participants and from individuals who had not attended due to last-minute commitments.

The second workshop

The second workshop was essentially a scenario workshop. Such an activity can provide an important contribution to foresight, though many national TF programmes have made little use of scenarios (with the exception of the Canadian and Norwegian exercises of recent years.) In contrast, scenario techniques have been widely used for investigating specific issues (for examples, see documents on the Foundation's EMCC website, where sectoral scenario studies are described in some detail[15]).

Scenarios as used in foresight can be defined as 'visions of future possibilities' that:

- have been derived and presented in a fairly systematic way;
- provide a more holistic view of the particular circumstances than is given by a simple profile of the future in terms of one or two key variables; a more comprehensive picture should indicate, or at least imply, how many parameters and features are linked together.

[15] See **http://www.emcc.eurofound.eu.int/sector_futures.htm**. For more general reviews of scenario activities, see I. Miles, 2003, **Scenario Planning**, pp. 69–98, in 'Foresight methodologies: Training module 2', Vienna, UNIDO V.03-87775.

An initial framework was provided to the national teams, proposing that all teams begin by presenting the three following basic scenarios to their workshops for elaboration:

- 'best guess' scenario – a vision of the future that assumes that a generally positive trend persists; it is the 'official future' aimed at by the political mainstream and achieved without substantial structural change;
- 'hard times' scenario – where the problems and contradictions of the above model come to the fore, where business as usual results in a declining competitiveness and/or cohesion;
- 'structurally different' scenario – a vision where a KS marks a paradigm change and is thus accompanied by substantial restructuring of socioeconomic relations; this tends to be more of an aspirational future.

Before the workshop, the national teams fleshed out these archetypal models, drawing on existing scenarios or debates for their countries. Each workshop was presented with the scenarios, which were then discussed. Later, the workshop moved on to the more detailed work of elaborating detailed scenarios.

At this point, the workshop was split into three groups, each of which was given the task of elaborating on one of the three scenarios, with particular emphasis on:

- signposts that would indicate movement towards the particular scenario, for example, headlines in the media or trends and events that would make the scenario most likely to happen (a useful mini-exercise is to generate a name or headline for the scenario itself);
- how the signposts, events and trends fit into the various features listed in the framework set out below;
- likely reactions and strategies of major stakeholders. What policies and social innovations might help people cope with or avert negative aspects of the scenarios and maximise positive aspects, if any.

The workshop then moved on to an analysis of the scenarios within a common tabular framework.

The different EUFORIA national workshops developed different approaches. Even so, these only reflected a fraction of the range of different styles of scenario workshop that can be implemented.

Germany followed a more or less 'normative' approach. After the project team had generated the three framework scenarios, the workshop chose to focus on what they believed to be the most desirable future, examining how this might be achieved within a single global context. This is a common practice in some types of foresight study, and can be very effective for formulating plans of action. Since it was anticipated that such an option might be chosen in some countries, it was suggested that in such a case the workshop would need to be split into subgroups working on specific elements of the aspirational scenario – e.g. its living conditions, working conditions, and industrial relations. Finland and Greece both developed three scenarios as proposed, but varied in the extent to which they took assessments of the evolving global context into account. The Greek scenarios considered alternative paths of world development and were able to draw on a national foresight programme to facilitate this. Finland did not consider such alternative paths in any explicit way.

Irish workshop possibilities

Workshops would certainly be useful in the Irish context, both for the assessment of indicators, trends and drivers, and for scenario analysis. There are many options for conducting scenario analyses in workshops. Three broad types of scenario work may be differentiated, namely:

- exploratory methods (to borrow the standard terminology from futures and forecasting studies – another term could be 'outer-directed scenarios'). These essentially involve starting from the present and posing 'what if' questions: What if the growth rate is x% or y%? What if events W or Z happen? What if one or the other strategy is pursued?;
- normative methods (again the standard terminology from futures and forecasting studies – another label could be 'inner-directed scenarios', since it can be argued that all scenario work will have some normative content). These involve starting from a point in the future, and asking 'how' questions: How could a future be reached where the parameter of interest is x% greater than its current value? How did we reach situation Y?;
- guided methods (a term recently introduced to cover a range of approaches that fall between the classical exploratory and normative methods[16]). These methods provide participants in a scenario workshop with a brief overview of a number of 'starter' scenarios, generated in some systematic way to capture (or be liable to capture) major issues confronting the area in question and/or the sponsoring organisation. Scenario development is then initiated from these 'starters', elaborating them into plausible and useful scenarios.

There are many ways to produce and use scenarios in workshops. In exploratory approaches, scenarios are often generated from scratch in a workshop. This could be accomplished through, for example, brainstorming of important 'what if' considerations, or voting on the top three or four considerations to adopt (from a previously prepared list). However, it is most common to use an approach that is structured by first undertaking an analysis of important drivers and topics in the group, followed by further group work to select a set of distinctive scenarios to explore, on the basis of these drivers and topics.

The stages involved in this process are as follows:

1. The workshop examines drivers seen as significant for the particular topic, i.e. trends, processes or events that are perceived as possible elements of the future, which could substantially shape developments in the field.
2. The main drivers are selected or prioritised, for example, by a rating or voting process, in which participants evaluate a list of drivers that has been generated in its discussion. Often, the drivers are rated in terms of their importance (potential degree of effect) and their uncertainty (an ambiguous term in practice, since it could either mean how uncertain developments in the driver are or how uncertain the implications of these developments are for the topic in question).
3. The most important and uncertain drivers are then chosen, and an effort is made to elaborate on a small set of scenarios that captures variations of development of these drivers. (Often, there are far too many interesting scenario possibilities to work with effectively. Selection may be based on a subgroup analysis, which could combine several scenarios.)

[16] See I. Miles, L. Green, R. Popper, 2004, *Scenario methodology for foresight in the European research area*, PREST report (D4.2) for FISTERA project, available at: **http://fistera.jrc.es/**. The discussion of exploratory and guided approaches that follows, partly relates to this text.

Often, this approach can be very time-consuming, and there can be confusion and contention in the selection of drivers and scenarios. Other, more guided approaches to multiple scenario analysis in workshops have, therefore, often been used. Some futures organisations, such as the Global Business Network[17] or the Institute for Alternative Futures (IAF)[18], operate by means of 'archetypal' scenarios.

The IAF runs workshops using four 'scenario archetypes', designed to capture a wide range of plausible future conditions. They are a:

- positive 'extrapolative' scenario;
- problem-plagued 'hard times' scenario;
- structurally different scenario – usually one that portrays a 'different kind of progress';
- scenario that imagines 'best feasible' possibilities.

These scenarios are outlined prior to the workshop, and the participants are invited to develop them (typically in subgroups). A similar workshop process can be used with different sets of 'starter' scenarios. These may be 'off the shelf' scenarios prepared in other work, or scenarios tailored to the particular organisation involved.

Multiple scenario analysis helps to deepen understanding of the possibilities and to assess the robustness of strategies. In contrast, the most common sort of normative approach focuses on one particular scenario – an 'aspirational' or 'success scenario'. This approach focuses on creating a positive vision, around which identification and analysis of relevant policies and actions can be generated. The two main elements of a success scenario are its:

- desirability – the scenario captures a vision of what could be achieved or aspired to by the sponsoring organisation or the wider community that it represents;
- credibility – the scenario is developed with the assistance of, and validated by, a sample of experts in the area, chosen to reflect a broad range of interests (and usually including both practitioners and researchers).

There are many possible implementations of such approaches, but two rather different models are outlined below, based on the guided and normative methods.

Option 1: Exploratory/guided multiple scenario analysis

This could follow the EUFORIA approach, in terms of having two workshops, the first being a more diagnostic workshop, the second a more prognostic and prescriptive one, focusing on the scenario analysis. However, the issues to be considered will need to be structured to suit Irish requirements. The ideas outlined below provide an example of how this might be achieved: detailed design would be best accomplished by an Irish team.

Each workshop would last at least one day, possibly a day-and-a-half. It is liable to involve several dozen participants, with 'break-out groups' of about six to 12 people exploring different scenarios in detail. The workshop would be conducted with inputs from at least one facilitator, while other facilitators could take notes, record material from flip

[17] See for example, J. Ogilvy and P. Schwartz, (originally written in 1998), Plotting your scenarios; and also P. Leyden, 2004, ***Scenarios come to Davos: A GBN conversation with Ged Davis***. The latter is an interesting interview, not least because Davis stresses the need to know what problems are being confronted before embarking on scenario exercises (see pp. 7–8).

[18] See The future belongs to those who…A guide for thinking about the future

charts, and deal with logistic issues as they arise. Typically, such facilitators would have acquired their skills through involvement in these and similar group activities; they may have received some training in workshop methods (from T-groups through management workshops to academic seminars), even though to date there has been little analysis of the processes in terms of knowledge development, and the skills are typically the 'task' and 'emotional' skills of classic group-work.

The first workshop could address issues such as:

- Ireland as a KS – what are the main features of a KS? Are there any particular features of an Irish KS to bear in mind?;
- what are the factors driving Irish development towards a KS? How can the indicator data be interpreted? (A list of major drivers could be prepared in advance for validation and elaboration);
- what are the particular SWOT circumstances for Ireland? A group SWOT exercise could be undertaken, using a structured SWOT framework and brainstorming (again, this might be accelerated by having an initial SWOT prepared in advance).

The second workshop would be scenario-focused. The approach adopted in EUFORIA (which drew heavily on the IAF model) is probably a good starting point. The specific topics that would be addressed are likely to be different, and it is possible that greater emphasis would be placed on the global context, on strategies of transnational corporations (TNCs), etc. It is also probable that the EUFORIA/Foundation themes of living conditions, working conditions and industrial relations would be replaced by other themes more directly relevant to the sponsor's policy concerns. If a tailored set of starter scenarios is adopted in place of the IAF's framework scenarios, a preliminary set of suggested scenarios relevant in the Irish context could be as follows:

(a) Ireland continues to prosper as a result of FDI.

(b) Irish prosperity is built, to a much greater extent, on endogenous entrepreneurial development.

(c) An Irish KS is based on new paths of development related to specific strengths of Irish culture.

(d) A problematic route to the KS results from a failure to adopt a new paradigm of growth and development.

The workshop would be expected to elaborate on these scenarios in more depth, and to identify key areas of uncertainty, indicators of change in one or other direction, and priorities for action and policy. It would result in a report that could be circulated among decision-makers and a wider audience – though the bigger impact would undoubtedly be on participants in the workshops, who should have gained a thorough understanding of the factors underlying the scenarios and the implications for their policy domains.

Option 2 A normative/ 'success scenario' approach

Alternatively, or following a multiple scenario approach, it might be valuable to undertake a 'success scenario' workshop. Such workshops have been used in developing policies in the UK, for example, for the IT, genomics and nanotechnology fields. In the case of such workshops, it is vital to include the participation of key stakeholders, including those responsible for the main policy areas being addressed.

There are a number of functions involved in developing success scenarios:

- The process of discussing research results, debating and agreeing upon goals and indicators, and identifying feasible actions is valuable for creating mutual understanding and sharing of knowledge. This can establish platforms for further interaction and efforts to put in place the actions proposed.

- The scenario forms a 'stretch target' to challenge those concerned to aim for excellence, to think beyond the boundaries of 'business as usual'.
- The development of indicators moves the scenario beyond vague aspirations and allows for clarity regarding what precisely is being discussed and whether and how far goals are being achieved.
- Finally, action points are developed and priorities may be established, with the advantage of being derived from a participative process.

Again, the key technique is to crystallise thinking about factors within different subgroups, in the form of lists (underpinned by discussions and background analyses). The background information, participants' knowledge and their conceptual frameworks are brought together in ways that challenge them to develop shared understandings. There are various ways in which this could be implemented, but one model for the steps in the workshop could be as follows:

1. Introductory matters are addressed, e.g. setting out the mission statement for the exercise, introducing participants, etc.
2. A common starting point in scenario workshops, used in the model described here, is to examine 'drivers and shapers' – factors that could be critical to influencing the course of events, promoting one or other sort of development, and leading to distinctive futures. Here, inputs can be used that are gathered from desk work and online analyses, perhaps grouped in a STEEPV framework, in which people are asked to identify factors and issues under the headings social, technological, economic, environmental, political, and value-based factors. This can act as a useful prompt, ensuring that a broad range of issues is considered. It also provides a helpful classification framework. Nevertheless, the workshop may be provided with an alternative classification, or be asked to come up with a group of 'shaping' factors at an early stage in its work.

   The discussion would, at least in part, be conducted in subgroups, formed to deal with specific aspects of KS (for instance, education, innovation, knowledge communities). The subgroups would be requested to work systematically through a range of factors that are liable to drive and shape the development of their part of the KS domain. They could be provided with lists of potential factors as part of the background material and asked to critique these factors, add new ones if appropriate, and especially to indicate how important each might be, and why. Each subgroup would be asked for a set of 'top' drivers in its field of interest.

   The discussion of drivers is inherently interesting. Its output can provide useful decision-making information, help assess the viability of scenarios, and position the success scenario. However, the process itself is equally important. Participants should become more familiar with working with the background material and working together. They should deepen their understanding (and possibly critique) of the material, as ideas are shared, and conceptual frameworks are aired. They should develop common ground rules for working, language in which to express ideas, etc.
3. A plenary session allows for the presentation of key drivers and for some form of voting on drivers that are most critical for the development of KS in Ireland overall. It may be helpful to go a step further, by looking at these most important drivers and shapers, and asking how uncertain the development and/or impact of this driver is liable to be.[19] Or, to what extent is this driver something that people have to live with, to what extent is it something that can be altered by policy interventions (and if so, at what policy level)? It can be insightful to plot 'importance' against 'uncertainty' and/or 'malleability'. It gives a view of whether the most critical drivers are ones that are liable to be transformed by our choices or by unknown factors.

[19] 'Uncertainty' as commonly used in these workshops often combines the two elements: uncertainty about how the driver may develop, uncertainty about what the 'impact' of a particular course of development might be.

4. The success scenario approach involves asking a plenary session of the workshop to consider what might be realistically achieved if Ireland is to be a successful KS. Just what does success mean? Is it solely a matter of competitiveness (for example, in attracting investment, in domestic production), or does it involve other elements of KS (quality and volume of job generation, work-life balance issues, social cohesion, etc)? The big challenge here is to work towards some level of consensus from which the workshop can proceed to break-out groups, in which different elements of this aggregate vision can be examined in more depth.

5. Working groups dealing with specific subtopics should elaborate on the meaning of this success in their areas. They would be asked to develop and characterise their segment of the success scenario; to succinctly describe it in terms of what success looks like in this area, what the main drivers and shapers are and how they might be called into play. A number of scripted prompts will be provided to the groups, suggesting, in a generic way, elements of the scenarios that it would be helpful to describe. The Handbook of Knowledge Society Foresight provides one template for the instructions that can be used in such a workshop, in this and other sessions.[20] These subjects form the basis of brief presentations to a plenary session. This provides an opportunity to contrast the different groups' scenarios and to see if they are consistent or divergent and what this implies.

6. The working groups will be asked to further characterise the success scenario by specifying concrete ideas about how to recognise if the success scenario becomes a reality. Again, some preliminary ideas of the sorts of indicator that might be developed are provided to initiate the work. The groups are challenged to suggest plausible quantitative estimates of such indicators, to clarify points of agreement and disagreement, to provide tools for monitoring progress, and to suggest alternatives to the narrow set of indicators that are typically used to drive policies.

7. The final working group task will be to provide suggestions for steps that need to be taken to maximise the likelihood of the success scenarios. One useful approach here is to use what was originally called a 'carousel method', where stations are set up with wall posters dealing with specific types of action, typically different policy areas. (Recent work in Latin America has suggested that this technique is given the evocative name of the 'samba method'.)

A broad categorisation of topics used in the UK workshops (technology-oriented) entails:

- research;
- people;
- facilities;
- finance and taxation;
- access to technology (and international collaboration);
- regulatory issues;
- other issues.

In the carousel/samba method, each group proceeds around the posters in turn, but starting at a separate point. Members of the group are allowed to read and comment on other groups' suggestions when visiting a station that another group has previously visited. An alternative approach is to form new working groups, dedicated to specific action areas. It is possible to envisage other ways in which this task may be organised. As well as specifying actions, participants are asked to indicate who might be responsible for seeing them through.

[20] Another template is provided in: I. Miles, L. Green, R. Popper, 2004, *Scenario methodology for foresight in the European research area* (see footnote 17).

The outputs of this phase of work need to be synthesised and prioritised, and plenary sessions are typically used to achieve this. Subgroups can relate back to a final plenary what they believe the key actions and targets should be. The plenary can be asked to discuss and vote on these.

Computer Support

The EUFORIA workshops were largely conducted using pencil-and-paper tools, wall posters and whiteboards, to supplement discussion within workshops. However, there is also considerable scope for using decision-support IT tools in such workshops. Computer-based systems now allow for the capturing of content and can enhance face-to-face meetings (as long as used sensitively, rather than overwhelmingly). For instance, recent scenario workshops for the FISTERA (Foresight on information society technologies in the European research area) project successfully combined online Delphi and face-to-face group work in the same meeting.[21] Since there may be scope for using such methods in Irish KSF, these are briefly discussed below.

Interactive discussion is a vital tool for learning, for raising awareness and for allowing synthesis of different viewpoints. Nevertheless, there is a danger that this can lead to the views of less vocal participants being marginalised. Also, many ideas may be lost and put to one side in order to channel discussion down the path that led to the groups achieving their objectives. Thus, a challenge for the design of the workshop is combining opportunities for brainstorming and capturing individual beliefs, with periods of interactive discussion in small groups and plenaries. One virtue of such tools is that they can hasten the task of preparing a report on the workshop that faithfully reflects the range of views expressed. The main danger is that in inexperienced hands, the technology can dominate. Computer interaction can displace interaction with other people, and most learning is likely to happen with the latter. The event needs to be designed so that the two activities can complement each other.

The FISTERA workshop mentioned above took place in a large long room, which was divided into two sections. One section – the people zone – could be used for plenary work and smaller group discussion. It featured four tables around which participants could sit and talk in small groups. By turning their chairs around, they could take part in a more collective discussion. The other part of the room – the information zone – was organised with a series of benches at which individuals could work and input material using networked PCs. The groupware used for the workshop was a web-based system, Surveylet XP, produced by Calibrum Corporation, which allows for activities like brainstorming, Delphi surveys, and online voting.

Both sections of the room had video projectors that were used to display material from laptop PCs. The small groups were aided by facilitators, with instructions presented verbally and with the use of powerpoint displays by the overall coordinator. Instructions were also reproduced on paper and handed out to participants. Appropriate tasks and formats for the workshop had thus been produced in advance, though some new tasks and modifications were introduced during the workshop.

There are other ways in which IT support can be utilised. In one recent workshop, a single zone was set up in which participants sat around a set of tables with their own laptop PC. This can also work effectively, although the situation may arise that someone is looking more at the screen than at their colleagues. In another case, subgroups conducted their work on PCs in a number of separate rooms and returned to sit around a single large table in plenaries.

If IT tools are not available, it is helpful to maintain a high level of interaction and to record discussions by regularly assessing the views of participants (e.g. by asking for votes or expressions of opinion). This can partly be accomplished using the time-honoured tools of flip-charts, wall posters, and post-it stickers.

[21] See I. Miles, R. Popper, L. Green, 2004, ***Exploring emerging applications: Report of the FISTERA trends, drivers & challenges workshop*** (workshop held on 16/17 June 2004, Seville, Spain), PREST report for FISTERA project.

Delphi approaches in an Irish KSF study

Why Delphi?

Delphi studies involve surveying expert opinion. The survey is designed to relay information back to respondents, in contrast to most opinion polls; this information is circulated to the same set of respondents at least twice (sometimes more in the original studies). Respondents in later rounds are not only asked to answer the same set of questions again, but also receive feedback on the structure of responses in previous rounds. They should be able to look at the pattern of results, i.e. how many people replied in each possible way to a given question. Ideally, they should receive additional information on why judgements, especially extreme judgements, were made. The rationale for Delphi studies is several-fold:

- The core idea is that experts are liable to make better-informed judgements when they can compare their own views with those of others.
- An anonymous survey should be less restricted by the influence of dominant voices and reluctance to disagree with authority than a conventional face-to-face meeting.
- The distribution of replies should enable all respondents to have access to special information that only a few possess, especially when these underpin judgements that diverge from the average.
- A Delphi survey typically allows for much greater outreach than a conventional meeting, enabling inputs from a huge range of experts.
- Well-formulated Delphi statements allow for more precise comparison of views and assessment of their relevance for forecasts than the more vague, qualitative statements that typically emerge from open-ended discussion and workshops.

Delphi studies can be organised in numerous different ways, with practically any topic being studied. The core feature of a Delphi study is that the survey questionnaire is reissued. After a first round of questioning it is returned with feedback to the original respondents, who are then able to revise their answers in light of this information. The process may be further reiterated, with second and even third round results being relayed back to respondents.

Ideally, Delphi studies will do more than just feed back quantitative information to respondents. They will also allow for some open-ended input of material, which may also be relayed back to enlighten respondents about reasons for specific responses, other categories of response that might be included, and so on. Often the formulation of topic statements for a Delphi study may be constructed from an earlier sounding of respondents' views regarding important topics to investigate.

Delphi studies have traditionally been administered by 'post, pen and paper' methods, but increasingly it is proving practicable to use online surveying. This approach has been pursued successfully in projects such as EUFORIA and FISTERA, both of which have demonstrated the importance of having local groups mobilising responses in their own countries. Occasionally, in earlier studies, the survey has been administered in the course of a workshop of some form; the online method can also be used in this context, with rapid feedback permitting a second round to be undertaken on the spot. In FISTERA, for example, the online survey was launched in a workshop, which provided a useful test bed, leading to some detailed revision of a number of questions in the survey. Since the Delphi study was also being used with a much larger and dispersed sample, over a period of several weeks, a second round was not attempted in the workshop, though the participants' first round responses were presented to them for comment and to inform the workshop process.

The next section outlines a number of illustrative examples of the types of topics that might be addressed in an Irish KSF study, and the ways in which they might be handled. The commentary will describe what some of the design choices are,

and why specific options might be chosen in relation to particular objectives for the study. If a Delphi study is to be undertaken, it will be helpful to build support for it, for example, by illustrating what the technique has been able to bring to earlier TF exercises. Designers must also be prepared to deal with several common misapprehensions in relation to Delphi, i.e. that it is always seeking consensus, that it is always a matter of forecasting, that one is seeking the same kind of statistical representativeness as in an opinion poll.

A common feature of any Delphi is the need for care in locating and mobilising relevant expertise. The most impressive quantitative results, displayed using the most striking charts and graphs, are worth nothing if the opinions and information do not come from the appropriate sources of knowledge. It is important therefore to define who the experts are that need to be sampled and, especially when they are few in number, to motivate them to participate in the survey. Often this is best accomplished by personal contact from an esteemed source. Locating the appropriate experts may entail, for instance, contacting a few known authorities and relevant associations and communities, and asking for their recommendations about who to contact.

The following are a number of options that can be used for Delphi studies.

Delphi Example 1: EUFORIA survey format, unmodified

Comment

This approach involved the use of KSF-relevant questions designed for the EUFORIA survey and described in detail in documents on the Foundation's website. This Delphi study was generated largely on the basis of inputs from workshops and other soundings undertaken by the Finnish, German and Greek teams in EUFORIA. In addition to the common survey questions, each country was allowed to insert a few country-specific questions into the set administered to its experts.

Main question

Topics were presented in terms of an existing state of affairs, such as: 'The balance between immigration and emigration in the EU15 causes the percentage of non-EU15 immigrant workers to more than double by 2015'; and 'Widespread use of ICT in e-governance enhances transparency in the procedures concerning the relationship between the citizen and the state in my country'. A complete set of the common questions is reproduced in the Table 2.

For each topic statement, the respondents were asked about the likelihood or extent of the development actually applying in the year 2015. This contrasts with a common form of Delphi, in which respondents are asked to specify the period by which the topic would be realised, if at all, since the option of 'never' is also included. This common approach reflects the fact that Delphi studies are often used to get a timeline of prospective future developments of different technologies and applications. The reason for the date-bound approach of the Delphi adopted in EUFORIA was that the study team desired a comparative view of how far different countries might have progressed in terms of KS developments, and of their implications for the Lisbon objectives at a point somewhat after the Lisbon target date of 2010.

Respondents were thus asked to specify whether each topic statement:

- underestimates the situation in 2015;
- is about right for 2015;
- overestimates the situation in 2015;
- does not reflect developments the will follow.

The option was also provided of answering 'I don't know/too uncertain', with the explanation that this means that the respondent has no opinion to express.

Impacts

An additional task was included, whereby respondents were asked to rate the influence of the development represented by the topic statement, assuming that it did materialise, on the following set of factors (which corresponded to Lisbon objectives and other EU goals):

- social cohesion;
- social exclusion or divides;
- sustainability/environmental quality;
- employer-employee relations;
- economic growth/wealth creation;
- entrepreneurship and innovativeness;
- employee exercise of autonomy and responsibility at work;
- work-life balance;
- job creation.

Advantages and disadvantages of this approach

This approach provides an assessment of a 'most likely' future. It does not necessarily give a direct indication of changes required to achieve a more desirable future. Nevertheless, by illustrating which KS developments are felt to be most likely achievable by 2015, and which ones are not, insight can be gained regarding where policy intervention might be required. It should be noted that the impact factors are based on the European Foundation interests for the three-country study, which may not correspond to the issues of most importance to an Irish team.

Table 2: *EUFORIA Delphi topics and topic groups*

	Governance and mobility
1.	The balance between immigration and emigration in the EU15 causes the percentage of non-EU15 immigrant workers to more than double by 2015 .
2.	Widespread use of ICT in e -governance enhances transparency in the procedures concerning the relationship between the citizen and the state in my country.
3.	Labour relations organisations (e.g. trade union and other representative bodies) will have a major influence on government and business in shaping the knowledge society in my country.
4.	New technologies and knowledge management methods greatly strengthen the ability of governments and organisations to engage in widespread social control in my country.
5.	Regulatory authorities take steps to ensure that users are confident that world-wide communication networks are secure against practically all conceivable emergencies.
6.	EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions and employer organisations.
	Health and privacy
7.	Concerns about possible health effects of low-level, long -term exposure to physiologically and psychologically active chemicals, microwave radiation and products of genetic engineering have debilitating influences on major industries.
8.	Social and political movements concerned with civil liberties have a major influence on government and business.

Table 2: *EUFORIA Delphi topics and topic groups (cont.)*

9. Widespread use of telemedicine and on line health monitoring systems increases the ability of people with serious chronic and age-related diseases to maintain their independence.
10. Practical use of DNA screening to test a person's suitability for work, education and health insurance creates new forms of ('genetic') inequality and dis crimination in my country.
11. Everyone in my country is compelled (at birth or entry) to provide blood or tissue for depositing in a national 'genetic fingerprint' databank to support health, criminal justice, and other systems.

Industrial relations

12. New forms of networked business organisation, that were unknown or very rare at the turn of the century, will now account for a substantial level of economic activity in my country.
13. A major increase occurs in my country in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work.
14. A majority of the workplaces in my country, in which collective agreements were in place at the turn of the century, are covered by individually agreed employment contracts.
15. Trade unions have become more important in my country, responding to new work arrangements, offering networked membership, new types of social security and other services to their members.
16. Large organisations in my countr y have widely introduced new, innovative and systematic models for employee participation in decision-making relating to working practices and capital investment.

Living conditions

17. A practical emphasis on ethics, justice and equity, increases in worki ng life, and strongly influences the development of business and conduct of professions in my country.
18. Harmonisation of educational standards (including certification) across the EU increases trust and transparency in my country's educational system.
19. Widespread concerns are expressed in my country about social isolation and loneliness, associated with increased reliance on ICT in working and everyday life.
20. Life-long learning becomes widespread with a majority of workers undertaking more than one period of substantial retraining during their working life.
21. Despite social and employment policy interventions, for most workers their work-life balance deteriorates causing rising family stress and conflict.

Sustainability and development

22. The widespread use of e-commerce removes obstacles to accessing products, services and employment in the peripheral regions in my country, increasing their competitiveness and stemming depopulation.
23. New European styles of busin ess management emerge to rival the American model of economic and business management.
24. Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies.
25. Increases in wealth creation and quality of life are achieved using proportionally less energy and natural resources than at present.
26. EU enlargement shifts economic resources towards accession and possible pre-accession countries, diminishing disposable income in the EU15 and creating the condi tions for persistent unemployment of at least 10% across the EU15.

Working conditions

27. Social and policy changes in my country encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities.
28. Widespread growth of a '24-hour' society in my country leads to a doubling in the amount of unsocial working time.
29. Widespread self-employment reduces reliance on conventional forms of employment in my country.
30. Widespread abandonment of conventional notions of retirement in my country enable the elderly to continue working if they wish to.
31. New organisational procedures and systems that turn firms and other organisations into 'learning organisations' have been widely adopted, and not just by a small vanguard, in my country.

Delphi Example 2: EUFORIA survey format, modified in terms of impacts, in order to correspond to specific Irish interests

Main topic statements

It would be possible to maintain the same topic statements as in example 1 above, since most if not all of the topics are of general interest in terms of KS development. It would also be possible to add a small number of questions specifically relevant to Ireland, concerning developments likely by 2015. This would be in line with the practice in other countries. Alternatively, more effort to develop Ireland-specific questions could be made.

Some examples of topic statements, based on earlier discussions with Irish participants in EUFORIA meetings, are as follows:

- Ireland has retained the reputation of being a 'Celtic tiger' in terms of foreign investment-led growth.
- The notion of Ireland as a 'Celtic tiger' has undergone considerable modification; economic development is dynamic, but is now driven far more by endogenous activity than by foreign investment.
- Recognition of the importance of investment in R&D is widespread in Ireland, where the Lisbon target that 3% of GNP should go into this activity is easily exceeded.
- In 2015, Ireland is able to attract sufficient FDI to support continuing growth in its share of the European information technology industries.

Of course, it would be possible to gain a greater insight using the EUFORIA Delphi design, and some thoughts on options here are set out below.

Impacts

One option is to retain the set of impacts used in the EUFORIA Delphi study. Alternatively, the set of impact dimensions could be modified, to take account of specific interests of an Irish team. This might mean retaining some topics that are particularly relevant to the Irish case, such as (speculatively):

- economic growth/wealth creation;
- entrepreneurship and innovativeness;
- job creation.

However, some 'new' impact statements could be used in place of those in EUFORIA, dealing with local concerns such as:

- the economic performance of small- and medium-sized enterprises;
- requirements for higher levels of skills at work;
- necessity for (or importance of) Government policies to stimulate local innovation;
- opportunities for 'lagging' regions to catch up with 'leaders'.

Advantages and disadvantages of this approach

Again, this approach provides an assessment of a 'most likely' future. It does not necessarily tell us about the changes required to get to a more desirable future, though it can be used to identify areas where action is necessary.

Delphi Example 3: A policy Delphi

Policy Delphis place much more emphasis on 'how' particular outcomes are reached. In contrast, 'decision Delphis' are much more about prioritising particular immediate actions.[22]

General Approach

One use of a policy Delphi would be as part of an attempt to identify critical objectives for Ireland. For example, there could be a number of alternative visions of the future, and respondents might be asked to select among and/or combine these. An approach that requires rather more consensus about a desirable future to be assumed would begin with a brief 'vision statement' of what the goals are for Ireland's future.

Vision statement

This sort of Delphi study begins with a brief statement or set of statements about what the goals are for Ireland's future. These are very important formulations. Each needs to be concise yet evoke a good deal of shared understanding. For instance:

- Ireland continues to be an economic high performer within the EU in the period to 2015.
- By 2015, Ireland is a strong participant in the EU's goal of becoming a competitive and dynamic knowledge economy.

If a single integrated vision is being examined, then the goals should be ones that are widely viewed as feasible and desirable, and they should not be too numerous. If part of the exercise is to prioritise or assess the degree of support that a number of (sub)goals receive, then they need to be expressed in broadly comparable terms.

The key point of the method is that it focuses on how the goals are achieved. One way in which this can be done is to ask 'how important' various actions, strategies, or circumstances would be for this goal to be achieved, or 'how far' each topic would contribute to the goal.

Main question

The purpose of this question is to provide some indication of 'how important' each topic is perceived, in terms of providing the conditions for the vision (or subgoal) to be achieved, or how far each topic would contribute to this objective.

Examples:

- How important would it be for this topic to be realised in order for Ireland to reach the condition described in 2015? (five-point scale from 'very important' to 'not at all important')
- If this came to be the case, how much of a contribution would it make to Ireland's reaching the goal described for 2015? (answers could be in terms of a five-point scale from 'very important positive influence' to 'very important negative influence')
- What would be the influence of this state of affairs on Ireland's ability to move towards the goal described for 2015? (five-point scale from 'very important positive influence' to 'very important negative influence')

[22] This can be illustrated with an example suggested by Denis Loveridge. One of the possible topic statements discussed in this section is: 'The skills generated by education and training institutions are increasingly out of alignment with those required for an innovative 21st century economy.' In a Decision Delphi this would take a form such as: 'Ireland's education and training institutions should be required to create skills and new competencies in fields vital to Ireland's interests.'

It could be very useful to ask a second question about the 'likelihood of development' of the topic statement itself, for example:

- How likely do you think it is that this state of affairs will come to characterise Ireland in the next 12 years? (answers could be in terms of a five-point scale from 'very likely' to very unlikely)
- How uncertain do you feel about this state of affairs being reached in the next 12 years? ('very certain that it will happen' to 'very uncertain that it will happen', or a formulation along the lines of that used in EUFORIA)

Topic Statements

A set of possible topic statements is reproduced in Box 7. This was derived from preliminary discussions with Irish colleagues in the course of EUFORIA, and is at best, a first step towards generating an appropriate set of questions. Hopefully, it will give some indication of the sorts of topics that could be addressed, and how they might be formulated. Many of the statements are somewhat vague because they have not been sharpened through the application of local knowledge; it should be possible to move from vague statements about increase, decrease, and so on with more precise formulations. Recall that the topic statements deal with developments in Irish society that may foster or impede development towards the sort of KS described in the vision statement discussed above.

There are many other KS-related topics that might be considered. Examples that have emerged on the basis of discussions include the following:

- Efforts are made to attract investment that will support innovative activities rather than more established forms of manufacturing.
- Efforts are made to foster links between universities and industry that can support higher levels of innovation in Irish industry.
- Severe shocks are experienced by industrial sectors based on inward investment that turns out to be footloose.
- Educationalists and policymakers become increasingly aware of the need to foster entrepreneurial attitudes among the young.

Some other areas where topics could be formulated include issues to do with the natural environment, health, active citizenship, and entrepreneurship.

Impacts and actors

A policy Delphi could examine impacts and use ides of the sort outlined in the previously discussed Delphi models. If these themes are not explicitly part of the vision statement, it would be possible to retain the impact factors used in the three-country study: e.g. the impact of each topic on social cohesion; social exclusion or divides; sustainability/environmental quality; employer-employee relations; employee exercise of autonomy and responsibility at work; work-life balance. However, it might also be appropriate to modify this list to include, for instance, factors of local concern and relevance to Irish clients, such as: economic performance of small- and medium-sized enterprises; need for higher levels of skills at work; government policies to stimulate local innovation. It would be necessary to ask about whether the impact was positive or negative, and judgements could be elicited on a five-point scale.

BOX 5: *Possible statements for a policy Delphi (first draft formulations)*

1. Irish policymakers continue to pursue, with little modification, the recipes that were successful in achieving growth in the 1980s and 1990s.
2. Irish policymakers have adopted substantially different policies for economic development, based on new challenges of a 'knowledge-based economy'.
3. Irish R&D investment rapidly reaches or even exceeds the Lisbon/Barcelona target of 3% of GNP devoted to this activity.
4. The skills generated by education and training institutions are increasingly out of line with those required for an innovative 21st century economy.
5. Irish education and training institutions put substantial efforts into redesigning curricula and training provision, to meet the needs of a more innovative economy.
6. Citizen access to low-cost broadband facilities (this may need to be specified) is increased substantially (this may also need to be specified, for example, it might need to be stated that 'over 80% of the population have ready access to…' and similarly for the following question.)
7. Business access to low-cost broadband facilities is increased substantially.
8. Substantial effort has been put into the reform of Irish rules, regulations and structures that impinge upon business.
9. Substantial effort has been put into the modernisation of national and local governance systems in Ireland.
10. Irish firms actively develop and adopt best-practice organisational innovations to improve their performance.
11. Irish policymakers give sustained backing to the promotion of social experiments to find new solutions for major social problems such as health and inequality.
12. Strong efforts are being made to diffuse knowledge of successful social innovations.
13. Concerns about threats to privacy in the information age become a serious impediment to technological and economic development.
14. Public and private institutions adopt deft strategies for reassuring those concerned about privacy issues in the information age.
15. Industrial relations remain organised very much along current lines.
16. New types of organisation to represent employee and self-employed interests become important on the Irish scene.
17. Trade unions put a large share of their effort into new strategies for reaching, informing and mobilising 'knowledge society' workforces.
18. There is considerably more reliance on public-private initiatives for the delivery of policies and services in many areas of Irish life.
19. For a large proportion of workers, employment conditions have become more conducive to a favourable balancing of working time and family life arrangements.
20. There has been substantial growth in the importance of the delivery of lifelong learning for educational institutions.
21. A majority of citizens undergo at least two periods of substantial retraining or professional development during their working lives.

BOX 5: *Possible statements for a policy Delphi (first draft formulations) (cont.)*

22. Ireland's attractiveness as a location for knowledge-based economic activity is increasingly a matter of quality of life and infrastructure provision.
23. Some major areas of service sector employment in Ireland have been heavily hit by footloose foreign investment moving away.
24. Ireland faces much intensified competition as an attractive location for investment, based on availability of relatively cheap low-skill labour.
25. Ireland's attractiveness as a location for knowledge-based economic activity is increasingly a matter of her supply of high-skill labour.
26. The Irish government mainly adopts a 'hands off' approach to management of economic affairs, focusing more on matters like education and provision of infrastructure.
27. Proactive and interventionist economic policies are applied in a systematic way by successive Irish governments to manage development of the knowledge economy.
28. Substantial and sustained efforts are undertaken to reduce digital divides in Ireland.

Moving closer to the Delphi decision model, an alternative model would focus less on where the impacts lie, and more on who needs to do what. For example, it would be feasible to ask 'how much change would be required in the following areas of policy/or policy areas and agencies', or to ask how much change is required from agencies responsible for:

- science policy;
- education policy and institutions;
- social policy (e.g. welfare, pensions, health);
- labour market and industrial relations policy;
- enterprise and industry policy;
- infrastructure policy (transport, communications, etc).

It would be important to include here some opportunity for specifying the extent to which policy integration across areas is required. Another formulation could be along the lines of 'how far would policymakers responsible for the following areas be required to take these developments into account in their policymaking?'. Alternatively, the formulation could be specified in terms of different actors rather than specific policy areas, asking for instance, how much change would be required from the following actors or agencies:

- overseas investors;
- large Irish firms;
- small- and medium-sized enterprises;
- universities;
- schools;
- government ministries dealing with social affairs, etc?

There are other possibilities, for example, addressing some very specific type of action, such as shifts in private investment decisions, output of higher skilled workers, geographical mobility of labour, and so on.

Advantages and disadvantages of this approach

Compared to the earlier Delphi model, this model, in principle, provides a more direct assessment of views concerning how much change is required for continuing Irish success, and where this change needs to be. However, there is a danger that the statements will be paint a rosy picture or evoke unrealistic aspirations; to avoid this, it will be necessary to work towards more specific topic statements than those outlined above.

Delphi Example 4: Multiple scenarios Delphi

This type of Delphi model addresses what would happen under various contingencies. For instance, it might ask what a particular feature would look like in scenario A, scenario B, and so on. This form of activity is most often pursued in a workshop format, where participants have the opportunity to immerse themselves in different scenarios (sometimes different sets of participants will specify each of the scenarios). However, some survey studies have revolved around alternative scenarios and, in principle, this approach can be valuable in making the issue of alternative futures more concrete. Again, several submodels are possible and a few of these are outlined here.

Main question

One approach would involve analysis of what would happen under only two contingencies. For each topic statement, two judgements have to be made: what is 'most likely' or what is the 'current path of development', and what would be the 'most likely' state of affairs if Ireland achieved a more desirable future. For example, the Delphi study could ask how far the topic formulation – that 'Ireland continues to be an economic high performer within the EU in the period to 2015' – is likely to apply if current trends persist, and how far it would apply if feasible shifts were implemented over the next few years. The precise formulation of the goals and the importance ratings will be somewhat similar to those outlined in example 3.

This approach essentially contrasts an extrapolative future with a more normative one, leaving it up to respondents to determine the content of these two poles. An alternative approach is to specify two or more (perhaps up to four) scenarios that represent alternative paths of development. The specification of these scenarios would require work informed by local expertise, but could involve, for example, the following scenarios:

(a) Ireland continues to prosper as a result of FDI.

(b) Irish prosperity is built, to a much greater extent, on endogenous entrepreneurial development.

(c) An Irish KS is based upon new paths of development based on specific strengths of Irish culture.

(d) A problematic route to the KS results from a failure to adopt a new paradigm of growth and development.

Impacts

Given the focus on alternative scenarios, the number of major questions asked concerning each topic statement is greater than that of previous Delphi models. This implies that the requirements for additional judgements should be minimised. A simple version of impact judgements used in the previous models (especially model 3) could be employed, however, examining views of changes in policies and strategies, or their outputs, respectively.

Advantages and disadvantages of this approach

This approach has some of the virtues of the previous model. It also opens minds up to alternative futures – there is not one single unalterable trajectory into the future. Compared to other approaches, it requires specific design work on the scenarios element of the activity.

Delphi approaches: Conclusion

Evidently, there are various types of Delphi studies that could be designed and implemented in an Irish context. As with other elements of Irish KSF, decisions regarding what to do and how, will depend very much on why and for whom the study is being undertaken.

There are a vast number of ways in which Delphi studies can be designed, to assess the knowledge and opinions that exist in the expert community. The examples above attempted to demonstrate how different types of Delphi studies could be used to address different types of policy requirements. It is not necessary to rigidly follow the most common Delphi models, and indeed these may not be the most appropriate for KSF. Instead, there is much scope for experimenting with some of the less common approaches to Delphi.

It should also be noted that there are other tools for dealing with expert opinion, such as cross-impact analysis, which could be employed in the KSF field. Delphi tends to be used very widely because it is relatively simple to administer, complete and analyse, something which cannot be said of some of the other methods. Some methods elicit a great deal of qualitative input from open-ended questionnaires, and this takes significant effort to analyse. Cross-impact analysis, for example, explores relations between parameters, rather like a simplified computer model. However, it is limited to a few variables, and even then this is very demanding of respondents. Another factor in the wide use of Delphi is the availability of earlier models in TF, which can be borrowed from, making the design task – the most challenging part of the exercise – easier, though not necessarily sufficiently well-tailored to meet local requirements.

Irish resources

There are numerous groups and individuals in Ireland who are active in analysis of contemporary developments, as well as a significant number of researchers who are also familiar with a range of approaches to future-oriented thinking and action. Box 6 contains a selection of such resources, prepared by Helen Acheson of FORFAS.[23] This list includes some regional players, and identifies some key publications as well as relevant parties.

Box 6

A sample of relevant Irish resources

- Irish Government (1999), National Development Plan, 2000–2006, Government Publications Office, Dublin
- Operational Programme for Regional Development and Operational Programme for Local, Urban & Rural Development, Government Publications Office, Dublin
- Department of Environment & Local Government (2000), 'What are the issues?', 'National Spatial Strategy: Scope and delivery', and 'Indications for the way ahead', available at http://www.irishspatialstrategy.ie
- Western Development Commission, Blueprint for success in the West, Blueprint for investing in the West, and The state of the West, available at http://www.wdc.ie
- Regional Studies Association (Irish branch), Competitiveness, innovation and regional development in Ireland, Edited by D. McCafferty & J.A. Walsh, 1997
- The Association of Irish Regions
- National Institute for Regional and Spatial Analysis (NIRSA), based in the National University of Ireland, Maynooth
- The Regional Science Association (British and Irish section)
- Enterprise Ireland, http://www.enterprise-ireland.com/english.asp
- Shannon Development, http://www.shannon-dev.ie/
- Údarás na Gaeltachta http://www.udaras.ie/
- Shaping our future: A strategy for enterprise in Ireland in the 21st century (Forfás, 1996), http://www.forfas.ie
- Centre for Governance & Public Management, University of Limerick
- Dublin City Development Board, http://www.dublin.ie

[23] Taken from: H. Acheson et al, 2002, *Practical guide to regional foresight in Ireland*. This list was developed with regional foresight in mind, and therefore omits some agencies that would have a valuable national perspective on KSF.

Reporting

KSF results may be disseminated through different means, such as reports, books, newsletters, and web pages; broadcast media may also be involved (generally through straightforward interviews rather than any sensationalising of results). The sponsoring organisation, steering committee, or foresight working groups may prepare material for such media. Material needs to be carefully tailored for intended audiences. Professional skills (copy-editing, journalism, etc) appropriate to specific media and audiences are required. It is important, however, not to let such 'formal' outputs displace more informal means of communication. Similarly, it is important not to assume that the recording of results in publications is more important than more informal outputs, in the form of improved networks or through the application of new knowledge in people's practices and organisations' approaches to issues. These may be harder to identify and quantify than documentation, but represent very important benefits.

There are a number of important messages to take into account in relation to reporting:

- Firstly, published reports should not be publicised to the point that the actual role of foresight activities is neglected in building networks, informing participants, and injecting a longer-term perspective into business strategy and policy decisions. When considering the evaluation of KSF, it is important to assess these more intangible outputs, as well as the more formal, tangible ones.
- Nevertheless, reports are important insofar as they may have a significant impact. To achieve this they need to be:
  - prepared with their specific users in mind, and presented in a way that will engage with their concerns and discourse;
  - set out in a concise and clear fashion, with good use of illustration, example, and non-technical language;
  - legitimate, in terms of accurately representing the KSF process and its results, and particularly reflecting the wide participation involved in the process;
  - timely, in order to influence key decisions and, if possible, to contribute to debates and 'hot topics' in media discussions. Press releases, for instance, might need to be reworded at the very last minute to take account of such issues;
  - newsworthy, by identifying novel elements as a 'hook' to engage an audience, while avoiding the danger of letting a particular controversial element to hijack the discussion (journalists may need coached, to offset their tendency to focus on problems, failures and possible scandals).

Reports can simply be scenario based, outlining a vision of a future or of multiple futures. Or, they can also contribute to, or contain, priority-setting elements or 'action plans'.[24]

[24] A note on 'action plans'. These are neither intended as 'wish lists', or sets of abstract targets. They should indicate actions and responsible agents, ways of monitoring progress, and indicators with which to assess the degree of success attained. It is important to link actions to the people responsible for executing them, while avoiding setting goals that are unrealistic (either because they too ambitious, or due to an absence of either political will or effective sanctions on the part of those responsible). This balancing act requires considerable skill and inside knowledge of the policy process; successfully linking decision-makers to the proposed actions is more likely to be achieved if they have been involved in the foresight process.

Afterword

To conclude, this report emphasises the point that for successful KSF in Ireland, it is important to ensure that:

- there is demand for this activity from within Ireland;
- specific Irish sponsors are prepared to champion the work;
- Irish foresight practitioners are available to design the process;
- they can enlist researchers, experts and stakeholders into the programme.

In accordance with this philosophy, the report has tried to avoid being too prescriptive in relation to what should be done. There is no standard solution for KSF. EUFORIA, for instance, was a pilot study designed to explore and demonstrate the applicability of foresight tools to KSF. It did not consist of a set of extensive national exercises and, in particular, lacked the close connection to local sponsors and decision-makers that is really required for comprehensive foresight studies. It did succeed, nevertheless, in demonstrating the applicability of various tools, which have described in this report, to give an indication of the lessons learned in relation to types of approaches.

Therefore, this report emphasises what 'could' be done, as opposed to what 'should' be done, and the different ways in which this might be achieved. Hopefully, this will contribute to the interest expressed in Ireland about conducting a KSF study, as well as assisting in the initial discussions in relation to scope and design of the study.

It is clear that there are sponsors in Ireland who are prepared to champion the work, and that there are highly competent individuals and groups who can design and implement it. Thus, the prospects look good for an exercise of the type described by the ISC, which would actualise the Sustaining Progress commitment to a KSF exercise. The ISC suggest that: 'A creatively designed national foresight exercise, aligned with the role of NESD in the area of collaborative policy development initiatives, should now be positioned to play a pivotal developmental role in three key respects:

- strengthening agreement around the key strategic conditions necessary to support and sustain innovation-driven wealth creation and growth;
- deepening understanding of the dislocation associated with the innovation process;
- securing the consensus necessary to support a distribution of the costs and benefits flowing from this growth and dislocation, in a manner that is equitable and sustainable over the longer term.'[25]

The experience of KSF will be an interesting one to watch, given the very distinctive circumstances in which Ireland finds itself, and the mission that has been set out above for the Irish exercise. It is likely that an Irish KSF will produce results that will be of great interest to those of us in other countries. This will probably be recognised most immediately among new Member States of the EU, given their interest in emulating Irish development. However, the overall strategy of conducting a national KSF study is highly relevant to all EU countries, as they continue to shape their own styles of KS.

[25] See: A. Hall, 2004, *Learning to innovate: Re-perceiving the global information society*, Mimeo, Draft discussion document, Department of the Taoiseach, Dublin.

European Foundation for the Improvement of Living and Working Conditions

Ireland and the knowledge society

2005 – 51pps. – 210 x 297 mm

EF/04/08/EN