TERMINOLOGY AND METHODOLOGY FOR BENCHMARKING FORESIGHT PROGRAMMES

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INTRODUCTION

The main objective of this paper is to provide a commonly agreed and used terminology for benchmarking and evaluating foresight programmes,[1] as well as a methodology for the former, in the frame of the ForSociety project, as part of Tasks 1.4. and 3.1. No doubt, a common language is a pre-requisite of a successful completion of these two tasks of the ForSociety project. Yet, currently there is no widely accepted, single definition of foresight (programmes, projects, exercises). (Annex 1) Moreover, different communities of practice – e.g. foresight practitioners, academics from different disciplines, consultants, and policy-makers – tend to understand foresight in fundamentally divergent ways. The first task is, therefore, to define what sort of programmes (projects, exercises, efforts, etc.) should be included when benchmarking and evaluating foresight programmes. An equally challenging task is to devise a terminology and methodology for benchmarking.

Relying on some of the salient features of foresight programmes, namely participation and consensus-building, these definitions and methods can only be developed collectively if they are to provide a sound basis for successful activities and analyses. In other words, imposing a glossary – and a set of methods – upon the participants of the ForSociety project, chosen arbitrarily by a small group of "experts" – let alone by one person – can only lead to conflicts, lack of commitment, and thus poor, unacceptable results. A closely related element of the recipe for failure would be trying to 'police' the use of terminologies, currently ranging quite widely, indeed. Thus, the modest intention of the former drafts of this paper has been to provide a basis for a fruitful discussion, leading to consensus among the participants of the ForSociety project. The current version is meant to capture this consensus.

In other words, this paper can be regarded as a result of collective efforts on many counts. Most importantly, a 1.5-day workshop, organised by the Danish Board of Technology (DBT) on 11-12 November was instrumental in shaping the first draft, revised by taking into account the written remarks and suggestion received from the partners, as well as the discussion at the Session on Benchmarking and Evaluation at the ForSociety Conference, held in the Hague on 2-3 December 2004. Further, it also draws on a number of previous projects – most importantly the discussions and written outcomes of FOREN, EuroFore, HLEG on foresight and the on-going COST A22 action –, in which the author has participated. More indirectly, a number of other interactions with foresight practitioners, policy-makers, participants of the

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[1] Discussions on an earlier draft of this paper have revealed that country context does matter even for an apparently simple issue such as the use of term 'programme'. In some countries, e.g. Hungary, UK or Sweden foresight programmes have been run as single 'projects': albeit a number of panels have worked simultaneously on various broad themes, they have followed the same policy rationale, and applied a common set of methods. In other countries, however, a 'foresight programme' – e.g. in Denmark, and perhaps in the Netherlands – is more of an 'umbrella' initiative, consisting of 5-7 or even more projects, with different policy rationales, and accordingly, applying different methodologies, involving different types of participants, etc. This crucial difference across countries cannot be resolved with any sophisticated definition of 'programmes' vs. 'projects'. Thus, the only available option left is to be pragmatic: the term 'foresight programme' is used throughout this paper, also denoting actual 'projects' or 'exercises' in the Danish or Dutch sense.

On top of these, another terminological snag causes a further difficulty: some researchers claim that the terms 'foresight project' and 'foresight exercise' suggest that these activities can be designed and conducted as disciplined, strict projects or exercises, and thus the importance of *process* – with its unintended impacts, outcomes and benefits, as well as unforeseen difficulties in terms of methods, content, tensions about participants, clients, etc. – is eclipsed or even denied. The author shares these concerns, and hopes that the term 'programme' does not have these connotations (eclipsing or denying the importance of the process itself). Thus, the term 'programme' is a preferred one in this paper.

A further reason stems from the pressing need to distinguish visionary thinking ('individual foresight') and collective efforts (hence the term: 'foresight programme'); see Section 2.1 for a more detailed explanation.

first Hungarian foresight programme and policy-makers attending various training seminars on foresight, as well as discussions with researchers working on related fields – e.g. innovation studies – have also contributed to the ideas and proposals presented here. Finally, it also relies on the related literature.

The paper presents the underlying concepts of benchmarking, and the final version of a template for individual programme descriptions, together with a glossary of the most important terms. This template has been discussed virtually before and after the second network meeting (held in Oslo on 18 February 2005).

Part 1 of this paper discusses the conceptual framework, and is organised as follows: Section 1 presents a brief overview of evolutionary economics of innovation, as a theoretical background. It provides a basis to develop a taxonomy of different types of foresight programmes, discussed in Section 2. This school of thoughts is also guiding the planned benchmarking activities in the frame of the ForSociety project, showing that mechanistic, or naïve benchmarking is likely to produce misleading policy conclusions, and thus intelligent benchmarking – in other words, learning by comparison, taking into account the broader context, too – is a much more promising way. Section 3 introduces these concepts. Combining the main ideas of Sections 1-3, one can conclude that there is no 'one best way', and thus actual foresight programmes should not be benchmarked against an 'ideal', 'optimal' or 'best practice' design of foresight. They, however, can be benchmarked against 3-4 'ideal types' (as defined by Max Weber) of future-oriented programmes, and this can lead to meaningful methodological and policy lessons. In other words, learning by international comparison, if designed and conducted in an appropriate way, can be fruitful, indeed.

The template for programme descriptions, and a glossary of the most important terms are presented in Parts 2 and 3, respectively. Finally, some foresight definitions can be found in Annex 1.

PART 1: CONCEPTUAL FRAMEWORK

1. THEORETICAL BACKGROUND

Foresight programmes do not have a single, all-encompassing theory to support them, and thus they rely on a range of – somewhat overlapping – theories and methods, including (i) evolutionary economics of innovation; (ii) sociology of science and technology; (iii) actor - network theories; (iv) political sciences and other analyses of policy processes; (v) communication, co-operation, and participation theories; (vi) decision-preparatory and future-oriented methods, techniques. This list is far from exhaustive, and most likely disciples of these theories would change the grouping, the order of their own discipline or even the wording used here. That might be an interesting discussion in its own right, indeed, for theoretical purposes. Yet, the intention here is just to indicate the 'eclectic' – and thus complex – nature of foresight programmes, rather than attempting to provide a meticulous, comprehensive treatise of these issues.

This section is concerned with the evolutionary economics of innovation because this theory provides useful observations to appreciate the relevance of foresight programmes from different angles. First, foresight (programmes), future, change, innovation and uncertainty are closely interrelated concepts – and some of these are the underlying terms of evolutionary economics of innovation. Second, foresight programmes are important policy tools, and thus

the nature of policy formation processes and the policy rationale of foresight programmes should be clearly understood (further explored in Section 2). Third, this theory, by emphasising the significance of diversity and context, also underpins the concept of intelligent benchmarking (Section 3).

1.1. The process of innovation and economic theories

The methodology presented here relies on the conceptual framework developed by evolutionary economics of innovation.[2] Obviously, no comprehensive overview can be provided here: only those main features are highlighted, which have implications from the point of view of the relevance and use of benchmarking of foresight programmes in the frame of the ForSociety project. (This summary is meant for those participants of the project who have a different academic background. In other words, those who are familiar with this body of literature are advised to skip to Section 2.)

Innovation, defined as "the search for, and the discovery, experimentation, development, imitation, and adoption of new products, new production processes and new organisational set-ups" (Dosi [1988a], p. 222), leads to variety (diversity), and competition. The latter one, in turn, both conducive to innovation and induced by innovation, selects among firms (or organisations, more generally).

In spite of the apparent similarity with biological processes, one should not mistakenly equate evolutionary economics with evolutionary biology. Freeman [1994b] highlights two fundamental differences. First, selection is at least partly conscious in the innovation process as decision-makers can choose between various 'mutations' (that is, new products, processes and organisational forms). Moreover, their expectations, hopes, plans and values also shape the 'evolution' of these 'mutations'. Ethical and social considerations, therefore, play an increasingly important role in the innovation process, notably in the development and utilisation of nuclear energy and biotechnology, as opposed to the process of biological evolution. Second, selection is taking place at a number of levels in the course of competition: among products, firms (organisations), sectors, regions, countries and socio-economic systems. There are some autonomous rules and laws of the selection process at these different levels. Strong interrelations and interdependencies, however, can also be observed. Technological innovations are shaping both their natural and socio-economic environment, while the success of innovations strongly depends on their environment, including the quantity, quality and distribution of accumulated capital in the form of production equipment, roads, railways, communications networks, bridges, etc., as well as policies, attitudes and norms, that is, institutions in short.

While rational agents in the models of neo-classical economics can optimise via calculating *risks* and taking appropriate actions, "innovation involves a fundamental element of *uncertainty*, which is not simply the lack of all the relevant information about the occurrence of known events, but more fundamentally, entails also (a) the existence of techno-economic problems whose solution procedures are unknown, and (b) the impossibility of precisely tracing consequences to actions" (Dosi [1988a], p. 222 – emphasis added). Thus, the notions of *optimisation* or *maximisation* become meaningless.

[2] See, *e.g.*, Dosi [1988b], Dosi *et al*. [1988], [1994], Dodgson and Bessant [1996], Dodgson and Rothwell [1994], Edquist (ed.) [1997], Ergas [1987], Fagerberg *et al*. [2005], Freeman [1994a], Freeman and Soete [1997], Levin *et al*. [1987], Lundvall (ed.) [1992], Lundvall and Borrás [1999], Metcalfe and Georghiou [1998], Nelson and Winter [1982], Nelson (ed.) [1993], [1995], OECD [1992], [1998], [2001b], Smith [2002].

Another important implication of uncertainty concerns the scientific and policy relevance of forecasting, based on the extrapolation of (supposedly) known trends. The space of events, in which *forecasting* can be meaningful is strictly limited: the only certain – and thus easily predictable – outcome of innovative activities is that most of the underlying technological and business trends can change quite radically even in the space of 10-15 years.[3] From a policy perspective, therefore, new methods are required, which can take into account uncertainty during a decision-preparatory process. *Foresight* is a prominent one from this point of view, for two reasons. First, it is capable of dealing with uncertainty by devising alternative (qualitatively, or fundamentally different) 'futures' (visions of future, future states or scenarios). In fact, it is a distinctive feature of foresight to consider alternative futures. Second, foresight processes can reduce uncertainty, too, because participants can align their endeavours once they arrive at a shared vision. To this effect, however, it is a necessary condition to involve the major stakeholders, who can significantly influence the underlying trends by shaping the strategies or policies of their respective organisations (government agencies, businesses, research organisations, NGOs, unions, etc. – depending on the issues in question, as well as the political and decision-making culture of the 'entity' conducting a foresight programme: international organisations or regions, nation states, sub-national regions, business associations, groups or individual firms, cities, etc.)

As opposed to the 'time-less' world of neo-classical economics, "*history counts*: past technological achievements influence future achievements via the specificity of knowledge that they entail, the development of specific infrastructures, the emergence of various sorts of increasing returns and non-convexities in the notional set of technological options." (Dosi [1992], p. 183) In other words, technological change is a *cumulative*, *path-dependent* process, and hence increasing returns are at least as important as diminishing returns. Closely related notions, also in the heart of evolutionary thinking, are *learning by doing, using, interacting* (Freeman [1994a]) and *comparing* (Lundvall and Tomlinson [2002]). The latter one includes intelligent benchmarking, too, and thus is of relevance for Task 1.4 of the ForSociety project.

Mainstream economics is mainly concerned with the availability of *information* (or information asymmetries in its jargon). Both the theoretical and empirical literature reflect, however, the growing recognition that the success of firms – regions and nations – depends on their accumulated *knowledge*, both codified and tacit,[4] and *skills*, as well as *learning capabilities*. Information can be simply bought, and hence mainstream economics is comfortable with it. Knowledge – and *a fortiori*, the types of knowledge required for innovation – on the contrary, cannot be mistaken with goods that can be purchased and used instantaneously; one has to go through a learning process to acquire knowledge and skills.[5] It obviously takes time and involves the process and costs of *trial and error*. Thus, the uncertain, cumulative and path-dependent nature of innovation is reinforced.

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[3] Obviously, there are certain trends, e.g. demographic ones, which are not directly influenced by innovative activities, on the one hand, and their 'stability' (predictability) extends to a much longer time horizon (in this case around 40-50 years), on the other. Also, the pace and intensity of innovative activities – and hence their impacts on major technological and business trends – vary significantly across time (different historical periods) and countries (socio-economic systems).

[4] For a brief, but highly informative, discussion of codified and tacit knowledge, and the policy relevance of this distinction, see Lundvall and Borrás [1999] (especially pp. 31-33), as well as the literature they refer to.

[5] Borrowing a sparkling parable of Dosi [1988b], although there are market conditions of access to information e.g. there is a market for textbooks and economic conditions of access to higher education (the level of tuition fees, the availability or scarcity of grants for students), "in any proper sense of the word, getting a PhD is not simply acquiring information, and it is even less true to say that there is a market for PhDs" (p. 1130).

Two aspects of learning should be underlined here as relevant points for the ForSociety project.[6] First, the emphasis on benchmarking for learning rather than benchmarking as an end in itself – conducted just because it is becoming an excessively popular tool – is critical. Foresight programmes can provide a bridge to transform traditional, mechanistic benchmarking exercises – relying heavily on a certain set of quantitative measures – into sensible comparative analyses, on which meaningful visions can be based. In other words, the possibility of a different future state can be demonstrated by real life examples, and visions can also be devised concerning the nature of strategies [broad policies], including policy rationales, policy-making methods and institutional set-ups. Eventually, this can and should lead to tangible policy measures – otherwise the vision would not be implemented.

Second, the level of learning might be an important issue. Some analysts and policy-makers highlight network re-alignment and RTDI policy updating as key foresight benefits – which are crucial impacts, depending on the 'focus' of a given foresight programme. (see Section 2.2.2 on 'focus') Case studies and anecdotal evidence clearly suggest, however, that there are often overlooked or 'hidden' benefits relating to learning at the level of individuals and communities. Actually, it is almost a commonplace among practitioners to refer to foresight as a learning process, although quite often they mean methodological learning. In any case, it might be a fruitful idea to make a clear distinction among the different levels of learning, i.e. not to focus exclusively at the 'macro' level, but give more prominence to individual and community learning in the ForSociety project.

Cumulativeness, path-dependency and learning lead to *heterogeneity* among firms and other organisations. Moreover, sectoral characteristics of the innovation process should also be taken into account while devising strategies or policies.[7]

A vast body of empirical literature has also clearly shown that innovators are not lonely scientists. While some path-breaking scientific or technological ideas might come indeed from individuals, successful innovations can only be generated by a close collaboration of different organisations such as: university departments, government and/or contract research labs, firms and specialised service-providers. Forms of their co-operation can also be varied widely from informal communications through highly formalised R&D contracts to alliances and joint ventures.[8] Thus, conscious network-building efforts of foresight programmes are crucial, indeed – as well as their unintended impacts on networking (in case of the lack of explicit objectives to strengthen existing networks, facilitate the formation of new ones, and more generally, foster communication and co-operation; see Section 2.2 on different types of foresight programmes).

1.2. Implications for RTDI policies

Evolutionary account of the innovation process leads to some sobering lessons: in a world of uncertainty, policy cannot bring about 'the' optimum either. A policy-maker is not "a perfectly informed social planner correcting imperfect market signals to guide private

[6] These observations are prompted by comments offered by Jennifer Cassingena Harper.

[7] A seminal taxonomy developed in Pavitt [1984] identifies supplier-dominated sectors, specialised suppliers, scale-intensive and science-based sectors. Further, ample evidence on sectoral systems of innovation and production substantiates the significance of sectoral differences.

[8] Freeman [1991], [1994a] and [1995] had provided a thorough literature survey on the importance of networks and the innovation system approach. See also Edquist (ed.) [1997], Lundvall (ed.) [1992], Lundvall and Borrás [1999], Malerba [2002], Nelson (ed.) [1993], OECD [2001b], Tidd *et al.* [1997], as well as the October 1991 and February 2002 issues of *Research Policy* (Vol. 20, No. 5, and Vol. 31, No. 2, respectively).

decisions toward more desirable outcomes". (Metcalfe and Georghiou [1998], p. 94) Of course, this is not easy to accept, especially for those trained in the paradigm of rationality, maximisation and optimisation:

> "For obvious reasons, many economists prefer models that provide precise policy recommendations, even in situations in which the models are inapplicable to the world of our existence. Our own view is that, rather than using neo-classical models that give precise answers that do not apply to situations in which technology is evolving endogenously, it is better to face the reality that there is no optimal policy with respect to technological change." (Lipsey and Carlaw [1998], p. 48)

Variety, selection and uncertainty also have repercussions on the very nature of policy and strategy formation, and thus decision-makers – either devising public policies or strategies for firms or RTDI organisations – should take into account these features. The relevant and potentially successful policies and strategies are *adaptive* ones, relying on, and learning from, feedback from the selection process leading to the development of further variation. (Metcalfe and Georghiou [1998]) In other words, policy and strategy formation is increasingly becoming a learning process. (Lundvall and Borrás [1999], Teubal [1998]) This notion underlines the importance of foresight programmes: more 'robust' policies can be devised when (i) alternative futures are considered, and (ii) participants with different background are actively involved in a decision-preparatory process, and thus bringing wide-ranging accumulated knowledge, experience, aspirations and ideas in.

Some more instructive policy lessons can also be derived from evolutionary theorising: given the characteristics of the innovation process, public policies should be aimed at promoting learning in its widest possible sense, in other words competence building at individual, organisational and inter-organisational levels. Co-operation and networking among a host of actors, including not only researchers and producers but also users are vital elements in generating and disseminating knowledge. A system-approach is required, therefore, in policy-making, whereby "policies recognise the division of labour in the generation of innovation-relevant knowledge, that no individual firm is self-sufficient in its knowledge and skills and that there are corresponding gains from linking firms with the wider matrix of knowledge-generating institutions". (Metcalfe and Georghiou [1998], p. 84) Indeed, a recent trend in the science and technology (S&T) policies of advanced countries is a shift from direct research and development (R&D) support to promoting linkages, communication and co-operation among the players in the innovation process and thus building an appropriate organisational and institutional infrastructure. (Dodgson and Bessant [1996]; Lundvall and Borrás [1999]; OECD [1998]); a special issue of *Research Policy* [Vol. 30, No. 6])

Certain types of foresight programmes (see Section 2.2) can take into account these broader issues, as opposed to focussing narrowly on advancing scientific research in specific fields of enquiry or developing particular technologies. It, therefore, can be a crucial policy tool, especially if it is explicitly aimed at strengthening – regional, sectoral, national or trans-border – innovation systems. (The network-building aspects of foresight programmes have already been discussed in Section 1.1.)

Another major policy implication of this analytical framework is that conscious, co-ordinated policy efforts are needed to promote knowledge-intensive activities in all sectors, with the explicit goal of upgrading firms' capabilities, and thus improving their overall competitiveness. In other words, despite of the wide-spread believes in the 'magic' and automatic impacts of the so-called high-tech industries on economic growth, policy-makers should be aware of the importance of knowledge-content (or, share of knowledge-intensive activities) in the low- and medium-technology (LMT) industries, too.

A recent EC document also draws the attention of policy-makers to this conclusion in a balanced, succinct way: "The EIS [European Innovation Scoreboard – A.H.] has been designed with a strong focus on innovation in high-tech sectors. Although these sectors are very important engines of technological innovation, they are only a relatively small part of the economy as measured in their contribution to GDP and total employment. The larger share of low and medium-tech sectors in the economy and the fact that these sectors are important users of new technologies merits a closer look at their innovation performance. This could help national policy makers with focusing their innovation strategies on existing strength and overcome areas of weakness." (EC [2003], p. 20) Foresight programmes, therefore, need – and should – not be confined to the narrow field of high-tech sectors (or 'advanced' S&T topics).

1.3. Foresight, innovation and RTDI policies

To avoid some potential misinterpretation, finally it should be stressed that opting for this theoretical framework does not mean that foresight should be understood as a vehicle to support narrowly defined (technological) innovation processes or RTDI policies. (See more on the policy rationale of the different types of foresight programmes in Section 2.2.) A narrow understanding would exclude, for example a foresight programme to create visions for cancer treatment.[9] Two aspects need clarification: (i) the relationships between foresight and innovation; and (ii) the links between foresight programmes, RTDI and other policies.

First, it might be useful to repeat that innovation should be understood as the introduction (practical application) of new or significantly modified products, production processes, services, as well as organisational and managerial practices (techniques). Thus, visions for new cancer treatments are about innovation, too, following this widely accepted broad definition: we should envisage not only new medicines (product innovations), but also new ways to 'provide services' in the health care system (service, process, organisational and managerial innovations).[10] Moreover, visions generated by a foresight process would certainly encompass prevention, too (concerning diet, drinking and smoking habits, doing sports, reducing stress, etc.). This is also a new approach in terms of addressing an issue, i.e. a policy and organisational innovation at a social level (requiring new habits at an individual level). Also, new cancer treatments are likely to contribute to socio-economic development in several ways. To mention just two of them here: (i) in a narrow economic sense they can be cheaper or more efficient than the old ones, i.e. more patients can be cured faster (losing less time, which can be used for 'productive' purposes) and at lower costs; (ii) more broadly, the quality of life is improved when less people suffer from cancer, and less people should fear of cancer, due to better treatments.

Second, so far it has only been emphasised that foresight is an important innovation policy tool. It should be added that it can be useful in other policy domains, too. The above example clearly shows that health policies also need to deal with – and promote – various types of innovations.[11]

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[9] These observations are prompted by a question of Göran Pagels-Fick, asked among his comments on the first draft of the paper: "Could we envisage a foresight programme to create visions for cancer treatment practices?

[10] This is a generally accepted definition of innovation by international organisations, such as the OECD and EU, shared by researchers and policy-makers, too. Quite often, however, other people, e.g. journalists and politicians still use the term in its narrow sense, i.e. they only refer to technological innovations.

[11] Ian Miles is among the pioneers to stress the importance of innovation in service sectors, and he has also written extensively on the role of innovation in services provided by the state, and thus on the need to devise appropriate policies in these fields to promote innovations.

In sum, the subject itself is not a decisive factor for being 'qualified' as a foresight programme; what matters is to meet the three criteria set in the next section.

2. TYPOLOGY OF FORESIGHT PROGRAMMES

2.1. Locating foresight programmes among future-oriented activities

Decision-makers, experts and laymen in different historical periods and in different socio-economic systems shared at least one desire: to know their future in advance or even to influence it for their advantage. They used very different approaches and methods from spiritual/ religious ones to scientific investigations and various modes of planning.[12] Without going into details here, it is worth recalling some of the major methods/ approaches in order to locate – and distinguish – foresight programmes:

- visionary thinking (in ancient times by prophets, more recently mainly by consultancy services or individuals)
- forecasting (at different levels, using different methods, e.g. trend analysis, extrapolation)
- futures studies (for academic purposes)
- prospective analyses (for business or policy purposes, e.g. [technology] roadmapping, list of critical/ strategic/ key technologies)
- strategy formation (at firm, sectoral, regional or national levels)
- scenario planning (at a firm level; see e.g. Godet [2001])
- indicative national planning
- central planning (at a national level)
- foresight programmes.[13]

Obviously, the above approaches have a number of common characteristics. All of them (a) deal with the future(s) in one way or another; (b) collect and analyse various pieces of information, and (c) can apply a wide range of methods, mainly scientific ones. Three key features can be used to differentiate among the above approaches, and thus distinguish foresight programmes. These approaches can:

- be action-oriented vs. 'contemplative' (passive)
- be participatory vs. non-participatory
- consider alternative futures vs. a single future state (already 'set' by external forces).

Action-oriented endeavours aim at shaping/ influencing/ acting upon the future,[14] while passive ones are 'contemplating' about it (e.g. 'pure' futurologist studies, without any policy

[12] Hence, a special chapter of the history of mankind can be devoted to the analyses of these different attitudes, methods and approaches towards the future.

[13] The term 'foresight programme(s)' is used throughout this paper as an attempt to distinguish individual (personal) foresight and 'collective' foresight programmes, i.e. the ones launched (and sponsored) by an organisation (or several ones), and conducted by a number participants. Moreover, an increasing number of articles published by researchers working in the field of future studies, in which 'foresight' is used as a new label for their work (although still following the 'futures studies' or futurology paradigm), see e.g. the recent issues of *Futures*, especially Vol. 36, No. 2. It does not seem to be a productive, promising dispute trying to establish the 'real' meaning of foresight, and then attempting to 'enforce' it across various communities of practice.

[14] E.g. the slogan of the first UK Foresight Programme was: "Shaping our future".

implications). In other words, the latter ones merely try to develop a better-informed anticipation of the future, e.g. for being better prepared by having more precise information.

Participatory future-oriented programmes/ projects meet all the three following criteria: they (i) involve participants from at least two different stakeholder groups (e.g. researchers and business people; experts and policy-makers; experts and laymen); (ii) disseminate their preliminary results (e.g. analyses, tentative conclusions and policy proposals) among interested 'non-participants',[15] e.g. face-to-face at workshops, electronically via the internet with free access for everyone, or in the form of printed documents, leaflets, newsletters; and (iii) seek feedback from this wider circle (again, either face-to-face or in a written form). Conversely, if any of these criteria is not met, that activity cannot be regarded a participatory programme or project.

Finally, certain approaches are based on the assumption that the future is not pre-determined yet; and thus the future can evolve in different directions, to some extent depending on the actions of various players and decisions taken 'today'. In other words, there is a certain degree of freedom in choosing among the alternative, feasible futures, and hence increasing the chance of arriving at the preferred (selected) future state. Clearly, there is a close link between being action-oriented and considering alternative futures. Some foresight programmes, e.g. the second Swedish Technology Foresight Programme, consider alternative futures with the explicit aim of identifying key choices confronting their 'constituency' or 'target audience', but do not intend to single out any preferred future. In other words, these programmes do not follow a normative approach.[16] Certainly, there is no reason to exclude these types of programmes from our analysis in the frame of the ForSociety project. Other approaches, on the contrary, can only think of a single future, already 'fixed' by certain factors, and thus the task is to explore (forecast, predict) 'the' future scientifically.[17]

In short, foresight programmes are action-oriented, participatory and consider alternative futures.[18] Thus, if this approach is accepted, it is relatively straightforward to establish which activities (programmes) can be included in the ForSociety project – and which ones not.

For practical reasons, however, it might be useful to include programmes using the key or critical technologies method, too, though clearly marked as such. The most notable examples in the partner countries of the ForSociety project are two French projects and later a Czech one.

From a somewhat abstract point of view, another open question is if programmes only using Delphi questionnaires, and thus – by definition – *not* considering alternative futures, should be included or not. The European examples are French and Austrian exercises conducted in the 1990s. These cases also illustrate that there are different types of Delphi-

[15] 'Non-participants' are those persons who have not been members of panels or working groups set up by the programme, and have not been involved directly in any other way, e.g. by answering (Delphi) questionnaires.

[16] This approach, and the example, has been mentioned by Göran Pagels-Fick among his comments on the first draft.

[17] Cuhls [2003] offers an excellent, comprehensive discussion on the differences between forecasting, prediction, planning and foresight. The possibility of a single future vs. "many" futures is a central element of her analysis.

[18] Other important features (elements) of foresight programmes are captured by the various definitions, descriptions presented in Annex 1. The intention here is not to provide a fully-fledged, academic definition, rather highlight those features, with which foresight programmes can be distinguished from other future-oriented activities, and thus can be selected for being benchmarked and evaluated by the various Tasks of the ForSociety project.

questionnaires used in the broad field of 'future-oriented activities'.[19] The French questionnaire – following the Japanese method – was concerned with technological statements, while Delphi Austria, conducted in 1996-98, had two set of questionnaires, namely one on technology and one on society and culture. Further, the Austrian questionnaires also asked about policy options, and thus can be called a 'decision' Delphi. (Aichholzer [2001a], [2001b]) From the point of view of selection – whether to be included in the ForSociety project –, nonetheless, these differences are not decisive. In other words, these characteristics become only relevant when there is decision to include them, and thus these exercises should be described, benchmarked and evaluated.

At a practical level, the question can be answered relatively easily. As there have been two critical technologies programmes at a national level in France, one of these programmes can be selected for benchmarking and evaluation, and thus there would be no need to include the French Delphi exercise. Similarly, in all partner countries there have been other foresight or critical technologies programmes, besides the ones solely relying on a Delphi-survey.

2.2. Types of foresight programmes

The 'maturity' of foresight programmes has reached a point, at which they can be classified. (Barré [2001], [2002], Johnston [2002], Renn [2002]) In other words, although no 'optimal' approach or any form of 'best practice' can be identified, taxonomies can be developed to highlight 'good practices': what has worked in certain circumstances (level of development, challenges and hence policy aims), and thus what approaches and set of tools are likely to be useful in different environments, for different purposes.

2.2.1. Simple ways to characterise foresight programmes

Foresight programmes can be either holistic, or just concentrate on particular technologies or some business sectors. They can have different geographical scopes, too, i.e. they can be conducted at international (either as group of countries, or collaborating/ neighbouring regions across national borders), national, sub-national regional, local, sectoral or firm (individual firms or business groups) level.

Foresight programmes can have different clients or sponsors. In the case of national programmes, the clients/ sponsors are usually one or more of the following actors:the government (one or more ministries/ government agencies, or the government as a whole)

- business associations
- research and expert communities (e.g. associations of engineers)
- a coalition of some of these actors.

There is no theoretical reason to exclude NGOs or unions among the clients, but for practical reasons – e.g. to be able to influence major decisions – they are more likely to join a coalition, than launch a national foresight programme on their own.

[19] It is practically impossible to find a better, more precise label; e.g. both the Japanese and Korean exercises, based on Delphi-surveys, are actually called technology forecasting programmes. (Kuwahara [1999], [2004], Shin [1998], [2004]) To further complicate this picture, more recently other methods are also used – or planned to be used – in Japan, and thus coming closer to the more strict definition of foresight presented in this section.

At sub-national regional and local levels, the likely clients/ sponsors are policy-makers; yet, business associations (chambers of commerce) can also join as sponsors, or commission their own foresight programmes.

In principle, firms – individual (large) ones, their groups, entire sectors (chambers) – can also launch foresight programmes (meeting the criteria set in Section 2.1).[20]

Foresight programmes can be product- or process-oriented, depending on the policy needs to serve, e.g. informing specific decisions by analytical reports, list of priorities, and/ or recommended actions vs. facilitating networking, communication and co-operation among key players. The separation of products and the process itself, however, is somewhat artificial. Two main reasons can be considered here. First, without a lively, constructive, and creative process we cannot talk of foresight, because in that case it would not be a participatory programme. Moreover, wide participation is likely to improve the quality of the 'final products'. (The process should be well-organised and focussed, of course, otherwise the more people are involved, the less coherent and concise report would be produced.) Second, without inspiring 'intermediate products' – background papers, draft visions and reports –, the 'process' cannot be triggered at all. Experts would not attend meetings and workshops in a sufficient number as they would not feel being intellectually rewarded for their time and efforts.

Foresight programmes can be supported by a number of analytical and participatory methods ranging from desktop research, expert discussions and brainstorming, SWOT- and trend analyses, scenario-building, Delphi-survey, to various forms of stakeholder involvement (workshops, consensus-building meetings). Some of them are exploratory in their nature (starting with the present situation and then identifying potential future states), while others are normative ones (describing desirable futures and asking what paths could lead there). In certain contexts, for certain purposes quantitative methods are more relevant, whereas in other cases qualitative ones can or should be used. (Cuhls *et al*. [2002], FOREN [2001])

2.2.2. Focus of foresight programmes

Foresight programmes may have rather dissimilar foci, ranging from the identification of priorities in a strict S&T context to addressing broad societal/ socio-economic challenges.

Georghiou [2001] and [2002] identified three 'generations' of prospective/ strategic technological analyses. The first generation is the classical technological forecasting, aimed at predicting technological developments, based on extrapolation of perceptible trends.[21]

The main aim of a second-generation foresight programme is to improve competitiveness by strengthening academy-industry co-operation, correcting the so-called market failure[22] and trying to extend the usually too short time horizon of businesses.[23]

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[20] In practice, however, it is more likely that firms are not inclined to finance participatory programmes. In any case, the ForSociety project is focussing on national programmes, and thus it is not a major concern here.

[21] These predictions are produced by a relatively small group of experts: futurologists and/or technological experts (that is, other types of expertise or actors are not sought after in the process of forecasting). The main objective is to predict which S&T areas are likely to produce exploitable results. Forecast results, in turn, are used in economic planning, either at firm or macro level.

[22] In short, private returns on R&D are smaller than social returns (as firms cannot appropriate all the profits stemming form R&D), and thus firms do not invest into R&D at a sufficient – socially optimal – level.

[23] Accordingly, a different set of actors is involved in these programmes: researchers working on various S&T fields and business people, bringing knowledge on markets into the process. These programmes are organised by following the structure of economic sectors (various industries and services).

A third-generation foresight programme tackles broad/er/ socio-economic challenges, and hence besides researchers and business people government officials and social stakeholders are also involved.

This classification is used here as point of departure to develop a typology of foresight programmes tailored to the needs of Tasks 1.4 and 3.1 of the ForSociety project. Three 'ideal types' of foresight programmes can be defined as major 'reference points', against which the actual national programmes can be benchmarked.[24] Identifying 'ideal types' is a long-established practice in social sciences (and somewhat similar to 'models' used in all fields of sciences): "The fact that none of these three ideal types (…) is usually to be found in historical cases in 'pure' form, is naturally not a valid objection to attempting their conceptual formulation is the sharpest possible form."[25] (Weber [1947])

Note, however, that all three ideal types of foresight programmes should meet the criteria defined above in Section 2.1: they should be action-oriented, participatory and should consider alternative futures. The underlying difference among them is their focus:

- S&T issues: type A foresight programmes
- techno-economic issues: type B foresight programmes
- broad societal/ socio-economic issues: type C foresight programmes.[26]

Their further characteristics, in terms of their aims, rationales and participants, are summarised in Table 1 below. One would notice immediately that these ideal types are not distinguished by their themes (topics): for example, they all deal with S&T issues, but by doing so, they pursue different aims, and follow different (policy) rationales. In other words, they address different challenges, ask different questions, use different approaches/ ways of thinking,[27] and involve different participants. In other words, these ideal types should not be thought of as "Matrjosa figures": the biggest one, type C incorporating the middle one, i.e. type B, and, in turn, type B encompassing the smallest one (the 'core'), Type A.

[24] Section 1 has already emphasised the importance of diversity, and that issue is further explored from the point of view of benchmarking in Section 3. The broader context and focus of any foresight programme is also of crucial importance for its evaluation (to be conducted by the team working on Task 3.1 in the ForSociety project).

[25] It is just a coincidence that Weber also talks of three ideal types when discussing legitimate authority.

[26] In short, the most important modification compared to the three generations identified by Georghiou is to replace technology forecasting with foresight programmes focussing on S&T issues. Technology forecasting projects usually do not consider alternative futures, and most of them are not participatory either (as defined above in Section 2.1). However, there is no reason to assume that S&T issues cannot be tackled in a participatory manner, considering alternative futures, and aiming at informing and influencing present actions. For example, the recent Turkish Foresight Programme – the Vision 2023 Project – has focussed on S&T issues. (Tümer [2004]

[27] See section 2.4 for more details on the differences in terms of questions, approaches – when analysing the same theme (technological field).

Table 1: Foci of foresight programmes

	S&T focus (type A)	Techno-economic focus (type B)	Societal/ socio-economic focus (type C)
Aims	Identify S&T priorities (following the logic of scientific discovery)	Identify research topics in S&T, of which results are believed to be useful for economic sectors	Identify research topics in S&T, of which results are believed to contribute to addressing major societal/ socio-economic challenges Devise other policies – or identify policy domains, which are relevant – to tackle these societal/ socio-economic issues
Rationale	Boost national prestige, achieve S&T excellence; Following the linear model of innovation, socio-economic benefits might also be assumed; implicitly or explicitly	Business logic: improve competitiveness Correct market failures: strengthen academia-industry co-operation, extend the short time horizon of businesses	Improve quality of life (enhance competitiveness as a means for that) Correct systemic failures, strengthen the National Innovation System
Participants	Researchers, policy-makers (e.g. S&T and finance ministries)	Researchers, business people, (some) policy-makers	Researchers, business people, policy-makers, social stakeholders (lay persons?)

Potential users usually constitute a broader group than the actual participants; they might include e.g. funding organisations, other policy implementation bodies and public service providers (including 'quangos' [quasi-NGOs]), professional associations representing the interests of their members (and thus involving them to some extent in strategy and policy formation processes in various ways), venture capitalists, trade unions, etc. Depending on the focus of a foresight programme (the types of challenges/ issues considered), as well as the political culture of a given country or region, some of these potential users and stakeholders might become participants, too. In any case, it is not possible to establish a one-to-one relationship between an 'ideal type' of foresight and its participants beyond the 'typical' participants indicated in Table 1. The type and number of participants, the methods, channels and for a used their 'internal' and 'external' dialogues,[28] as well as the intensity, quality and impacts of these dialogues is obviously a question for the individual case descriptions, and then for benchmarking and evaluating actual foresight programmes.

Types A and B programmes have a longer tradition, and thus in general they are better known. Obvious examples are the Turkish Vision 2023 Project (type A) and the first UK Foresight Programme (Type B). (Tümer [2004] and Georghiou [1996], respectively)

Therefore, only type C programmes are explained here in some more detail. The shift in focus is reflected in the structure, too: these programmes are organised along major societal/ socio-economic concerns (e.g. health, ageing population, crime prevention in the case of the Hungarian, the first Swedish or the second UK foresight programmes; see Boxes 1-2 in Section 2.3). A new element in the underlying rationale can also be discerned, the so-called systemic failure argument: the existing institutions (written and tacit codes of behaviour, rules and norms) and organisations are not sufficient to improve quality of life and enhance competitiveness, and thus new institutions should be 'designed' by intense communication and co-operation among the participants. In other words, the existing gaps should be bridged by new networks, appropriate policies aimed at correcting systemic failures, and establishing or strengthening relevant organisations. A foresight programme, based on this rationale, can deliver solutions in various forms: by strengthened, re-aligned networks as 'process' results of the programme, as well as by policy recommendations ('products').

An actual foresight programme is likely to combine certain elements from various types. In most cases, however, one type of rationale would be chosen as a principal one – it thus would underlie the more detailed objectives and structure of a programme, as well as the choice of its participants. Otherwise, it would likely to lead to an incoherent – even chaotic – exercise, characterised by tensions between (a) the various objectives, (b) elements of its structure, (c) the objectives and methods, (d) the participants and objectives, and/or (e) among the participants themselves. A certain level of tension might be quite useful – or even essential – to produce creative, innovative ideas and solutions, of course, but too intense and too frequently occurring – structural, inherent – conflicts would most likely tear a foresight programme apart.

[28] Internal dialogues take place among the participants of a given programme, e.g. among panel members, between panels, between panels and the management team, between the steering group and panels – or any other internal groups of participants in case these ones have not existed. External dialogues are organised among the participants and other stakeholders, clients, target groups, etc., i.e. those, who have not participated in the programme in a direct way.

2.3. Themes and time horizon

At a first glance, the focus of a foresight programme determines the themes to be discussed/ analysed to a large extent. For instance, as already alluded, typical themes for a technology forecast program would be specific fields of science and technology, such as microelectronics, communications, bioinformatics, energy technologies, new materials, bio- and nanotechnology. These topics have been dictated to a non-negligible extent by 'fashion' or fads, too: earlier much had been written on nuclear and space technologies, then came ICT to yield significance, and notice more recently the fields denoted by prefixes of 'bio-' and 'nano-'.

The time horizon can be driven by the dynamics of a given discipline or the imagination (agenda) of the futurist. For the latter, perhaps an extreme example is when Molitor [2000] predicts the weight and height of human beings in 3000. He has also published a book entitled *The Next 1000 Years*. It is not uncommon, however, to try to predict major events in a 50-100 years time horizon.

The so-called critical or key technologies method is also concerned with technological fields – as its name clearly indicates – but in this case the time horizon is much shorter, usually 5-10 years, as it is derived from policy-makers' needs to set mid-term priorities.

A typical type B foresight programme, e.g. the first UK one, deals with economic sectors, such as chemicals, construction, financial services, food and drinks, leisure and learning, retailing and distribution, transport, as well as technological fields, such as aerospace and defence, communications, IT and electronics, life sciences, materials. The time horizon in this case was 15-20 years, similar to a number of other national foresight programmes.

At a national level, only a handful of type C foresight programmes have been conducted so far. As already mentioned, these are concerned with broad societal/ socio-economic issues, such as human resources, health, ageing population, crime prevention, usually with a time horizon of 20-25 years.

Box 1: UK1 and UK2 foresight themes

UK 1st round (1994-99)	**UK 2nd round (1999-2002)**
Science driven sectors:	*Thematic panels*
Chemicals	Ageing population
Defence and aerospace	Crime prevention
Health and life sciences	Manufacturing 2020
Materials	*Sector panels*
Exploitation sectors:	Built environment and transport
Communications	Chemicals
Financial services	Defence aerospace and systems
Food and drink	Energy and natural environment
IT and electronics	Financial services
Policy driven sectors:	Food chain and crops for industry
Agriculture, natural resources and environment	Healthcare
Energy	Information, communications and media
Retailing and distribution	Marine
Transport	Materials
Human resource and management driven sectors:	Retail and consumer services
Construction	
Leisure and learning	
Manufacturing, production and business processes	

Box 2: Hungarian and Swedish foresight themes

TEP, Hungarian Foresight Programme (1998-2000)	**Swedish Foresight Programme (1998-2000)**
Human resources	Health, medicine and care
Health (life sciences, health care system, life style, pharmaceuticals, medical instruments)	Biological natural resources
Natural and built environment	Society's infrastructure
Information technologies, telecommunications, media	Production systems
Manufacturing and business processes (new materials, production processes and management techniques, supplier networks)	Information and communications systems
Agri- and food businesses	Materials and material flows in the community
Transport	Service industries
	Education and learning

2.4. Different approaches to the same theme

A premature conclusion from the above examples would suggest a mechanistic link between the focus and themes of a given foresight programme, as well as between themes and time horizons. A more detailed look, however, would reveal there is no strict one-to-one relationship in either case. E.g. information and communication technologies (ICTs) are usually analysed by all sorts of foresight programmes – with important differences, of course:

- in a critical (key) technologies programme the emphasis would be on specific technological terrains of this broad field, usually with a 3-5-year time horizon, and hardly any attention would be devoted to social issues (e.g. exclusion – inclusion of certain social groups; gaps between generations, regions cities vs. villages; e-democracy; regulations on, and incentives for, different types of content; etc.);
- a type A foresight programme would also put the emphasis on – the usually assumed positive – technical aspects (including perhaps also the overall impacts on the society in general, i.e. not differentiated/ elaborated by social strata; but not considering the potential impact the other way around, that is, how socio-economic needs and trends would shape technological developments). These programmes opt, however, usually for a significantly longer time horizon (say, 20-25 years) than the one used in a critical (key) technologies programme.
- a type B foresight programme is likely to focus on broader technological fields – as opposed to specific sub-fields analysed by the critical technologies approach. (Yet, in the first UK programme, IT, electronics and communications were not integrated into a single panel.) It would pay much more attention to the economic (market) aspects than the above ones, and perhaps would discuss some social factors, too, as they shape demand, but not much elaboration can be expected on social challenges (either dealing with the new ones caused/ accentuated by ICT or asking how ICT can contribute to tackle existing social challenges). The usual time horizon is around 10-15 years when this approach is chosen.
- a distinctive feature of a type C foresight programme is the marked, deliberate shift towards precisely to those socio-economic aspects which are neglected by all the other approaches, and thus mentioned above as "negative examples". Technical aspects, however, are not ignored by this approach, either, but discussed in a different context (also usually in a more integrated way, e.g. ICT and various types of media are understood as a complex, closely inter-related entity): other types of questions are asked, and new drivers and shapers come to the forefront. The time horizon, therefore, is also determined by the socio-economic issues identified by the programme: it would depend on the amount of time required to change the underlying settings, to influence the major shaping factors so as to achieve a certain (desirable) future state. (In other words, the time horizon cannot be shorter than the period of time needed for a change aspired by the programme.)

ICT has been used as an example here because it is – by definition – a technology, and as it is a significant one; thus, it is no surprise at all that various types of technology foresight programmes would deal with this issue. Non-technological topics – such as human resources, crime prevention, etc. – on the contrary, are only addressed by type C programmes as major issues. (This is not to be mistaken with the fact that some socio-economic factors might be included in a type B foresight programme as shapers influencing market dynamics – as mentioned above.)

Finally, it goes without saying that some inherent features of a given topic to be analysed also have repercussions on the time horizon. Usually changes take much more time e.g. in the

field of agriculture (classical breeding), environment, education or in demographic trends than in rapidly evolving technologies, such as ICT or biotechnology. These determinants should not be ignored, and various themes/ topics of a given foresight programme, therefore, might have somewhat different time horizons.

In sum, although there is a great deal of overlap in terms of broad themes discussed by various types of foresight programmes, a closer look clearly shows that these apparently same topics are dealt with in rather different manners. A different focus means that different approaches are applied when analysing seemingly similar issues: a different set of questions are asked, and hence various – social, technological, economic, environmental and political – factors and values are taken into account to a different degree (some of these factors not at all in certain foresight programmes) by a different set of participants (technology experts, business people, researchers, policy-makers, lay people). The time horizon, in turn, is determined to some extent by the inherent (technical, social, etc.) features of the various themes, but also by the focus (main objectives) of the programme, in which these topics are taken up.

3. FROM MECHANISTIC TO INTELLIGENT BENCHMARKING

Modern benchmarking techniques have been developed and used by private firms in order to improve their performance, and thus profitability, but more recently are applied in the public sector, too.[29] This section provides an overview of the different rationales, methods and levels of benchmarking, and highlights some of the potential benefits and drawbacks of the various approaches.[30]

3.1. Rationales and definitions of benchmarking

The underlying assumption of benchmarking private firms is that 'best practice' can be identified in a given industry by applying various measures – mainly quantitative indicators –, and then organisational practices leading to this superior performance can be copied by (transferred to) other firms. The widespread use of benchmarking clearly indicates that managers and business consultants reject the way, in which standard microeconomics models characterise firms: the notion of 'representative agents', assuming that all firms have equal and easy access to the same set of technologies and management practices, and hence apply the same rules of rational decision-making, is at odds with reality.

The accelerating pace of technological and structural changes, coupled with the increasing volatility of globalising markets and the ever more intense competition reinforce the search for methods assisting managers in coping with these challenges. Sophisticated,

[29] Fagerberg [2003], however, recalls that Japanese government officials started a study tour as early as 1871 to examine the judicial system, the military, the navy, the railways, banks, and schools in the US, then in Britain, France, Germany and other countries in order to identify those aspects of Western civilisation that could be most beneficially adopted in Japan, as part of the modernisation endeavours of the Meiji government. They meticulously analysed which country had been the most advanced in these fields. Their findings were published in 5 volumes in 1878. As a result, for example the new education system followed the French pattern of school districts, while the universities were based on the US model. The Imperial Japanese Navy was copied on the British Royal Navy, as well as the telegraph and railway systems. The Meiji Constitution and the Civil Code were of German origin, but the Criminal Code followed the French one. (pp. 13-14) Thus, history tells us that neither 'reverse engineering', nor benchmarking is a new method.

[30] This summary draws on Fageberg [2003], Lundvall and Tomlinson [2002], Lundvall *et al.* [2002], Niosi [2002] Smith [2001] and Soete and Corpakis [2003].

comprehensive and hence resource-intensive and time-consuming methods, such as "operational research, linear programming and technology assessment may be too cumbersome and too slow when it comes to cope with a much more fluid, rapidly changing and uncertain reality. In such a context, a more intuitive and interactive procedure may be more efficient. Instead of calibrating explicit and exact models, benchmarking will reflect the establishment of consensus on an incomplete, implicit and intuitive model". (Lundvall and Tomlinson [2002], p. 207)

From this angle benchmarking is an important step forward, indeed. Evolutionary economics, however, has clearly shown that innovation is a path-dependent, cumulative process, and thus one-to-one copy of technological or organisational (managerial) innovations is simply not possible. Organisational, managerial practices and various types of innovations introduced by successful organisations (programmes) should be understood in their context: they mobilise the formal, codified as well as the tacit elements of knowledge and skills, accumulated over time. Thriving firms (organisations) also rely on routines and norms, of which some are tacit and organisation-specific, i.e. hardly possible to transfer. Further, one of their 'secret weapons' for success is that they find a way of mutually beneficial co-operation with other organisations. Finally, they benefit from the existence of 'extra-mural' institutions.[31] Hence, what works in a given context, might have negligible, or no impact at all in a different setting, or even bring negative effects.

Moreover, neither would one-to-one copy be desirable, as diversity is a major source of economic evolution, and thus a key to innovations, leading to improved performance. In other words, the dominance of the same set of managerial techniques across firms, industries and countries – the supremacy of so-called 'best practice' – would be detrimental in the long run. This general consideration is valid for foresight programmes, too: diversity of approaches and methods is an important source of innovation in this field as well.

The above, simplistic, version can be termed as naïve or mechanistic benchmarking. Other approaches, which put more emphasis on careful analysis of the context, in which organisations operate, and therefore underline the importance and benefits of learning by comparing, are more appropriate and useful. By doing so, both intra- and inter-industry differences – applied to the ForSociety project: differences inside and across countries – can be tackled, that is, the role of tacit knowledge and skills, organisation-specific routines and norms, as well as the impacts of 'extra-mural' institutions can be better understood, and appropriate strategies for improved performance can be devised. This approached is called intelligent benchmarking. (Lundvall and Tomlinson [2002])

Actually, the 'variety' or 'heterogeneity' of definitions and approaches to benchmarking shows in itself the importance 'diversity' in real life situations. Lundvall and Tomlinson [2002] list five different definitions (pp. 205-206), before developing their own concept. Of these five definitions, the closest one to the 'learning by comparing' approach of benchmarking is as follows: "A disciplined process that begins with a thorough search to identify best-practice organisations, continues with the careful study of own practices and performance, progresses through systematic site visits and interviews, and concludes with an analysis of results, development of recommendations and implementation." (Garvin [1993])

[31] Just to give a few examples, one can think of the structure and rules of local labour market, the average mobility of labour, networks of suppliers, customers and knowledge producers, various types of regulations, and most importantly the position of a given firm in these networks, i.e. its linkages and co-operation with the other actors. (Lundvall and Tomlinson [2002], pp. 209-210)

When benchmarking applied for public policy , the level (unit) of analysis can range from specific public sector organisations (e.g. hospitals, schools, universities, research institutes, government agencies), policy programmes, such as foresight, via sectors (e.g. health, education or research sectors, as well as the public administration as a whole) to entire national systems of innovation. The higher the level of the analysis, the more important it becomes to understand the systemic nature of the performance, that is, the context in which procedures are to be assessed and improved. Moreover, the role and impacts of the different types of actors – i.e. not only those of the public sector employees and managers, but also the effects of the private sector organisations and their managers, as well as the civil society – should also be taken into account.

3.2. Some traps and potential benefits of benchmarking

As already mentioned, benchmarking tends to rely on quantitative indicators so as to be - and to be seen – objective. It is certainly a legitimate aspiration to establish a solid ground for proposals aimed at improving performance. Two traps, however, should be avoided. First, using numbers as a basis of comparing organisations might deceive decision-makers: the technique is likely to appeal to them as a truly scientific method, leading to undeniable conclusions. In practice, however, organisations themselves are complex entities, and hence the set of quantitative indicators used – out of the hundreds or thousand possible measures – can only be selective. In other words, either important elements influencing the overall performance are neglected, due to lack of a thorough understanding of processes, or worse, the selection of indicators can be manipulated by those who pursue certain types of changes, and able to pick some numbers, which seem to support their agenda. Second, a closely related issue is context-specificity. As discussed in the previous section, the success of various organisational practices is highly dependent on their broader contexts, and hence these factors should be analysed, too, when comparing organisations working in different environments. Smith [2001] offers a stark, sobering warning for policy-makers and analysts: "Diversity implies that there is no single best way to do anything, or to reach any target, and so any overarching single 'guide' or indicator for performance ought to be treated with suspicion. Best practice, in particular, a very dubious concept in the presence of different capacities and different performance measures." (p. 276)

Qualitative analysis, therefore, should be an integral part of any sensible benchmarking. Finding an appropriate balance between quantitative and qualitative indicators is, of course, an important tool to tackle the problems arising from the first issue, i.e. 'internal complexity' of organisations: a sound analysis of factors leading to success is likely to lead an appropriate set of numbers as benchmarks, and can also minimise the danger of manipulation.

However, we still lack sensible, meaningful, and yet, readily available indicators for some of the most important aspects of the innovation process, which are highly relevant for foresight programmes, e.g. intensity and quality of interaction and network formation. Moreover, our current terminology to analyse certain crucial factors of innovation systems, as well as (certain) foresight programmes, such as trust and social capital is far form sufficiently clear. In other words, significant theoretical efforts are required to develop more operational basic concepts, eventually leading to affordable measurement methods and comparable indicators.

Further snags of benchmarking also derive from the importance of context. What is a relevant indicator in a certain national system of innovation, might be a misleading one in other systems. Context-specificity may lead to another practical problem: if one wants to

confine a benchmarking exercise to those organisations that operate in similar conditions – taking into account the major characteristics of regional, sectoral and national innovation systems, in which they are embedded – the number of comparable organisations is likely to be very low, in extreme cases even zero. That is why those 3 ‘idealised types of foresight programmes are proposed here as ‘benchmarks’.

In spite of the above conceptual and practical difficulties, benchmarking offers a huge advantage. It helps focussing attention on performance, and seeing a given organisation from a different angle, i.e. opens eyes to other, potentially more efficient practices. It stimulates learning as managers and other key employees are forced to think about the major factors of success in a comparative, systematic way.

In sum, benchmarking exercises – either top-down or bottom-up ones – should be designed and conducted carefully, taking into account a host of actors and factors.

PART 2: TEMPLATE FOR CASE DESCRIPTIONS

Introduction

The aim of this template to assist case descriptions in order to obtain detailed information on each exercises selected by the ForSociety partners, in the form of case studies, rather than just a few words in a table format. Then it can be used as crucial input to perform various tasks of the ForSociety project, without further extensive data collection, that is, duplicating work and wasting time.

> 'Case description' might sound as a strange term. However, discussions on a previous version of this template have revealed that country context does matter even for an apparently simple issue such as a distinction between programmes and projects. In some countries, e.g. Hungary, UK or Sweden foresight programmes have been run as 'single projects': albeit a number of panels have worked simultaneously on various issues/ challenges, they have followed the same policy rationale, and applied a common set of methods. In other countries, however, a 'foresight programme' is more of an 'umbrella' initiative, consisting of 5-7 or even more separate projects, with different policy rationales, and accordingly, applying different methodologies, and involving different types of participants (e.g. in Denmark, and perhaps in the Netherlands). This difference across countries cannot be resolved with any sophisticated definition of 'programmes' vs. 'projects'. Thus, a pragmatic approach seems to be reasonable: (i) the selected 'programme' – also in a Danish or Dutch sense – should be described in section I (Landscape) of this template; (ii) in sections II and III of this template, wherever possible, the questions should also be answered from a "programme" point of view. However, to reduce complexity (and thus workload) a 'project' in a Danish or Dutch sense, or a few specific panels in a Hungarian/Swedish/UK type of programme, can be chosen for certain questions of section III. (iii) The questions of impacts, methods and science-society dialogue in section III should be replied from a "programme" point of view – be it a Danish, Dutch, Hungarian, Swedish or UK type of programme –, so as to give an overview of the variety inside the programme. (This way, a comprehensive picture can be obtained from those countries, too, where there is a wealth of foresight initiatives, without repeating the case description for 5-7 times for each 'projects' in a Danish or Dutch sense.)

This template has been designed by taking into account two underlying assumptions. First, foresight and key technologies programmes (exercises, projects, efforts) are embedded in a broader societal context (national and/or sectoral innovation systems; policy decision-making system and methods, policy-making culture) as well as in a specific institutional context or 'landscape' (history of 'future-oriented activities' in a given country, the main players in this field). That is why a detailed case description is required for any sensible analysis. From a different angle, there is no 'best practice' in this field, i.e. intelligent benchmarking is the appropriate approach (as opposed to 'naïve' or mechanistic benchmarking – discussed in Section 3 [Part 1] of this paper).

Second, foresight and key technologies programmes are learning processes, i.e. participants can learn from previous programmes conducted in their own country, as well as in other countries, and also from their own experience, during the programme ('learning by doing'). Thus, it is quite likely to have unintended impacts/ outcomes of the programme, and significant changes might also occur in terms of objectives, target audiences, participants and methods. Given these assumptions, a section is devoted to the 'landscape', and further questions are asked on the 'frame conditions', as well as on the process elements of the programme. Further, a strong emphasis is put on changes and learning during the programme.

The questions are organised into four main sections: (i) Landscape; (ii) ID card of the selected programme; (iii) Main characteristics and history of the programme; (iv) Questions/ issues relevant for other tasks of the ForSociety project.

Please select a completed or an on-going [one being close to completion] national foresight or key technologies programme (project, exercise) for benchmarking in the frame of the ForSociety project. From now on, it will be referred to as the *(selected) programme* – also denoting 'projects' in the Danish or Dutch sense, as mentioned in the introduction of this Template. Please describe the selected case by following this template.

See the definitions of foresight and key technologies programmes in the Glossary.

I. Landscape

Institutional context

I.1. Which organisations have conducted (launched, initiated, strongly influenced, etc.) foresight activities or key technologies programmes in your country?

When have these programmes been conducted?

What has been the geographical scope of these programmes? (trans-national, cross-border regional, national, sub-national regional)

Describe the objectives, intentions of these organisations concerning the above activities, and their role in those activities!

I.2. What is the specific role of the selected programme in this landscape? (e.g. establishing foresight culture in your country, following previous programmes, initiating new ones, etc.)

I.3. If foresight or key technologies programmes have been conducted in your country, has the selected case taken into account the lessons of the previous ones?

If yes, what lessons, in which way?

If not, why? (e.g. lessons have not been made explicit/ available; organisational memory has been 'erased'; rivalry among key persons/ organisations associated with these separate programmes; …)

International context

I.4. Has the selected programme taken into account lessons learnt from foresight or key technologies programme conducted in other countries?

If yes, what lessons, through which channels (e.g. inviting experts to your country via bilateral or multilateral schemes; discussions at EU, UNIDO or other international conferences, workshops)? How has it affected the selected case?

If not, why? (e.g. lack of contacts; lack of willingness to learn; fundamental differences in the context)

I.5. Has any international initiative (support programme, etc.) – especially those by the European Commission – made any impact on the selected case?

If yes, please describe the most important impacts!

Thematic context

I.6. If the selected programme has analysed a single theme (e.g. a specific field of S&T; green agriculture or flooding), please map the main actors in this field!

The list of main actors is likely to be theme- and country-specific. As a hint, they can be stakeholders (including customers), government bodies, NGOs, professional associations, key individuals, relevant media, etc.

How do these main actors relate to the theme and how do they relate to the selected programme? From a different angle: it is equally important how they do not relate to the selected programme. On this basis, please assess to what extent the selected programme has been integrated into the overall agenda-setting and decision-making process in this field; and how influential it has been (can be)!

For programmes covering a number of broad themes (e.g. as panel topics), it would be too demanding to characterise the context of each themes. In these cases, however, a few themes might be selected if they offer major lessons either for other countries or for future foresight or key technologies programmes in your country.

II. ID card of the programme

II.1. Name of the programme in own language:
in English:

II.2. Website:

II.3. Start of the programme: …. [year]

Status: completed : …. [year]

on-going

Duration: …. years

II.4. Which organisation(s) has (have) initiated it?

II.5. What has been the main (policy) rationale to launch it?

Please rely on the key documents; refer to the essential phrases used in those documents, and if possible/ relevant, relate these ideas/ phrases to the focus of foresight programmes and types of critical (key) technologies programmes – as defined in the Glossary.

II.6. Estimated costs (000 €):

II.7. Which organisation(s) has (have) financed it?

……. …. (%)

……. …. (%)

……. …. (%)

Please indicate their approximate share (%) in the total budget!

II.8. Which organisation(s) has (have) run it?

III. Main characteristics and history of the programme

Frame conditions

III.1. Please describe the societal context – 1) policy-making culture; 2) policy decision-making system; 3) national and/or sectoral innovation systems –, in (and by) which the programme has been conducted and implemented!

III.2. What level of autonomy the programme has enjoyed? From a different angle, to what extent has it been dependent on political or business organisations, other influential groups?

How has the autonomy/ bindings been reflected in the ways the programme has been conducted and its results implemented?

III.3. What alliances have emerged to promote the programme? (Intentional – unintentional; formal – informal ones; organisations – key individuals; etc.)

III.4. Who have been the 'competitors' (those, who might want to hinder the programme)?

III.5. Please describe the management team of the programme, using the following criteria:
number of staff and their profile (professional competence, e.g. project management, research, policy-making, communication skills)

III.6. Please describe the structure of the programme!
e.g. Steering Group; panels and/or working groups; experts commissioned to perform specific assignments; projects within the programme for particular tasks; etc.

What logic has been followed when setting up panels/ working groups/ task forces, etc.? (e.g. by S&T fields/ disciplines; economic sectors; broad [horizontal] socio-economic issues; regional issues; …)

What have been the relationships between the management team, the Steering Group and panels/ working groups/ task forces (in case the selected programme has had these 'units') in terms of knowledge flow/ knowledge management; decision-making on the substance of reports, on financial issues and other relevant matters?

Have these relationships changed during the programme? If yes why, and how?

III.7. Has the programme been monitored?

If yes, please describe the main methods used!

What have been the main lessons/ findings?

How the findings have been fed back to the relevant players (e.g. sponsors/ clients of the programme, steering group, panels)?

Aims, target audience, focus, time horizon, methods

III.8. Please describe the formal objectives of the programme by relying on the key documents!
If possible/ relevant, please interpret/ assess the formal objectives in the following categories: to support centralised decision; to support joint decisions between stakeholders; to support loosely coordinated independent decisions among stakeholders; to create credibility for findings among a limited group of actors; to create credibility for findings and stimulate debate in public.

Who (organisations, key individuals) have been involved in defining the objectives of the programme? In which way: providing ideas, drafting documents, giving opinions on draft proposals, etc.?

What methods have been used in preparing the programme? (e.g. survey of literature on other countries' experience, consultation with, commissioning of, foreign – local experts; preparatory discussions with which stakeholders, etc.)

III.9. Please describe the target audience/ clients of the programme (e.g. policy-makers, businesses, NGOs, individuals)! How they have been identified as target audiences?

Has any change occurred in terms of the target audience during the programme (both intended and unintended changes, e.g. new groups identified or become interested; groups originally identified as part of the target audience lost interest)? If yes, please describe them!

How have the target groups been reached/ involved in the programme? (Methods, channels, feedback, impact on the programme, etc.)

III.10. What has been the geographical scope of the programme?

trans-national	[ ]	cross-border regional	[ ]
national	[ ]	sub-national regional	[ ]

See the Glossary for the definition of geographical scope!

III.11. What has been the focus of the programme? Please tick the most relevant 'ideal type'!

S&T	[ ]	techno-economic	[ ]
societal/ socio-economic	[ ]	key/ critical technologies	[ ]

If necessary, add further details to explain the main characteristics of the selected programme, and indicate its 'distance' from the ideal type ticked above!

See the Glossary and Section 2.2.2 in Part 1 of this paper for the definition and explanation of 'focus' of a foresight programme and the definition of key/ critical technologies!

III.12. Please list the main themes/ topics covered by the programme! (e.g. the name/ title of the panels, in case there have been panels)

Who (organisations, key individuals) have been involved in defining the main themes/ topics of the programme? In which way: providing ideas, drafting proposals, giving opinions on draft proposals, etc.?

What methods have been used in selecting the main themes/ topics of the programme? (e.g. survey of literature on other countries' experience, consultation with, commissioning of, foreign – local experts to assess the importance/ relevance of potential themes/ topics/ issues; preparatory discussions with which stakeholders, etc.)

III.13. What has been the time horizon of the programme? [Please specify in years, e.g. 5-10; 15-20 years.]

Please indicate if any variance occurred among the themes/ topics (sub-projects) of the programme in terms of time horizon!

Themes/ topics driven e.g. by fast changing technologies might have different time horizon than other ones, even in the same programme.

III.14. Please indicate the methods used during the programme by ticking the relevant boxes in the list below!

Delphi-survey(s) [ ] scenario workshops [ ]

vision creating workshops [ ] action oriented/ negotiation workshops [ ]

citizen involvement [ ] consensus conferences / citizen juries [ ]

mediation techniques / conflict resolution [ ] desk research [ ]

polling techniques [ ] stakeholder consultation procedures [ ]

expert panels [ ] stakeholder panels [ ]

mixed panels [ ]

If you tick this box, please indicate the composition of these mixed panels by underlying the relevant categories: citizens; politicians; stakeholders; experts

SWOT [ ] identifying drivers and perspectives [ ]

STEEPV (to identify Social, Technological, Economic, Environmental, Political, and Value-Based factors and issues) [ ]

other [ ]; please specify:

other [ ]; please specify:

III.15. Please list the dominant/ principal methods of the programme (using the above categories)!

What have been the reasons to opt for these dominant/ principal methods?

What competing methods have been considered?

How the methods have been chosen? Who have been involved in that decision? Who have had the final say?

III.16. Have the methods changed in the course of the programme (e.g. methods chosen at the outset have been modified/ revised; additional ones applied)? If yes, why, and with which impacts?

III.17. Has there been any mismatch (tension) between the aims and methods of the programme? If yes, when it has been recognised? What steps have been taken to 'align' them?

III.18. Are there important methodological lessons (for future national foresight programmes to be conducted in your country, other countries or for trans-national programmes) stemming from this experience? If yes, please describe them!

III.19. If a Delphi-survey has been used, please answer the following questions:

How the sample has been selected? (criteria for in/ex/clusion; methods for identifying whom to send the questionnaire, e.g. co-nomination, data bases, etc.)

Please indicate the size of the sample, if relevant, for each questionnaire separately!

Has it been a postal survey or conducted on-line? How many rounds have been used?

How many questionnaires have been designed?

Usually it depends on the number of main themes/ topics considered, e.g. in the case of having panels, each one designs a separate questionnaire.

Who have been responsible for drafting the questionnaires? (e.g. panel members, Steering group members, management team, external experts)

> Please answer separately for the Delphi-statements (rows in the questionnaire) and for the 'variables' or 'questions' (columns in the questionnaire), if relevant!

Who have made the final decision on the questionnaire (e.g. the respective panels dealing with an issue, the Steering group, the management team, representatives of the client or sponsor organisation(s)

> Please answer separately for the Delphi-statements (rows in the questionnaire) and for the 'variables' or 'questions' (columns in the questionnaire), if relevant!

What has been the balance between technological and non-technological statements in the questionnaire(s)? Please give a rough indication in percentage!

Please list 'variables' or 'questions' (columns in the questionnaire)!

Please indicate the number of Delphi-statements (rows in the questionnaire), if relevant, for each questionnaire separately!

What has been the response rate? If relevant, reply for each questionnaire separately!

How the results have been processed (what 'research questions' have been followed)?

Have the results been compared to other countries' Delphi-results?

How the results have been discussed and presented (i) internally; (ii) to the clients and (iii) to the wider target audiences?

Have the results have been fed into (used for) other tasks of the programme (e.g. for policy recommendations)?

III.20. If visions/ fully-fledged scenarios have been used, please answer the following questions:

Fully-fledged scenarios or visions (descriptions of an end state) have been developed and used during the programme?

> See the Glossary for the definitions of fully-fledged scenarios and visions (descriptions of an end state)!

Normative or exploratory visions or scenarios have been have been developed and used during the programme?

> See the Glossary for the taxonomy of scenarios and visions!

What has been the role of visions or scenarios in the programme? (e.g. to guide/ structure the internal discussions among the participants; underpin/ derive recommendations; as a means to present the results, get attention; others?)

At what level these visions/ scenarios have been developed (e.g. global, trans-national, cross-border regional, national, sectoral, thematic)?

How have these visions/ scenarios been developed? (What methods have been used, who have been involved, who have decided on the final version, etc.?)

How these visions/ scenarios have been discussed and presented (i) internally; (ii) to the clients and (iii) to the wider target audiences?

Have the main findings of these visions/ scenarios have been fed into (used for) other tasks of the programme (e.g. for policy recommendations; designing Delphi-statements)?

III.21. How diversity of opinions has been managed among participants? How dissenting views have been integrated? What balance has been struck between keeping (presenting) diversity of views and integrating them (e.g. for shared visions and policy recommendations)?

III.22. What methods have been used to define key actions and set priorities (if these have been among the planned outcomes of the programme)?

III.23. What outputs, deliverables (data sets, analyses, reports, visions/ scenarios, policy recommendations, etc.) have been set in the initial programme design? Has any change occurred in this respect during the programme? If yes, why, and how?

III.24. Please list the actual outputs of the programme! (in terms of the number of data sets built, reports produced, etc.)

Participants, 'dialogues'

III.25. Please use the table below to indicate the role/ involvement of various groups of people during the programme! In other words: who has done what? You may wish to add further information to explain/ describe relevant details in a supplementary text.

Types of participants/ Role (involvement)	Experts	Stakeholders (please specify!)	Citizens	Decision-makers (please specify!)
Participating in awareness raising and information campaigns (including seminars, workshops, media coverage)				
Answering questionnaires, giving opinion in interviews				
Participating in 'external' discussions, dialogues, conferencing (e.g. giving opinion on conclusions, policy recommendations drafted by those who have been involved directly in the programme)				
Drafting conclusions, policy recommendations				
Steering/ managing the project				
Taking major decisions (please specify!)				

III.26. Please use the table below to indicate the aims of the involvement/participation of various groups of people! You may wish to add further information to explain/ describe relevant details in a supplementary text.

Types of participants/ Role (involvement)	Experts	Stakeholders (please specify!)	Citizens	Decision-makers (please specify!)
Support knowledge creation for the programme/ project; Data collection				
Clarify values, visions; Create opinions; Support networking				
Take decisions; Implement conclusions; Create action; Legislate				

III.27. What constitutes – in the general understanding used in the programme – a science-society dialogue? In other words: Who should communicate with whom, and in which ways?

What paradigm of participation has dominated the programme? Please use the following terms, and add further details (e.g. 'variations on the theme', exceptions) if relevant!

Public understanding of science [ ] Corporatism [ ]

Public participation [ ] Direct democracy [ ]

Other [ ] please specify:

III.28. What criteria and methods have been used to identify the participants? Who has (have) nominated them? Who have made the decisions to invite participants? If relevant, reply separately for 'direct' (or 'internal') participants, e.g. panel and Steering Group members, and 'indirect' (or 'external') participants, e.g. those who attended workshops, conferences at various stages of the programme to discuss preliminary and final results/ recommendations!

III.29. Please characterise the 'direct' (or 'internal') participants by their types/ background: (i) experts from various stakeholder groups, e.g. business people, researchers, policy-makers; lay persons, and give their approximate number (by types of participants, and by panels/ working/ steering groups, if relevant, e.g. in case of big differences across panels/ working/ steering groups in terms of their composition by the type of participants)

III.30. Have any participants from other nations been involved in the programme? If relevant, reply separately for 'direct' (or 'internal') participants, e.g. panel and Steering Group members, and 'indirect' (or 'external') participants, e.g. those who attended workshops, conferences at various stages of the programme to discuss preliminary and final results/ recommendations!

III.31. Has there been any mismatch (tension) between the aims and the (type/ composition of) participants of the programme? If yes, when it has been recognised? What steps have been taken to 'align' them?

III.32. Please describe the 'dialogues' occurred during the programme among the members of panels/ working groups/ steering committee on the one hand, and other stakeholders, clients, target groups (i.e. those who have not participated directly in the programme), on the other!

Has any group of non-participants been given special attention/ role in these dialogues? If yes, which groups, and why? (e.g. members of parliament, other politicians, professional associations)

III.33. What methods, channels have been used for dialogues and participation?

III.34. What sort of human (intellectual) and financial resources have been devoted to dialogues and participation?

III.35. Has the efficacy of participation/ dialogues been evaluated (self-evaluation or by independent experts)?

If yes, what impacts (benefits, results) have been identified? What lessons have been learnt for future programmes in your country? What lessons can be useful for other countries and for trans-national programmes?

If no process evaluation has been conducted, please try to answer the above questions by relying on the judgment of those people who know the relevant details of the selected programme!

Dissemination

III.36. What methods, channels, means (e.g. leaflets, newsletters, printed reports, closed and/ or electronic discussions, web publications, meetings, workshops, conferences) and fora have been used to disseminate the programme's results? For which target audiences? Separate the methods, means and for a by target audience, if relevant!

III.37. Have the (preliminary, tentative) results been disseminated continuously throughout the programme, or has the programme had a separate (dedicated) dissemination stage?

III.38. Have any groups/audiences been targeted outside the national context? If yes, what methods have been used? What benefits have been achieved? What difficulties have emerged?

Implementation, impacts

III.39. What have been the intended (planned, expected, envisaged) impacts of the programme?

III.40. Have the results been implemented (taken up) by decision-makers (policy-makers, quangos, R&D institutes, universities, businesses, NGOs, media, opinion-leaders, etc.)?

III.41. What planned and unintended changes/ impacts can be identified?

e.g. initialising new policies; (business/ individual) actions; changes in (i) knowledge creation; (ii) networking, network-building; (iii) attitudes, norms, behavioural patterns, values; (iv) other relevant impacts

Please use the table below to indicate specific impacts:

Impact	Project / activity example: which element/ activity/ project of the programme caused the impact? (e.g. a panel, working group, workshop, study)	Method used	How can the impact be seen/ noticed/ recorded?	Has it been an intended (I) or unintended (U) impact? (Please indicate by 'I' or 'U'!)
Technical/social options made visible (K)				
Comprehensive overview on consequences given (K)				
Structure of conflicts made visible (K)				
Policy objectives explored (K)				
Existing policies assessed or evaluated (K)				
Setting agenda in political debate (O)				
Stimulating public debate (O)				
Introducing visions / scenarios (O)				
Mediating self-reflection among actors (O)				
Breaking down barriers (Blockade running) (O)				

Impact	Project / activity example: which element/ activity/ project of the programme caused the impact? (e.g. a panel, working group, workshop, study)	Method used	How can the impact be seen/ noticed/ recorded?	Has it been an intended (I) or unintended (U) impact? (Please indicate by 'I' or 'U'!)
Building bridges between opposing actors (O)				
Comprehensiveness in policies increased (O)				
Policies evaluated through debate (O)				
Democratic legitimisation of action perceived (O)				
Further scrutiny / action plan of the issue decided (A)				
New orientation in policies established (A)				
New ways of governance introduced (A)				
Initiatives to intensify public debate taken (A)				
Policy alternatives filtered (A)				
Innovations implemented (A)				
New legislation passed (A)				
Others – please supplement with other relevant impacts				

Legend: K: Knowledge; O: Opinion; A: Action

International co-operation

III.42. Has international co-operation on methodological issues contributed to the execution of the *selected programme* in the form of

- informal or semi-formal methodological co-operation: transfer of methodological experience/ expertise at face-to-face meetings, discussions, seminars organised for the clients, participants
- formalised methodological co-operation: following the same set of methods, e.g. in the frame of a project (such as eForesee), but not aligning the content/ substance of the programme?

If yes, please give the relevant details (type of co-operation, partners, benefits, etc.), and indicate the main institutional, administrative, legal, and process barriers that have had to be overtaken!

III.43. Has the *selected programme* been conducted as part of a

- jointly designed, simultaneous programmes run nationally (same/ similar topics/ themes and methods; comparative analysis of results at the end of the programme [nationally and/or by a small, international group of experts])
- truly co-operative, jointly designed, organised and run programme with participants from a number of countries working closely together, e.g. as members of the same panel, and thus producing and analysing the (preliminary) results together, during programme

If yes, please give the relevant details (type of co-operation, partners, benefits, etc.), and indicate the main institutional, administrative, legal, and process barriers that have had to be overtaken!

III.44. Has any other type of international co-operation issues contributed to the execution of the *selected programme*?

If yes, please give the relevant details (type of co-operation, partners, benefits, etc.), and indicate the main institutional, administrative, legal, and process barriers that have had to be overtaken!

III.45. Are you aware of any *other (recent)* international co-operation in the field of foresight or key technologies programmes in your country (but outside the frame of the selected programme)?

If yes, please give the relevant details (type of co-operation, partners, benefits, etc.), and indicate the main institutional, administrative, legal, and process barriers that have had to be overtaken!

III.46. Are you aware of any *planned* international co-operation in the field of foresight or key technologies programmes in your country (but outside the frame of the selected programme)?

If yes, please give the relevant details (type of co-operation, partners, benefits, etc.), and indicate the main institutional, administrative, legal, and process barriers that have had to be overtaken!

Evaluation, self-evaluation

III.47. Has the programme been evaluated by independent experts? If yes, please give the relevant details: who has commissioned the evaluation; composition of the evaluation panel (the number of foreign and local experts); main criteria of the evaluation; main evaluation methods; main findings; availability of the evaluation report, etc.

III.48. Has the evaluation report been discussed with the clients/ target audience of the programme (or any other relevant stakeholders, decision-makers)? Has any action been taken as a consequence of the evaluation?

III.49. If the programme has not been evaluated by independent experts: has it been evaluated internally? If yes, who initiated it, what criteria and methods have been used, what are the main findings? Have these results been published/ discussed with the participants/ clients/ target audience of the project (or any other relevant stakeholders, decision-makers)?

Summary

III.50. Has any of the following tensions occurred during the programme, between:

- participants with different background, mindsets, values, objectives, interests
- participants with different affiliation (e.g. 'fighting' for the same resources)
- the management team vs. participants
- participants vs. non-participants (e.g. those wanted to be involved, but have not been)
- experts vs. lay persons (either involved, or not involved in the programme)
- the nature of the programme (by definition must be open-minded) vs. policy-making structures (autonomy vs. embededdnes of the programme)
- time horizon of the programme vs. political cycles
- complexity of the issues considered by the programme vs. departementalised (compartmentalised) government structure
- governance structure vs. issues (e.g. decision-making competence of national authorities vs. trans-national issues, e.g. environment)
- trans-national issue vs. the national character of the foresight programme, e.g. a trans-national issue is taken in account mostly/only in its national outreach by the way, in which agendas for the foresight process are set up, questions in the foresight process are raised, participants are involved, result of the foresight programme (e.g. trends, visions, scenarios, recommendations) are formulated
- any other major tension not covered by this Template?

If yes, how have they been resolved?

III.51. Please add other points/ comments on issues relevant for the ForSociety project, which have not been covered by the previous questions of this Template!

IV. Questions/ issues relevant for other tasks of the ForSociety project[32]

This section has already been distributed, so as to provide the respective task leaders with crucial input from you by mid-March, 2005. In case you have further ideas/ pieces of information since the first version of your answers have been sent, please contact the respective task leaders directly.

Please rely on all the relevant sources – your own thoughts, pertinent studies, projects, discussions; i.e. not just the selected case described above – when answering these questions!

IV.1. Please list existing and envisaged contacts with other ERA NET projects! (Task 1.5)

IV.2. Please list your links with other European foresight-related activities (e.g. Foresight Knowledge Sharing Platform [FKSP], COST A22, FISTERA, eForesee, ForeTech, Blueprints)! (Task 1.6)

IV.3. Please propose issues for high-level policy dialogue! (Task 1.7)

IV.4. Please propose topics/issues, which could be the focus of trans-national future dialogues, to be organised within the framework of the ForSociety project! (Task 3.2)

[32] This list has originally been compiled by Ferenc Kováts, and then revised by taking into account comments/ suggestions received from Task leaders either in a written from or during the Oslo meeting (18 February 2005).

PART 3: GLOSSARY

Critical/key technologies programme: a type of prospective analysis aimed at identifying a list of critical/ key technologies with a clear indication of related policy actions that should enable the implementation of the results. There is no unambiguous, widely accepted definition of the term 'critical' technology. In practice, it is used at least in four different meanings.

1. Critical technology as the state of the art

   This definition of critical technology equates "critical" with "advanced", making critical technology a synonym for high technology.

2. Critical technology as a component of national self-sufficiency

   A critical technology is one in which a nation state has an abiding interest in maintaining secure domestic sources.

3. Critical technology as pace-setting factor for specific applications

   A critical technology makes possible some desirable process or product; that is, criticality is not inherent in the technology itself but is derived from the importance of the outputs of the system of which the technology is a constituent, as well as from the significance the technology has for enabling that system.

4. Critical technology as generic and pre-competitive

   At an early stage of development, a technology can be judged "useful" for many applications. A technology is "critical" because development efforts are believed likely to produce a wide array of returns not tied to any specific product application. This definition provides distinctions along two dimensions: between pre-competitive and proprietary technologies, and between those of broader and narrower applicability.

Critical technologies programme vs. foresight programme: The former one is not necessarily a participative one; it does not consider alternative futures; and its time horizon is usually significantly shorter (5-10 years, as opposed to 15-25 years).

Focus of a foresight programme: The principal rationale of a foresight programme underlies the more detailed objectives of a programme, as well as the choice of its participants. Thus, foresight programmes can be characterised by their aims, rationales and types/ affiliation of their participants. A particular combination of these features can be called the focus of a foresight programme. On empirical grounds, three different foci can be distinguished: A) S&T focus; B) Techno-economic focus; and C) Societal/ socio-economic focus.

These are ideal types, i.e. the actual cases do have their own distinctive features, often being between these 'pure' forms. A certain level of coherence, and a shared understanding of the focus of a given programme, however, is crucial. Otherwise, tensions are likely to emerge between (a) the various objectives, (b) elements of its structure, (c) the objectives and methods, (d) the participants and objectives, and/or (e) among the participants themselves.

A) S&T focus

Aim	Identify S&T priorities (following the logic of scientific discovery)
Rationale	Boost national prestige, achieve S&T excellence Following the linear model of innovation, socio-economic benefits might also be assumed; implicitly or explicitly
Participants	Researchers, policy-makers (e.g. S&T and finance ministries)

B) Techno-economic focus

Aim	Identify research topics in S&T, of which results are believed to be useful for economic sectors
Rationale	Business logic: improve competitiveness Correct market failure: strengthen academia-industry co-operation, extend the short time horizon of businesses
Participants	Researchers, business people, (some) policy-makers

C) Societal/ socio-economic focus

Aims	Identify research topics in S&T, of which results are believed to contribute to addressing major societal/ socio-economic challenges + other policies to tackle these societal/ socio-economic issues
Rationale	Improve quality of life (enhance competitiveness as a means for that) Correct systemic failure, strengthen NIS
Participants	Researchers, business people, policy-makers, social stakeholders (lay persons?)

Forecasting: estimation of a future state – in the short, medium, or long run – in a specific field, using scientific methods and techniques.

Foresight programme (/ project/ exercise): a type of prospective analysis, meeting three criteria: (i) action-oriented; (ii) participatory and (iii) considers alternative futures.

(i) A foresight programme aims at shaping/ influencing/ acting upon the future. It is needs-oriented, and its results are used in decision-preparatory or decision-making processes. In other words, it is not an exercise conducted for pure scientific purposes (advancing knowledge for its own sake, publishing books or articles in academic journals).

(ii) It is a participatory endeavour in the following sense: (a) it involves participants from at least two different stakeholder groups (e.g. researchers and business people; experts and policy-makers; experts and laymen); (b) its preliminary results (e.g. analyses, tentative conclusions and policy proposals) are disseminated among interested 'non-participants', e.g. face-to-face at workshops, electronically via the internet with free access for everyone, or in the form of printed documents, leaflets, newsletters; and (c) it seeks feedback from this wider circle (either face-to-face or in a written form). If any of these criteria is not met, that activity cannot be regarded a participatory programme.

(iii) It is based on the assumption that the future is not pre-determined yet; and thus the future can evolve in different directions, to some extent depending on the actions of various players and decisions taken 'today'. In other words, there is a certain degree of freedom in choosing among the alternative, feasible futures, and hence increasing the chance of arriving at the preferred (selected) future state.

There is a close link between being action-oriented and considering alternative futures. A foresight programme, however, can also consider alternative futures with the explicit aim of identifying key choices confronting its 'constituency' or 'target audience', but without the intention to single out any preferred future. In other words, these foresight programmes do not follow a normative approach.

Geographical scope: a foresight or key technologies programme (/ project/ exercise) can address issues at different level: trans-national, cross-border regional, national, and sub-national regional.

A **trans-national** foresight or key technologies programme involves several nation states, and initiated/ organised/ financed and conducted by themselves or with the help of international organisations (such as the EU or UNIDO, etc.) to analyse issues (challenges, themes, topics) relevant at a trans-national level. The issues at stake are trans-national (cross-border) ones by their very nature, e.g. *a)* they concern common security threats, environmental dangers, the management of water resources, traceability of foodstuffs and global climate change, or there is a need for common approaches to regulations, standards, measurement and testing; etc.; or *b)* there is a direct link to new or existing international – e.g. EU – policy; and *c)* it can enhance the competitive position of a group of countries (either an ad hoc group, or a formalised one, such as the EU, NAFTA, OAS, APEC, Mercosur, etc.) e.g. by identifying areas of industrial strength and research excellence that are based on common training infrastructures, market systems, regulatory structures. (This is not an exhaustive list; other reasons can also prompt a trans-national foresight or key technologies programme.) The fundamental, common, feature of these types of challenges is that they must be addressed by a trans-national programme (joint actions/ policies/ regulations are required by a group of countries or an international organisation). If not, the answers will only be partial or inadequate.

A **cross-border regional** foresight or key technologies programme involves several regions (usually, but necessarily neighbouring ones), located in different nation states. The programme is initiated/ organised/ financed and conducted by these regions themselves or with the help of international organisations (such as the EU or UNIDO, etc.) to analyse issues (challenges, themes, topics) relevant at a trans-national level. The distinctive feature of cross-border regional programmes is that they consider cross-border issues, in which the regions concerned have the necessary resources and competence to deal with these issues jointly. (In other words, joint actions/ policies/ regulations are required by these regions, and not at a level of nation states acting together or by an international organisation.)

A **national** foresight or key technologies programme concerns one nation state, and is initiated/ organised/ financed and conducted by some organisations of this country to analyse issues (challenges, themes, topics) relevant at a national level. The financial and intellectual resources, legal and professional competences to deal with these issues can be found at a national level.

Various types of trans-national or cross-border issues can be identified by national programmes, too, but this is not the main concern of a national programme, and it is more an exception than the rule to deal with these issues.

International co-operation or assistance in various forms (methodological, financial, etc.) can be used by national programmes, but that does not change the fundamentally national character of these programmes (issues, resources, competences).

A **sub-national regional** foresight or key technologies programme concerns one region inside a nation state, and is initiated/ organised/ financed and conducted by some organisations of this region to analyse issues (challenges, themes, topics) relevant at a (sub-national) regional level. Most of the financial and intellectual resources, legal and professional competences to deal with these issues can be found in the region, where the programme is launched, but some national (or international) resources can also be mobilised.

Various types of national, trans-national or cross-border issues can be identified by national programmes, too, but this is not the main concern of a sub-national regional programme, and it is more an exception than the rule to deal with these issues.

International co-operation or assistance in various forms (methodological, financial, etc.) can be used by sub-national regional programmes, but that does not change the fundamentally sub-national regional character of these programmes (issues, resources, competences).

Prediction: estimation for any time period – before, during, or after the current one – in a specific field, using scientific methods and techniques.

Prospective analyses: all types of systematic, analytical activities – action-oriented and 'contemplative' ones; participatory and non-participatory ones; those considering alternative futures or just a single future state – aimed at producing anticipatory (forward-looking) intelligence, relying on a rigorous methodology (qualitative and/ or quantitative methods).

Scenario (fully-fledged): a 'time-line' of actions and events leading to a specific state in future (end state).

Taxonomy of scenarios

	Top-Down Approaches	Mixed Approaches	Bottom-Up Approaches
Exploratory Approaches	**1)** Analysts define "what-if" scenarios	**2)** Analysts heavily structure group discussion or survey instruments to focus on a few predefined exploratory scenarios	**3)** Experts involved in free-form scenario workshop, or provide survey responses (e.g. conventional forecast Delphi) which are grouped by statistical methods to yield scenarios
Mixed Approaches	**4)** Analysts define scenarios based on different theories/ perspectives	**5)** Analysts define normative profiles, these are elaborated by experts	**6)** Experts grouped according to worldviews and expectations by statistical methods or discussion, and then elaborate scenarios as distinct groups
Normative Approaches	**7)** Analysts define normative end-state scenarios	**8)** Analysts define normative scenarios, experts comment on them, identify key issues	**9)** Experts involved in free-form normative scenario workshop, or provide survey responses (e.g. goals Delphi) which are grouped by statistical methods to yield scenarios

Source: Ian Miles: "Scenarios for TAP-ASSESS", 1999, PREST

Vision: a description of a specific state in future (end state) [without indicating the path – 'time-line' of events, major decisions, cross-roads, etc. – leading to this future state].

ANNEX 1: FORESIGHT DEFINITIONS

"(technology) foresight is the process involved in systematically attempting to look into the longer-term future of science, technology, the economy and society with the aim of identifying the areas of strategic research and the emerging of generic technologies likely to yield the greatest economic and social benefits" (Martin [1996])

"A systematic means of assessing scientific and technological developments, which could have a strong impact on industrial competitiveness, wealth creation and quality of life. (First UK Foresight Programme)

"A programme that aims to create sustainable competitive advantage and enhance the quality of life by bringing together business, the science base and Government to identify and respond to emerging opportunities in markets and technologies." (Georghiou [1996])

"Foresight activities are policy-making processes, in which collective learning is developed in the S&T-related area via interaction between industrial, academic, governmental and social actors. It operationalises interactive processes aimed at exploring openly and collectively possible futures. In this way, it both increases and distributes Strategic Intelligence among social actors on emerging generic technologies and innovations. Such processes help formulate and co-ordinate the forward-thinking of institutions concerned with (technological, social and organisational) innovation, thus enhancing their strategic capabilities. As both a 'means' and an 'end', Foresight processes also help establish hybrid networking, build shared agendas and overcome established boundaries, be they geographical, institutional, or disciplinary ones." (Barré [2001])

"Foresight is the overall process of creating an understanding and appreciation of information generated by looking ahead. Foresight includes qualitative and quantitative means for monitoring clues and indicators of evolving trends and developments and is best and most useful when directly linked to the analysis of policy implications. Foresight prepares us to meet the needs and opportunities of the future. Foresight in government cannot define policy, but it can help condition policies to be more appropriate, more flexible, and more robust in their implementation, as times and circumstances change. Foresight is, therefore, closely tied to planning. It is not planning - merely a step in planning." (Coates [1985])

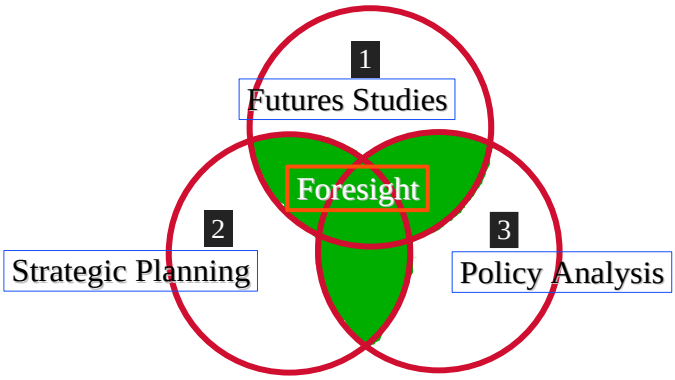
"**thinking about emerging opportunities and challenges, trends and breaks from trends**, and the like. But the aim is not just to produce more insightful 'futures studies', more compelling scenarios, more accurate econometric models. Foresight involves **bringing together key agents of change and sources of knowledge, in order to develop *strategic visions* and *anticipatory intelligence***. Of equal importance, Foresight is often explicitly intended to **establish networks of knowledgeable agents** who can **respond better to policy and other challenges**. This is made possible not only by the improved anticipatory they have developed, but also through the **awareness of the knowledge resources and strategic orientations of other members of the network**. The key actors involved can include firms, governments, business sectors, and also voluntary organisations, social movements, and technical experts. The contexts in which Foresight can be employed are equally wide-

ranging: much work to date has focused on national competitiveness and especially the prioritisation and development of strategic goals for areas of research in science and technology. But Foresight can and does also deal with issues like demographic change, transport issues, environmental problems, and other social, political, and cultural factors. Indeed, one of the main lessons of Foresight exercises to date is that **science and technology issues are inextricably linked with a wider range of social factors – and vice versa**. Social forces shape the development and use of science and technology and the social implications associated with this. (emphasis added – AH)

Foresight involves five essential elements:

- Structured **anticipation** and **projections** of long-term social, economic and technological developments and needs
- **Interactive** and **participative methods** of exploratory debate, analysis and study, involving a wide variety of stakeholders, are also characteristic of Foresight (as opposed to many traditional futures studies which tend to be the preserve of experts).
- These interactive approaches involve forging new social **networks**. Emphasis on the networking role varies across Foresight programmes. It is often taken to be equally, if not more, important than the more formal products such as reports and lists of action points.
- The formal products of Foresight go beyond the presentation of scenarios (however stimulating these may be), and beyond the preparation of plans. What is crucial is the elaboration of a guiding **strategic vision**, to which there can be a shared sense of commitment (achieved, in, part through the networking processes)
- This shared vision is not a utopia. There has to be explicit recognition and explication of the implications for **present day decisions** and **actions**. (emphasis in the original text)

Foresight is an approach that is extremely appropriate at the present time, arising as it does from the convergence of three trends:



1. In *policy development*, the shift from an elite-driven/ top-down to a broader, more participatory approach- this in part reflects desires for greater democratisation and legitimacy in political processes, and in part builds on the increasing awareness that no single body (especially not a government agency!) can know everything that needs to be known in order to effect desired changes. Knowledge is distributed widely, and decision-makers have to live with this, and develop their intelligence-gathering methods accordingly.
2. In *strategic planning*, there has been a move from a "rational" approach aimed at achieving equilibrium and stability, to a more evolutionary approach. This is conditioned by the discovery that high levels of uncertainty are the norm, not the exception, and that qualitative changes frequently undermine the assumptions based upon expectations of quantitative change. "Long-term planning" has been discredited, but the long-term still has to be taken into account in many decisions:
3. In *futures studies*, too, there have been several important developments. One is a shift from emphasis on predictive approaches to more exploratory studies, and from one-off

studies to more continual iteration of the process of envisioning future challenges and opportunities. Equally important is increasing recognition of the need to involve "users" in the process of study, rather than to present them with a vision or set of visions of the future that descends from "on high"; and alongside this, the need for the "futures researchers" to develop ways of seeing that the messages of their studies are absorbed into policymaking in a systematic – and ongoing – way.

Foresight thus occupies the space in which planning, futures studies, and policy development overlap. It is not a matter of academic or consultancy-based forecasts of the future (though it should take these into account). It is not planning, it does not define policy, nor does it displace existing decision-making and planning processes. Rather, it complements them and increases their effectiveness." (FOREN [2001])

"A systematic, participatory process, collecting future intelligence and building medium-to-long-term visions, aimed at influencing present-day decisions and mobilising joint actions" (FOREN [2001], EC DG Research [2002])

"The foresight process involves intense periods of open reflection, networking, consultation and discussion, leading to the joint refining of future visions and the common ownership of strategies, with the aim of exploiting long term opportunities opened up through the impact of science, technology and innovation on society. (…) It is the discovery of common space for open thinking on the future and the incubation of strategic approaches." (Cassingena Harper, [2003])

"a participatory process of constructing better understanding of what desirable and feasible futures could be, and how different socio-economic partners need to work together to create them" (Keenan [2003])

"The FOREN definition states that Foresight involves five essential elements:

- Structured **anticipation** and **projections** of long-term social, economic and technological developments and needs.
- **Interactive** and **participative methods** of exploratory debate, analysis and study, involving a wide variety of stakeholders, are also characteristic of Foresight.
- These interactive approaches involve forging new social **networks**. Emphasis on the networking role varies across Foresight programmes. It is often taken to be equally, if not more, important than the more formal products such as reports and lists of action points.
- The formal products of Foresight go beyond the presentation of scenarios and beyond the preparation of plans. What is crucial is the elaboration of a guiding **strategic vision**, to which there can be a shared sense of commitment (achieved, in part, through the networking processes).
- This shared vision is not a utopia. There has to be explicit recognition and explication of the implications for **present day decisions** and **actions**.

These defining features are particularly salient in today's policy and innovation environments, which is why Foresight approaches have proved to be so popular in recent times. The

emphasis on each of the above listed features in a given foresight exercise may, however, considerably vary depending on the context and the issues considered."
(EUROFORE [2003])

Learning by – and – for co-operation (Paraskevas Dimitri Caracostas, 13 Nov, 2003, Malta, eForesee Conference)

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