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Creative System Disruption: Towards a Research Strategy Beyond Lisbon

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The Mandate: Key Technologies Critical for Europe's Future

Europe is currently facing the challenge of a highly dynamic and fluid policy context. It is confronted with a seemingly accelerating pace of change, both internally and externally. Internally, a culturally diverse, ageing and risk-averse population, a mix of high tech and declining industries and growing environmental and security concerns require governments to design new frameworks for research and innovation. Externally, this policy context is influenced by and influences the emergence of key technologies. The speed and the magnitude of their disruptive impact on the economy and society in turn depend on and are embedded in a wide range of socio-cultural factors.

This challenge calls for a substantial leap forward in thinking and mindsets, by moving from incrementally improving on business-as-usual approaches to exploring new paradigms and alternative futures. A redefinition of the "European model" is called for, capturing the minds and spirits, and bringing together the inherent collective strengths of the EU and its 27 member states. It should comprise a combination of strategic responses addressing short to medium and long-term research policy agendas. For this purpose, a Key Technologies High Level Group composed of experts in 15 key technology areas, and led by a chairperson and a rapporteur, was set up by the K2 Unit of Directorate-General Research, to "assess the potential and the emerging scientific and technological research topics in fifteen specific areas, their impact on EU competitiveness and societal fabric, and the potential response of EU and its Member States".^[1]

Building on Technology Reports

At the kick-off meeting in January 2005, the Group started by deliberating and agreeing on the main objectives of the exercise and the methods and approaches to be used. It was agreed to build as extensively as possible on previous work, in particular recent reports by the High Level Groups on Converging Technologies and Universities.

In this first phase, the work of the Group concentrated on the preparation of area reports by the experts in the following research and technology fields: agriculture, biotechnology, cognitive sciences, communications, complexity, energy, environment, health care, information technology, Manufacturing, nanotechnology, security, services, social sciences and the humanities (SS&H) and transport. The reports were to assess where the EU stands in the particular field on the global scale as well as to provide a forward look. Beyond area-specific analysis, the reports also highlight cross-linkages and interfaces



with other research and technology areas. By way of examples or cases the main trends and key messages (e.g. technology roadmaps) were illustrated. In order to facilitate cross-referencing and comparison, the reports were organised according to a common template, covering the following main points:

- Key socio-economic challenges Europe is facing in relation to the research/technology field
- An overview of EU policy responses in the last 5-10 years
- An overall comparison of Europe's position in research in the field (based on levels of R&D spending for the EU as a whole, member states and competitors/partners and current level of related research funding under FP6)
- A SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) of research and innovation in Europe's sectors and industries
- Policies and programmes of Member States and international organisations
- A Forward Look: long-term challenges and visions in the respective fields, drawing on recent foresight work

At the start of the subsequent second phase, the draft area reports were presented and discussed at an internal group workshop. Emerging issues and headlines were elaborated, cross-linkages with other reports identified, and "executive" SWOT-statements as well as first policy recommendations discussed. The consolidated area reports were then subject to a validation process in the course of which another 10-15 experts in the field were consulted. Building on a condensed SWOT analysis and the key messages from the individual key technology reports, the compilation of the Synthesis Report was led by the Chair and rapporteur. The cross-cutting issues or common clusters of messages and lessons to learn were finally cross-checked with the area experts.

The Group's key findings and recommendations were presented at the EU Conference on Key Technologies in September 2005 inaugurated by Commissioner Potocnik. The visions and reactions of leading personalities from the public and private sectors complemented the presentations of the individual reports and were fed into the final synthesis report.

Policy Transition and Coordination

The EU R&D Action Plan represents a joint agenda for research and innovation actors at European and member state levels to realize creative systemic disruption. As part of that agenda, government policy needs to undergo an equally significant transition as the respective research and innovation systems. For instance, defining the right frameworks and incentives is crucial in order to enable a long-term change or

transition to sustainable production-consumption systems, relying on what has been called system innovations. Ground-laying research on system innovations and transitions is the key to give better orientation to policy and corporate decision-making (Weber 2005).

The policy transition and coordination theme is common to a number of the reports and relevant actions are outlined below:

- To overcome major systemic barriers and path-dependencies through organizational change.
- To promote policies which master the whole innovation chain (basic, applied research, innovation and diffusion) and address innovation policy and management in a holistic, knowledge-driven and participative way.
- To work towards more rigorous policy coordination of strategies, methods and approaches, i.e. the coherence of policy initiatives taken in different realms, ranging from research and technological development (RTD) policy and regulation, standardization, assessment and market creation to competition policy and infrastructure development. Coordinated policy strategies are particularly important for system innovations in order to create stable long-term perspectives for innovating firms. As a consequence, a better coordination between policies is now increasingly sought, departing from a focus on individual instruments towards well-tuned strategies to embed adaptive combinations of instruments (Rennings et al. 2003, Weber 2005).
- To encourage more intense policy coordination across different instruments and funding mechanisms, ranging from research to innovation, technology transfer and commercialization and to ensure that the synergetic effects between different policy instruments are exploited in order to promote key technologies effectively (Weber 2005).

Foresight as a Catalyst for Creative System Disruption

A number of the reports highlight foresight's crucial role in facilitating the policy transition process and preparing the ground for system disruption. Foresight is instrumental in:

- providing a new arena/space "where policy and investment decisions are discussed and in which "futures" are contested..." (Braun 2005) and helps quantify and qualify the future potential of a key technology;
- playing an outreach role in bringing about broader stakeholder participation, engagement and learning in the communication of longer term issues and the building of consensus on the most promising areas;

- acting as a coordination device of collective strategy development for realizing system innovations in society, by aligning “the individual strategies of the variety of industrial, research, policy and societal actors... when they are geared towards long-term objectives that cannot easily be achieved through market mechanisms”(Weber 2005);
- providing insights into decisions related to strategic funding of research and development in relation to emerging opportunities and niche areas;
- overcoming two pervasive weaknesses: the reluctance to approach the problems within a systemic and holistic framework and a resistance to adopting disruptive strategies;
- reflecting on EU research strategies – long term and short term – in the light of global pressures;
- evaluating the strategic fit between the Lisbon Strategy, the long term and short term research agendas with ever changing external parameters.

Sources and References

[1] This Brief draws on the Synthesis Report prepared with Professor Teresa Lemos, Chairwoman of the Group, and the individual reports of the HLG experts.

Braun, A. (2005): Healthcare: Key Technologies for Europe, a report from the expert group ‘Key technologies for the future’, ftp://ftp.cordis.europa.eu/pub/foresight/docs/kte_healthcare.pdf

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Weber, M. (2005): Environmental technologies, Background Paper for the European Commission’s High Level Group on ‘Key Technologies’, July 2005, ftp://ftp.cordis.europa.eu/pub/foresight/docs/kte_environmental.pdf

All Key Technologies Reports can be downloaded from http://cordis.europa.eu/foresight/kte_expert_group_2005.htm

About the EFMN: Policy Professionals dealing with RTD, Innovation and Economic Development increasingly recognize a need to base decisions on broadly based participative processes of deliberation and consultation with stakeholders. One of the most important tools they apply is FORESIGHT. The EFMN or European Foresight Monitoring Network supports policy professionals by monitoring and analyzing Foresight activities in the European Union, its neighbours and the world. The EFMN helps those involved in policy development to stay up to date on current practice in Foresight. It helps them to tap into a network of know-how and experience on issues related to the day to day design, management and execution of Foresight and Foresight related processes.