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Greek National Technology Foresight 2021 Foresight Brief No. 12

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Sponsors: Ministry of Development – General Secretariat for Research and Technology
Type: National technology Foresight covering scientific as well as socio-economic fields
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Duration: 2001 to 2003 **Budget:** €1.5M **Time Horizon:** 2015-2021

Purpose

The National Foresight Programme in Greece mainly focused on exploring the future of the Greek economy and society and the potential role of science, research and technology in shaping the future in terms of the development of a knowledge society.

The Greek Vision of the Knowledge Society

The National Foresight Programme in Greece was implemented in the framework of the Operational Plan for Competitiveness under the Community Support Framework for 2000-2006. It was 75% co-funded by the European Union on the basis of the Regional Development Fund. The remaining 25% was provided by the General Secretariat for Research and Technology at the Greek Ministry of Development. The programme was undertaken in order to explore new strategic methods for the decision making that will promote the development and competitiveness of the country within an Enlarged Europe – time horizon: 2015 - 2021. The main aim of the project, which was concluded in 2004, was to develop a set of key guidelines to assist the government in the policy design and decision-making process and the enterprises in improving the planning of their strategy. The main objective was the creation of a potential Foresight centre for exploiting the know-how and promoting further foresight activities in Greece. Although the national foresight programme utilized a combination of techniques emphasizing dialogue and interaction the approach

was mainly based on the scenario building method. This meant that scenarios were built through processing information literature review¹, etc. Scenario building was selected as it allows the development of potential worlds or ‘mondes possibles’ where specific actions and activities as well as social leaders are identified. The main focus for the development of these worlds was not the past experiences, but the utilization of imagination and creativity; furthermore, the most important issues examined for the production of scenarios were research, science and technology. At the macro level, the monitoring team for the project developed some original scenarios that were further developed by the working groups utilizing a top-down approach. These scenarios examined the potential future developments for Europe and Greece. At the micro level the analysis mainly focused on 11 thematic areas. These areas were:

- Biotechnology,
- Defense Technologies,

¹ Processing information literature review mainly refers to the effort to identify the main critical factors affecting Greece’s course towards the Knowledge economy through the most recent studies and reports referring to knowledge performance indicators and the most important trends that were taken into consideration for the scenario building.

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- Tourism & Culture,
- Energy,
- Environment,
- Health and Quality of Life,
- Industrial Production and Manufacture,
- Materials,
- Information and Communication Technologies,
- Transport,
- Agricultural Development and Fisheries.

Detailed micro-scenarios were developed examining strategies and policies for science, technology and innovation priorities in each of these themes as well as visions of ‘future worlds’ depending on progress made in these domains.

Overall management of the exercise was handled by a monitoring team, which developed a ‘start-up document’ for the beginning of the work. They provided guidelines and organized meetings between the working groups. These were assisted by support teams made up of representatives from various organisations, social groups and professional associations, as well as people with experience in the theme of the working group. Each working group provided a synthesis of results from their analysis and the monitoring team was responsible for synthesizing the results from all working groups in the final report.

Towards a Knowledge Society

Greece occupies a position of geopolitical importance with respect to the Balkans and the Middle East. From an economic perspective however it has a number of structural weaknesses and is considered one of the weaker members of the European Union. The big challenge for the country over the next few years will be to achieve real convergence with other EU economies in terms of quality-of-life for the average citizen, and to manage its transition to a ‘knowledge society’ that does not alienate or exclude important segments of the population. The most important findings concerning the Greek progress towards a knowledge society are as follows:

- The creation of a **Knowledge Society**, the promotion of social and organisational learning, and the introduction of new forms of work such as teleworking is an important objective of S&T policy makers in Greece. To achieve this however it is crucial to increase R&D intensity as well as R&D and innovation activities in the public and private sectors through the promotion of initiatives and programmes that will enhance the innovation and research performance of Greek enterprise.
- Since the end of the 1990s the creation of an **Information Society** has also been a major policy objective. The main aim being to increase usability of ICT across the country, promote and support indigenous companies capable of becoming leaders in the ICT sector. The development of synergies with other fields such as bio- and nano-technology has been promoted and encouraged.
- Greece faces challenges due to **globalisation** and changing determinants of economic growth. Economic challenges, trends and impacts and certain weaknesses were identified concerning the extent to which Greece has exploited so far the globalisation of markets.
- **Brain drain** – the loss of high qualified human capital due to the inability of the system to absorbing high level human resources such as scientists and researchers that could make a difference in their fields is a challenge that Greece has faced for years. Not much has been done in order to tackle this issue apart from small scale initiatives aimed at the repatriation of young scientists.

- Many countries of the European Union face the issue of **population ageing**. The issue is even more pressing where small countries like Greece are concerned. As a consequence there is a risk of disruption to work-life balance and worsening quality of life, whereas health and welfare issues related to changes in work-life balance, the need for better health care and the need for better quality of care sector are becoming more important.
- The **changing structure of the economy** in other words the transition from a ‘traditional’ economy to a more knowledge intensive one is a hot topic. Greece needs to maintain its high rate of economic growth without Community funding all the while promoting structural change and building up its research and development potential.
- The **quality of human capital** is also an issue. Employment and the promotion of training to increase employability and better address emerging market needs is an issue. There is a need to set new objectives in educational and training policies and identify emerging market needs.
- Due to regional disparities and changing patterns of the population issues of **social cohesion and exclusion** in terms of economic immigration, regional disparities, geographical seclusion, etc are considered as very important and they affect significantly the course towards a knowledge based economy/ society, as knowledge should be shared between the people.
- **Quality of social capital** is an issue of great interest in the sense that the promotion of collaboration with non profit and non governmental organisations and the development of synergies with social partners is important for the application of R&D and innovation.
- **Environment and Energy Policies** now need to address the issue of **sustainability**, concerns for the future of the planet and future energy sources. There is a need to explore renewable energy sources and develop applications for changing consumer behavior and consumer attitudes towards the need for improved quality of life and more environmental friendly products.

Visions of the Way Forward

The technological and sectoral trends and visions are not presented in a synthesis but per thematic area examined by the working groups:

- **ICT:** Greece has a low level of ‘digitalization’ compared to the EU average. The trend is to promote ‘technology pull’ rather than ‘technology push’ mechanisms. The main goal for 2021 is to change this pattern for example by promoting synergies with domains such as Biotechnology and Nanotechnology with a view to creating new hybrid technologies and help develop an Information Society with extended ICT usage and deeper knowledge and understanding of the sector by industry.
- **Biotechnology:** This is considered a critical and emerging scientific field. Although Greek citizens are well informed about GMOs and their impact there is limited information sharing among scientists and researchers. There is a need to raise awareness and inform society and industry about the applications and impact of biotechnology, to promote synergies with other research fields, stimulate the interest of private investors and promote collaboration between research centers, universities and industrial sectors for the development of innovative and competitive products.
- **Materials:** Through materials science it is expected that sustainable development will be attained. It is expected that through the use of new technologies in particular through the interaction of ICT, biotechnology, environment, energy, agriculture, industry, transport, tourism, culture, health & defense, hybrid technologies with industrial applications will arise and lead to the development of new competitive industrial sectors.
- **Energy:** As Greece is a country with very low energy resources it is of extreme importance to examine ways of using energy rationally and exploiting renewable energy sources such as passive solar power and wind generation. The main objective is to achieve a more rational use of energy, to promote RES and the application of RES technology and to improve energy policy and energy demand by the year 2021.
- **Agricultural Development:** By 2021 about 5-10% of the population will be employed in the agricultural sector. The main objective of ‘Agricultural Development’ is to achieve sustainable development through the development and interaction of the countryside and agriculture.
- **Transport:** The vision for 2021 is to achieve Sustainable Mobility on the basis of high quality of services that provide safe transportation and protect the environment, to

achieve sustainable energy use, create new forms of business based on the integration of innovation and with social acceptance of new technologies.

- **Industrial Production and Manufacturing:** Industry and more specifically the manufacturing industry currently plays a strategic role in the country’s economy. The main aim is to apply new technologies and promote research in the industrial sector by creating or extending linkages with research centers for the creation of new and innovative products and processes. As Greek industry has a low level of international competitiveness it is necessary that industrialists and entrepreneurs become more innovation and technology oriented.
- **Tourism:** Tourism is considered one of Greece’s most important industry sectors. The fact is that the services provided are generally low-level. There are few high-level human resources in the sector. The aim should be to promote sustainable and alternative forms of tourism. The existing services should be enhanced in terms of promoting the natural and cultural assets of the country. Increased competition from countries such as Turkey, Spain, Italy & Portugal should provide an incentive for improving and changing the services offered.
- **Defense Technologies:** The national defense sector is expected to contribute to the Greek version of the Knowledge Economy and Society by 2021.
- **Environment:** Sustainability and environmental protection is one of the major goals to be achieved. The use of new environmental technologies, clean manufacturing and the promotion of an eco-economy could play a major part in re-structuring the national economy. GDP could be improved by developing and exporting new eco-technologies abroad.

The development of the macro and micro scenarios and the integration of the results of the various thematic areas working groups in them provide a list of potential opportunities and threats, challenges and weakness. The main focus though is in the promotion of R&D and innovation in all identified emerging sectors/technologies in order to achieve sustainable development and create a knowledge based society/economy.

Policy Response

The main policy issue raised concerns the GDP share of funding for R&D in Greece. To meet the Lisbon and Barcelona

objectives expenditure must increase from 0.7% in 2001 to 1.5% in 2010 and 3% in 2020. The most important challenges faced by the Greek Economy and in relation to the main objectives set out by the Lisbon strategy are the following:

- Insufficient investment in education and training,

- Insufficient investment in new technologies and R&D,
- Low ability of attracting foreign investments,
- Lack of expertise and specialization in technology and knowledge intensive sectors,
- Low ICT knowledge and usability,
- Low social capital.

The following policy measures were proposed in order to tackle the challenges identified in the foresight exercise:

- **Structural changes in the labour and product markets:** In order for an economy to maintain a high level of competitiveness it is necessary that product, labour and capital markets work efficiently. Regulatory reforms are required in product markets that are dominated by the public sector enterprise and suffer from low competitiveness. The dominance of the public sector in these markets should also be decreased by selling parts of the enterprises to the private sector, in order to lead into stabilization and more intense involvement of the private sector through the liberalization of the markets to increase innovation and encourage development capabilities. Furthermore there is a need to transform social security legislation since the current system encourages self-employment. This reduces the labour pool for enterprise, limiting their growth and leading to low productivity and low competitiveness.
- **Education:** It is necessary to increase investments in education. The quality of the educational system needs to be improved. Reforms of the educational system should focus on providing more freedom and autonomy to Universities while all educational institutes should be assessed regularly. Furthermore linkages should be created between education and training, between educational qualifications and skills and market needs. Finally, it is necessary support life-long-learning and vocational training in order to enhance and improve the skills of the work-force.

- **Social Capital** should be enhanced through upgrading governance and Public Administration, eliminating bureaucracy and corruption from the economy and society and decreasing the intermediate phases for the provision of public goods through an efficient assessment of public servants and by providing incentives connected to performance.
- **R&D Expenditure:** Expenditure in R&D is very low. This has particularly negative consequences for the long-term development of the country. According to the Barcelona objectives the EU as a whole should increase R&D expenditure from 1.9% of GERD to 3% by 2010. The main suggestion was that changes and improvements are needed in framework conditions for an environment supportive of innovation and R&D. In order for such framework conditions to flourish financial support mechanisms and funding initiatives are required. These initiatives should support enterprises and offer them public funds, reducing risk and enhancing the return of investments in R&D, thus motivate companies to undertake more R&D investments. The structure of the R&D and Innovation system must be improved in order to promote the most promising emerging scientific and technological sectors - and in order to become more competitive within the EU.

It is crucial to include all key players in the process for shaping the future and for promoting R&D and Innovation based on new technologies. This means that apart from the government, the policy makers and other political parties, the science and research community should be included as well as representatives of professional associations, NGOs and citizens' organisations.

Sources and References

- www.gsrt.gr
- www.foresight-gsrt.gr

- www.foresight-gsrt.gr/english
- http://www.gsrt.gr/default.asp?V_ITEM_ID=1241

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.