Parliamentary Assembly
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COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

Resolution 1070 (1995)[1]

Strategic technologies

Parliamentary Assembly

1. No period of history has been as strongly marked by technological progress as the last few decades. The welfare of future generations depends to a large extent on national scientific and technological choices.

2. An analysis of future development of economic life in industrialised countries shows the predominance of knowledge-based economic growth. Many governments have committed themselves to investing in science and technology, though to varying degrees, as a means of overcoming economic difficulties.

3. Among highly sophisticated recent technologies, which increasingly influence our daily life, some occupy a special position. They are called "key", "critical", "emerging" or "strategic" technologies. In this context they have no military connotations, but it is generally acknowledged that they will play an essential role in economic and social life, and in world trade in years to come.

4. Although it is difficult to draw up an exhaustive list of these technologies the following can be considered as having the potential for substantially contributing to the economy over a ten-year period: information and telecommunication technologies, biotechnology, new materials, superconductivity, optoelectronics, nanotechnology and, on a longer time scale, bionics. Some long-standing technologies such as aerospace and computers maintain, however, their importance.

5. By the year 2000 it is expected that more than 60% of work places will have been affected by structural change as a result of new technologies. The annual sales in the United States alone of emerging technologies are estimated at 350 thousand million dollars. In Europe, the production and use of information technologies may account for more than 10% of GDP. These figures are significant in appraising the future parameters of world economy.

6. The main common feature of these technologies is that they result from research in boundary areas between formerly isolated disciplines such as physics, chemistry and biology. The focus, in applied sciences, now lies in integration, interaction and synergy.

7. In this connection there is a shift from the traditional concept of invention or technological breakthrough to a new model where existing knowledge and technologies are recombined and exploited in a creative manner. This is a new process of "technological innovation", in which Japan leads the way and which will be the dominant trend in the years to come.

8. It is therefore crucial that the new model of innovation process is widely understood both by the public and private sectors. The old linear model, focused too much on a scientific base with direct technological applications, is being replaced by a complex interactive process. Policies contrary to this reality will be doomed to failure and inefficiency.

9. This novel technological culture also entails the rewarding of creativity of a certain type with which both the existing financial mechanisms and intellectual property rules appear to be out of step. This is especially true in Europe which has risk averse economic traditions and conservative banking. On average, Europeans invest 30% less than the United States and Japan in "innovation".

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1. Assembly debate on 29 September 1995 (31st Sitting) (see Doc. 7379, report of the Committee on Science and Technology, rapporteur: Mr Lenzer). Text adopted by the Assembly on 29 September 1995 (31st Sitting).

10. The Assembly therefore recommends that governments and parliaments of member states take account of the following proposals in drawing up their technology policies:

A. Government role

Government support in promoting innovation is a delicate matter and has to be handled with care. It should respect the following principles:

1. it should be demand-driven and be designed in full consultation with industry. It should take into account the growing public expectation that R&D ought to have directly perceptible results in terms of economic growth, environmental protection and better health, thus presenting a value to society;

2. publicly funded support should be given at pre-competitive level. Subsidies to near-market research could distort competition. Besides, with the exception of a few defence and prestige programmes, picking winners in industry is an unfair and dangerous game for governments;

3. bureaucracy and overregulation are an additional handicap, in particular in areas where technology changes rapidly. The telecommunication sector is a good example where monopolistic companies still dominate in many countries. Governments have to speed up the deregulation process;

4. governments can also play a catalyst role in promoting co-operation between universities and companies and in bringing partners together, especially when new technology is developed in a small start-up company which has no or limited possibilities of finding venture capital. Very often high-tech start-up firms need to co-operate with larger firms to go beyond the prototype stage;

5. a knowledge-based economy and drastic changes in technology require reforms in scientific education and technical training. There is an even greater need for people who can understand the interface between technologies and manage innovation networks. We have to move away from sector or firm-specific specialists to multidisciplinary professional competences;

6. .in the long term, promoting a greater awareness of the importance of innovation throughout all sectors of the economy is the major task of governments. Public authorities should seek an integrated approach in organising a national innovation system, which has ramifications in finance, industry, education, training, etc., and which largely determines the economic performance of a nation.

B. At European level

Europe has a good record of co-operation in big scientific and technological projects _ the European Space Agency (ESA), Airbus and the European Organisation for Nuclear Research (CERN) are but a few examples. The Eureka programme contributed greatly to bringing together the know-how of European firms at pre-competitive level. The 4th framework programme of the European Union on research and technological development foresees important action in the field of new technologies, with substantial budgetary means. Despite these efforts there is an innovation deficiency which requires a rethinking of the system:

1. in order to face international competition in this new technologies market Europe needs, above all, a common strategy. It is imperative to move towards harmonisation of national standards so that the widest possible internal market is created;

2. a university/industry relationship is still looked upon by many in Europe with scepticism or distrust. A change in mentality as well as the lifting of regulatory barriers may lead to better interaction, in the form of informal links or formal contracts. Involvement in industrial research should not constitute an impediment when academic performance is assessed;

3. .Europe needs new intellectual property and patent rules more adaptable to the new concepts of co-ordination of research, technology linkage and creative marketing;

4. the potential contribution of the military sector to innovation capacity is beyond doubt. "Dual-mode" technology-defence funding constitutes a substantial tool in the United States as a means to boost domestic industry in leading sectors. Europe has to reconsider its strategy in this area, taking also into account the enlarged geographical context and the question of conversion of military technologies;

5. as a concluding point the Assembly is convinced that Europe possesses the infrastructure and the technical skills necessary in order to remain in the leading group with the strategic technologies. It needs, however, a new inspiration and a clear political impulse to stimulate its creative capacity. Past technological successes leave the possibilities open for new exciting experiences.

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