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A POLICY FOR INDUSTRIAL INNOVATION - STRATEGIC LINES OF A COMMUNITY APPROACH

Communication from the Commission to the Council

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A policy for industrial innovation

Strategic lines of a Community approach

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The challenge

1. In its communication 'Industrial development and innovation'¹ the Commission drew the attention of the European Council to the urgent need to improve industrial innovation in Europe and to some of the associated problems. As a result of its discussions, the European Council:

- considered that, in the necessary adjustment of their industrial structures, Community undertakings must aim resolutely at applying and developing activities based on an innovative approach. This effort must be undertaken in conjunction with both sides of industry as a necessary component of an active policy on employment;
- hoped that the efforts made in this direction by the Member States will be better coordinated in order to improve the competitiveness of European products by making the best use of the dimension afforded by the common market;
- requested the competent authorities of the Community to examine ways of eliminating the fragmentation of markets and improving incentives to innovation and the dissemination of knowledge.

In response, the Commission, in its report on the 30 May mandate² and in the proposed fifth medium-term economic policy programme,³ has emphasized the introduction of a Community policy for technology and innovation based on the internal market.

2. Reinforcing innovation and the technological strength of the Community should be one of the cornerstones of a longer-term-oriented economic and social policy which should set the basis for the creation of secure jobs based on productivity gain, competitiveness and growth in our economies. It is the innovation process that converts potential technical progress into economic and social fact.

Industrial innovation is difficult to seize in orthodox economic terms. It principally means the introduction of new products, services, production methods or marketing and management techniques throughout the economy. Rad-

ical innovation creates new infant industries, incremental innovation revitalizes traditional branches. Innovation may be heavily research-based, and/or it may depend on ingenuity in production and marketing. It may depend on the spontaneity of small entrepreneurial units or be based on the economies of scale available only in large organizations.

However, beyond the specifics of economic units and industrial branches, innovation is carried by the dynamics of our market, social and scientific systems. It needs as essential inputs or elements: enterprises capable of innovating; an efficient research and education infrastructure; an economic and social climate which accepts and encourages innovation.

3. During the last decade, industrial innovation has come to show a twofold pattern:

- It has grown in importance for all sectors of industry and the economy. There are many hundreds of thousands of products on world markets. Their average product life cycle is declining. Consequently, the innovation pressure is constantly increasing. Because of the multitude of management tasks involved, it is obvious that coping with the innovation process must be primarily a matter for the enterprises themselves. Only decentralized decision-making and efficient competition in the market can yield the best economic and technical solutions.
- Certain technologies have come currently to play a key role in the evolution of our future industrial pattern and to act as vital sources of innovation; most prominently the new information technologies, with the emergence of the microprocessor and, more generally, telematics (see 'European society faced with the challenge of new information technologies: a Community response'¹); and biotechnologies which will have their full impact in the more distant future. The application of these new technologies will contribute substantially to innovation in other sectors vital to our economies: energy technologies in both supply and use (see 'The development of an energy strategy for the Community'²); food and agricultural technologies; space technologies; flexible manufacturing systems. Beyond this, all our more traditional branches will be deeply affected.

¹ Bull. EC 12-1980, points 1.1.8 and 2.1.141.

² Supplement 1/81 — Bull. EC.

³ *European Economy* No 9, July 1981.

¹ Bull. EC 11-1979, point 2.1.21.

² Pages 7 to 20 of this Supplement.

A strategy for industrial innovation therefore should address both: the general factors which are vital for market pull and the broad wave and diffusion of innovations throughout our economies which we need; and the requirements for building a strong position in key sectors and providing for technology push where required, in order to avoid the development of a new dangerous dependence on foreign sources.

4. That innovation needs strengthening in the European economies is emphasized by numerous indicators:

- decline in the rates of European productivity increase and growth, as compared with those in Japan and other countries;
- reduced competitiveness of European products because of growing technical and operational cost advantages elsewhere, with a dangerous impact on the Community's external balance;
- a diminishing share of the world markets for advanced technological products, in contrast with the growing shares of our principal competitors.¹

The introduction of new products and production techniques is required to open up new markets and to induce and justify investment by our firms. Innovation will be essential to revitalize our industries and our socio-economic structures.

Europe needs a continuous reinforcement of its innovation potential. What has been done so far is insufficient.

Social acceptability of innovation

5. European economic recovery will quite clearly depend on our capacity for innovation and creativity, which must be nurtured at all levels in the working population — in large and small companies, in national and local administrations, in the trade unions and in the teaching profession. The necessary spirit of entrepre-

¹ e.g. the specialization index characterizing the Community's export position in advanced technology products is at 0.9 (1979), compared to 1 for the average of industrialized countries, and to Japan and the United States, each at 1.4; see statistics prepared for the fifth medium-term economic policy programme.

neurship and imagination must come largely from within the education system of the Member States and will require not simply a greater emphasis on technology within the curriculum, but also a greater commitment to making a consistent link between the acquisition of knowledge and skills and their application by the individual in the economic system.

There is the fundamental problem of social acceptability of innovation and new technology, which requires careful analysis and discussion.

Negative or cautious attitudes about innovation centre around the uncertainty of its effect on overall employment levels. This will depend in particular on the success of innovation in revitalizing European industry and the degree to which it gives a new dynamism to demand in the Community market and also in other markets. Whatever the direct and indirect results for employment, however, employment cannot be considered the sole measure of social progress. The wider social consequences of innovation should also be beneficial. Thoughtfully applied, innovation can and must make a major contribution to the improvement of living and working conditions in the Community countries. Indeed, this is in itself an important objective of the process.

Bottlenecks

6. The innovation capacity of our economies appears to be jeopardized by bottlenecks occurring at numerous points in the long journey from the original invention to the sale of a new product, especially at the stage where the capacity and willingness of the entrepreneur to invest is concerned.

The detailed situation differs between Member States, regions and industrial branches. In this context, it may be recalled that the Commission is currently preparing a report on the competitiveness of European industry.

Bottlenecks may include the following: the research and development potential may not be fully exploited (hidebound structures, lack of flexibility, ageing of research staff, insufficient funds, unsatisfactory management); contacts between basic research, applied research, industrial firms, the social partners and the general public may be inadequately organized; access to research and development results abroad

may be lacking; investment activity of firms may be hampered by lack of management talent, but also by bureaucratic and time-consuming procedures; availability of risk capital may be inadequate; fiscal systems may discourage risk-taking; investment may be insufficient due to unfavourable general economic conditions; an appropriately trained workforce may be unavailable in the right place and at the right time.

Bottlenecks must be eliminated where they are found, and appropriate policy choices made.

The European dimension

7. The Community and the Member States must ensure that Europe's enterprises, within the Community, encounter at least as favourable an environment for innovation as that which has been created, in different ways, in the other two major market economies.

A general requirement is the creation of more favourable economic framework conditions and, above all, the establishment of a true Community-wide internal market which should act as the solid home-market base for worldwide strategies of European enterprises.

Concerted efforts are needed in the key technology sectors on the same scale as the US and Japanese strategies in these fields.

Sustained efforts are needed to build a strong infrastructure in education and basic research at all levels for the knowledge-based industries of the 1980s: not only to promote a climate and attitudes favourable both to acceptance and to stimulation of innovation, but also to provide for the training of a qualified and creative workforce.

An intense promotion of the dialogue between the social partners is also needed, in appropriate bipartite and tripartite frameworks and at its right timing, and support for the necessary transformations in the working environment and in working skills.

8. The major part of these tasks falls to the Member States. But, given that all Member States are facing these problems and that coherence of Member States' actions is essential, the Community can add substantially:

Firstly, in pursuance of its task 'to promote... a harmonious development of econo-

mic activities... and closer relations between the States belonging to it' (Article 2 of the EEC Treaty), by analysing and discussing, within the Community framework, the economic policy options which should create a stable basis for economic development and the investment climate in the Community.

Secondly, where the vigorous application of the Treaty and the further development of the regulatory framework can contribute in a decisive way to the innovation environment, the rapid completion of the internal market and a constructive competition policy will exert a most significant market pull on innovation.

Further, as regards technology development projects of international size, the Community alone is able to provide the strategy, market and political framework which can give to these projects their full weight and impact on the European innovation potential even if, in certain cases, they are developed outside the Community framework.

The Community can play a more direct part where the European dimension allows more efficient new ways to stimulate, such as the promotion of more European cooperation groupings and joint ventures at enterprise level in key sector technologies, or the promotion of new-technology-based firms with a European market perspective.

The Community should give support, where national resources are insufficient, for reasons of scale, to develop key technology programmes and where disadvantages for smaller Member States, or regional imbalance, must be avoided.

Proposed action

9. At this stage, the Commission emphasizes the following issues and proposals:

Policies are needed which favour long-term investment, risk-taking and entrepreneurial activity. Revived investment depends on the control of inflation: inflation creates profound uncertainties which undermine the prospects of economic stability in which soundly based demand can expand; high nominal interest rates discourage investment. Revived investment also depends on the availability of long-term capital, and the willingness of companies

and savers to channel available funds into productive investment and innovative activity; this means reviewing tax and other systems which can unduly favour investment in property or public bonds instead of productive investment.

The Commission proposes to undertake:

- a careful scrutiny, together with the Member States, of financial and tax measures affecting investment to identify the most effective techniques;
- the development of common criteria for innovation incentives and their field of application, taking account of Member States' experience; innovation incentives must become more transparent, more stable and leave more flexibility for entrepreneurial decisions. They should be more efficiently oriented to serve coherent ends and thus have greater impact at minimum cost in favouring sound investment in competitive activity.

With regard to the Community's lending instruments and the Regional and Social Funds, it must be ensured that they play the stimulating and incitatory role which falls to them: both by more coordinated use, together with national means, and by giving priority to innovation within their operations; and by combining the lending instruments and budgetary means in new imaginative ways, such as budget guarantees and flexible interest rebate schemes, targeted specifically upon strategic elements of the innovative framework where a European dimension is involved.

In addition to this general role, Community financial instruments can of course make a more specific contribution in their particular fields, in particular the Social Fund in the realm of training.

10. Although the need to strengthen innovation capacity applies to firms of all sizes, the particular opportunities and problems of small and medium-sized enterprises deserve special attention. The great contribution they make in the United States and Japan to improving innovation strength, drive and flexibility and to increasing employment is well known. In the Community this potential has been up to now exploited to varying degrees; in particular, in spite of special measures in some Member States, new research-intensive firms often suffer

from unsatisfactory access both to venture finance and to public incentives.

Provision of finance to small and medium-sized new-technology-based ventures in Europe is insufficient, especially as regards the financial resources necessary to operate on, and take advantage of, the whole Community market in an early stage of the life cycle of new products. This puts the Community's new small ventures at a basic disadvantage as compared to their counterparts in the United States and Japan. The Commission considers that the sources of venture finance, and the channels through which it flows, must be encouraged in the Member States by developments which draw on the best experience both within and beyond the Community; a possible role for the Community's own instruments should be investigated.

Small and medium-sized enterprises also suffer because they do not have satisfactory access to technical, scientific and market information, and sometimes lack appropriate management guidance.

In this field, too, there is substantial scope for Community activity.

11. The prospects of innovative enterprises depend on their ability to penetrate the market. Initially, they are dependent, for their success, on a home market of sufficient size which can only be, in Europe, the Community's large domestic market.

With this priority in mind, the Commission trusts that the increased effort demanded by the European Council for the establishment of a European internal market will be successful (see recent communication to the Council on the state of the internal market.¹ Proposals in relevant fields such as technical norms and standards, government procurement, intellectual property rights and company law are presently before the Council. Other proposals will be brought forward.

The Commission cannot, however, ignore the danger resulting from the workings of national industrial policies geared to purely national aims in the Member States. Where these industrial policies are supported by the use of State aids, be it in the field of innovation or any

¹ Bull. EC 6-1981, points 1.1.6 and 2.1.11.

other, they are subject to the application of Article 92 *et seq.* of the EEC Treaty. The Commission examines the compatibility of such aids with the common market from the point of view of the common interest as expressed in the derogations contained in Article 92(3) of the EEC Treaty. When examining proposed aids for innovation, the Commission will evaluate their contribution to Community objectives, determine how the project concerned relates to programmes of other Member States and of the Community and give its agreement, if necessary, under the condition of appropriate coordination with these other programmes.

12. The weakest point in the construction of a European internal market is public purchase (some 10% of GDP) and, more generally, all procurement which is influenced by the Member States either directly or indirectly through the institutions dependent on them. As this tendency increases, a large part of economic activity in the Community is walled off in this way, with contracts placed essentially within national boundaries.

In fact, public authorities are often in the position of dominant buyers as regards introduction of new technologies (for example, in large areas of telecommunications, data processing, energy, transport, health and education). Given the effective fragmentation of these markets which unfortunately persists in spite of Community efforts and directives, the virtual exclusion, in this way, of introductory purchases of new technologies, and especially of pre-production series, from a single Community-wide competitive market is a painful and crippling burden to the development of innovation. It is likely, unless conditions are improved, to render it impossible to catch up with the Japanese and American lead in some key areas for many years in most, if not all, Member States.

The Commission proposes to investigate means to take positive action in this field. One possibility to be considered could be stimulating the formation of *ad hoc* groupings of European firms in these areas, by giving preference in Community technology programmes to such groupings, and by providing special incentives, in the framework of the working of the Community's financial instruments, to public purchasers from such groupings.

13. In view of pressures arising from the difficult state of public budgets in the Member

States concerned, a too nationally oriented defence procurement constitutes a special problem.

It leads to a waste of scarce resources and, as far as innovation is concerned, to a loss of those benefits which industry could otherwise derive from technological spin-offs.

As a matter of fact, it cannot be overlooked that defence technology is often interwoven with civil applications as, for example, in aerospace. The economic cost which results from excessive fragmentation of markets in this area is significant. This cost could be reduced by more intense and longer-term cooperation in defence procurement in suitable bodies. Experience over the past twenty-five years suggests that such an attempt need not be unsuccessful.

14. In relation to international technology development projects outside the Community framework, an area of considerable importance to the Community's innovatory potential, both in its own right and through its spin-offs, is the cooperation of Member States in space technologies in the framework of the European Space Agency.

Regardless of whether or not it would be appropriate to associate the activities of ESA with the Community's own research efforts, the Community can contribute, in contact with enterprises at European level, a new market and strategic perspective to technology development in this area.

Better coordination of the European partners, both as regards private enterprises and Member States' governments, would be desirable in such projects, to provide for a firm political basis and for coherent strategic objectives.

15. Developing consistent strategies for key sectors of our industrial structure will be central to our innovation potential, additional to the creation of the general framework conditions.

Member States have recognized this and have initiated national programmes. What is needed in addition, given that these technologies are often heavily research-based and depend on long lead-time development and economies of scale, is more focus at the European level, matching in a European way the focus which is provided, in different ways, in the United States and Japan. The Community must also

ensure that these new technologies are effectively available to all Member States, independent of their size.

The Community has already developed the first elements of the strategies which are needed:

- by considerably streamlining and concentrating the Community's own research and its research coordination activities on priority areas (see recent communication on scientific and technical research and the European Community¹);
- by the establishment of demonstration project programmes in the energy and informatics field which should help to bridge the gap between research and industrial application;
- by implementing exemplary public new-technology projects in the telematics field, such as Euronet and now the planned INSIS and CADDIA networks.

The Commission develops this approach further in its recent communication.¹ It also draws attention to proposals presently before the Council which will form important elements of future strategy: the proposals concern micro-electronics and the opening of the telematics markets, energy demonstration projects, and research on biotechnological engineering.

16. Innovation is a market-determined process and the challenge must be taken up first of all at enterprise level. Therefore, new mechanisms involving cooperation of enterprises at European level could help substantially in the thinking out of strategies in key sectors.

To create a 'platform' for European industry in the information technology field, the Commission has initiated a 'round table' of representatives of industry. To develop the exchange of views further, the Commission is currently discussing with industry details of a joint planning exercise in information technologies which would define areas of needed long-lead-time precompetitive research in detail.

Cooperation groupings and joint ventures of enterprises at European level in areas of long-lead-time precompetitive research, set up in ways compatible with competition rules, would considerably contribute to the cohesion of the

internal market and should assemble the resources needed in large-scale long-lead-time research. The Commission proposes that a Community role in stimulating such cooperation should be considered and the possible use of the Community's instruments to provide incentives be investigated.

17. The Community and the Member States must make determined efforts to create a better interface between research and industry Europe-wide and to develop collective industrial research systems further, especially for innovative small and medium-sized enterprises. The Commission will continue to work for a European orientation of national information, valorization and consultancy services and thus to strengthen the transnational innovation infrastructure which is essential for an efficient European market in innovation.

18. An area demanding special attention and efforts at the Community level is the need to work out a social consensus which would not be limited to the acceptance of innovation, but which would actively stimulate it.

Some of the problems and the possible scope for action at the Community level are discussed in a forthcoming communication from the Commission to the Standing Committee on Employment on new information technologies and social change in the areas of employment, working conditions, education and vocational training.

The Commission's approach rests on active cooperation between the social partners in managing change to bring about a balanced social and economic development and in promoting a social and educational climate favourable to creativity.

The climate necessary to the success of this programme can only grow out of active discussions between those involved at all levels. The Commission will develop discussions with the social partners and governments of the Member States at a European level on the existing basis, while at the same time encouraging extension of these discussions to the national level.

The Community should develop the use of the Social Fund, in conjunction with its other funds and instruments, particularly enhancing its role in stimulating policy development, in the search for solutions to social problems and

¹ Pages 21 to 32 of this Supplement.

in preparing the working population for actively coping with change. The Member States are called upon to make use of existing provisions by proposing suitable programmes.

19. Finally, a general awareness is needed that we must again turn towards investment

into our future as compared to consumption now. We must have the courage to take new avenues to stimulate the entrepreneurial potential and the social strength of our societies. We must evolve consistent concepts for our industrial future and abandon passive attitudes. We must set a new trend in motion. A start must be made now.