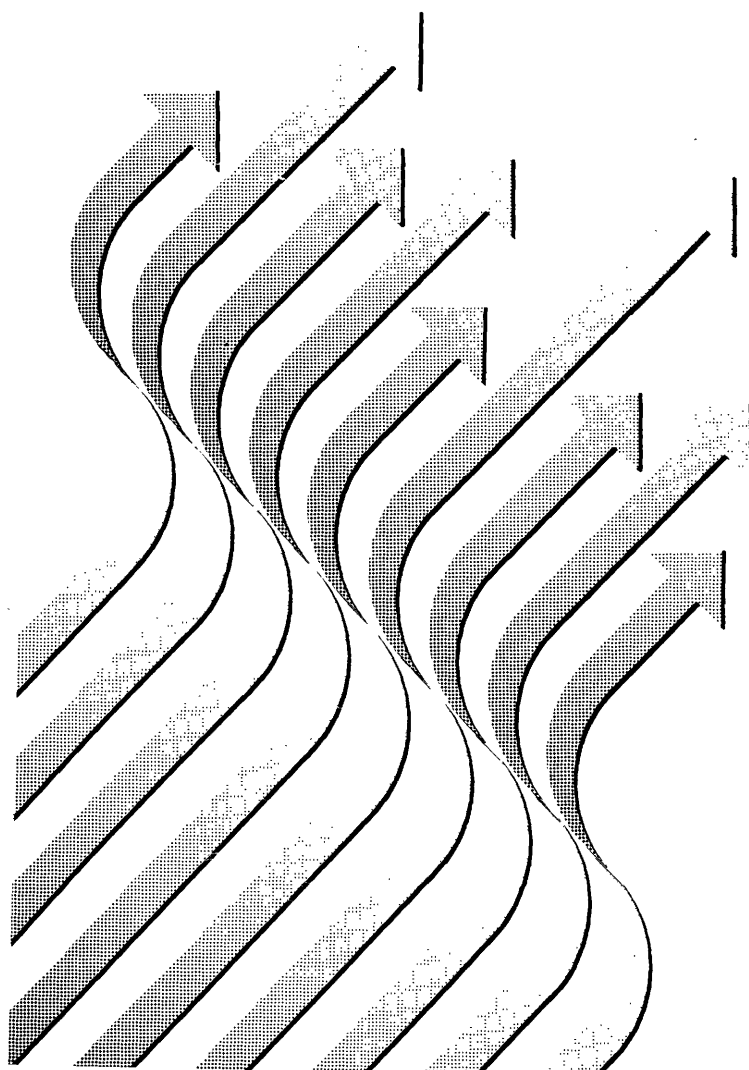


Industrial innovation: A guide to Community action, services and funding



Commission of the
European Communities
1985

EUR 9120 EN
Second edition



Industrial innovation: A guide to Community action, services and funding

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Second edition completed and updated by
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Commission of the European Communities
Directorate-General
Telecommunications, Information Industries and
Innovation

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EUR 9120 EN
Second edition

**Published by the
COMMISSION OF THE EUROPEAN COMMUNITIES
Directorate-General
Telecommunications, Information Industries and Innovation
Bâtiment Jean Monnet
LUXEMBOURG**

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This publication is also obtainable in the following languages:

DE	ISBN 92-825-5703-0
FR	ISBN 92-825-5705-7
IT	ISBN 92-825-5706-5

Cataloguing data can be found at the end of this publication

Luxembourg, Office for Official Publications of the European Communities, 1986
ISBN 92-825-5704-9 Catalogue number: CD-NT-85-002-EN-C

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Printed in Belgium

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INTRODUCTION

This booklet is a guide and not a report. It offers encapsulated information on the European Commission's expanding range of programmes, projects and services in the related areas of industrial innovation and the research and development effort being intensified at Community level.

As a guide, it does not try to assess any of the EEC-level initiatives in terms of success or failure. Many are still too recent, while others are at the proposal stage and await adoption by the EEC Council of Ministers before they can be implemented by the European Commission. Almost all should, in any case, be seen in relation to the various national measures in effect within the Community Member States.

This booklet's aim is to provide a clear and objective description of the various technical programmes that together make up the industrial and technological innovation strategy for Europe that is currently being evolved by the Commission in consultation with the Ten.

The principal value of such a guide is that it should encourage the reader to take full advantage of the services on offer. The more use that is made of EEC programmes, the more developed and useful they will become. For that reason, contact names and telephone numbers have been given wherever possible. It is hoped that direct access to the relevant Commission officials will not only speed-up the process of enquiring into and perhaps participating in schemes, but will also demonstrate the minimum of EEC red-tape attached to them.

The guide is divided into seven separate sections, and between them these group more than 40 different subsections of greatly varying length. The majority of the subsections, however, detail the practical services, projects and financial support programmes that the European Commission makes, or plans to make, available to business, industry and research bodies in the EEC.

These seven main sections into which items are grouped are, it is hoped, self-explanatory and presented in reasonably logical sequence. There nevertheless remain areas of potential confusion. The rapid proliferation of EEC-level initiatives since the late 1970s, together with the overlaps that are natural to the relationship between R&D work and industrial innovation, makes such shading of clear-cut definitions quite inevitable. In short, a number of Community measures listed in this guide are relevant to more than one of the main section headings.

The guide's opening section has been devoted to "Information", meaning the elements in the Commission's campaign to disseminate technical know-how and practical experience, because the communications network concerned is the basis of rapid and successful innovation in the EEC. The distinctions between the subsequent sections should be self evident, except perhaps in the case of Section 6. Devoted to the various Community-level R&D programmes, it might at first sight appear to overlap with Section 4 devoted to Information Technology and the ESPRIT projects and with Section 5 on Biotechnology. Section 6 is in fact concerned most of all with the administrative and budgetary frameworks.

An important caveat, however, is that a number of the items or projects described in this handbook are still at the stage of being European Commission proposals to the Council of Ministers. Where the Member States have yet to approve and adopt a scheme, either because of political objections or constraints on the timetable, a note at the foot of that section makes it plain that Council approval is still pending. Readers wishing to obtain an up-to-date assessment of a project's status should contact the Commission official designated in this guide. In cases where no contact name is given, the coordinator of the Industrial Innovation Task Force, Dennys Watson, is available either to answer himself or to re-direct the enquiry. (DG Information Market and Innovation, 200, rue de la Loi, 1049 Brussels, Tel. 235. 6017/8388).

Why "industrial innovation"? - an assessment

As the wide range of services and projects listed in this booklet makes plain, "industrial innovation", is a broad term. Yet to say that basically it covers the activities that form a bridge between the laboratory and the marketplace is also an over-simplification.

The European Commission's definition of the term is as follows:

"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. Radical innovation creates new infant industries, incremental innovation revitalises 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 organisations."

Even that determined effort to cover all eventualities does not fully answer the question of how the comparatively fresh-coined term "industrial innovation" differs from earlier types of industrial development. Nor does it give any real indication of the scale of new EEC-level actions involved.

The key to both questions is the radically different nature of the new technologies from those that have traditionally provided Europe's wealth and employment. The most striking and significant characteristic of the "third industrial revolution" currently being brought about by micro-electronic technology is the speed with which it is moving.

In marked contrast to the two previous industrial revolutions - that of the 19th Century stemming from steam and that of the 20th Century based on the internal combustion engine - the present technological upheaval is for a number of reasons an unpredictable maverick.

Instead of yielding up its product innovations and market developments at the even rhythm both producers and consumers are accustomed to, it is spewing out radical new technologies at a rate that is disconcertingly exponential. In doing so it is beginning to shake at the foundations of our most familiar economic structures.

Consider just two developments. Never before in the industrial history of mankind has the cost of human labour been undercut so rapidly by progressively cheaper capital equipment as is the case today. For the tumbling prices of micro-electronic products are beginning to upset the long-standing balance between labour and machinery; the former has generally cost from ten to a hundred times less than the latter, thus imposing a constraint on an employer's propensity to automate. It may be that the labour market will eventually readjust to this accelerating structural change, but the period of flux may well last to the turn of the Century and will probably have a profound political impact on the workings of industrial innovation.

The second key development, whose implications are still far from clear, concerns the amortisation of investments in the technological "typhoon" of the 1980s; products are being out-dated so rapidly that their commercial lifespan is not long enough to pay back the investment outlay. A graphic example of this phenomenon is the dilemma facing the half-dozen Japanese producers of the new 256-kilobit dynamic RAM "superchip", the VLSI (very large scale integrated circuit) that marks an important technological breakthrough by storing over a quarter of a million basic items of information (bits) in the memory of a single silicon chip. The Japanese companies are reportedly delaying introduction of the super-chip, and risking the erosion of their lead-time, for urgent commercial reasons. They are fearful that the price of their comparatively new 64k RAM chips currently dominating the market would collapse in the same way that prices of the 16k RAM did when the 64k chips were suddenly introduced. So far, the Japanese producers' problem is seen only as symptomatic of their lengthening technological lead, enabling them to choose the time and the price for introducing new products. In fact, though, the debate raises much more fundamental questions about the economics of the Information Technology revolution.

Experience of the new technologies and their radical impact on industry has, indeed, generally been limited to date to micro-electronics. For that reason, this essay gives some prominence to the adjustments and improvements that the European Community must rapidly make in Information Technology.

Yet all the indications are that the looming bio-technological "fourth" industrial revolution will be faster and more unpredictable still in its unsettling effects, with less time than ever allowed to latecomers in the international R&D race to recapture lost markets.

It is precisely the need in Europe to speed up the time gap between initial product development and market exploitation that has ensured high priority for industrial innovation amongst public policymakers in the EEC Member States. The drive by EEC Internal Market Commissioner Mr. Karl-Heinz Narjes to develop the dynamic of the Community market has been complemented by the establishment of two special "task forces" within the European Commission. One concentrates on Information Technology, the other coordinates and develops the efforts of the different Directorates General where they are relevant to industrial innovation.

The Commission's EEC-level programmes are intended as an essential parallel to Member States' national measures. While they are inevitably much smaller than the sum of national projects - EEC-level R&D spending in 1982 was just 2.2% of all R&D in Europe - they are nevertheless the cement between the bricks. Briefly, the Community measures detailed in this booklet are intended:

- (a) to prevent wasteful duplication of effort,
- (b) to encourage cooperative arrangements and cross-border joint ventures,
- (c) to stimulate industry to take full advantage of the EEC internal market, and
- (d) to reduce intra-EEC barriers to innovation and to the development of new technologies.

The economic targets still to be met by the combined Community and national drives on industrial innovation are daunting, both in terms of achieving a return towards full employment and raising living standards as well as in terms of greatly improved international competitiveness.

Reduced to the most simple terms, the European Community has yet to break through the barrier that separates micro-electronics and Information Technology from being a job-creator rather than a job-destroyer. That in turn means becoming a net exporter of high-technology products and creating an industrial environment in which innovation is seen as a generator of new economic activity rather than as a trimmer of payrolls. The demographic and cyclical factors contributing towards the present crisis in employment do not, it must be recognised, make the challenge any easier. Some four million new jobs are needed in the EEC over the next two to three years merely to peg Community unemployment at today's unacceptably high levels. During this decade, furthermore, some 30-60 m jobs in the EEC will in some way be altered by the Information Technology revolution. To date, the new technologies have failed to create very much employment in Europe, yet their impact on traditional jobs will continue during the rest of this century.

It is clear, however, that the major traditional industries like steel, textiles, shipbuilding and even automobiles that have given employment to millions, either directly or far downstream in service sectors, will in future years be smaller still. For new economic activity, Europe must look first to the high-technology industries and then to the innovative small start-up businesses that account for an overwhelming four-fifths or more of all job creations.

Europe's worsening competitive position vis-a-vis Japan and the US in Information Technology goods and services already means that unless the EEC industrial innovation effort increases sharply there will be serious economic consequences.

Characteristically, it is the speed of the EEC's relative decline that is the most striking, for the "technology gap" separating Europe from its main industrial competitors has widened much faster than most governments and their main IT producers thought possible.

As recently as 1975, the EEC was running a surplus on its international trade in IT goods and services, and in its development of the emerging new technology could still be considered on a par with the US and Japan. By 1980, that surplus had turned into a \$5 bn IT trade deficit and by the end of 1982 it was estimated to have doubled to \$10 bn. Worse, on analysis it emerged that the Community's IT exports during the 1980s have increasingly become the older and more mature technology products of the 1970s. Its imports are no longer components but the entire central processing units and computer memories developed by Europe's competitors.

The risk that Europe's IT industry is sliding into "client" status is itself a matter for concern. But some analysts go further and argue that as the EEC lags ever further behind, even its appetite to import technology will be blunted because its output of finished IT products will also be falling. Thus one projection has it that Europe's consumption of semiconductors as a percentage of the world market will be only 19% by 1986, having stood at 27% in 1979. Total world semiconductor sales, meanwhile, are due to rise by about 15% yearly during the 1980s, which is the growth rate that in 1983 boosted total semiconductor sales worldwide to \$16.7bn.

In market terms, despite a 17% common external tariff on semiconductors, that is amongst the highest for OECD countries, the EEC IT sector's collapse is alarming. Although the European Community is itself a full third of the world market for Informational Technology goods and services, the EEC industry commands nowhere near that amount of the business. Thanks in considerable part to government procurement policies that strongly favour national suppliers, Europe's IT companies enjoy 40% of their EEC "home market", and occupy just 10% of the world "export market" open to them.

As matters presently stand, the European industry risks being trapped by a vicious circle of shrinking sales and vanishing profitability. Viscount Etienne Davignon, the EEC Industry Commissioner, has warned that European IT companies see a return on sales of only 2.5%, which is two-thirds that of Japan's, and are therefore forced to cut R&D spending. In the long-term, Commissioner Davignon believes, this "profitability gap" is leading to a 1% yearly loss of world market share for the EEC. As matters stand, he points out, "we only have 15% of the market, and our natural market share is 30%".

In other words, Europe will on present trends be helping itself to a progressively smaller slice of what will be an increasingly larger cake. The size of the world market for Information Technology hardware was \$237 bn in 1980, is currently reckoned at over \$300 bn, has been projected to reach \$500 bn by the mid-1980s and could by the early 1990s have doubled again to \$1,000 bn. Average IT growth rates are 8-10% a year and set fair to remain at around that level, while in some areas like data-processing systems and integrated circuits growth rates are 17% and 25% respectively.

The IT sector is far from being the only area of industry where rapid development of technology and accelerating international competition are threatening Europe's traditional innovative position. Biotechnology is emerging as a "fourth industrial revolution" that could have an equally profound effect on economic development, yet already there are fears that the European Community may soon lag behind the US and Japan. Biotechnology currently has some application or relevance to about 40% of the manufacturing sectors in Europe, yet EEC governments' public sector research efforts in the field are running at half the rate of comparable spending in the US, while Japan's own carefully planned biotechnology strategy was launched a full ten years ago.

In biotechnology as in Information Technology, the need for a concerted response by Community Member States is abundantly clear, and all Member governments are in principle agreed on that. But the political obstacles remain formidable. The European Commission's industrial innovation drive, for instance, was launched in the late 1970s when the need for a campaign of accelerated national and Community action

had become evident. Yet the political will to overcome domestic objections and act in a common cause has not been strong enough. A major victim has been the Commission's proposal for voluntary liberalisation of EEC governments' telecommunications purchasing, so that in order to boost the size of the EEC market, up to 10% of governments' procurement would be open to bids by all Community producers. Together with a number of innovation and R&D proposals covered in this booklet, that important IT market measure has not been adopted yet by the EEC Council of Ministers.

There is little doubt that a more determined concentration on industrial policy by the Ten would pay dividends.

Advocates of such a new commitment by the Member States see a tripod structure of policies; the three main areas would be internal market liberalisations, a greater pooling by the EEC partners of human and financial resources and, crucially, the reorientation of such "flanking policies" as regional development, social funding, competition policy, and industrial innovation along commonly agreed lines.

It is not impossible that such a pact might emerge from the fog of battle that currently surrounds the Member governments' attempts to agree an acceptable new budgetary framework for the Community. But it would be more realistic if the Member States were to arrive independently at the conclusion that their industrial policies are in any case mostly overdue for a re-think. The defensive interventions begun during the 1970s, in which the European governments compete with each other in the marketplace by subsidising their overcapacity-ridden lame duck industries, may be politically expedient but are increasingly being revealed as expensive and futile.

For Europe, the reality has not only been heightened by intra-EEC tension and increasingly overt protectionism. It has also seen the collapse of almost all those great cross-border industrial partnerships - Hoesch-Hoogovens, Dunlop-Pirelli, VFW-Fokker to name a few - that were to have pointed the way toward the creation of an integrated industrial structure for the Community. That various EEC governments made little effort to rescue and repair such partnerships is a matter

for reproach. The Commission itself took the initiative in 1974 by proposing a regulation to create the so-called European Cooperation Groupings to foster cross-border, inter-firm cooperation within the Community. The draft regulation is still awaiting adoption by the Member States. But the blame must also be shared by European industry itself, for it is the companies' perception of their interests that can shape and even dictate governmental decisions.

SECTION ONE

THE INFORMATION FRAMEWORK

The term "information" in the context of this guide is used to cover Commission and Community services giving access to research results, commercial intelligence, legal and administrative requirements, business partnerships, contract tenders, etc.

The programmes and services detailed in this section are: EURONET DIANE, EURO ABSTRACTS, INNOVATION NEWSLETTER, SIGLE (Grey Literature), TED (Tenders Electronic Daily), BUSINESS COOPERATION CENTRE.

Information Services

The creation of advanced information services in the Community, together with an efficient and properly functioning market for that information, is a vital part of the EEC's industrial innovation strategy.

The information sector encompasses a wide range of subject headings, some of which are only subtly distinct from one another while others seem at first almost unrelated. Their common denominator, however, is that each permits the results of research or development work to be retrieved and used elsewhere in the Community. At best an efficient information market can provide an otherwise elusive and invaluable "missing link", and at very least it saves unnecessary and wasteful duplication of effort in different EEC Member States.

The European Commission's own central executive function in the development and administration of EEC-level industrial innovation and research strategies has meant that increasing effort has been devoted to information. Quite apart from the electronic data bank developments it is supporting, the Commission has become a major publisher of conventional printed information.

In 1983 some 650 reports and 300 academic articles were published, together with some 2,500 papers that had been presented at conferences. Detailed proceedings of some 60 conferences, seminars or courses that had also been organised by the Commission itself were published. Of this total, about 100 reports and conference proceedings were contracted out to commercial publishers.

Euronet DIANE

The Euronet DIANE data base network jointly developed by the European Commission and by the National PTTs of EEC Member States now offers access to some 500 different data bases. Thanks to the work on the Euronet system produced by the three Three-year Action Plans (1975-83) for information and for scientific and technical documentation, the Community now has the foundation of an information industry.

The Community has since the outset of that action programme considerably narrowed the gap that existed between the EEC's comparatively few electronic data bases and those available in the US by encouraging the development of access systems operated largely by private industry.

The European Commission is attempting to encourage further the more rapid development in the EEC of computerised information services that can be added to Euronet DIANE. Details of some new data banks under development can be found in the "state-of-the-art" interim report prepared by the Commission's Information Market and Innovation services on contracts that resulted from its call for proposals⁽¹⁾. In addition, important lines of Euronet DIANE development are now: (i) helping the wide user Community (by mid-1983 over 4,000 organisations were using Euronet DIANE) exploit fully this new facility, through the development of user aids, etc. (ii) exploring export possibilities.

A complete 85-page guide to the data banks and data bases is available free-of-charge from Euronet DIANE, 177, route d'Esch, Luxembourg. For other details concerning Euronet DIANE contact:

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(1) For the calls for proposals procedures, see p.60

Euro Abstracts

The Euro Abstracts journal is an important element in the Commission's drive to disseminate to a greater extent the results of EEC-level, Community-supported R&D to potential users. The monthly publication presents analyses in summarised form of reports, Commission documents, scientific articles and conference papers relating to the European Economic Community (CEE), Euratom and the European Coal and Steel Community (ECSC) (Euro Abstracts, Section II, in German/English/French).

Bibliographic information published in Euro Abstracts since 1968 together with similar information on R&D findings can also be consulted through the EABS data base that is part of Euronet DIANE (see page 3). The EABS data base can be consulted through the Commission's ECHO host computer. The résumé of the EABS Section One has been, since 1984, contained in the EABS data base.

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Tel.: 48.80.41

Newsletter

DG XIII (Directorate-General Information Market and Innovation) has introduced a newsletter entitled "New Technologies and Innovation Policy" in order to provide brief but regular information about what is happening in the areas of DG III (Directorate-General Internal Market and Industrial Affairs), DG V (Directorate-General Employment, Social Affairs and Education), DG VI (Directorate-General Agriculture), DG XII (Directorate-General Science, Research and Development), DG XIII/A (Directorate New Technologies) and DG XVII (Directorate-General Energy). The main purpose of the newsletter is to reach those who are not regular readers of the Official Journal and to advise them of programmes which might benefit them.

The newsletter contains short announcements of new R&D programmes, forthcoming scientific and technical conferences and seminars and details of important new publications. It also provides short reports on the work of the Consultative Committee on Innovation and Technology Transfer which assists the Commission in implementing the transnational plan for the development of infrastructure for innovation and technology transfer.

The newsletter is distributed free-of-charge to some 14,000 people in the Community and is available upon application.

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SIGLE (System for Information on Grey Literature in Europe)

The expansion in Community-level cooperation and joint ventures concerning industrial innovation and R&D has led to a major increase in the amount of grey literature, or non-conventional literature. Grey literature does not stem from conventional commercial publishers but consists of reports, theses, conference proceedings, limited-circulation official documents and non-commercial translations.

It is obviously hard to gain access to grey literature, and yet it contains information of a kind that is central to much of the Community's current technology push. Following a 1978 conference organised in York (UK) by the Commission and attended by 30 experts from Member States, the framework for a bibliographical data base was agreed. This data base would contain details of all the grey literature produced in the Member States.

The System for Information on Grey Literature in Europe (SIGLE) started in early 1981 and during the initial two-year phase was restricted to science and technology. Information centres in five EEC countries - France, Germany, Belgium, Luxembourg and the United Kingdom - are involved in the project, and the participation of Italy and the Netherlands is expected in the near future.

During the initial phase the project concentrated on preparing a data base that is now accessible on-line through Euronet DIANE by INKA and Blaise host computers. In the current phase (1984-85) the scope has been widened to include economics and social sciences.

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"Innovations from Community Research" brochures

An increasing number of inventions with commercial potential for industry emerge each year from the various Community research programmes.

Some of these inventions are presented by the Commission at various exhibitions. For each event a brochure is sent to interested firms who have asked for their names to be included on the mailing list.

Furthermore, when any invention has reached the stage of commercialisation - i.e. when it becomes an innovation - it appears in "Innovations from Community Research", a brochure which is distributed annually to those on the same mailing list.

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Tenders Electronic Daily (TED)

TED is an electronic information service in seven languages that provides detailed information about public procurement contracts which are awarded by national, regional and local authorities in the Member States and for which suppliers and contractors throughout the Community may bid.

TED is the computerised version of the "S" series of the Community's Official Journal and contains all the notices of invitation to tender which are published.

The documents are available in the morning, and this represents a considerable saving of time for users. Access to this data base is essential for every organisation, in view of the fact that contracts may be worth several million dollars.

CONTACT:

ECHO Consumer Service
(European Community Host Organization)
177, route d'Esch
L-1471 LUXEMBOURG
Tel.: 48.80.41

Business Cooperation Centre

In 1973 the Commission set up the Business Cooperation Centre with the aim of encouraging cooperation between small and medium-sized enterprises from different Member States.

The Centre provides firms with information, which might be useful with a view to cooperation, on national or Community legislation in the legal, fiscal, financial or administrative fields.

The Centre regularly receives and circulates requests by firms who are seeking partners for transnational cooperation on more than simply a commercial basis. Cooperation agreements may cover research and development, combined purchasing, complementary production or joint marketing, sales or management. Agreements of this kind may lead to financial links.

At present the work of the Centre is geared mainly to Spain and Portugal. Requests from these countries get priority treatment, and cooperation is also encouraged by the organisation of symposia which allow firms in a particular sector to make contact with EEC firms.

Particular emphasis is also being given to the encouragement of subcontracting agreements at the European level:

- by producing sectoral terminologies in all the Community languages;
- by organising meetings where national subcontracting representatives can exchange information;
- by publishing a calendar of trade fairs and exhibitions of interest to potential subcontractors;
- by sponsoring events such as the above.

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SECTION TWO

FINANCING INNOVATION

The section deals mainly with the Commission's efforts to improve access to financial markets for small and medium-sized enterprises, as well as with various types of funding for industrial innovation and R&D.

The item on venture capital is featured later in the guide under the transnational development plan.

The subject headings in this section are: NCI IV, "Secondary market" funding for NTBFs, the Luxembourg Symposia, Tax and financial incentives to innovation, and EEC structural funds (Social Fund and Regional Fund).

Innovation Investment

Encouraging, targeting and arranging the flow of capital investment towards industrial innovation in the EEC is an important area in which the European Commission can make direct effective use of its executive role and of its Rome Treaty powers.

The following pages focus on the various aspects of venture capital investment and innovation or R&D funding currently being undertaken by the Commission, sometimes in association with intermediary financial institutions.

To avoid repetitive introductions to each subsection, it is worth giving here a general overview of the investment problems facing the Community.

The investment picture must, inevitably, be sketched first in terms of comparison with the EEC's major international competitors. Here, the European Community scores poorly on both the general level of investment in manufacturing industry and on the establishment of new financing techniques that will stimulate innovation by channelling risk capital to entrepreneurs; in spite of the fact that the Community has drawn attention to the decline of productive investments and worsening of the competitiveness of European firms. The Commission has worked towards a reversal of this tendency by proposing and obtaining a reinforcement of the Community Loan instruments and the development of the activity to support the investment.

By the start of the 1980s, only 15% of all investment funds in the EEC were being spent on manufacturing industry, as opposed to some 23% ten years earlier. That decline has been a generalised trend in the US and Japan as well. The difference for the EEC (and in the US too) is that Japan's manufacturing investment currently accounts for 5-6% of gross domestic product, or twice the European and American rates.

The European Commission's most recent analysis of the international competitiveness of Community industry warns that this stagnation of EEC manufacturing investment compares poorly with continued growth in

Japan. And while the US figures at first glance suggest that American industry is as laggard, investing only some 2.6% of GDP in manufacturing as against the EEC level of 3.0%, the giant strides made in the US in the development of venture capital investment is widely considered to compensate.

Indeed, the US is increasingly seen as the model that the European Community must emulate if it is to launch and fund the start-up of NTBFs at the rate needed to narrow or close the international technology gap.

Thanks to growth rates currently running at around 32% a year in their operations, the financial institutions that make up the US venture capital industry have seen their sector double in size in the four-year period to 1982. Total venture capital now committed to industry in the US, and principally to high technology newcomers, is some \$6.6 billion, with new venture capital investment now running at \$1.5 billion a year and rising⁽¹⁾.

There are reckoned to be some 300 specialist financial institutions making up the US venture capital industry, while for the EEC's "Big Four" countries the number is put at about 150⁽²⁾.

(1) **Venture Capital in the USA - 1982:** contribution of Walter B. STULTS, President, National Association of Business Investment Companies, to the European Commission's symposium "The Needs of New Technology Based Enterprises", Luxembourg, 17-19 November, 1982.

(2) **Assessment of and Prospects for Innovation Financing in Various European Community Countries:** contribution of Ch. CLEIFTIE, Deputy Director General of Sofinnova, to the Commission's symposium "Financing More Innovation at Less Risk", Luxembourg, 16-17 December, 1981.

Much more important is the calculation that US venture capital funding is running at ten times the EEC rate. For it is the innovative new companies that are being thus launched which are proving essential to US efforts to maintain technological leads in key areas. Over 25% of all innovative industrial breakthroughs in the US are made by firms with a workforce of less than 100. The slowdown in EEC industrial investment has been especially marked since the mid-1970s. It has now reached the point, according to the Commission, where it will not be easy to reverse the trend. In its document setting out new initiatives for promoting investment in the Community⁽³⁾, the Commission emphasises: "Even if there were a sustained fall in interest rates, the present level of self-financing would be insufficient to enable firms to achieve a satisfactory balance between own funds and loan capital. This is because the degree of self-financing has declined steadily in recent years (1978-81), sometimes by up to 20%."

In a detailed analysis of the EEC's investment problems⁽⁴⁾, the Commission had earlier charted the fall since the mid-1970s of the share of gross fixed capital formation in Community GDP. The key point that it underlined was that the result of this decline in investment "is an ageing of productive equipment and a slowdown in the incorporation of technological progress."

The Commission has therefore set out a broad strategy for the promotion of investment in the Community. It would involve Member States in adopting a common approach on matters ranging from tax and regulatory mechanisms to the restructuring of public spending that in many Member States has been crowding out private sector borrowers from capital markets.

(3) COM (82) 641 final: Commission Communication to the Council on Initiatives for Promoting Investment.

(4) COM (82) 365 final: Commission communication to the Council on the Problem of Investment.

As well as urging an overall framework of cohesive macro-economic policies for implementation by EEC governments, the Commission has also initiated and undertaken action in a number of areas with the aim of stimulating investment in New Technology-Based Firms.

Investment financing in the Community

In the light of conclusions reached after a three-year pilot project and after a series of preliminary studies, the Commission spotlighted the need for a financial instrument specifically tailored to the development of innovation by means of venture capital. This led to the proposal of 7 June 1983 for a Council decision empowering the Commission to help finance innovation within the Community (COM(83) 241 final).

European Innovation Loan

The attempt to make the first move towards the establishment of a European Innovation Fund failed, at least for the time being, when the proposal was blocked at the meeting of Economic and Financial Ministers on 4 June 1984. Nine Member States accepted the French compromise but one State refused to abstain and the decision was thus blocked in accordance with Article 235 of the Treaty.

The Commission does not intend to abandon the idea and reserves the right to submit new proposals shortly. On 22 May 1985, it approved a proposal (COM(85) 250 final) for a Council decision implementing NCI IV, intended mainly for the financing of investment by SMEs in new technology and innovation.

NCI IV, worth 1,500 million ECU, incorporates some of the provisions which originally featured in the European Innovation Loan proposal. Thus loans may be granted with the help of financial intermediaries, and there is provision for the deferred repayment of the principal and interest. The loans may also be used to finance certain intangible assets directly linked to the investment in question; these assets include patents, licences, know-how and the cost of research and development.

The intermediary can provide financing to a company by way either of a loan or of a stake in the equity. In both cases, the intermediary services the loan and also bears the risk.

STATUS

Proposal from the Commission to the Council (COM(85) 250 final) of 7 June 1985: the Council is expected to approve the proposal during the last quarter of 1985.

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"Secondary Market" funding for NTBFs

The Commission is anxious to help reverse the trend, evident since the mid-1970s, of a sharp slowdown in European industries' access to financial markets. It is, in particular, studying possibilities for improving New Technology-Based Firms' (NTBFs) opportunities for raising equity and quasi-equity capital.

The industrial innovation task force of the Commission has initiated a number of studies on the subject of secondary market funding and potential improvements⁽¹⁾, while since 1980 it has also organised regular annual symposia in Luxembourg on the financing of innovation (see p. 21).

Among the developments currently being scrutinised most closely in this area by the Commission are the emergence in a number of Member States of secondary-level capital markets, such as the Unlisted Securities Market (USM) in the United Kingdom.

These secondary markets not only provide SMEs with a less expensive and less radical method of "going public" than that of obtaining a full stock exchange quotation, they also provide a crucial "exit mechanism" that allows venture capital institutions and other investors to sell or trade their interests in innovative companies and also facilitates second-round financing.

Such "off-exchange" secondary markets providing equity financing that is particularly suitable for NTBFs now exist in London, Amsterdam, Copenhagen and Paris while there is also considerable activity in West German financial centres. Although it was in Italy that the first, unsuccessful, attempt was made to establish a secondary market of this type, it was the City of London that led the way with the November 1980 establishment of the Unlisted Securities Market.

(1) **Advantages of Secondary Markets for Shares in the Equity Capital of Small Industrial Companies:** Prof. Hartmut SCHMIDT, Hamburg University, 1983.

The USM is in fact not an "unlisted" market at all. The term is used to indicate that the entry rules and requirements have been relaxed in order to attract small and technologically innovative companies to the new market.

Within one year the London USM listed 40 companies and by mid-1983 there were 150 with a quoted value of some £1.4 billion. The USM's proponents predict that by the early 1990s USM quotations may outnumber the 2 000 listings of the London Stock Exchange. Meanwhile, Amsterdam has established a similar secondary market with its "Parallelmarkt"; the Paris Bourse has launched its own secondary market and in Denmark the "share three" special market is flourishing in Copenhagen.

The launching of the London USM reflected the UK government appointed Wilson Committee's concern to improve equity finance for NTBFs, but it also emulated US experience. The "curb" or over-the-counter market there has been described as the keystone of the innovation financing system in the US and consists of quotations for some 2 500 small technology-based companies with a daily transaction volume of about 30 m shares, or more than half that of the New York Stock Exchanges "Big Board"⁽²⁾.

The London USM still remains something of a pilot for secondary markets elsewhere in Europe, and represents the prime example of the considerable savings that can be achieved by companies wanting to float shares. The entry requirements and press advertising costs of a full quotation on the London market can cost a minimum of £300,000, while the USM costs half or a third of that. More importantly, a company seeking a listing on the USM in London need offer only 10% of its stock to the public, as against the 25% minimum more usually required.

(2) **Financing More Innovation at Less Risk:** proceedings of EEC Luxembourg symposium, Dec 15-17, 1981, Infobrief, Luxembourg, p.143, Paper delivered by Ch. CLEIFTIE, Sofinnova.

The "exit mechanism" of London's USM is increasingly well established, with about a third of the funds raised by flotations having changed hands, thus enabling the original investor to recoup his capital and invest it elsewhere if he so desires.

For details of other secondary markets in operation, notably in London which also has the so-called "Nightingale market", see the studies initiated by the Commission's industrial innovation (DG XIII) services⁽³⁾. Also, for management buy-outs which increasingly constitute a form of capitalisation for SMEs, see the proceedings of the 1981 symposium organised by the Commission on innovation financing.

Although the efforts being made by the Commission, EEC national governments and by the European financial institutions to improve secondary market funding for NTBFs are considerable, there remains much ground to be made up. Between 1972 and 1976 some 7.3% of France's GDP, and 4.7% and 3.8% of the GDPs of the UK and West Germany were represented by funds raised on the financial markets by industry and other corporations. During the second part of the decade those three figures had dropped, respectively, to 5.9% of GDP for France, 2.8% for the UK and 3.4% for Germany.

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(3) SCHMIDT Report, op. cit.

The "Luxembourg symposia"

In September 1980 the Commission launched the first in what has since become a series of regular annual symposia on the financing of innovation. The first symposium on 30 September and 1 October 1980 was entitled **"The Role of the Banker in Industrial Innovation"**. Subsequent symposia were on **"Financing more Innovation at Less Risk"** (15-17 December 1981), **"The Needs of New Technology-based Enterprises"** (17-19 November 1982), **"Venture Capital Markets or the Regeneration of Industry"** (23-25 November 1983) and **"Improving Venture Capital Opportunities in Europe"** (3-5 October 1984). On 28 and 29 November 1985, the Commission together with the International University Institute of Luxembourg will organise its sixth symposium, entitled **"Contribution of Credit Institutions to the Renewal of the Economy"**.

In addition to providing a forum in which industrial innovation experts and executives from Community Member States can study new methods and techniques, the symposia also encourage informal exchanges of information between Commission officials and influential figures in financial and industrial circles.

The proceedings of the symposia are available in book format from Infobrief in Luxembourg and from the private companies which publish the proceedings on behalf of the Commission.

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Tax and Financial Incentives to Innovation

The Commission has asked Member States' governments to examine the whole issue of fiscal measures affecting investment and industrial innovation. It has set out its analysis of the problems, produced both by unimaginative tax laws that are insufficiently adapted to EEC industries' needs and by competitive tax incentives offered by different Member States, in a communication to the Council: "Tax and Financial Measures in Favour of Investment" (COM(83) 218 final).

At the same time, and in an effort to supplement the conclusions and recommendations of this communication, the Commission is continuing to review the effectiveness of tax and financial incentives to innovation. The main areas of research and the results of broad based consultation cover five main headings:

- the roles which taxation can - and must - play in the encouragement of industrial innovation;
- tax relief for research and development by enterprises;
- tax relief for venture capital transactions by financial organisations;
- taxation of the return on venture capital in the case of private investors;
- tax relief for the establishment, recovery and transfer of enterprises.

After consultation with national representatives and experts, the Commission has produced a preliminary draft proposal for a directive on the harmonisation of the depreciation rules for determining undertakings' taxable profits. The EEC-wide rules being put forward also extend to the carry-forward and carry-back of losses and to tackling problems of double taxation in the Community.

In its review of the taxation question the Commission has emphasised that any new incentives must not only be simple and transparent but also should be part of a planned taxation framework rather than individual measures introduced piecemeal.

The Commission has initiated a number of studies into existing tax rules in Member States affecting industrial innovation. One of the earlier studies carried out on behalf of DG XIII produced an inventory of all public measures for stimulating innovation⁽¹⁾.

The report detailed Member governments' investment incentives and other grants and services. The measures covered included: fiscal instruments, patents; information systems and advisory services; government laboratories and collective research centres; grants and support for selected technologies; development loans; venture capital aids and a comparative analysis of the various innovation instruments used by governments in the EEC.

The subsequent inventories prepared for the Commission in 1980, 1981, 1982 and 1984⁽²⁾ cover similar headings. They also include details of regional measures in the Member States as well as comprehensive

(1) **An expanded inventory of public measures for stimulating innovation in the European Community with emphasis on small and medium-sized firms**, report for the Commission by Staffgroup Strategic Surveys, TNO, Apeldoorn, May 1979.

(2) **Inventory of the direct and indirect public measures for promoting industrial research and development in the Member States of the European Communities**; 1st edition prepared by J.M. DIDIER and Associates, April 1980; 2nd edition also by J.M. DIDIER and published by Infobrief Luxembourg, December 1981, in the series Industrial Innovation Management; 3rd edition (retitled "Directory" in place of "Inventory") giving the situation as of September 1982 published by Infobrief Luxembourg, August 1983, 4th edition, June 1985.

listings of relevant government organisations and financial institutions in each EEC country. A review of legislation in preparation is also included.

Three studies initiated by the Commission on the fiscal and technical instruments available for stimulating industrial innovation in the EEC have recently been published.

The first, prepared by the consultancy firm of Coopers and Lybrand, is a four-part survey covering EEC Member States' tax laws, tax treatment of selected forms of financing, likely tax treatment of possible Community financing and an evaluation of possible Community financial measures with regard to the possible tax consequences for companies⁽³⁾.

The second study, by Philippe Weckel of Strasbourg University, concerns seven proposals for using fiscal measures to encourage industrial innovation⁽⁴⁾.

The third study, again by Coopers and Lybrand, looks into the potential use of stock option plans as incentives for new-technology companies within the EEC⁽⁵⁾.

(3) **Study of fiscal aspects of possible options of financial interventions in favour of innovative enterprises**, Coopers and Lybrand, Report EUR 8821.

(4) **La fiscalité et à stimulation de l'innovation industrielle dans la Communauté** (Fiscal measures to encourage industrial innovation in the Community), P. WECKEL, Report EUR 8820.

(5) **The potential use of stock option plans as incentives by new-technology companies within the EEC**, Pascal P. MINNE, John ANDREWS and the Eurotax Group of Coopers and Lybrand, Report EUR 9596.

The main aim of the Commission at present, however, is to improve investment financing in the Community. At the same time, it is anxious to cut the level of Member States governments' direct subsidies to investment. In contrast with the general decline in industrial investment levels in Europe since the mid-1970s, government subsidisation has increased. State subsidies amounted to 4% of total gross fixed capital formation in the Community in the first half of the 1970s, but currently accounts for at least 5%.

In addition to adjusting and harmonising the tax burden on companies throughout Europe, the Commission is concerned to improve the operation of capital markets in the Community. To that end, it has already secured Council approval for a number of EEC directives concerning consolidated accounts and their transparency⁽⁶⁾ and is studying the creation of more favourable conditions for risk capital. Before the end of the 1985, the Commission expects to publish the conclusions of a wide-ranging Community study of this particular aspect of taxation⁽⁷⁾.

In addition, the Commission has proposed a directive for the liberalisation and coordination of laws, regulations and administrative procedures affecting Collective Investment Undertakings for Transferable Securities (CIUTS).

The tax thresholds relating to industrial innovation schemes in EEC

(6) The most recent directive, the **Seventh Directive on Consolidated Accounts**, was approved by the Council of Ministers on 16 May 1983. Companies must comply by 1990.

(7) **Interim report to the Commission of the European Communities on the study "Fiscal environment of, and corporate vehicles for, venture capital in the European Communities"**, DELOITTE, HASKINS and SELLS.

Member States are examined in a report to the Commission⁽⁸⁾ on the overall financing methods being adopted by Member governments to encourage high-technology business start-ups.

Working groups at the symposia organised by the Commission in Luxembourg in 1982, 1983 and 1984 identified taxation policy as a prime means of encouraging NTBFs and venture capitalists. The Commission is therefore now studying possible proposals for a set of recommendations for better tax arrangements for institutional or private providers of venture capital.

The members of one symposium working group went so far as to suggest that the investment during 1981 by European financial institutions of some \$300 million in US venture capital programmes (ten times the amount invested in European venture capital) largely reflected the tax position in Europe⁽⁹⁾.

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(8) **Analysis of recent developments in the financing of industrial innovation in the Community**, report by P. DOURNEL to the Commission, October 1982.

(9) Recommendations of Working Groups 3 and 4 at the symposium **"Needs of new technology-based enterprises"**, Luxembourg, 17-19 November 1982 (Infobrief Luxembourg).

The Community's Structural Funds (Social and Regional Funds)

The Community's traditional financial instruments such as the Social and Regional Funds are also sources of financial support for innovation. Monies available from these structural funds take the form of outright grants. They are therefore not reimbursable. They are, however, subject to strict conditions. Applicants for grants from the Social and Regional Funds from the private or public sectors (project promoters) cannot file requests for financial support directly with the European Commission. These have to be channelled through national governments. In addition, in the vast majority of cases, the promoters must first secure financial support for their projects from public sources in their home country before they can qualify for matching finance from the Community Funds. It must also be borne in mind that the prime purpose of the Funds is not to promote industrial innovation per se, but to develop employment possibilities (in the case of the Social Fund) or to even out regional economic disparities within the Community (in the case of the Regional Fund). "Sunrise" sectors of high technology have, of course, become increasingly important in the Funds' operations in recent years.

The addresses of the competent national authorities which deal with Social or Regional Fund applications are given in Appendix III of this Document.

The European Social Fund (ESF)

The European Social Fund was set up in 1958 to ease employment problems and to increase the geographical and occupational mobility of workers within the Community. ESF aid takes three main forms: financial support for vocational training schemes, wage supplements and aids for geographical mobility. Vocational training schemes account for more than 80% of the Fund's budget, which amounted to 1 300 million ECU in 1982 and nearly 1 700 million in 1983. The rest is earmarked for co-financing employment schemes, job-creation programmes and special measures to increase worker mobility. In line with the priorities of Member States, the Social Fund in recent years has played a part in supplying funds for job creation, particularly in the form of recruitment premiums and wage aids for jobs which are deemed to be of benefit to the Community.

Training workers to adapt to technological innovation accounted for 11% of the ESF budget in 1984. Priority schemes in this sector included training to safeguard jobs endangered by new technologies, training to enable small and medium-sized firms to adopt more modern production and management techniques, and training to produce the skilled workers required for the introduction of new technologies.

In October 1983, the Council of Ministers approved new rules for the operation of the Social Fund. As a result of the changes, 40% of ESF grants will go to promote employment in priority areas such as Ireland, Northern Ireland, Southern Italy, Greece and the French Overseas Departments. The level of Social Fund contributions is 10% in these five priority regions. In addition, at least 75% of allocations will be used to promote jobs for young people. Under the revised rules, while concentrating on the general objective of guaranteeing a job or proper training for young people, the Commission will attach priority to programmes which dovetail with common policies such as rectifying shortcomings in training workers to handle the new information technologies.

The level of subsidy granted by the ESF can reach a maximum level of 50% of the total cost of a project in cases where it is being carried out by a public agency or where the other 50% of the funding requirements comes from public sources. In the case of a private scheme, where the promoter finances, say, 40% from his own sources, the Fund will pay a matching amount to the sum put up by the national authorities. The financing in this instance would therefore be: 40% private promoter, 30% public authorities and 30% Social Fund.

From 1984 onwards the Fund has financed a number of specific actions of an innovative nature which accounted for a maximum of 5% of the 1984 budget.

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The European Regional Development Fund (ERDF)

1. The European Regional Development Fund was set up in 1975 to rectify regional imbalances in the Community. ERDF aid is granted to areas and regions which are disadvantaged mainly as a result of reliance on agriculture, industrial changes and structural under-employment. It is the main instrument of Community regional policy and it seeks to complement the aid which is granted by national authorities. In general, ERDF aid provides supplementary financial assistance for the development of the recipient areas or regions.
2. Since 1975 the ERDF has provided funds for more than 25 700 investment projects, including 19 200 infrastructure projects (transport, energy, etc.) and 6 500 projects in industrial sectors. The total amount of aid granted exceeded 11.7 billion ECU at the end of 1984.
3. ERDF aid has until now been concentrated in half of the Member States. Five countries (Italy, the United Kingdom, Greece, France and Ireland) received more than 91% of the aid provided by the Fund in 1984.
4. The Regional Fund budget is fixed annually in the general budget of the European Communities. In 1984 it amounted to 2.14 billion ECU, or 7.3% of the Community budget. The money allocated to the Fund has increased over the years.
5. A new ERDF Regulation has been in force since January 1985⁽¹⁾. The former quota system has been replaced by the idea of a "range" of resources. The whole of the Fund's operations are no longer based on quotas but on quantitative guidelines ensuring that the operations are consistent with the aims and priorities of the Community.

(1) Council Regulation (EEC) No. 1787 of 19 June 1984 on the European Regional Development Fund, OJ L 169 of 28 June 1984.

6. Each Member State is allocated a proportion of Fund resources between a lower limit, which is guaranteed if it submits an adequate volume of applications for aid which satisfy the conditions set out in the regulation, and an upper limit. The upper and lower limits apply for periods of three years.

Member State	Lower limit %	Upper limit %
Belgium	0.90	1.20
Denmark	0.51	0.67
Germany	3.76	4.81
Greece	12.35	15.74
France	11.05	14.74
Ireland	5.64	6.83
Italy	31.94	42.59
Luxembourg	0.06	0.08
Netherlands	1.00	1.34
United Kingdom	21.42	28.56

7. The ERDF participates in the financing of Community programmes, national programmes of Community interest, projects and studies. Priority is given in the management of resources to Community programmes, and the Commission wants to move gradually from the financing of individual projects to the financing of contracts for multiannual programmes. In this way the Fund's operations will be more consistent with the objectives of the regional development programmes and other policies at the Community level.
8. It is the Commission plan that three years after the introduction of the new Regulation at least 20% of the Fund's resources will be used to finance Community programmes and national programmes of Community interest.
9. Community programmes serve Community objectives and the implementation of Community policies. They are proposed by the Commission. The Council adopts the guidelines for these

programmes and decides the criteria for the selection of the regions involved. A Community programme as a rule concerns the territory of more than one Member State. The programmes are drawn up by the Commission after close consultation with the relevant authorities in the Member States concerned. In some cases the programmes may apply to regions of the Community which are not currently covered by national aid schemes of regional scope.

10. National programmes of Community interest are defined at national level and consist of a set of consistent multiannual measures corresponding to national objectives and serving Community objectives and policies. They are proposed by the Member States and drawn up in collaboration with the relevant authorities. The areas and regions covered by national programmes are restricted to the areas established by Member States in applying their systems of regional aids. To be of Community interest, programmes must contribute to the attainment of the Community's objectives. They are assessed on the basis of various criteria such as the relative severity of the economic imbalance of the region, the direct or indirect effect of the programme on employment, the diversification of economic structures, the speedy realisation of necessary infrastructure, encouragement of indigenous development potential and the integrated use of other Community financial instruments. A programme which has been agreed on by the Commission and the Member State involved is adopted by the Commission after the ERDF Committee has been consulted.

12. The change to financing on a programme basis allows a greater and more specific selection of objectives in accordance with Community policies and priorities, regional development requirements and the need to lay greater stress on the encouragement of productive investment, especially investment which benefits small and medium-sized enterprises. As part of the operations to encourage indigenous development in the regions, the ERDF can assist in the financing of measures to provide undertakings with facilities enabling them to expand their

activities and to obtain access to new technologies. This greater selection of objectives will be accompanied by a considerable increase in the Fund's contribution rate. Mention may also be made of aid for the establishment and operation of local and regional applied research organisations and, in the case of small and medium-sized undertakings only, the financing of technology transfer.

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SECTION THREE

THE COMMUNITY DIMENSION OF INNOVATION

This section chiefly concerns measures and initiatives aimed at liberalising or improving the Community's internal market and thus giving a demand stimulus to innovative industries. It also details the Commission's "Transnational Plan" for EEC-wide cooperation on the infrastructure for innovation, even though the plan includes items covered elsewhere in this document, particularly, Section One on the "Information framework". The subject headings in this section are: The Internal Market, The "Transnational Plan", European Standards, Public Procurement by EEC Governments, Patent reform and Block Exemptions from Competition rules.

The Internal Market

The dynamic effects of a truly common market on the EEC's industrial innovation effort cannot be over-emphasised. One calculation quoted by the European Commission (COM(82) 251 final) that sums up the importance of a unified market is that no single one of the 10 national markets "constitutes more than 5-10% of the market required to justify the investment decision necessary for a major technological innovation".

The Commission's (and increasingly the Community's) concern over growth in intra-EEC non-tariff barriers is well known, and is currently the object of a liberalisation drive set in motion by EEC heads of government in December 1982. Obstacles to trade between EEC countries are estimated to "cost" 1 000m ECUs a year by imposing an unnecessary price surcharge of 5-7% on products traded between Community partners. The result has been that intra-Community trade which for many years was growing at an average 16% a year, compared to a 9% growth rate for EEC exports, began to shrink in 1981 having earlier dipped sharply in 1975⁽¹⁾.

For New Technology-Based Firms (NTBFs) in the Community, the protectionist pressures that are fragmenting the EEC internal market are particularly serious, not only because of the need for an enlarged potential market but also because of their vulnerability to technical barriers. Infringements of the EEC treaty, not necessarily all relating to trade between Member States, have risen from eight in 1963 and 30 in 1973 to 332 in 1982.

NTBFs are also extremely susceptible to the effects of public procurement policies operated by national governments in the EEC. Government purchasing is an important aspect of the wider issue of internal market liberalisation. Estimates of the proportion of European economies made up of government orders for goods and services vary from some 10-15%, depending on whether the definition of "government" includes major public sector companies and institutions. But there is

(1) For a detailed analysis, see documents COM (83) 80 final and COM (82) 399 final.

little disagreement over the "pump-priming" effects that government contracts can have on industry, and particularly on new high-technology sectors.

The Commission is not alone in arguing that the stimulatory effects of public procurement would be markedly greater if EEC governments did not restrict the great bulk of such orders to national concerns. The widening of their procurement calls to all potential EEC tenderers would clearly create a larger market for European industries and would have a considerable effect on reducing intra-EEC protectionist pressures. In 1980, the Commission recommended (COM(80) 422 final) a scheme of voluntary liberalisations to Member governments under which, during a 1981-83 experimental phase, they would have opened at least 10% of their tenders for telecommunications terminals to competitive bidding from all Community manufacturers. There was no follow-up to this initiative⁽²⁾.

The Commission's criticism of rigidly national public purchasing systems in the Member States also extends to the negative effect that they can have on industrial innovation. The propensity toward non-market rules and national design descriptions is alleged to reduce innovatory tendering. As part of its proposals to Member governments for improved information covering technical standards and regulations (COM(80) 400 final), the Commission has emphasised that a major impact favouring innovation could be made if performance criteria were to be used as an EEC harmonisation base rather than product specifications.

(2) See also Section Four, heading on Telecommunications (p.64).

Plan for the transnational development of the supporting infrastructure for innovation and technology transfer

The development plan was adopted by the Council and referred to the Commission for action on 25 November 1983. The plan covers a three-year period and forms an integral part of Community policy on industrial innovation. The main aim of the plan is to set up a Community infrastructure for innovation which will benefit small and medium-sized enterprises in particular, restore and maintain Europe's competitiveness and guarantee full employment in the long-term.

The common factor linking the major areas of the plan is that collaboration and consultation are required at Community level.

There are three broad aims:

- 1) to enhance the effectiveness of the organisations and services already operating and developing in this field by facilitating their activities in, and access to, the Community market; this transnational extension of facilities in the Member States will be based on a flexible and dynamic approach involving cooperation and liaison procedures;
- 2) to provide assistance - insofar as is necessary to achieve the aim - in meeting the fundamental requirements concerning communication, know-how and technical means;
- 3) to aid the general development of methods in this field by actively encouraging consultation and the exchange of ideas on the perfecting of new methods in the Member States.

The transnational plan provides a framework for various programmes.

Chapter I of the plan has four programmes and emphasises human networks:

- 1.1 Industry-research interface;
- 1.2 Technology and management advisory services;
- 1.3 Venture capital transactions;
- 1.4 Interface between public users and innovative industries.

Chapter II of the plan has three programmes and emphasises the reinforcement of structures which facilitate the introduction of innovation and technology exchange:

- 2.1 Support facilities for the awareness and evaluation of new technologies and market opportunities;
- 2.2 Access to patents and licensing markets;
- 2.3 Opening up of new methods of communication to accelerate the market introduction of new products.

Chapter III of the plan has three programmes:

- 3.1 Increased consultation and exchange of information and ideas within the Consultative Committee;
- 3.2 Comparison and assessment of programmes and measures;
- 3.3 Community Support for the development of new methods, particularly the transnational innovation infrastructure.

The Consultative Committee for Innovation and Technology Transfer (CIT) was formed to help the Commission carry out the plan.

It was only in January 1984 that the plan got under way, and 1984 thus marked its first full year. However, a certain amount of time was required to set up the CIT, to define and get accepted its working procedures, and to arrange the logistics and manpower needed for implementation of the Decision. Thus the first concrete actions did not get under way until some months had passed, and so the results of the first year's activity should be judged in the light of this gradual start-up.

Implementation of the plan: actions

1. Human networks

STCELA (Standing Technological Conference of European Local Authorities)

STCELA sprang from the realisation that innovation is sometimes hampered less by technical factors than by market conditions, especially an excessive fragmentation of the market.

Since August 1983, STCELA has existed as an international scientific organisation. Several ambitious projects have been submitted by STCELA to the Commission as part of the plan.

By way of an initial response, the CIT has given a favourable opinion on a pre-feasibility study concerning the publication of a specialist magazine entitled "New local government technology" (Action No.10) and the setting up of an information service for technology demonstration or pilot projects for local authorities (Action No.11). It has also approved a project for local authority action on domestic refuse treatment and vehicle fleet management (revised Action No.2).

However, in agreement with the Commission, the Committee attached conditions to its approval:

- the establishment of direct links between STCELA and the local authorities, so that they can be fully informed of the activities of the Committee and so that they can play an active and useful part;
- guarantees that the STCELA organisation is in fact able to perform the tasks to be carried out.

The actual implementation of the actions proposed by the organisation seems to have run into difficulties linked to these conditions.

The Commission is well aware of the benefits of transnational collaboration among local authorities in the field of innovation and technology transfer and is therefore exploring other possible methods and solutions with which STCELA could be associated as needed. The CIT is kept regularly informed of developments in this area.

Venture capital

As long ago as 1978, the Commission became aware of the part that venture capital could play in the encouragement of innovation and the adaptation of European companies to new technology.

Several preliminary studies were followed by a pilot scheme which ran from October 1980 to September 1983. The scheme set out to assess by way of experiment the opportunities for collaboration at the European level between companies involved in innovation financing, the idea being to encourage the rapid development of new innovative companies by allowing direct access to Community markets which were to be regarded as a single interior market.

The pilot scheme revealed the need:

- to establish a European infrastructure for stimulation, coordination and representation for the benefit of an emerging profession which was at widely different stages of development in the various Member States;

- to introduce a financing scheme specifically tailored to the development of innovation through venture capital (see the proposal of 7 June 1983 for a European Innovation Loan (COM(83)241 final and COM(84)21 final).

The next step was the decision to set up a European Venture Capital Association (EVCA), a non-profit making international association under Belgian law with its registered office in Brussels. EVCA held its first general meeting in Brussels on 9 November 1983.

Article 3 of the Association's rules states that its purpose is to provide for the study and discussion of venture capital management and investment within the European Economic Community, with the aim of developing and maintaining a venture capital industry to finance innovation and small and medium-sized undertakings, using own resources, and in order to establish high professional standards and criteria for the conduct of business.

The Association lists eight priority areas:

- to establish a code of professional conduct to be observed by members in order to affirm the reputation and authority of this new form of financing;
- to publicise the profession in order to make it the natural partner for the various national and European bodies which provide funds for innovative small and medium-sized enterprises;
- to encourage the formation of European venture capital syndicates in order to make transnational investment more common within the EEC;
- to develop advisory networks of experts and consultants to encourage the transnational development of enterprises financed by venture capital companies;

- to encourage contact within the profession and organise meetings where members may exchange ideas and experience on topics selected in advance;
- to maintain regular contact with various regional, national and international organisations;
- to assemble economic, financial and fiscal information useful for the development of the venture capital market in Europe;
- to distribute information on the activities of the profession, including the publication of reference works.

One year after being formed, EVCA had doubled its number of members. In mid-1985 they totalled 110, consisting of 64 full members and 46 associate members, drawn from all the Member States and from other non-Community countries.

The Association has also organised an information programme:

- publication of a quarterly newsletter;
- organisation of two internal seminars;
- organisation (jointly with the Commission) in October 1984 of a symposium entitled "Improving venture capital opportunities in Europe";
- distribution of a brochure entitled "Raising venture capital in Europe: an entrepreneur's guide book".

The 1985 programme includes the continuation of work begun in 1984 and also the implementation of a number of actions designed to promote the development and profitability of innovation financing.

This involves the following:

- publicity, canvassing and selection of new members;
- participation in conferences, seminars and symposia on venture capital and innovation financing;
- publication and regular updating in the Association's three official languages of the brochure entitled "EVCA Information/Facts/Fakten", intended to become the Association's yearbook listing members and summarising their activities;
- publication of **EVCA Info**, the quarterly newsletter in three languages;
- distribution of the monthly **EVCA Press Review**, a summary in English of articles on venture capital and innovation in the European press (members may obtain versions in the original language from the EVCA Secretariat);
- rapid transmission (when necessary) of an EVCA Newsflash containing confidential financial information for members;
- publication of information compiled on various aspects of innovation financing and advanced technology with reference to each country in the Community (e.g. stock options, tax regulations, etc.).

EVCA also organises meetings:

- in order to encourage innovation financing in countries where venture capital is not so developed as elsewhere, part of EVCA's budget is allocated to the organisation of meetings to acquaint financial managers with the techniques of venture capital management and to set up an exchange programme for trainees;

- EVCA also wishes to introduce a method of gathering information on innovation financing in the Community; the financial information which is collected from members and other sources (total available funds, amounts invested and broken down by sector, country, etc.) will be used in regular reports and studies on the status of venture capital in the Community; the work will preferably be carried out together with an organisation which has similar needs and will allow the development of innovation financing in Europe to be charted; the Association will be able to make a significant contribution to a better understanding of venture capital in Europe by utilising reliable statistical sources which for the most part are lacking at the moment; it is planned at a later stage to expand the range of information by adding a reference network of experts and consultants.

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European Association for the Transfer of Technology, Innovation and Industrial Information (TII)

This Association is destined to play a role of prime importance by virtue of the help it can offer small and medium-sized enterprises in their desire for innovation by providing the technical and management information they need.

In November 1983, the Commission signed a contract with IRI (Institute for regional cooperation in inter-Community border regions), as a result of which the Institute was required formally to set up the Association and see it through the initial period of 12 months. This initial phase was financed by the Commission from funds not covered by the Plan. The Association was officially formed at an inaugural

general meeting in Luxembourg on 4 May 1984. It is a European network of intermediaries whose purpose is to stimulate innovation. Its aims are:

- to stimulate innovation;
- to promote technology transfer;
- to facilitate transnational collaboration among European undertakings.

To achieve these aims, the Association organises:

- professional exchanges among members;
- transnational training visits of short and medium duration;
- seminars on innovation advisory services for SMEs: design of products responding to market needs; links between industry and universities;
- standing study groups;
- action for the introduction of a common market of transferable technology in direct collaboration with the Commission of the European Communities;
- introduction of a telefax network.

In its first six months, the Association boosted its membership to a total of about 100 member organisations.

The Association organised an internal seminar in Copenhagen and a study mission in Belgium, brought out a presentation brochure and played an active part in preparing a number of actions, such as setting up a telefax network between industrial information transfer centres, and formulating a project for a European data bank of technology supply and demand.

Transnational collaboration between advisory bodies

One of the fundamental aims of the plan is the development of transnational collaboration between SMEs, particularly in the area of technology exchange, in order to facilitate the rapid spread of new products and services throughout the Community market.

To achieve this aim, the Commission has sought the special help of the intermediaries or advisory bodies - both individual and legal entities, private and public institutions - existing in a Member State.

Experience shows in fact that groups of undertakings, particularly if they are small or medium-sized, need proper professional advice if they are to succeed.

Using several methods approved by the CIT, the Commission has attempted to set up or link networks of intermediaries with the aim of achieving transnational collaboration between enterprises.

Study missions and exchange visits

a) Study missions (Action No.5)

The purpose is to enable those involved in industrial information transfer:

- to get to know each other as swiftly and as effectively as possible;
- to become acquainted with work practices in other countries;
- to explore the opportunities for transnational collaboration, especially in the areas of technology transfer, financing, etc.

Guided tours lasting a few days are arranged for groups of about 20 people and are reserved exclusively for those working in another country. The tours normally last 3-4 days and consist of visits of about one day in length to various bodies in different regions of the

country visited. The TII Association is responsible for arranging the visits. A first visit was arranged in Belgium in December 1984 and others are scheduled for 1985.

b) Transnational exchange visits of short duration (Action No.6) and medium duration (Action No.14) for those involved in industrial information transfer

The purpose of these actions is similar to that of the guided tours organised under Action No.5, but a more detailed picture is provided.

Under Action No.6, those working in the field of industrial information transfer can spend two weeks in another country to study working methods there and to lay the foundations for permanent transnational cooperation by establishing personal contact with foreign counterparts.

Action No.14 is identical in all respects, except that the duration of the visit is longer (up to three months).

2. Strengthening the foundations

Chapter 2 of Annex I of the Council Decision lists a number of areas where Community action seems necessary to strengthen the foundations so that innovation can proceed and technology transfer function in optimum conditions.

The series of actions are based on three ideas:

- the first is that innovation requires a **speedy awareness** of technological opportunities; systems must be introduced to inform undertakings, particularly SMEs, about new technologies and potential markets; several concrete actions considered by the CIT in 1984 are linked to this;
- the second idea is that it is necessary to **organise the European patent and licence market** in order to develop transnational technology exchange;

- the third idea is that reforms are necessary to **accelerate market introduction of new products, services or processes.**

"Conferences"

The purpose of this action (No.4) was to help the organisers of conferences on innovation or technology to give a European dimension to their event by inviting speakers from other Member States and by making a special effort to attract an audience from several countries rather than only from the country in which the event is held, and by disseminating the proceedings at Community level.

EuroTechAlert : European technology awareness scheme

The purpose of this project (Action No.2) is to create a Community-wide technology awareness scheme using the results of research based on the British TechAlert experiment. In the British scheme, a specialist group of the Department of Trade and Industry scans reports by public research centres for information of interest to industry. Abstracts are prepared and circulated to technical magazines and journals which are free to use them for publication.

In accordance with the recommendations of the committee, a group of national experts met in Luxembourg on 16 November 1984 to lay the groundwork for the project, which has still to be formally approved by the CIT.

Better use of the results of publicly-funded research

This is an exploratory project (Action No.8) which can be situated upstream of the EuroTechAlert scheme. The thinking behind the two actions is the same: how to make the results of national and Community research more readily available to industry, in particular small and medium-sized undertakings. The project has been discussed by the CIT but has not yet been formally approved.

Information on technologies and limited-access markets

The committee repeatedly considered the problem of the acquisition, analysis and distribution of information about limited-access technologies and markets, especially the potential interest of Japanese grey literature (Action No.15).

Common market for patents and licences

Technology transfer is the result of contacts between two interested parties: the supplier and the purchaser of technology. Several methods are used to ensure that contact is made: specialist exhibitions on technology transfer, magazines and journals, meetings between specialist intermediaries, computerised data banks.

A review of these different methods and the need for a centralised European system of information on technology opportunities were discussed at two seminars in Luxembourg on 15-16 October and 20-21 November 1984.

A detailed project (Action No.9) is now being formulated in collaboration with the TII Association and DG III's Business Cooperation Centre.

Removing barriers to the spread of innovation: information on standards (ICONE)

Paragraph 2.3 of Annex I to the Council Decision refers explicitly to two types of action:

- speedier diffusion of notices of invitation to tender for public contracts by using new channels of communication;
- establishment of an up-to-date information system on technical regulations and standards.

Only the latter has so far been considered by the CIT. A comparative index of national and European standards (ICONE - Action No.7) has been discussed several times in committee. Given the complexity of the matter, it was decided that a meeting of national experts should consider the question and, in order to avoid duplication of effort, that the relevant Community departments should be contacted.

This project, which has to be reconsidered by the CIT, has been discussed with DG III, the Task Force on Information and Telecommunications Technologies, the European Standard Coordination Committee and the European Committee for the Coordination of Electrical Standards. It was also discussed at an ad hoc meeting of national experts in Luxembourg on 17 January 1985.

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Cooperation on European standards

Standardisation provides a major contribution to the free movement of industrial products and, furthermore, to the creation of a technical environment which is the same for all undertakings. Standardisation helps industrial competitiveness both in the Community market and in external markets, especially in the area of new technologies.

In March 1983 the Council adopted a directive laying down a procedure for the provision of advance information concerning technical standards and regulations. The directive therefore goes a little way towards cutting through the Member States' use of norms and standards as non-tariff barriers to trade by strengthening the European standard consultation mechanism. Under the terms of the directive, Member governments must give each other and the Commission prior warning of impending new national standards and norms. The aim is to avoid duplication of effort and the implementation of divergent norms, as well as to give time to develop EEC-wide (as opposed to national) norms where these are considered appropriate. The procedure for information on standardisation became operational in January 1985.

National standards institutions in the Community are grouped in the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC). There is also an EEC Standing Committee of Member governments' representatives which has the sole task of implementing information procedures. The committee meets representatives of the European standards institutions twice yearly to review efforts to reverse the trend whereby Member States' national norms and standards have both proliferated and become increasingly divergent. In May 1984 subcontracting agreements were signed with the two European standards organisations mentioned above for the operation of the information procedure on standards. The necessary infrastructure, in particular data processing, was thus set up. On 16 July 1984 the Council adopted conclusions concerning certain guidelines in respect of standardisation, the main features of which were:

- agreement by the Member States to keep a constant check on the technical regulations which are applied - whether de jure or de facto - on their territory so as to withdraw those which are obsolete or unnecessary;
- agreement by the Member States to ensure the mutual recognition of the results of tests and the establishment, where necessary, of harmonised rules as regards the operation of certification bodies;
- agreement to early Community consultation at an appropriate level, in accordance with the objectives of Directive 189/83/EEC, where major national regulatory initiatives or procedures might have adverse repercussions on the operation of the internal market;
- extension of the Community practice in matters of technical harmonisation of entrusting the task of defining the technical characteristics of products to standards, preferably European but if necessary national, where the conditions necessary for this purpose, particularly as regards health protection and safety, are fulfilled (a draft model directive on referral to standards is at a very advanced stage and was scheduled to be considered favourably by the Council during 1985);
- a very rapid strengthening of the capacity to standardise, preferably at European level, with a view to facilitating on the one hand harmonisation of legislation by the Community and on the other industrial development, particularly in the field of new technologies, since this could in specific circumstances involve the Community in introducing new procedures to improve the drawing up of standards (e.g. standardisation bureaux, ad hoc committees); the adoption of European standards would be submitted to the European standardisation bodies for approval.

In high technology sectors in particular, subjects should be identified where common specifications and standards will make for efficient exploitation of the Community dimension and the opening of public works and supply contracts so that the decisions required in this

connection may be taken. (On 13 November 1984 the Commission signed general agreements with the European Committee for Standardisation and the European Committee for Electrotechnical Standardisation in order to define the cooperation arrangements between the Commission and the two institutions regarding the practical consequences of Directive 189/83/EEC and especially for the implementation of actions as a result of the Council statement of 16 July 1984.)

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Public procurement by EEC governments

The public procurement activities of the 10 Member governments are estimated, if defence and aerospace equipment is included, to represent some 15% of the European Community's gross domestic product. Defence spending in fact represents some 12% of total public procurement, so the balance of civil equipment that could theoretically be put out to open tender from all EEC suppliers would create unprecedented opportunities for high technology companies, inter alia, who have been largely restricted to purely national markets.

Under EEC directives of 1971 and 1977, invitations to tender for public works and supply contracts (exceeding 200 000 ECUs in value) to be awarded by central, regional and local governments must be published in the Official Journal (series "S"). The directives do not cover telecommunications, transport, water supplies and energy. Details of tenders are also available through TED (see p.8).

In the absence of recent progress to open public procurement market further (cf. the Commission's Recommendations on Telecommunications - see p.64), initiatives in the procurement field have been generally limited to local authority purchasing, where the setting-up of a cooperative framework called STCELA has met with success.

The voluntary liberalisation of telecommunications orders would also have included informatics, and in the Commission's view would, if adopted, have rapidly harmonised telematic services within the Community and by creating a single market would have greatly improved EEC producers' technological position.

The Commission has initiated a number of studies into the potentially dynamic effect that the liberalisation of government procurement could have on innovative industry. One such report⁽¹⁾ details relevant EEC law, the situation in Member States and both the US and Japanese experiences.

(1) "Public Procurement Policies and Private Sector Innovation", a report to the European Commission by Staff-group Strategic Surveys, Delft, the Netherlands, May, 1979

Patents in the context of innovation

Within DG XIII there are five main areas of activity in the field of promoting patents and licences in the context of technological innovations:

1. patent protection of the results of R&D work carried out by the Commission's Research Centre and the offer of these patents to Community firms for industrial exploitation under licence;
2. contracts for the study of possible existing solutions with regard to the adaptation of legislation and regulations on patents to the requirements of industrial innovation (including patent terms, cost of litigation, criteria for obtaining patents);
3. progress reports on technological trends assessed on the basis of multiannual and multinational patent documentation in high-technology fields (e.g. biotechnology) or for specially selected R&D subjects;
4. assistance for transnational cooperation programmes for the research, exchange and marketing with regard to the potential supply and demand under licence of technologies inside and outside the Community;
5. encouragement of disadvantaged innovation groups (e.g. independent inventors) to defend and protect their interests and of professionals without patents for the purpose of seeking information in patent documents (e.g. supply of training material).

Apart from these activities, work is now geared towards the development of assistance for national patent information and documentation infrastructure with the aim of computerising their procedures and facilities (electronic patent offices, machine-readable information on patents).

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Block exemptions from competition rules

As part of its attempts to encourage cross-border cooperation on R&D work and on commercial joint ventures, the Commission has adopted further general exemptions from the EEC competition rules defined in Article 85 of the Treaty of Rome. In addition to the block exemptions concerning specialisation agreements on licences and distribution, a similar block exemption regarding R&D link-ups was adopted at the end of 1984.

Two points are important:

In cases where the firms are not competitors, they may collaborate and exploit results for five years;

In cases where the firms are competitors, they may collaborate if their joint share of the market is no more than 20% and they may then exploit results for five years, after which their share of the market is again assessed.

In 1971 the Commission was authorised by the Council to grant block exemptions from the provisions of Article 85 in three specific areas: specialisation agreements, R&D pacts and standardisation agreements. The last category has not produced requests by EEC industries for exemption, but the other two have.

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SECTION FOUR

INFORMATION TECHNOLOGY

Section IV of this guide deals in general with the Community's ESPRIT strategic information technology research programme and more specifically with: Programme execution and infrastructure, Telecommunications, Project types, Current status of programme and Work plan coverage and intended response.

ESPRIT

The European strategic programme for research and development in information technology, more commonly known as the ESPRIT programme, is a ten-year plan designed to stimulate European R&D efforts in information technology and telematics and to encourage the pre-competitive phase of R&D projects at European level. Undertakings in various countries can cooperate and contribute to a reduction of the wasteful duplication of effort so that a boost can be given to EEC industry to enable it to catch up with Japan and the United States in the next ten years. At a time of recession, information technologies are in fact experiencing spectacular growth. What is at stake is vital for Europe and the requirement is to:

- reduce the duplication of national research and development efforts which weigh heavily on the manufacturing stage;
- create research teams which are large and stable enough to concentrate on the key areas and obtain valuable results;
- to end the delays caused by dependence on imported technology.

The ESPRIT programme is designed to stimulate pre-competitive R&D activities in the field of information technology by means of projects carried out in collaboration with governments, industry and research centres in the Member States and financed in part by the Community. A management plan, the annual work plan, has been drawn up to enhance the control and accountability of the programme. The programme is updated by the Commission every year and follows a specific schedule.

A call for proposals is announced at the beginning of the year - at which time there is also an assessment of the various works - and the deadline for submission of proposals is normally set about March. At the beginning of the summer there is a first meeting with industry to discuss the plan; it is considered by the management committee which includes government and industry representatives. This is followed by technical week (work plan and assessment). The plan is then approved

by the Commission and referred to the Council. The second work plan, initiating the 1985-1989 period, is now operational.

In the selection and definition of information technology areas that ESPRIT should address, two considerations were important:

- a) to have sufficient command of basic technologies;
- b) to have systems capabilities which are adaptable to changing market needs thereby permitting the knowledge of markets to have further influence on technology development.

Five areas or subprogrammes are of strategic importance to the Community. Three concern crucial technologies and the other two refer to specific areas for application.

The central "enabling" technologies are:

- advanced microelectronics;
- advanced information processing;
- software technology.

The specific areas for application are:

- office systems;
- computer integrated manufacture.
- In the case of advanced microelectronics, the aim is to develop better circuit technology (smaller, more powerful, more reliable) in order to give systems greater capacity and a wider range of functions. Europe, while using 20% of the world output of integrated circuits, produces only 6%. The design, testing and manufacture of very large-scale integration (VLSI) silicon chips are essential requirements for Europe.

- Advanced information processing (AIP) is at the forefront of ESPRIT's pre-competitive research role, with its emphasis on the future industrial exploitation of information and knowledge engineering, storage and usage, signal processing and external interfaces involving recognition. The overall objective is to establish technological functions which are closer to human thought processes as distinct from the present level of calculation and information storage.
- Software technology is a vital area of information technology in which ESPRIT can make an important contribution in both centralising and disseminating software research results as well as eventually overseeing a comprehensive set of engineering standards and a unified framework of concepts and descriptive notations. The software technology subprogramme aims at making available at Community level efficient and cost-effective methods for the industrial production of high-quality software, and is intended to lead to more rapid introduction of new products and a reduction of life-cycle costs in software.
- Work in the subprogramme addresses theories, methods and tools to put software production on a sound engineering basis, project management and industrial aspects to put these into the business and industrial context, a common integrated software engineering environment and the demonstration of the effectiveness of new software production methods.
- The challenges facing office systems development include understanding and supporting the tasks of office workers and not simply providing a technological update of traditional office functions, achieving improvements in man-system interfaces that allow productive use of office systems by a wide range of office workers, and the development of system-oriented approaches to office problems.
- The two main objectives of the computer integrated manufacture (CIM) subprogramme are: one, the creation in the Community of an environment in which multivendor automated manufacturing

systems can be implemented with the resulting integrated system having minimum functional overlaps and maximum connectivity; and two, to support individual work on selected subsystems, interfaces and tools whose development or refinement is seen to be of strategic value to Community industry, and whose design aims are consistent with the general architecture of the environment.

Work in the subprogramme relates to the total requirements of manufacturing activities, from the planning and design stage to real-time control of production. It then includes computer-aided design (CAD), computer-aided engineering (CAE), computer-aided manufacturing (CAM), flexible machining and assembly systems, robotics, testing and quality control.

Programme execution and infrastructure

The Commission will manage and monitor the execution of the programme. It will see that the infrastructure needed for programme execution is set up. Part of this infrastructure is the information exchange system (IES). Another part is the dissemination of results and reports and the acquisition of information. A third part is concerned with the interrelationship between the R&D work and standardisation activities.

The ESPRIT Information Exchange System (IES) serves as a management tool. The IES is an IT based data communications system for the exchange of information between separated participants in ESPRIT projects, their own managements and policy making bodies, and the Community and national administrations involved in programme or project management.

A number of the research and development projects in ESPRIT will lay the scientific and technical foundations on which standardisation activities will be based later. Conversely, some demonstrations of the interworking of standards may require additional work; this work will be considered as part of the infrastructure. The work towards standardisation will be guided by the general IT standardisation policy

established and not duplicate any of the existing organisations or actions.

The dissemination of results of and information acquisition for ESPRIT is an important element of ESPRIT. Its goals will be the quick application of research results from ESPRIT in the Community industry and to provide the best basis for the planning and management of the programme, and for project participants. For this purpose both classical mechanisms like publications or workshops or conferences and newer communication methods through electronic means, for instance the IES, will be used.

Telecommunications

When the ESPRIT plans were originally drawn up, it was recognised that telecommunications formed an important part of information technology. However, the subject was not included per se at that time.

Telecommunications is one of the advanced technology areas in which the Community has a vast potential. At present it is still a net exporter of telecommunications equipment. But although the volume of Community exports is high, they are increasingly of the traditional types of equipment rather than those incorporating the latest technological advances.

In September 1983, the Commission prepared a communication to Council, demonstrating the increasing economic importance of telecommunications to the economic development of the Community, and putting forward actions in this field. The Commission was then asked to detail proposals for the six lines of action so identified in the action programme.

The proposed second line of action recognises the key role of cooperative R&D, it calls for "cooperative R&D and worksharing at the pre-competitive stage of the ESPRIT type". Accordingly, the Commission initiated a Planning Exercise in Telecommunications (PET) in conjunction with major European companies and the national PTT laboratories. The aim was to enable proper assessment of the

advantages that might stem from a Community approach in laying down the technical ground for a significant implementation of Integrated Broadband Communication (IBC) by 1995 in the Community.

As a result, a Commission proposal for an inventory of R&D requirements in telecommunications, "R&D in Advanced Communications Technologies in Europe (RACE)" is being made. The draft RACE Workplan states that the work undertaken within ESPRIT must be taken into account.

Types of project

Throughout the ESPRIT 1985 Workplan, a distinction is drawn between Type-A and Type-B projects. These are defined as follows:

Type-A projects are projects that are individually described in the Workplan, with specified intermediate objectives. They usually require large resources, both human and financial, and considerable infrastructure with clear and constant perspectives.

Type-B projects are covered by "research themes" which are indicative but do not form an exhaustive listing. They usually require smaller resources and are not as amenable to milestone management and review cycles as the larger projects.

Current state of the programme

This Workplan specifies the work that will be open to proposals in 1985. It also describes work in progress in 1984 or likely to start before the 1985 call for proposals. The steps leading to this work were as follows:

- An advance notice for participation in the main ESPRIT Programme was published on 30 December 1983. The Council of Ministers approved the programme for an initial period of five years on 28 February, 1984. The 1984 Workplan was published in the Official Journal of the European Communities.

- A first call for proposals for the main programme was issued on 21 March 1984. Nearly 450 proposals were received in response and were evaluated during May and June 1984. A shortlist was selected in July 1984 for detailed negotiations and final approval. In addition, much of the work carried out under the earlier Pilot Phase is expected to combine with the main programme. A direct consequence in the 1985 Workplan is the inclusion of descriptions of projects already underway.
- A further call for proposals should be expected in early 1985 and at proposal time about 120 projects will be underway already.
- For participation in the IES development and services, a call for proposals was published on 14 July 1984 and has produced 25 responses which have been evaluated.

Workplan coverage and intended response

The 1985 Workplan covers the period 1985-1989. This is sufficiently long to cover the duration of the longer projects. However, information technology is rapidly evolving and therefore the R&D objectives may well have to be modified in the course of yearly revisions. Accordingly, the intermediate objectives that are set out in this Workplan are less specific towards the end of the planning period.

Such intermediate objectives are, however, necessary to provide the framework and reference for evaluation, proper management, and further refinements. They have been introduced in the Workplan as the best current estimate of how the overall objectives of the project may be achieved. They are indicators and checks against which concrete proposals for projects will be examined. Intermediate objectives shall, however, not be regarded as legally mandatory in the sense that proposals having perfectly acceptable end objectives should not have to be rejected only because they may have been designed to rest on different intermediate objectives than the ones proposed here.

Within each of the separate subject areas of ESPRIT there exist programmes of work which may depend on skills, techniques or

technologies which are being developed within one or more of the other subject areas.

In individual cases this may lead to specific milestones in one area replacing identified demonstrators in another area. Conversely demonstrations might be requested or started as a separate entity in such cases.

Under each R&D topic, the Workplan indicates where proposals for A-type and B-type projects are expected. To aid the presentation, the descriptions of current work are typographically distinguished. These descriptions are located under the most appropriate heading, but it should be realised that in some cases projects formulated in response to previous Workplans overlap the subject boundaries currently used. There are some areas for which no new proposals are expected in 1985.

The best information on these projects available at the time of writing has been incorporated in the 1985 Workplan. However, it should be noted that at the time this Workplan was drafted the Commission had not yet concluded final negotiations on all this work and some modifications may prove necessary in some cases.

A-type projects are part of an explicit plan deemed necessary for the success of ESPRIT. This means that in a given topic area all A-type projects taken together must address the totality of the goals set for that area in the Workplan. The evaluation and selection process of new A-type proposals is directed to achieve such coverage.

As B-type projects are covered by research themes, the response shall not necessarily be limited to the items explicitly mentioned. Proposals addressing additional related topics will be considered as well, and also (as a general rule) B-type proposals in support of the work described under the A-type headings will be considered. In spite of being less constrained by topic or result to be achieved, B-type proposals must have, however, a strong industrial orientation and lead to industrially exploitable results.

As regards topics or subdivisions thereof that are already addressed by A-type work and for which no new A-type work is invited this year, it must be noted that, if for any reason, the existing work should not be continued as expected, other major proposals addressing the same area may then be considered again.

A-projects or B-themes for which no proposals or no satisfactory proposals are received, or areas in which existing work is discontinued for some reason, will be considered again for inclusion in the Workplan for the subsequent year.

Resources breakdown

Allocation of the budget between the five subprogrammes will be a function of the work envisaged in the 1985 Workplan and of the final allocation of resources to the projects started in 1984. However, as an indication of a top-down allocation, the desired overall balance between the subprogrammes can be used. Since the 1984 proposals for Software Technology* (subprogramme 2) fell significantly short of expectations, some allowance is made for this by allocating more resources in 1985.

The overall Workplan breakdown of resources for each subprogramme is also subject to modification in the light of further technological evolution in the world. In particular, in the light of the industry response to calls for proposals, it must be possible to transfer resources between the various subprogrammes - after all the partitioning of ESPRIT into five areas is a management convenience and is not intrinsic to the nature of the work. It must be stressed that all subprogrammes are very heavily interrelated.

* See COM(84) 608 final for further information.

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**Information projects in specific sectors
(Information for industry)**

One of the stated aims of the Community's five-year programme for the development of the specialised information market in Europe, which started on 1 January 1984, is to contribute to the creation of high-quality information services in Europe. Special attention will be given in the near future to stimulating the development of the information market for industry and encouraging the use of new information and media technology such as electronic news services and optical disk storage.

The support mechanism used to find projects will probably be the subject of a call for proposals published in the C series of the Official Journal. This procedure was successfully used for action plans in the field of scientific and technical information and documentation. In 1982 and 1983 calls for proposals were published in the fields of trade and industry, energy and social science (OJ C 169 of 7 July 1982), agriculture and the environment (OJ C 60 of 4 March 1983), biomedicine and health care (OJ C 121 of 6 May 1983) and electronic document delivery (OJ C 288 of 5 November 1982).

To qualify for support, projects must satisfy a number of criteria, in particular that they are of Community origin, that they are intended to meet an existing need, that they are of broad interest to a large number of users and preferably unique in character, that they will be organised in more than one Member State and that they are likely to be commercially viable. Financial aid normally covers 25-50% of development costs.

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SECTION FIVE

BIOTECHNOLOGY

The new biotechnologies are the subject of an EEC action programme containing R&D elements comparable to those of ESPRIT in the Information Technology sector.

Biotechnology

The outline of the Commission's strategy for the development of the biotechnology sector in the EEC is set out in its proposals:

1. for the 1984-87 R&D framework programme (COM(82) 865 final) and (COM(83) 260 final);
2. in two Commission publications: "Biotechnology: the Community's role" (COM(83) 328 final) and "Biotechnology in the Community" (COM(83) 672 final).

The Commission proposed a five-year programme of 88.52 million ECU in its proposal for a Commission decision (COM(84) 230 final). With this proposal the Commission adopted an EEC biotechnology research programme to run for several years. The programme was adopted by the Commission on 19 December 1984, but the budget was cut to 55 million ECU and the details of the programme are still to be worked out.

The proposal identifies six areas:

- research and training;
- concertation of national biotechnology policies, within the Community departments, between Community and Member State programmes, between universities, industry and agriculture, and between public and private sector activities;
- new regimes on agricultural outputs for industrial use;
- progress on the harmonisation of regulatory regimes to promote a genuine common market for the bio-industries;
- European access to intellectual property rights in biotechnology;
- a programme of demonstration projects to accompany R&D activities in biotechnology.

With applications in such areas as agriculture, health care, the chemical industry, agri-foodstuffs, environmental protection and waste recycling, biotechnology-related products already concern some 40% of manufacturing sectors of industrialised countries. Recent estimates suggest that by the year 2000, the market for biotechnology goods could be \$100 000 million a year, and in the genetic engineering field recombinant DNA alone could account for \$40 000 million of the total. These figures are only tentative because they do not take into account the "knock-on" effect on competition in the major sectors. To put the figures in context, worldwide sales totalled \$250 000 million at the beginning of the 1980s and are expected to reach \$1 billion by the beginning of the 1990s.

The EEC Member States spend as much as the United States on biotechnology R&D but less on information technology. Overall, they spend more than Japan. An estimate of annual expenditure on biotechnology R&D in the public sector puts it at \$130 million in the Community, \$200 million in the United States and \$50 million in Japan. It is feared that EEC spending lacks coherence and effectiveness. The Community programme attempts to avoid duplication of Member States' own R&D programmes and to ensure that conflicting norms and standards are not adopted.

Following approval by the Council of Ministers in December 1981, the Commission introduced a training and research programme in bi-molecular engineering in April 1982. A second programme for 1984-1986 worth 7 million ECU was approved by the Council in October 1983. The programme was expanded to cover new areas as a result of the Council decision of 19 December 1984.

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1. See in particular the supporting paper **"Plan by objective: Biotechnology"**, M.F. CANTLEY (Ref.XII-37/83/EN), January 1983.
2. COM(83) 328 final/2, May 1983, **"Biotechnology: the Community's role: Background note: national initiatives for the support of biotechnology"**.
3. For further information about bioinformatics and its importance for Europe, see: **"Bioinformatics in Europe: Foundations and Visions"**, Mark F. CANTLEY, Swiss Biotech 2 (1984) No.4, pp.7-14.

SECTION SIX

THE R&D EFFORT

This section groups the various R&D programmes concerning both commercial technologies and those still at the precompetitive stage. There is inevitably some overlap between this section and others in the guide because the R&D programmes are sometimes administrative or budgetary frameworks encompassing projects dealt with elsewhere. The items covered in this section are: The 1984-87 Framework Programme, The Research Action Programme, Basic Technological Research, the Application of New Technologies, the "Stimulation Plan", the JRC Multiannual Programme (1984-87), FAST II, the streamlining of the R&D administrative structure and the European Business and Innovation Centre Network.

The 1984-1987 framework programme for a European scientific and technical strategy

The 1984-1987 framework programme provides the structure for a growing number of Community-level schemes for the encouragement of pure or applied research and development.

The common strategy for 1984-1987 is founded on three basic principles:

- a reinforced priority to be given to developing scientific and technical activities in the context of the redeployment of the Community's policies and activities and the allocation, in the framework of this redeployment, of an increasing percentage of human and financial resources to these activities;
- starting out from the basic goals, making use of an objective-based approach, that is, of a selection of well thought out and significant objectives for the period 1984-1987 with a view to:
 - facilitating the implementation of the research specifically desired by the Member States;
 - facilitating the subsequent adoption of action programmes for implementation by identifying and putting into order the priority needs of the Community and thus the relative weighting to be given to the corresponding scientific and technical objectives;
 - testing in a specific manner the method of making political and technical choices as between national, international and Community activities;
- the undertaking of a sustained effort to stimulate the efficacy of the Community's scientific and technical potential.

The Commission proposal outlined the basic goals and the broad scientific and technical objectives for the initial framework programme covering the 1984-1987 period:

Community goals		Scientific and technical objectives	
1.	Promoting agricultural competitiveness (including fish)	1.1	Development of agricultural competitiveness and improvement of products (Fish)
2.	Promoting industrial competitiveness	2.1	Elimination and reduction of hindrances
		2.2	Improvement and development of new techniques and products for conventional industry
		2.3	Promotion and development of new technology
		2.3.1	Information technology
		2.3.2	Biotechnology
3.	Improving the management of raw materials	3.1	Optimal use of raw materials (including recycling them)
4.	Improving the management of energy resources and reducing energy dependence	4.1	The development of nuclear fission energy, especially safety aspects
		4.2	Controlled thermonuclear fusion (JET)
		4.3	The development of renewable sources of energy
		4.4	Rational use of energy (systems analysis, hydrocarbons, coal, energy saving)
5.	Reinforcing development aid	5.1	The implementation of S/T activities which benefit developing countries
6.	Improving living and working conditions	6.1	Improvement of safety and protection of health
		6.2	Protection of the environment (and prevention of hazards)
7.	Improving the efficacy of the EEC's S/T potential (Stimulation)		

The Commission proposed that the 1984-1987 framework programme be re-examined regularly during the first years of its implementation. A review of the programme was scheduled for the second half of 1985. The proposal dealing with the second framework programme will be put to the Council and Parliament at the end of 1986 with a view to its adoption during the first half of 1987. It would be a proposal covering the period 1988-1991.

Research action programme on industrial technologies (RAP)

The research action programme on industrial technologies groups together within a common management structure a number of existing and proposed R&D activities aimed primarily at improving the competitive position of Community industries other than high-technology industries.

The principal areas of the current programme and subprogrammes are as follows:

a) Action to eliminate or reduce barriers to trade

1. Community Bureau of Reference (BCR)

The purpose of this subprogramme is to improve the accuracy of measurements and hence the equivalence of the results of such measurements throughout the Community. It covers metrology, analytical chemistry and technical measurements. The work under way addresses problems of economic, commercial and industrial significance at Community level.

For each project the Commission seeks the participation of the leading laboratories of each Member State. Their collaboration receives financial support and the work on each project continues until the results are precise enough for practical use. The results are then available to all Community laboratories.

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2. Nuclear measurements: the objectives of this subprogramme are:

- to optimise the design and operation of fission reactors and to contribute to the technological development of fusion reactors;
- to provide specialised reference materials required by the nuclear industry;
- to use nuclear measurement techniques to develop and characterise references in several fields;
- to give direct help to the BCR programme in the preparation, conditioning, sampling and conservation of BCR reference materials.

b) Multisectoral research (i.e. research on industrial technologies which may be used in several industrial sectors)

1. Basic technological research and application of new technologies: the work in these fields will be carried out under a programme entitled Basic Research in Industrial Technologies in Europe (BRITE).

The Commission has introduced a system of "expressions of interest", one of the aims of which is to facilitate access to individual firms and in particular to small and medium-sized undertakings, without however requiring the drafting of expensive official proposals.

These expressions of interest have also made it possible to obtain a clear picture of the priorities of industries, universities and research centres. The expressions of interest were examined by independent experts and on the basis of reports a list of priority subjects was drawn up.

In March 1984 a procedure was started, and lasted until the end of the year, for the purpose of grouping expressions of interest in the same

subject. The aim was to give various interested parties details of those working on similar subjects in order to facilitate cross-border contact among those in the same group and to organise projects involving firms from various Member States.

The BRITE programme was approved by the Council on 19 December 1984. The programme will run for four years with a budget of 125 million ECU. The main objective is to stimulate the creation of a sound basis of advanced technology to help Community industry safeguard its international competitiveness in the next ten years. In more concrete terms, the programme brings together the possibilities for complementary research in various sectors of the Community. With financial aid which will be sufficient to stimulate the action, the programme will apply the research to the technical fields which are considered to be of top priority for Community industry.

Each proposal must as a rule be submitted on behalf of a group of participants who intend to collaborate on the project. Each group must include partners based in at least two different Member States and at least one of the partners must be an industrial undertaking.

The Community contribution is generally no more than 50%, the rest being met by the participants in industry. The projects must satisfy the conditions specified in the technical annex to the Council decision.

The projects must also:

- be of notable technical merit;
- concern pre-competitive R&D work;
- consist of innovative research which does not overlap with or duplicate existing work;
- involve considerable resources (it is expected that the average budget of the projects to be financed will be approximately one million ECU).

The BRITE programme is divided into two subprogrammes:

- pre-competitive technological research and development;
- pre-competitive technological research and development, including pilot projects and demonstration projects on the application of new production technologies in the textile and clothing industries.

Further information is contained in the brochure on the BRITE programme which may be obtained from the following address: Arts/Lux 2/52.

2. High-temperature materials

The aim of this subprogramme is to satisfy the need for construction materials for long-term service in high temperature aggressive environments, particularly in the critical areas of industrial processes. The subprogramme provides a scientific service in the fields of materials information, data processing and direct research programmes, and thus contributes to the development and updating of improved technologies, materials and components.

Five projects in the form of concerted actions as part of the COST scheme (European Cooperation in the field of Scientific Research) are financed by the participating countries and concern: high-temperature materials for conventional power stations, corrosion in the construction industry, powder metallurgy, castings technology and materials for steam turbines.

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c) Application of new technologies to specific industrial sectors

1. The aim of the textiles subprogramme is to safeguard and develop the industrial and commercial potential of the Community textile and clothing industry. The objective of the research which is planned for this subprogramme is technological innovation, since the industry will not be able to defend its position on world markets unless a sustained effort is made in this precise direction.

The second clothing and textile programme (indirect action) covers the following specific areas:

- garment physiology and construction;
- quality of knitted fabrics;
- use of new spinning technologies in the wool industry;
- upgrading of linen.

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2. Steel research is an ECSC area of the action programme. This subprogramme responds to joint research needs with the ultimate objective of strengthening the competitiveness of the Community steel industry in international markets.

Priority is given to applied research, aimed at short and medium-term objectives which make it possible to reduce production costs and increase productivity, to improve product quality and promote the use of steel for construction purposes.

The scientific research of the subprogramme covers five major fields:

- iron ore reduction;
- steelmaking;
- rolling and mechanical working;
- measurement and analysis;
- properties and service performance.

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Stimulation plan

The Commission has followed up its 1983 programme with a stimulation plan for 1985-1988.

The Commission is seeking to increase the mobility of researchers, promote cooperation and encourage the professional integration of young researchers by a wide-ranging action based on:

- a plan covering multisectoral and multiannual activities (1985-1988);
- the increasingly systematic use within each sectoral programme of specific methods of intervention designed to promote the training and mobility of researchers.

In the framework of the multisectoral plan the aim is the broad development of the stimulation activities previously carried out on an experimental basis, with the aim of breaking down the barriers between basic and applied research, encouraging multidisciplinary approaches and supporting strategic research. This would be achieved by implementing:

- a) incentive measures: laboratory twinning, operations, grants;
- b) contextual measures to encourage the mobility of researchers: researcher's card, career seniority for "mobile" researchers, information system on exchange and cooperation possibilities.

In the light of the needs which were expressed during the experimental phase and in accordance with the Council guidelines of 28 February 1984, the stimulation plan:

- relates to the whole field of scientific and technical activities and to all forms of R&D (basic and applied research, development) and covers all fields of the exact and natural sciences; some fields however, where stimulation is an urgent requirement - will receive particular attention: mathematics,

optics, surface chemistry and physics, chemistry, biocommunications, earth sciences, oceanography, scientific instrumentation;

- is open to industrial laboratories which are interested in participating;
- may be extended to non-Community countries in Europe by means of financial arrangements which will be agreed on a case-by-case basis.

A total of 60 million ECU is available to the Commission for the 1985-1988 period (a revision is scheduled in 1986).

The Commission hopes to involve approximately 1% of the researchers in the Community during the 1985-1988 period, and the long-term objective is to involve 5% of Europe's scientists (approximately 20,000 people).

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Joint Research Centre multiannual programme (1984-1987)

The Joint Research Centre (JRC) is being fully integrated into the overall Community research strategy, and is to play a central role in two major research areas:

- Norms and standards
- Safety and the Environment

A major proportion of its 700 million ECU budget for the 1984-1987 period formally approved by the Council of Ministers on 13 December 1983 will exploit the JRC's strong nuclear R&D base, but in addition to fusion, fission and nuclear measurements work the JRC is also to concentrate on non-nuclear energy sources and environmental protection. The JRC programme is due to be reviewed in 1986 once Member governments have approved the proposals put forward by the Commission in COM (83) 327 final.

A full description of the activities of the Joint Research Centre at Ispra, northern Italy, and of the winding-down of the JRC's Super-SARA project and ESSOR reactor complex as decided by EEC Member governments can be found in COM (83) 107 final⁽¹⁾. Even before its nuclear research activities were reduced in proportion to non-nuclear work, the JRC had been responsible for some 75% of the Community research projects that have been successfully commercialised and detailed in the Commission's brochure series "Innovations from Community Research"⁽²⁾.

(1) The JRC has establishments in four places: Ispra (Italy), Karlsruhe (Germany), Petten (Netherlands) and Geel (Belgium).

(2) See above p.7

FAST (Forecasting and Assessment in Science and Technology)

The selection and direction of Community R&D objectives and priority areas require an increased effort by the Commission in the forecasting and assessment of long-term scientific and technological prospects and their implications for the economic and social development of the Member States. To that end, the initial five-year programme (1978-1983) of studies by the FAST research team has been followed by a second phase, FAST II, covering the period 1983-1987.

FAST I yielded three major study themes, while in all the five-year programme produced 36 different research projects involving some 60 research teams from all the Member States. The three themes were:

- work and employment, key problems of the 1980s;
- the "information society" the major change of the next 20 years;
- the "biosociety", one of the major changes of the next 30 years.

During the initial phase the FAST team consisted of six researchers and four support technicians with programme resources of 4.4 million ECU supplemented by 1.2 million ECU from public and private agencies in the Member States. An appraisal of the FAST experiment was conducted by the Advisory Committee on Project Management (ACPM) and by a group of seven independent experts appointed by the Commission.

FAST I identified five major long-term priority guidelines for Community research and development, including:

- strengthening of Europe's industrial base in the agriculture-chemical-energy fields and in the space-electronics fields;
- strengthening of European infrastructure for services during the next 30 years.

Within each main guideline FAST I formulated 6-10 specific recommendations relating to both technological and social aspects. The

recommendations ranged from the structural (organisation of research activities) to the contextual (action on the scientific and socio-economic environment) and to the specific (joint projects to be carried out in Europe). Depending on the situation, the aim was to assemble basic knowledge, promote experiments, create tools or reinforce existing actions.

Research work in the FAST programme produced some concrete results, for example in France (chemistry), Scotland (study on biomass and regions) and Denmark (social aspect of information technologies). At the Community level the FAST team was involved in drawing up the first framework programme for a European scientific and technical strategy⁽¹⁾ and also the ESPRIT programme and the biotechnology action plan⁽²⁾.

The results of FAST I provoked a great deal of interest in scientific and economic milieux. The Community therefore decided in June 1983 to continue FAST activities for a new period of four years (1983-1987) with a budget of 8.5 million ECU, plus 2 million ECU in national contributions. A central team of 12 people, including six scientists, is responsible for the programme.

The work is carried out by means of research contracts, an information and cooperation network and - an innovation - researchers seconded by the Member States for a limited period (12-24 months). FAST II concentrates on four main areas of research.

- relations between employment, technology and work;

(1) European File No.8/83, **"Towards a European research and science strategy"**.

(2) European File No.8/84, **"The European Community and new technologies: From ESPRIT to the Biosociety"**.

- transformation of service activities and technological change;
- integrated development of renewable natural resource systems;
- new strategic industrial systems in the communication (audio-visual, cable systems, telecommunications) and food sectors.

These areas of investigation are dealt with in the light of the uniform approach of the FAST programme, i.e. to define the possible role of science and technology in the search for new development in Europe.

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The streamlining of the R&D administrative structure

Changes to the administrative and supervisory machinery of the European Community's technology and industrial innovation have been proposed to Member governments by the Commission as part of its drive to streamline procedures.

The changes are also intended to overhaul the consultative system under which the Commission manages Community R&D innovation schemes in association with EEC Member governments and independent experts from Community countries.

In planning the changes to the command and control structures, the Commission has had uppermost in mind the needs of the new EEC strategy for scientific and technical research and development in the 1980s.

- At the top of the administrative pyramid, the Scientific and Technical Research Committee (CREST) would be abolished and replaced by the Higher Policy Committee for Science and Technology (HCST). Member governments are, however, scrutinising this proposal.

- The Council of Ministers decided on 13 December 1983 to create sectoral Management and Coordination Consultative Committees (MCCs). These will replace the CREST subcommittees which covered energy, raw materials, environment, medical research and R&D training in informatics. The aim is that the MCCs would have a wider role of implementing and managing R&D activities than had the CREST subcommittees, and would therefore also replace the Advisory Committees on Programme Management (ACPMs) and Concerted Action Committees (COMACs) that had subaltern responsibilities in the seven different R&D sectors - new energies and conservation; nuclear energy; resources; environment; medicine; competitive economic development; R&D of benefit to LDCs.

The Commission has identified four main functions that it must serve if the Community R&D strategy is to be properly implemented:

- (a) Identification of objectives. With the forecasting services of the FAST team, and the analyses available from CODEST⁽¹⁾ and CORDI the Commission believes it can select the right scientific and technical goals to be tackled as part of the R&D Framework Programme.
- (b) Definition and choice of R&D activities. Selection criteria here, in addition to those inherent in the foregoing section, include projects that have an EEC-level character or that would act as a catalyst to various national R&D efforts.
- (c) Implementation and management of R&D. The Commission has management responsibility for a wide variety of R&D projects - Joint Research Centre (JRC) programmes, cost-shared actions, concerted or coordinated action and demonstration projects.
- (d) Evaluation of R&D. The Commission is planning (COM (83) I final) to increase the scope of evaluation exercises in order to improve the process of launching new projects.

Details of the streamlined and revised consultative and administrative committee structure are contained in COM (83) 143 final, the Commission's communication on the subject to the Council of Ministers. A closely related analysis is the Commission's communication to both the Council and the European Parliament on the promotion and utilisation of R&D results (COM (83) 18 final).

(1) CODEST was set up in the framework of the "Stimulation Plan" (see above p.85 and glossary p.101).

European Business and Innovation Centre Network (EBN)

The representatives of a number of Business and Innovation Centres from several Member States of the Community met in Brussels in November 1984 and decided to set up an international association called the European Business and Innovation Centre Network (EBN). The Community was asked for its support and the Commission agreed in December 1984. The network is currently being set up.

The main task of a Business and Innovation Centre (BIC) is to stimulate the spirit of enterprise and to increase the chances of success of new activities, with the aim of creating a maximum number of jobs. The task involves initiating a process for the permanent and intentional establishment of new innovative activities in new or existing small and medium-sized undertakings.

The primary role of the BICs is to identify, select and give impetus to both entrepreneurs and technologies (incubator role) and to serve as a centre for the promotion of new activities (science park). The BICs are run like proper firms and provide a range of services and resources, including the identification and selection of entrepreneurs, the selection, assessment and introduction of technologies, basic training for the management and operation of new activities, advice and assistance in seeking finance for projects, marketing assistance and the use of premises equipped with common facilities.

This approach, which has also given rise to a new profession, has proved effective in several countries in recent years marked by structural change. In the United States, for example, a chain of Business and Innovation Centres has succeeded in encouraging the creation of several hundred new firms, the survival rate of which after four years of operation is 80% against a national average below 20%.

In addition to its direct impact, a BIC is of economic importance for the impetus and fallout it generates at the industrial and technological levels. They can revive a local or regional economy by contributing to its modernisation and reconversion. The creation of a BIC can be the starting-point of an effective association between the public and the

private sectors by harnessing the potential of banks, universities, public authorities, existing firms and human resources. BICs offer an approach to industrial policy which may, at the present time, be better adapted than traditional policies based on subsidies.

The main functions of the European Business and Innovation Centre Network are to promote, strengthen and assist centres which already exist or which are about to be set up. To this end, the network will:

- serve as a centre for the exchange of information and ideas both between BICs and between associated firms;
- provide technical advice and direct assistance to existing BICs and to those being set up, with the aim of improving their effectiveness and their resources;
- encourage and facilitate cooperation between member BICs and associated firms, particularly in the areas of marketing and technology transfer;
- supply services to the Commission on a contract basis.

There are two levels of EBN membership: full and associate. All the activities of the association are open to all members, but only full members have a right to vote.

About 20 organisations have submitted applications for membership.

Applications should be sent to:

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SECTION SEVEN

DEVELOPMENT PROGRAMMES AND PROJECTS

Known also as "medium-term lead projects", these are Community supported development projects with twin roles. In addition to their immediate function they also serve an important purpose by stimulating the R&D effort in key technologies.

The projects are: INSIS, CADDIA, Eurotra, Systran, Eurodicautom as well as the Demonstration Projects in the field of energy-saving and alternative energy sources.

INSIS (Inter-institutional Integrated Services Information System)

The INSIS programme is making a vital contribution to the setting-up of advanced information systems linking the Community institutions and EEC Member governments' administrative machinery. INSIS is also one of the lead programmes launched by the Commission with the parallel aim of helping to stimulate the development and application of information technology.

A Member States Advisory Body was proposed to the Council of Ministers in July 1981 and approved in principle in December 1982. This body, representing the governments of the Member States and the other institutions of the Community, met in the middle and at the end of 1983. Its recommendations have now been submitted to the Council after favourable opinions from the Economic and Social Committee and the European Parliament.

As the INSIS systems become operational they should have a significant impact on the process of inter-governmental consultation within the Community. They will link users by various means of communication, notably electronic mail systems, video conferences, videotex, rapid facsimile transmission and electronic data storage and retrieval. A number of pilot experiments have already been carried out in different fields.

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Eurotra, Systran, Eurodicautom and the 1983-1985 third action plan for improvement of the transfer of information between languages

Community-level efforts to develop computerised automatic translation systems have resulted in a two-pronged attack on the problem. Under the multilingual action plan automatic translation techniques are being applied and improved upon in the context of the Systran project; the second prong is the Eurotra project which is separately funded and which is an advanced R&D effort aimed at producing a breakthrough in the field of translation.

In November 1982 the Eurotra project was split from the multilingual action plan and allocated by the Council its own budget of 16 million ECU, to which can be added another 11 million ECU in national contributions. The project will run for five and a half years and involves three phases: the two-year preparatory phase (which ended in December 1984) costing 2 million ECU, the two-year intermediary phase costing 8 million ECU and the final phase lasting 18 months and costing 6 million ECU. On completion Eurotra should yield an operational prototype that will provide the basis for further development on an industrial scale.

Eurodicautom is a terminological data bank that can be accessed via Euronet. It provides a dictionary of technical and Community terms and at present carries more than 300,000 entries, plus 70,000 abbreviations, in at least one of the seven official languages of the Community.

Systran is a free text machine translation system that has been under development at the Commission since 1976. It has been used by the translation services of the Commission in Luxembourg since 1982 and in Brussels since the end of 1984. The pilot operation in Brussels was initially restricted to DG XVII (Energy) but was scheduled to expand during 1985.

Systran is also used on a trial basis by external users: the SNIAS aerospace company in France and the nuclear research centre at Karlsruhe in West Germany, and since 1985 by various public-sector departments in several Member States.

A new project is under way and concerns communication between European languages and non-European languages of economic importance, i.e. Japanese, Chinese and Arabic. The project comprises:

- teaching these languages;
- analysis of scripts for data processing;
- access to Japanese scientific and technical information and documentation.

A fourth action plan is scheduled for 1986-1990.

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Demonstration projects (energy)

To stimulate R&D activities in the allied fields of energy-saving and alternative energy sources, the Commission has since mid-1978 granted Community financial support to a growing number of demonstration projects.

Since 1978 some 750 demonstration projects making full-scale use of new equipment or processes have received EEC funding which is never more than 49% of the total cost of the project but which is generally about 40%. The volume of EEC funding is steadily increasing and during the whole period 147 million ECU has been given to energy-saving projects, 119 million ECU to alternative energy projects and 152 million ECU to solid fuel projects.

Calls for demonstration projects are made by the Commission's DG XVII (Energy) and are published in the C series of the Official Journal. Between 1979 and 1984 six calls were made for energy-saving projects, five for solar energy projects, four for geothermal energy projects, four for coal gasification or liquefaction projects, two for wind energy projects, two for biomass and energy from waste projects, two for solid fuel projects, and one each for projects on hydroelectric energy and the use of electrical power and heat.

The most recent call was published in OJ C 330 of 10 December 1984 and concerned the following fields: energy saving, transport, energy industry (use of electrical energy and heat), solar energy, biomass and energy from waste, geothermal energy, hydroelectric power, wind energy, use of solid fuels and liquefaction and gasification of solid fuels. The final date for the submission of projects was 17 April 1985, after which no application would be considered.

The Commission also publishes a series of information notes in French and English to publicise the demonstration projects and final reports on the projects. A general assessment report was planned for 1985.

Project proposals must be submitted to the Commission after a call for proposals has been published.

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GLOSSARY AND INDEX

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C

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CAE - Computer-aided engineering..... 63

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CENELEC - European Committee for Electrotechnical
Standardization..... 51, 52, 54

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plan replacing CERD (Committee for European Research
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APPENDICES

APPENDIX I A

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UTE (France) Union technique de l'Electricité 12, place des Etats-Unis F-75703 PARIS CEDEX 16	IIRS (Ireland) Institute for Industrial Research and Standards Ballymun Road IRL-DUBLIN 9
BSI (United Kingdom) British Standards Institution 2 Park Street UK-LONDON W1A 2BS	ETCI (Ireland) Electro-Technical Council of Ireland Institute for Industrial Research and Standards Ballymun Road IRL-DUBLIN 9
BEC (United Kingdom) British Electrotechnical Committee British Standards Institution 2 Park Street UK-LONDON W1A 2BS	Luxembourg : Inspection du travail et des mines 2, rue des Girondins L-LUXEMBOURG
DS (Denmark) Dansk Standardiseringsrad Aurehøjvej, 12 Postboks 77 DK-2900 HELLERUP 12	NNI (Netherlands) Nederlands Normalisatie Instituut Postbus 5059 NL-2600 GB DELFT
DEK (Denmark) Dansk Elektroteknisk Komite Strandgade 36st. DK-1401 KØBENHAVN K	NEC (Netherlands) Nederlands Elektrotechnisch Comité Kalfjeslaan, 2 NL-2623 AA DELFT
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European Communities — Commission

**EUR 9120 — Industrial innovation: A guide to Community action, services
and funding**
Second edition

G. Merritt

Luxembourg: Office for Official Publications of the European Communities

1986 — XIV, 118 pp. — 21.0 × 29.7 cm

Innovation series

DE, EN, FR, IT

ISBN 92-825-5704-9

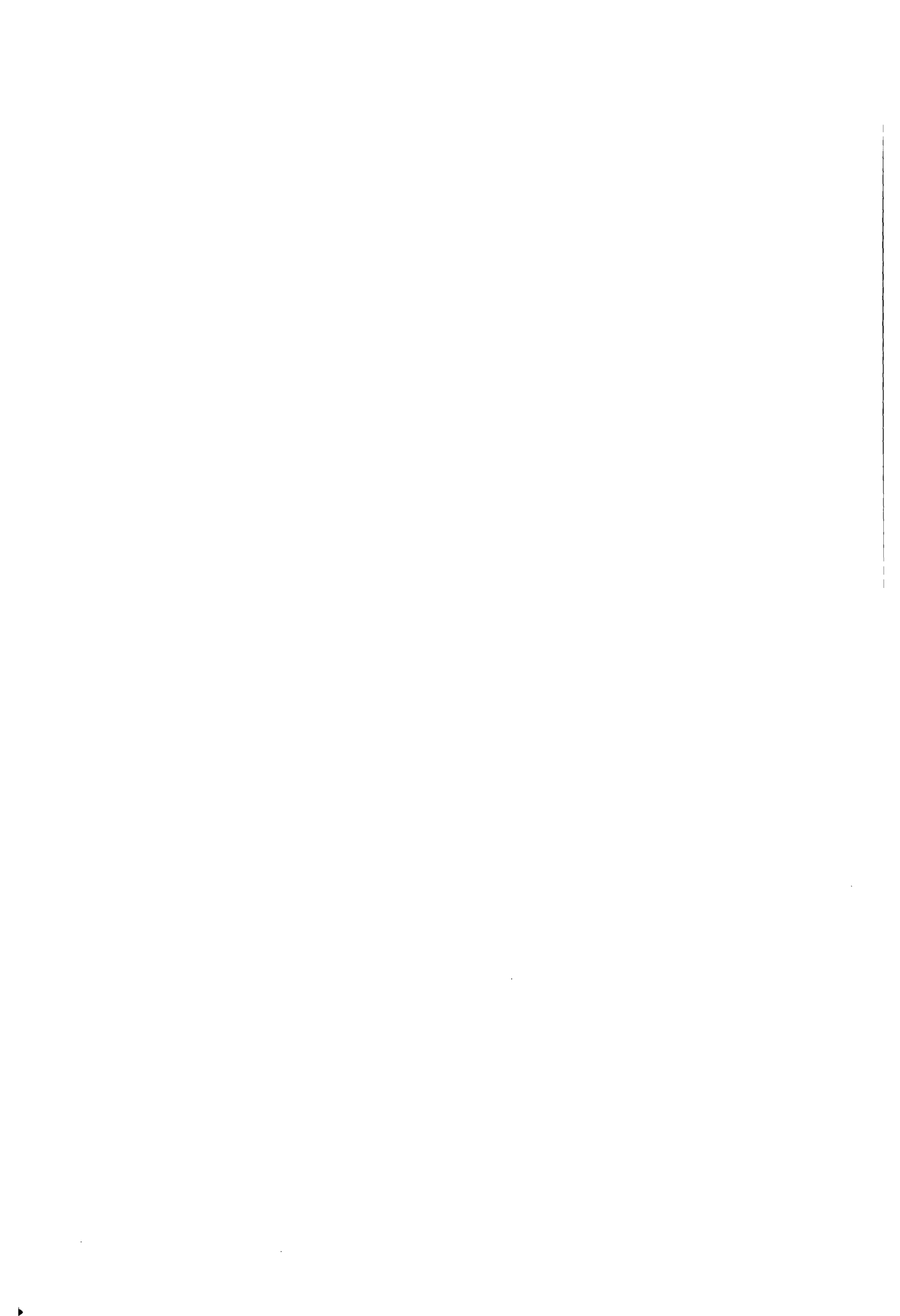
Catalogue number: CD-NT-85-002-EN-C

Price (excluding VAT) in Luxembourg

ECU 11.09 BFR 500 IRL 8 UKL 6.30 USD 9

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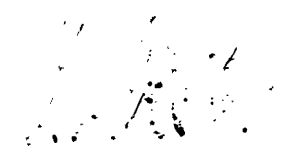
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