

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 30.04.1996
COM(96) 187 final

COMMUNICATION FROM THE COMMISSION
TO THE COUNCIL, THE EUROPEAN PARLIAMENT
AND THE ECONOMIC AND SOCIAL COMMITTEE

**AN INDUSTRIAL COMPETITIVENESS POLICY FOR THE
THE EUROPEAN CHEMICAL INDUSTRY : AN EXAMPLE**

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EXECUTIVE SUMMARY

This Communication, drawn up in consultation with representatives from the European chemical industry, is within the framework of the 'Communication on an Industrial Competitiveness Policy for the European Union¹ (EU). It seeks to identify the industry's main challenges and needs and to define a set of actions² to enhance its competitiveness.

1. The features of and challenges facing the EU chemical industry

* The main challenge facing the European chemical industry is to strengthen its long term international competitiveness, by supplying its clients, in Europe and abroad, with high quality, environmentally sound and competitively priced products. In the light of this challenge and bearing in mind the need to maintain a level of profitability sufficient to ensure that investment continues in Europe, several key features of the industry have been identified :

- Chemical products and environmental and health policy

The chemical industry has a wide range of customers : big industrial sectors (e.g. automobiles and other means of transport, food and beverage, pharmaceuticals, textiles, construction); the agricultural sector for fertilizers and pesticides; and individual end-users for plastic packaging, paints, detergents, cosmetics, etc. Chemical products are closely related with everybody's daily life. Within Europe, there is thus a high level of awareness of the related health and environmental implications. This, as well as the actual risk and the complexity of the issues have given rise to an increasing number of regulations, frequently of national origin: such regulations should be founded on a sound scientific basis and their potential economic impact, including on the international competitiveness of this industry must be fully taken into account.

- The European and global dimension of its markets

In this context it is important to promote a level playing field, at least with the main OECD and newly industrialised competing countries, in terms of market access, environmental framework, and, if possible, competition rules, fiscal and social regulations.

- Its dependence on imported raw materials and energy inputs

Oil and gas, used in the production of petrochemicals and their derivatives, as well as industrial minerals required for the production of inorganic chemicals, are in general not endogenous to Europe and must be imported. Together with energy sources such as electricity and gas, which are supplied by European companies, these represent up to 60% of chemical companies' production costs. Effective competition requires that the unit prices for these inputs must not be distorted; whether in the third countries that supply them, or within the EU.

- Its high reliance on capital and RTD

Net assets higher than 1 Million ECU per employee, for a major part of industry (especially basic chemicals) and an average expenditure on research and technological development (RTD) of about 5% of turnover, compel the chemical industry to seek high capacity utilisation rates in order to minimize fixed costs and maximise income. This involves :

- continuing restructuring, tending towards production in the most efficient facilities and the possible closure of the least profitable ones.
- an effort to ensure the largest possible markets, requiring the consolidation of an effective Internal Market within the EU and, access under conditions of undistorted competition to external markets.
- increased efforts towards co-operative research, both with competing and user companies in more "horizontal" fields of RTD (promotion of recycling, greater use of information technology, etc.).
- the continuous development of innovative new products and manufacturing processes, as a long term strategy in order to counter the increasing pressure from newly industrialising countries (e.g. Asia, Arabian Gulf states) particularly in products with lower value-added, and from those

¹COM(94)319

²See also Table A

industrialised countries (e.g. USA, Canada) benefiting from certain comparative advantages (raw material and lower energy prices, etc.)

- * These characteristics represent, by their diversity, complexity and interdependence, a genuine challenge for an effective implementation of an horizontal industrial competitiveness policy for the EU chemical industry. A number of courses of action and concrete measures have been identified in the context of the chemical industry ; these could be used as an example for similar industries.

2. Basic principles and actions aimed at strengthening the international competitiveness of the EU chemical industry.

In any market economy, each industrial company is responsible for the strategic decisions and initiatives it must take in order to maintain or strengthen its medium and long term international competitiveness. Nevertheless, public authorities have a role to play in creating the legal and economic framework and by adopting, if necessary, accompanying measures for the actions taken by industry. The actions to be developed by the Commission, industry and/or Member States are grouped around the four priority areas of the industrial Competitiveness Communication :

2.1. Actions to improve the regulatory framework

This improvement, in line with the recently adopted "Guidelines for Regulatory Policy", should concentrate on :

- the consolidation, the updating and/or the simplification of the current regulatory framework for chemical substances and preparations. Among examples of such activities are the codification of the Directives on fertilizers, on limitations for placing on the market, and on detergents; the reshaping of the Directive on preparations, the simplification of the Directive on the protection of the health and safety of workers from the risks related to chemical agents at work and the simplification of procedures for the notification of new chemicals, especially by the SMEs, are other examples of such activities.
- the application of a sound approach for all new possible regulatory initiatives concerning chemical products or facilities, involving :
 - a scientific evaluation of the risk that the substance, preparation or type of facility in question represents for health, safety and/or the environment and a comparison with the risks associated with possible substitute products or alternative processes;
 - an appropriate analysis of the costs and benefits of the options available at EU level, and also of possible national measures;
 - whenever possible and relevant, a comparative analysis of similar legislation, in force or under elaboration, in the most competitive third countries.

If the results of these three types of analysis justify a new initiative, be it at international or at EU level, this should be implemented by means of the instrument which is the simplest and the least costly and which ensures a high level of health and environment protection. A wide range of such instruments exists : unilateral industrial initiatives, negotiated agreements at EU or national level (for which the Commission is preparing a general framework), economic incentives and regulatory initiatives at EU or, if possible and necessary, at international level.

This approach will also apply, whenever possible, to current cases where, despite harmonization measures already taken, the internal market for chemical products is still fragmented: partial directives (asbestos); national requests for implementation of article 100A§4 (pentachlorophenol-, cadmium, creosote, ..)

These different actions should be analysed and developed in co-operation with the representatives of industry and/or the Member States concerned.

2.2 Actions to ensure effective competition

The global dimension of the chemical industry and the need for the permanent adaptation of its structures will be taken into account by the Commission in the application of the competition rules, inside and outside the EU, in particular when :

- analysing possible proposals coming from industry aiming at finding solutions to structural overcapacity in certain basic chemical industries, through appropriate actions by the companies concerned, provided the existence of such structural over-capacity is proved and the proposed action is compatible with the competition rules ;
- pursuing efforts to liberalize the electricity and gas markets within the EU, which will allow a reduction of costs for the chemical industry, being an intensive energy user.
- pursuing efforts for the effective use of trade instruments, and in particular for the elimination, among the members and in certain WTO applicant countries (Arabian Gulf states, China), of non-tariff barriers (double pricing systems for certain raw materials, registers of imports, etc);
- exploring bilaterally, with the main trading partners (e.g. with the USA, through the Transatlantic Business Dialogue and the Joint Action Plan), and multilaterally new agreements on competition and international trade, in particular on the removal of barriers to international investment.

2.3 Actions to strengthen intangible investment

The increasing need for innovation in new, high quality chemical products for diversified markets and for the development of more efficient sustainable manufacturing processes, lead industry, the Commission and national authorities, to focus their efforts on RTD, education and scientific training, in particular on :

- the continuation of co-operative research programmes at European level, not only between industries with similar characteristics (such as the SUSTECH and PRIMA initiatives for process industries such as food, steel and paper), but also with user industries (transport, construction) and with computer software suppliers (for greater use of information technologies);
- a greater integration of the chemical industry in existing or future multi-sectoral initiatives (task forces, clusters), which will allow better access to the various Community programmes and an optimization of their results through a better coordination;
- a greater flexibility in the development and revision of the Community-specific RTD programmes;
- the improvement of patent protection for example for pesticides or products resulting from biotechnology;
- the industrial initiatives aimed at improving young people's chemical education and the scientific training of workers which, together with the Community programmes SOCRATES, Leonardo da Vinci, certain sub-programmes of the 4th Framework Programme and actions eligible for Structural Funds, and with the necessary cooperation of the educational programmes of the Member States, will strengthen the essential educational and scientific basis for an innovative chemical industry, which must include education in health and safety of workers.

2.4 Actions to develop industrial cooperation

The complex and highly diversified structure of this industry - containing not only major multinational corporations, but also numerous SMEs - as well as the risks and the opportunities offered by certain international markets, require an intensification of actions for industrial co-operation.

- The importance of the SMEs in a number of sectors and their essential role in the creation of jobs and subcontracting , requires the continuation and/or the development, by industry and the Commission, of actions such as:
 - the improvement of access by the SMEs to non confidential technical, economic and legislative information, through a more computerized communication system being developed by the European Chemical Industry Federation (CEFIC) and through the DG III coordinated network RISC (Reseau d'Information du Secteur Chimique.). The Bilbao Agency on health and safety will also be a source of impartial, validated information.
 - the promotion, among chemical industry SMEs of various Community programmes developed by the Commission to facilitate partnerships and subcontracting, to improve management techniques, etc

- International co-operation projects, to be developed by industry, with the support of the Commission, can reduce the risks and increase the opportunities existing in third country markets :
 - for the countries neighbouring the European market (CEECs, certain NIS and the Mediterranean countries), training and technical assistance projects for national administrations and for managers within the chemical industry, in order to promote the progressive establishment of a regulatory framework (public and occupational health, environment, competition laws, etc.) similar to that of the EU, will help those countries which are candidates for accession, but would also allow the extension of the EU internal market providing more stable and homogeneous conditions of competition;
 - for third countries with fast growing markets (certain CEECs, China, South-East Asia and Latin America), training and technical assistance projects combined with other activities more centred on technology transfer and investment promotion, will allow better access ;
 - for countries rich in raw materials or energy resources (e.g. Russia, the countries of the Gulf Cooperation Council), investment in infrastructure or in industrial minerals will allow better access to these resources and perhaps better control over erratic prices.

3. Conclusions.

- * The Commission considers that the chemical industry of the EU, though among the most modern and competitive in the world, faces a set of challenges that must be met if it is to maintain and, if possible, strengthen, its international competitiveness.
- * In order to do this, a set of actions to be developed or pursued, by industry, the Commission and Member States, has been identified in the present Communication. The Commission will implement, in co-operation with representatives from the European chemical industry, a structured follow-up programme, and will closely monitor the evolution of the international competitiveness of this sector and the adoption of the various measures proposed in this Communication.

TABLE A
ACTIONS ENHANCING CHEMICAL INDUSTRY COMPETITIVENESS

Actions	Commis- sion	MS	Industry
1. Consolidate Internal Market legislative work; resolve asbestos, dioxins, PCP cases	✓	(✓)	-
2. In absence of international level regulation, take account of competitiveness of EU industry prior to EU regulation	✓	-	-
3. Undertake risk assessment and adequate analysis of the costs and benefits for all new regulation or action	✓	-	-
4. Develop and widen Responsible Care initiatives	-	-	✓
5. Establish a Community framework for voluntary agreements in MS	✓	✓	(✓)
6. Assess rapidly mergers and joint ventures	✓	-	-
7. Continue to increase the transparency of State aids rules	✓	-	-
8. Liberalise energy, especially gas and electricity, markets	✓	(✓)	-
9. Investigate causes of structural and cyclical overcapacity and capacity shortage	✓	-	(✓)
10. Seek new WTO members apply tariffs of 0 %, 5.5 %, 6.5 %	✓	-	
11. Pursue non-tariff barriers, especially double pricing (distorting investments incentives)	✓	-	(✓)
12. Reflect the Transatlantic Business Dialogue suggestions to harmonize rules on classification, etc of chemicals	✓		✓
13. Explore multilateral agreements for trade and competition	✓	-	-
14. Improve 4th RTD Framework Programme including Task Forces; develop 5th Framework Programme	✓	-	
15. Promote SUSTECH and PRIMA approaches	(✓)	-	✓
16. Enhance scientific and technological culture	(✓)	✓	✓
17. Implement Commission proposal for increased patent protection for crop protection products	✓	✓	-
18. Develop RISC	✓	-	✓
19. Intensify actions for SMEs	✓	(✓)	✓
20. Relaunch EASTT	-	-	✓
21. Enhance technical assistance on chemical legislation to CEECs	✓		(✓)
22. Increase industrial cooperation with China and others	✓	-	✓

I. INTRODUCTION

1. The Communication will briefly describe the chemical industry and the challenges it faces, and will propose a series of initiatives to enhance its competitiveness. The initiatives or actions will be either those currently pursued or those to be undertaken by the Commission, by Member States and by industry. Those to be undertaken are contained in the paragraphs in bold type. The Commission's actions should be seen as part of the horizontal industrial competitiveness policy prescribed in the September 1994 Communication¹ which in turn built upon the 1990 Communication² on industrial policy. The actions or initiatives will have particular relevance to the chemical industry but not only be applicable to it. The preparation of the Communication has involved consultation with representatives of industry from the earliest stages. Significant divergences of views between the Commission and industry are made explicit. This approach could be used as an example for other similar industries.
2. Following a description of the industry and the foreseeable challenges it faces for the next ten years, the Communication will examine certain measures grouped under the four priorities of the industrial competitiveness Communication : improving the regulatory framework (there referred to as the modernisation of the role of the public authorities), ensuring effective competition, promoting intangible investment and developing industrial cooperation. A final chapter will seek to establish overall conclusions and a common work programme to ensure that the Commission and industry improve their working together to enhance competitiveness.

II. THE EU CHEMICAL INDUSTRY

II.A FACTS ABOUT THE INDUSTRY

3. The chemical industry is very heterogeneous in character. Its principal activity is chemically transforming materials into diverse substances with new chemical and physical properties. Its main sectors can be grouped into: basic organic and inorganic chemical products; fertilizers and nitrogen compounds; basic plastics and synthetic rubber; pharmaceutical and medical products; speciality chemicals, which include agrochemicals, and specialty polymers; paints, varnishes and coatings; cleaning and polishing preparations; perfumes and toiletries; and man-made fibres. The industry is divided into two upstream sectors: basic inorganic chemicals and petrochemicals (or basic organics), while the rest of the sectors are downstream. The upstream sectors' outlets are almost exclusively the downstream sectors. This Communication will generally not cover the pharmaceutical sector which is already the subject of a separate Communication³, nor man-made fibres, though some of the statistics include data from these two sectors.
4. The chemical industry is the EU's second largest manufacturing industry, just behind food, drink and tobacco, in terms of production, and electrical engineering in terms of value added. The EU is the world's most important producer of chemicals, well in front of the USA and even further ahead of Japan. Its positive trade balance is also bigger than that of chemical industries in the USA or Japan. 15 of the world's top 30 chemical companies have EU headquarters (a further three are in Switzerland) and the three largest are German.

¹COM (94) 319 An industrial competitiveness policy for the European Union

²COM (90) 556 Industrial policy in an open and competitive environment

³COM (93) 718

The EU chemical industry directly employs 1.65 million people and has a turnover of ECU 316 bn. (see tables 1,2) Another three million employees work in sectors using output of the chemical industry as direct inputs and thus depend on its competitiveness.

5. Popular belief sees the typical chemical company as a large firm; this is true for petrochemicals, but small and medium sized enterprises (SMEs) play a vital role in the chemical industry as a whole and overwhelmingly characterise sectors such as paints, specialty chemicals, cosmetics, basic pharmaceuticals and plastic processing. Eurostat data for 1990 show the chemical industry in the EU 12 comprised 32,700 enterprises (this excludes the plastics transformers). 87% of the enterprises have less than 50 employees, although they only account for 12% of persons employed and 16% of total turnover. Medium-sized firms, i.e. those employing between 50 and 249 employees, represent nearly 9% of total enterprises or nearly 17% of persons employed, and 16% of total turnover.
6. Employment in the EU chemical industry fell by 4.4% in 1994, a year of good economic recovery. 1995 is also likely to have seen a decline though a smaller one. Although 1.65 million people worked in the chemical industry in 1994, this figure has almost continually declined from the 1980 figure of 1.95 million (though with a plateau during the boom years 1987-1990). It might be noted that both the USA and Japan saw much smaller declines in chemical industry employment (table 3). Declining employment has been offset by improved quality of the workforce, e.g. even blue collar staff now require advanced education and training to cope with computer-controlled processes. The chemical industry has had to continually restructure in the face of global competition; declining employment is one indication of this. The basic chemical sectors have been especially affected by this : the fertilizer industry has seen its workforce fall from 140,000 in 1980 to 28,000 in 1995.
7. Certain parts, especially petrochemicals, are very cyclical, experiencing wild swings in prices and profitability. Some people have seen industrial cooperation measures as a possible means of avoiding the problems of excess capacity during economic downturns : high unit costs, cut-throat price cutting, large financial losses and a lack of investment in new technologies. Structural excess capacity is essentially the result of an inability to adapt the structure to the cycle, taking the appropriate measures which may include shutting down plants. New capacity coming on stream in a depressed market can add to the problem.
8. The EU chemical industry is currently doing reasonably well in terms of profitability after several years of depressed earnings. Sustained worldwide economic recovery is certainly part of the reason for this. The gross operating surplus rose in 1994 to 13.5%. Real output of the industry grew 6% in 1994. 1995 will have seen lower growth but still a satisfactory rate, especially compared with the depressed years 1990-1993. But even with those poor years the EU chemical industry increased output while all manufacturing industry saw output fall in the early 1990s. Between 1985 and 1994 the chemical industry saw output increase faster than GDP, which in turn grew faster than total industry output (see table 4). The relative decline that has been affecting the EU's manufacturing sector as a whole is less prevalent in the chemical sector but the average return on capital employed across economic cycles is lower in Europe than in the USA or East Asia.

9. The European chemical industry owes its current competitiveness to five principal factors : flexibility and willingness to restructure; a multinational structure favouring open markets and free trade; a heightened sense of responsibility towards the environment; a capacity to innovate; and a high quality workforce and management.

II. B FEATURES OF THE INDUSTRY

10. The chemical industry is a global industry with many multinational companies, though several product markets remain regional. In Europe a sizeable number of factories belong to American companies. European companies also have significant investments in the USA and other parts of the world. Many sectors benefit from significant economies of scale in production and distribution that may lead to global product markets. Trade as well as investment is important. 20% of EU chemical output is exported.
11. In general terms, the industry is both capital and research intensive. Many parts of the industry see over ECU 1m capital assets per worker employed. This means that there are very high fixed costs and a need for substantial cash flows. More than 5% of turnover goes on research and technology development (RTD). Intellectual property plays a vital role and becomes an increasingly valuable component of competitiveness : therefore the chemical industry is especially vulnerable to a lack of protection for intellectual property. Patents are a key indicator of efforts to acquire such assets. European-based chemical companies are among the world leaders in patent ownership (table 5). However the EU chemical industry cannot afford to become complacent in this area. As a whole the EU had only 36% of patents in the field of chemicals in 1987/9 period, no better than the EU average for all types of technologies. The USA has a higher than average share of patents in chemicals.
12. In terms of capital spending, the European chemical industry appears less well placed against the USA and Japan. 1994 saw a slightly higher figure for investment in the European chemical industry compared with 1993, but this figure was 25% down on 1990. In contrast the US chemical industry significantly increased capital spending in 1994 and was spending 40% more than in 1990. Japan saw capital spending fall in 1994, a slight reduction from 1990 (table 6). Different phases of the economic cycle explain some of this.
13. Energy and gas-as-feedstock costs play an important role in the chemical industry as a whole, representing between 15% and 60% of manufacturing costs for most products. The vital importance of electricity for chlorine products and natural gas for fertilizers are just two examples. Much of the primary energy is imported into the EU as are many of the raw materials for the industry, especially for basic chemicals. This tends to lead to certain input cost disadvantages.
14. Energy efficiency in the chemical industry has made substantial progress. The energy consumption per unit of output fell by 25% between 1960 and 1980 and a further 25% between 1980 and 1993. In many sectors energy efficiency is reaching its theoretical limits. Lower gas and electricity prices are therefore even more necessary for competitiveness. The Paris-based International Energy Agency produces data showing that industry in European OECD Members paid \$169/toe for natural gas against \$127/toe in the USA in 1993. Electricity prices to industry were 7.4 c./KWh (\$866/toe) in OECD Europe and 4.9 c./KWh (\$565/toe) in the USA. Furthermore, inside Europe energy prices vary by as much as 100% between Member States.

15. The chemical industry produces products which affect everybody's life. This is part of the reason why there are special sensitivities surrounding the public and occupational health and environmental aspects of chemical products. Governments and the industry are fully aware of and respond to these sensitivities.

II. C THE CHALLENGES FACING THE EU CHEMICAL INDUSTRY

16. The EU chemical industry's aim is to retain or improve its place in the global economy and achieve a satisfactory return on capital. To this end, its objective is to supply its customers worldwide with the highest quality products, at the lowest competitive cost, in a healthy and environmentally sustainable fashion and on a long term basis. This requires it to generate sufficient profits from current sales to provide for the investment necessary to find new products. Furthermore, in a world of highly mobile capital, Europe must offer attractive rates of return on capital invested or see a dwindling of investment and a decline in activity therein. The objective of the Commission and Member States is to provide the best possible horizontal framework, to allow the chemical and other industries to fulfil their aims and objectives and ensure that this maintains or increases the level of highly qualified employment in the EU.

II.C.1 Better and more environmentally sound products

17. New and higher quality products require innovation. These are the products that meet environmental concerns and consumer preferences, that can reduce car exhaust emissions, result in new fabrics or improve skin care. The challenge is to ensure that innovation continues to produce better products, with reduced environmental impact through the complete life cycle of the product. Innovation may represent an incremental improvement or a radically different set of molecules altogether. Innovation requires significant spending on RTD. It also requires excellence in the science base and an adequate pool of well educated scientists and researchers.
18. Companies can decide on how much they spend on RTD but the public authorities must ensure that the population is well educated and should encourage a rational scientific debate over issues such as new products and processes. The authorities recognise the need for independent public sector research to address public concerns and perceptions in the acceptability of the risks involved. Furthermore, these authorities can inhibit innovation with requirements for the testing and registering of new products. Innovation is the key to guarantee and enhance the EU's industry competitiveness. There are reports from certain segments of the European chemical industry that the number of new products launched per year have fallen significantly over the past 15 years; a fall of 50% is reported by the dyes industry. There are indications that many of Europe's chemical companies are increasingly locating their innovation activities outside the EU - notably in the USA. The public authorities and industry must work together to address these worrying trends. In particular environmental legislation should encourage innovation while guaranteeing a high level of protection of the environment. It can best perform this dual role when appropriately integrated into other policies.

II.C.2 Competitively priced products

19. Competitively priced products are the only way the EU chemical industry will sell, make money, continue to invest and operate. The challenge is to ensure that Europe can continue to produce good products at sufficiently low prices to compete with products made in other parts of the world. One way is to concentrate on those products and

processes where Europe has a comparative advantage. Continual restructuring is necessary with the least efficient firms leaving a particular sector and the industry as a whole shifting investment from unprofitable sectors to profitable ones. Certain impediments to the process exist; barriers to exit, e.g. excessive state aid, are part of the challenge.

20. Efficient resource allocation requires markets to work and as a global industry the EU chemical industry benefits from open markets worldwide. Such markets initiate continual restructuring but efficient resource allocation and real competitiveness indications can only be achieved if competition is effective. The EU should ensure that foreign chemical producers abide by World Trade Organisation (WTO) rules.
21. Europe will continue to provide the basis for the EU chemical industry's sales but exports are a vital source of earnings. European firms have every interest in being present in those markets which are experiencing fast growth, in order to reap the benefits of economies of scale and reduce costs. Most forecasters see the Pacific Rim as providing the fastest growing markets. EU firms are already present in all the Pacific Rim countries but need to be more present. China will probably be an important sales area for the next decade and the other East and South Asia countries will drive world sales. It is not easy to sell or engage in business ventures half way round the world but it is a challenge which must be met. This can be helped by ensuring fair conditions for free access to and investment in these countries. The Pacific Rim will also pose a major challenge as a supplier of chemical products to other parts of the world.
22. Competing globally and being able to produce competitively through economies of scale requires minimum efficient scale sites and companies. Joint ventures or mergers offer two of the possible ways of creating companies large enough to obtain these advantages provided that such operations do not lead to an appreciable restriction of competition. The challenge is for the EU competition authorities to ensure that companies are allowed to grow big enough to compete, but not to allow such operations which can impede effective competition within the EU. However, SMEs also play an important role, especially in some sectors such as specialty chemicals and paints and varnishes where sales are made to final consumers. SMEs are often suppliers or customers of the larger companies and one key challenge facing the industry is how to improve this complicated but potentially highly flexible structure to reduce costs.
23. The rationale for the Single Market is to allow firms to benefit from the economies of scale from a large market. The Single Market has certainly come a long way, but the challenge is to ensure that remaining barriers are abolished and that integration is improved. Certain specific national regulations for chemicals still exist. As with other industries, chemicals suffer from the lack of truly integrated railway or road transport networks. The still missing internal market for electricity and gas is a big drawback impacting negatively on the competitive position of the chemical industry. The lack of a single European currency is a further challenge with currency fluctuations causing major complications.

III. ACTIONS TO ENHANCE COMPETITIVENESS

24. To meet these challenges, industry, the Commission and Member States need to take specific actions. Some actions are currently underway and need reinforcing; but some new initiatives are required. The Commission, together with industry and the Member States, must act within the four priority areas for industrial competitiveness policy:

improving the regulatory framework, ensuring effective competition; promoting intangible investment; and developing industrial cooperation.

III.A ACTIONS TO IMPROVE THE REGULATORY FRAMEWORK

25. Most of the chemical industry's activities have an impact on public health and the environment, and therefore many of the industry's domains of activity are regulated. More specifically, regulation covering production processes and products is of paramount importance for the chemical industry. Being a highly capital intensive industry, it is most important that the legal framework is as stable and predictable as possible.

III.A.1. The current framework

26. The legal basis of a Community legislative measure is determined, in accordance with the case-law of the Court, in the light of the objective pursued by this measure. Legislation, the objective of which is to guarantee free movement of goods within the Internal Market, is based on Article 100 A. When the objective of legislation is to protect the environment, the legal base used is Article 130 S. Article 118 A provides a mechanism for developing health and safety initiatives which calls for cost effectiveness studies to avoid constraints on SMEs, a full scientific base for regulations and a tripartite consultation process. It enables Member States to maintain or introduce more stringent measures for the protection of working conditions. Article 129 provides the framework for the development of measures dealing with public health.

27. Internal Market issues and environmental protection are closely linked to each other. When proposing Internal Market legislation, the Commission must take as a base a high level of environmental protection (Article 100 A3), while Member States wishing to "apply" (under Article 100 A4), "maintain or introduce" (under Article 130 T) stricter environmental rules than those in force at EC level must make sure, according to Article 130 T, that such national measures are compatible with Treaty rules, including principles relating to the free movement of goods.

Free movement of chemicals

28. Chemical products move freely within the Internal Market. According to the principle of mutual recognition which has been derived from the "Cassis de Dijon" judgement⁴, products legally produced and marketed in one Member State must in principle be admitted in all other Member States. In order to identify cases in which a Member State has refused the free movement of goods, despite the fact that they were legally produced and/or marketed in another Member State, an information procedure has been set up under which the Commission and the Member States will exchange information, from January 1997 onwards, on national measures which derogate from the principle of the free movement of goods.

29. Whilst the principle of mutual recognition applies to all types of products, some Member State actions may have the effect of fragmenting the Internal Market. This places an obligation on the Commission to harmonise, that is, to propose Union-wide regulations which deal with the risk to health and the environment while assuring free circulation. A comprehensive framework for chemicals control has been created at Union level. The Community's direct contribution began with ad-hoc measures. Development of a harmonised system for classification, packaging and labelling of dangerous substances

⁴ Case 120/78 Court of Justice 20 February 1979

began with adoption of Directive 67/548/EEC. A harmonised system for limiting the marketing and use of dangerous preparations⁵ and substances⁶ followed. Harmonised rules for the classification, packaging and labelling of dangerous preparations were established by Directive 88/379/EEC. In more recent years, controls have been extended in a more programmed way to include notification of new substances⁷ and the systematic evaluation of existing substances⁸. A systematic approval system is to be set up for biocides. Moreover, a Community framework has been set up which lays down essential safety requirements that have to be met throughout the Community in order to allow for free movements of dangerous goods. The Community's legislative action in the field of chemicals has been generally appreciated in the sense that a single set of rules at Union level is, clearly, more efficient than fifteen different systems at national level. Further consolidation is of course possible and is already under way for dangerous preparations, fertilizers and detergents.

30. Environmental conditions are different between the Member States and, for that reason, some Member States may wish to apply national rules going beyond Community legislation. The major challenge is to balance the need to develop and maintain the internal market with the need for higher levels of environmental protection in those Member States.
- 31. The Commission will continue to consolidate the internal market rules for chemicals to avoid difficulties, such as restrictions of trade, caused by different sets of national legislation.**

Environmental regulation and sustainable development

32. Complying with environmental requirements is sometimes seen by industry as a non-productive cost. However, environmental leadership can stimulate innovation for new technologies and products and thus provide a competitive advantage. Also, good environmental performance can bring about important savings in resources and contribute to creating a good corporate public image for each company.
33. A key objective of both public authorities and industry is to enhance the international competitiveness of industry in a context of sustainable development. The concept of sustainable development involves economic, social and environmental aspects, as was concluded in the 1992 United Nations Conference on Environment and Development that met in Rio de Janeiro. The Fifth Environment Action Programme⁹ stresses that these three aspects are key elements in developing policies based on sustainable development.

III.A.2 Principles for future action

34. The internal "Guidelines for Regulatory Policy", adopted by the Commission on 16 January 1996, constitute the basic reference for future proposals. The main objective is to make sure that the evaluation of policies reflects the common interest. The paragraphs below

⁵ Directive 76/769/EEC

⁶ Directive 79/117/EEC

⁷ By the 6th Amendment to Directive 67/548/EEC

⁸ Council Regulation 793/93/EEC

⁹ COM (92) 23 Final

summarise how this could be pursued when legislation affecting the EU chemical industry is being prepared.

35. Once a potential risk to health or the environment has been identified (often in a Member State), the Commission should decide whether or not to act. Perhaps no intervention is necessary and the matter can be resolved through mutual recognition of Member States rules. Article 130R.2 of the Treaty foresees that the precautionary principle is to be applied to environmental questions. This application could potentially occur when indications for a very high level of danger for the environment or the human health exist and risk assessment, for practical reasons, can not be carried out.
36. A detailed analysis to justify intervention is also needed. In this context a risk assessment is first carried out according to Community principles. Then, having confirmed that an unacceptable risk does exist, detailed strategies for risk reduction are identified and the most cost-effective option is chosen. This process must involve an appropriate analysis of the costs and benefits of the options available. (See in annex an example of the proper application of such principles in the case of nickel) As far as proposals relating to the environment are concerned, Art. 130R.3 of the Treaty requires that in preparing its actions relating to the environment, the Community take account of the potential benefits and costs of action or lack of action. This is also foreseen in the Fifth Environmental Action Programme. The same should apply to Member States in their areas of competence. A proper economic and environmental analysis aiming at appraising the net benefit for society of a measure, sheds light on its efficiency and helps add more objectivity to an otherwise potentially emotional debate. CEFIC has to continue to provide proper scientific data (exposure of workers, toxicological studies) in order to facilitate the proper legal framework for an improved competitive environment.
37. **The Commission will carry out a comprehensive risk assessment and an adequate analysis of the costs and benefits prior to the adoption of proposals affecting the chemical industry. In areas where Member States intend to apply stricter rules than those in force at EU level, the Commission will encourage them to carry out the same analysis. When Member States already apply these stricter rules the Commission will, in the framework of the analyses that it carries out as regards the compatibility of national measures with Community law, pay special attention to the analysis of risks and to the cost-benefit aspects of such national measures.**
38. Deciding on the level at which intervention should take place is important. Will it be at international level (OECD, UNEP, PARCOM) or will it take place at EU level? Evidently, consideration needs to be given as to whether the risk is one that transcends the relevant territorial boundaries. Also, stricter regulation by the EU may affect the EU chemical industry's competitive position *vis-à-vis* the chemical industries in other zones of the world. International convergence of policies, one of the central issues of the present debate on trade and environment,¹⁰ is needed not only to avoid the temptation to use environmental and health protection arguments to justify protectionism, but also to prevent some countries from exploiting a comparative advantage as 'dirty producers' of chemical products. When rules in other industrial economies are less strict than in the EU, delocalisation of certain production lines may occur; this may also encourage imports from third countries of products whose production is no longer possible within the EU.

¹⁰ See the (draft) Communication to the Council on trade and environment, Section I point 2.3

39. **When agreement at international level is not possible, the implications of new European environmental measures on the competitiveness of the chemical and other industries will be taken into account. It might be preferable to involve at least the OECD countries and advanced developing countries in environmental rules.**
40. The most appropriate type of action must be selected. Besides regulation, voluntary action and economic instruments can play a complementary role in achieving desirable health and environment targets. Voluntary agreements and economic instruments are more likely to be effective in improving environmental performance than in regulating the free circulation of chemicals.
41. Voluntary action can take the form of unilateral industry programmes, such as the chemical industry's Responsible Care Programme or the Voluntary Energy Efficiency Programme (VEEP). Voluntary approaches and agreements reflect bilateral cooperation between public authorities and industry and may serve to achieve Community objectives. One high-profile example where voluntary sectoral agreements can play an important role is in reducing CO₂ emissions, provided that they include quantified reduction targets. This approach is favoured by industry instead of a CO₂/energy tax. Examples of voluntary actions concerning products at international and EU level include the reduction of risks from brominated flame-retardants (implemented at OECD level) and the labelling of detergents (implemented at EU level). Another example of voluntary action is the substitution applied by industries in some Member States of some dangerous pesticides by less dangerous ones.
42. **Industry will develop and widen Responsible Care initiatives and other environmental management systems leading to better overall environmental performance. It will develop new processes and products that are more environmentally friendly and more resource effective and invest in new equipment and facilities which decrease emissions and energy use (Voluntary Energy Efficiency Programme (VEEP))**
43. When preparing voluntary agreements, attention should be paid to conformity with competition rules, since voluntary agreements which imply cooperation among firms may pose problems with regard to potential anti-competitive practices by participating firms. Where such voluntary agreements fall within the scope of Article 85§1 of the Treaty, they may nevertheless benefit from an individual exemption provided that the conditions of Article 85§3 are met.
44. **As far as the use of voluntary approaches or agreements is concerned, a Community framework is under consideration, aiming at establishing criteria within EU environmental policy and at ensuring that such agreements do not fragment the Internal Market.**
45. Economic instruments are becoming widely used in the environmental field. In particular, public authorities can influence the environmental choices of companies and consumers through taxation. As a rule, fiscal instruments e.g. incentives for accelerated depreciation are decided at Member State level, taking into account the Commission policy on state aids and, in particular cases, specific provisions for fiscal instruments in Council Directives¹¹. The CO₂ dossier has shown the difficulties of reaching unanimous agreement

¹¹[An example is Art. 15 of Directive 94/62/EC on packaging and packaging waste (O.J. n° L 365, 31.12.94,p10)]

on environmental-related taxes. To date, some Member States (Denmark, Finland, the Netherlands and Sweden) have unilaterally proceeded with national schemes, including exemptions for certain activities. They think that economic instruments are a cost-effective way to deal with environmental problems. In order to avoid unfair competition and distorted resource allocation, these exemptions must respect the conditions laid down in the framework for environmental aids, which was adopted by the Commission in December 1993¹². At the request of the ECOFIN Council, the Commission is currently considering the possibility of devising a new approach for the taxation of energy products which will deal, at a Community level, with the problem of competition, whilst creating a framework within which Member States can, if they so wish, pursue other specific policies such as reduction of CO₂ emissions. However, the EU chemical industry is not convinced that environmental levies are a good way of addressing environmental issues.

- 46. In addition, a communication on environmental levies is under consideration by the Commission. This Communication will give Member States guidelines on how to reconcile the use of economic instruments to achieve environmental targets with the requirements of the Internal Market, while strictly observing inter alia the above-mentioned framework for environmental aids.**

III.B ACTIONS TO ENSURE EFFECTIVE COMPETITION

47. The chemical industry, comprising many firms operating across several Member States and indeed operating as multinationals in the global economy, requires effective competition inside and outside the EU.

III.B.1 Effective competition internally

Competition law, mergers and joint ventures

48. The competitiveness of the industry as a whole requires that large companies should not abuse possible dominant positions, nor engage in anti-competitive practices. The competition authorities should allow mergers or joint ventures which do not threaten to lead to an appreciable restriction of competition and disallow those which do. In this context it is particularly necessary to assess how the partners are placed on the market which is increasingly global, especially for certain basic chemicals and advanced technologies.

- 49. The Commission will ensure that both cooperative and concentrative joint ventures are assessed rapidly. The Commission has submitted a Green Paper on the revision of the Merger Regulation which is presently being discussed with the Council and European Parliament. The Commission is seeking to lower the thresholds for the Merger Regulation removing the need for multiple notifications and creating a real 'one stop shop'.**

Cycles of excess capacity and capacity shortage

50. Many capital-intensive industries are prone to cycles of excess capacity and capacity shortage and the petrochemicals sector is particularly vulnerable. The problem is easy to identify, the development of effective mechanisms to address the issue is much harder, particularly in a competitive climate where each firm believes it will succeed and even capture market share from others. Furthermore, in the petrochemicals sector, the cycles of

¹²O.J. n°C72, 10.3.94, p. 8

capacity excess and shortage may have causes and consequences outside Europe and a global analysis would be appropriate. The industry is providing certain input for the Commission work as part of a scenario-planning exercise.

- 51. The Commission will encourage restructuring in cases of structural inadaptation and will investigate the causes of cyclical and structural capacity mismatches in petrochemicals when assessing whether any form of industrial cooperation might alleviate the apparent problems without infringing competition rules.**

State aid

52. State aids should not give unfair advantages to some chemical companies, allowing less efficient producers to maintain or even increase market share, lowering the efficiency and thus competitiveness of the industry as a whole. The industry should also not face unfairly subsidised competition from other sectors. The chemical industry contains many capital intensive activities and has an interest in minimising distortions caused by state aid. In determining which State aids are allowed, the Commission will continue to apply transparent and objective criteria. Sectoral aid frameworks may discriminate against small enterprises and new-comers. The new synthetic fibres framework, for example, has reduced this distorting effect, which was present in the former one. The revised framework for state aids for SMEs makes it easier for all small companies to invest in intangible investment.
- 53. The Commission will continue its efforts to increase transparency in the rules on State aid and in its administration of State aid cases to reduce the overall amount of state aids granted, and to minimise the distortions such aid can cause. The Commission will continue to study a horizontal control system for regional aid to big investment projects, which would set up a multisectoral discipline.**

Prices of energy and other inputs

54. Effective competition requires unrestricted access to inputs at world market prices if the EU is not to be disadvantaged. Energy is one key input. However, agricultural based products, e.g. sugar and starch, which serve as basic products for certain fine chemicals and specialties should also be included.
55. Much work has already been done in identifying the remaining obstacles to the integration of energy markets, and some progress has been made in removing barriers. However, it has to be recognised that within the energy sector, the markets for electricity and gas are still far from being open and competitive. An industry like the chemical industry, being exposed to global competition needs to benefit from competitive energy input prices which can only be assured through the realisation of internal energy market. Large industrial users, will gain particular benefits in terms of lower costs, thus leading to direct and indirect advantages to all consumers, increasing global industrial competitiveness.
- 56. The Commission will continue efforts to liberalise energy markets in the EU, leading to more efficient energy production and distribution and also to cheaper energy inputs for the chemical and other industries. Effective third party access for gas and electricity is one major element of such liberalisation.**

III.B.2 Effective competition externally

57. Externally, effective competition requires the Commission to create a level playing field and ensure that the newly-created WTO works effectively. The long term objective of both the Commission and the European chemical industry is to eliminate all barriers to trade. Tariffs for chemicals in developed countries are relatively low and will decrease further and be harmonised at 0%, 5.5% and 6.5% thanks to the Uruguay Round in which the industries of the EU, USA, Canada and Japan played a major role. Developing countries, especially the richer, more advanced nations such as Malaysia, Thailand, Brazil and Mexico and China, should be encouraged to reduce their tariffs to these harmonised rates.
58. **The Commission will seek to ensure that new members of the WTO , especially those that are relatively advanced, apply the harmonised rates for chemicals, from the start. Efforts to reduce others' tariffs will also be made.**
59. Non-tariff-barriers or measures, and in particular double-pricing of raw materials and feedstocks, distort trade. The latter is of particular concern to the petrochemical industry for whom feedstock double-pricing in certain developing countries causes unfair competition. Among the various means available to tackle this problem, countries intending to join the WTO should, when possible, be obliged to refrain from applying such practices. Double-pricing of natural resources may have a distorting impact on trade-flows and on investment decisions. Testing and certification problems also frequently represent non tariff barriers to trade in chemicals, with China and Poland being recent sources of such difficulties for EU exporters. Special registration and mandatory declaration procedures that distort trade should be ended. Although not considered illegal measures by the WTO, technical rules on the classification, packaging and labelling of dangerous chemicals and preparations and on Prior Informed Consent for trade in hazardous substances which differ from region to region, also constitute barriers to trade. Whilst the United Nations is trying to promote global harmonization of these rules the work is proceeding only slowly. There are moves to accelerate this through joint EU/USA leadership.
60. In consistency with its market access initiative, the Commission will seek to address these problems firstly by using all available instruments at multilateral level and in particular by being vigilant to ensure that the Community's trading partners adhere to WTO obligations and respect them. It will also, whenever appropriate, raise market access issues in the context of its bilateral relations with third countries as well as pursue other policies such as the promotion of international industrial cooperation.
61. **The Community adopted the Trade Barriers Regulation (TBR) in December 1994 to address non-tariff-barriers and other trade distortions. It will act upon a complaint by a company or industry concerned. Imports into the Community subject to injurious dumping and subsidisation will be combated, though a rigorous application of the updated commercial policy instruments, further to a valid complaint from the company or industry concerned. The Transatlantic Business Dialogue (TABD) contains working groups covering *inter alia* certification, regulation and trade liberalisation. If the TABD so recommends, the Commission could reactivate bilateral discussions with the USA to harmonise the rules on classification, packaging and labelling and Prior Informed Consent, first bilaterally then globally.**

62. The international dimension of competition policy, combined with the lack of international rules, also affects competitiveness. This is particularly damaging when the nature of the market is global. One example is the export cartel of US rock phosphate producers, which prevents EU fertilizer manufacturers gaining access to phosphate at prices low enough to compete with US-made phosphate fertilizers. Trade and competition is an important issue on the new trade agenda. The Commission will seek a multilateral agreement whose main elements would be the creation of a framework based on a set of common rules, a binding positive community instrument and a dispute settlement procedure.
63. Coordination between the competition authorities in the EU and USA is already assured via an agreement. Similar arrangements are being considered with other countries, e.g. Japan. The Europe Agreements incorporate rules on competition with implementing provisions similar to those of the EU/US agreement. Such rules are also included in the agreements being concluded with Mediterranean countries.
- 64. The Commission plans to explore international agreements on competition law -both bilaterally and plurilaterally. The Commission will evaluate, on a case by case basis, possibilities and benefits of the incorporation of competition rules in new cooperation and association agreements, in order to remove barriers to trade in these countries. In addition, within the OECD, work on International Investment might permit the reduction of such practices as double pricing. This will tackle export cartels and barriers to market access caused by coordinated practices between domestic producers.**

III.C ACTIONS TO STRENGTHEN INTANGIBLE INVESTMENT

- 65 A company's competitiveness on the eve of the 21st Century depends increasingly on its innovative power¹³ in terms of processes, products, work organisation and the rapid dissemination of new technologies. Investment in research and development, intellectual property, training, health and safety, data processing and the whole panoply of areas covered by 'intangibles', is essential if the chemical industry is to remain competitive. Research productivity is a major target, taking into account the contribution of research to standards and regulations, the role of RTD in promoting rapid absorption of new technologies in particular by SMEs, the need for a more coherent and coordinated public intervention and private efforts in RTD. Furthermore, the chemical industry will continue to give due attention to education and training issues involving chemistry and chemical engineering; and to reinforcing the science base of industry. Innovation in the chemical industry also has an important effect on other sectors e.g. vehicles and electronics.

III.C.1 Research and development

66. The chemical industry has long realised the importance of RTD leading to innovation in products and processes as a fundamental source of competitiveness. Until recently it has tended to avoid collaboration with its competitors. Although it has been involved in previous Framework Programmes, this was relatively low key given the level of its own RTD capabilities. However, growing pressure from society to develop 'cleaner' technologies and to maintain a competitive position in the global market, coupled with high costs and high risks for such RTD, have made participation in the 4th Framework

¹³See 1995 Green Paper on Innovation

Programme more attractive and important for the chemical industry. This has led industry to launch SUSTECH, an initiative extending beyond the chemical industry, aimed at promoting collaborative RTD in technologies for sustainable process industries in Europe. The term "sustainable" is used in this context to mean process industries which are resource and energy efficient and which generate the minimum of waste and damage to the environment.

- 67 Within the current 4th Framework Programme, specific programmes such as Industrial and Materials Technologies (BRITE-EURAM), Standards Measurement and Testing (SMT), Information Technologies (ESPRIT), Environment and Climate and Marine Science and Technology and Biotechnologies finance a large number of projects relevant to the chemical industry. To take two examples: within ESPRIT, the PRIMA initiative involves 16 large companies from the chemical, food and beverages, steel, paper and utility industries and is designed specifically to strengthen the competitiveness of Europe's processing industries by securing the maximum business advantage from information technology; within BRITE-EURAM the ADMIRE project involves several chemical companies cooperating on new design methods for large scale gas liquid reactors.
- 68 The creation of Task Forces has been an important step to promote better coordination within industries and European authorities in RTD Programmes : the chemical industry can and should participate actively in the car, train and plane of the future projects as well as in water technology and healthcare subjects. Concerns over competitiveness mean that the structure of the RTD programmes needs to support cross-disciplinary working, to get results to market faster and to make processes simpler and more flexible. Part of this can be achieved by thematic clusters, whose aim is, through coordination and integration, to secure added value by improving synergies, facilitating technology transfer and catalysing the dissemination and exploitation of results. Clusters can also be based around particular suppliers or user groups, such as the process industries and include demonstration and application-oriented actions.
69. **The 4th Framework Programme will continue to support collaborative RTD initiatives of the chemical industry . The research-industry Task Forces combine other Community policies with RTD and application projects. This model has already proved its worth and could be extended .**

New thematic clusters could arise directly out of industry and user demands, with the chemical industry playing a key role as a vital supplier. The Commission is seeking industry input on the orientations for the 5th Framework Programme.

III.C.2 Intellectual property

70. Intellectual property is a vital asset in the competitiveness of the chemical industry . The patent system allows companies to recoup the investment they put into RTD. One threat to European competitiveness has been the short effective life of the intellectual property protection afforded to pharmaceuticals and, still today, to crop protection products. Though the patents themselves last 20 years, their effective life is as short as ten years because of the time taken between patent granting and the bringing of these products onto the market . This long period is because of the stringent and lengthy testing procedures necessary for such powerful chemicals.

71. Although an additional patent protection term of up to five years has been granted for pharmaceuticals via a Supplementary Patent Protection Certificate scheme¹⁴, the same is now about to be adopted for crop protection products¹⁵. Its early adoption is important in ensuring Europe remains the global leader in RTD and production of crop protection products when, as hoped, it is fully adopted by Council in early 1996.
72. Biotechnology is an important factor for future competitiveness, since it is a technology that can provide high added value products, which address people's needs (e.g. drugs to fight so far incurable diseases, improved crop plants which allow the application of more environmentally-friendly growing methods or which are less affected by severe climate conditions -drought, cold-, etc.). Biotechnology is therefore a key part of the activities of certain chemical companies, but suffers from a number of shortcomings in its legislative framework, among which is the lack of harmonised patent protection in Europe. Without a clear and risk-based legal framework, research and production will increasingly take place in Japan and the USA, already the global leaders in this field. The European Parliament rejected a proposal to harmonise and improve patent protection for biotechnological inventions. A new Commission proposal was put forward in December 1995¹⁶. It makes a clear distinction between invention and discovery. If accepted, this new proposal will contribute to a more innovative climate and will provide a harmonised basis for patent protection within the EU. It will ensure the patentability of biotechnological inventions in Europe while taking into account ethical aspects.
73. The Commission has also just proposed a modification to the rules on the contained use of genetically modified micro-organisms, which without jeopardising the current high level of protection for human health and the environment, aims at making the Directive more risk-based and at increasing its flexibility. The proposal is streamlining the administrative procedures for certain no and low risk activities, thus eliminating regulatory redundancies which are not justified by safety reasons and which therefore cannot fail to have a negative impact on Europe's capacity to innovate, while maintaining a sufficient transparency for the consumers. Furthermore, the recently revised block exemption on technology transfer offers the indispensable legal security for agreements on licensing intellectual property which is of particular importance for the biotechnology sector.

III.C.3 The need for a scientific culture

74. The EU chemical industry is worried about the decline of the scientific culture in Europe. To remain a global leader, industry needs a scientifically literate workforce and governments which take decisions based on scientific principles. Too many schoolchildren and university students believe science is 'too hard' or 'too dirty' for them. More must be done by national governments, and to whatever extent possible by the Commission to foster an atmosphere which is pro-science.
- 75. Industry will intensify efforts to improve the scientific and technological culture in Europe. Under the title of "Education, Industry Partnership", CEFIC has already launched three actions: 'Chemical Industry and the Young' is a multi-annual programme to nurture in the under-18s a better understanding of the fundamentals**

¹⁴Regulation 1768/92

¹⁵COM(95) 456 Final

¹⁶COM(95) 661 Final

of science and an awareness of the benefits and risks brought by the chemical industry and the means used to reduce such risks. The 'Science Education Award' is an annual competition to find the best European science teachers. The 'Museums Project' is aimed at renewing chemistry exhibitions in Europe's museums. The Commission also emphasises the need for a strong scientific and technical base within education in its published White Paper, "Teaching and learning : towards the learning society"¹⁷. The SOCRATES programme funds educational exchanges and promotes the use of new technologies in schools.

III.C.4 Training

76. Training is a major area of Commission activity and can play a role in improving the climate for science. Three separate sets of Community financial supports contribute to improved training: The Leonardo da Vinci programme seeks to promote actions to improve the quality of training policies and practices and to develop new ways of learning through pilot projects, exchanges and placements as well as surveys and analyses in the context of transnational partnerships. The 4th RTD Framework Programme, already referred to, provides specific financial aid for research projects linked with training and long distance learning. The fourth activity of the Framework Programme concerns the stimulation of mobility of researchers, with the aim of promoting a quantitative and qualitative increase in human resources within Europe. The objectives are to stimulate training through research and to improve transnational mobility and cooperation. In some RTD programmes, specific training is also included as an accompanying measure to research projects, as for example the industrial training of young candidates through participation in a research project within the BRITE-EURAM programme. One specific programme Environment and Climate, also finances projects in socio-economic areas including examination of the best way of diffusing innovation and projects to facilitate exchanges and further research. The Structural Funds provide financial assistance for training and development. Such finance can come either from national programmes or Community initiatives. ADAPT and the new Objective 4 programmes are particularly focused on training. The incorporation of health and safety within such training programmes is equally important as a cost effective approach and a contribution to competitiveness.

77. **The future RTD Framework Programmes will provide further opportunities to support training through research. The Structural Funds will continue to target training as a component to enhance competitiveness. A new call for proposals for the Leonardo da Vinci programme for 1996 has been published on 29 February 1996.**

III.D ACTIONS TO DEVELOP INDUSTRIAL COOPERATION

78. Industrial policy measures involving industrial cooperation have an internal and an external dimension. Both sets of measures seek to make businesses more competitive by giving them opportunities they would not have as isolated players, by facilitating the transfer of non confidential knowledge and experience between companies.

III.D.1 Industrial cooperation within the EU

Chemical sector information network

¹⁷COM (95)590

79. One area of industrial cooperation is in the field of better information and communication. The Commission has set up a comprehensive network for the chemical sector: 'Le Réseau d' Information pour le Secteur Chimique (RISC)' to allow it and industry to be better aware of the activities and desires of the other. The main aim of RISC is to create a synergy between the various private and public operators in order to encourage dialogue and to allow the exchange of information between the Commission and industry via European federations. The current activities within the network are to exchange, collect, process and analyse the data in various fields such as economics, foreign trade and the legislative area while fully respecting competition laws.
- 80 **RISC will be further developed including increased integration with industry federations, thus gaining maximum benefit from electronic data transmission. RISC will also enable other European federations to be better integrated into the policy making process. The Commission and industry will continue to devote significant resources to improving communications, in particular linked with the means provided by the Information Society. Investment in information technology will continue to increase. Better links will be created to harness the results of advances in information technology to the needs of the chemical industry thereby enhancing its competitiveness in concrete terms.**

SMEs

81. There are numerous programmes and support measures in favour of SMEs under both Enterprise policy and other Union policies to improve the business environment and to support the creation and development of SMEs. In March, the Commission presented a proposal for a Council decision on a new Multi-annual Programme for Enterprise and SMEs to cover the period 1997-2000 which will provide the legal and budgetary basis for the Community's specific enterprise policy actions¹⁸. While these policies are not specifically geared towards the chemical sector, there are some which are particularly interesting to chemical SMEs. The Euro-Info-Centres, provide a business information network and act as a 'first stop shop', the B.C. Net, Europartenariat and Interprise programmes provide co-operation opportunities, and there are other measures aimed at improving SMEs' management capability, access to finance and technological know-how. One specific example of an area for enhanced competitiveness is certification to international quality standards. This is difficult for chemical industry SMEs to achieve but Quality Assurance Certification is vital for their ability to sell. SMEs should be encouraged and assisted to obtain it. The proposed SAFE programme will also contribute to supporting improved quality management within SMEs.
82. **Specific action is underway to enhance the competitiveness of chemical SMEs and promote better links between SMEs and between them and bigger companies. CEFIC, other federations and the Commission are involved in studies to understand better how SMEs function in the chemical sector and on what their competitiveness depends. To this end their role in subcontracting, employment-creation and exporting will be carefully examined and proposals made to enhance their competitiveness.**

III.D.2 External industrial cooperation

¹⁸COM(96) 98 Final of 20 March 1996

83. The role of the Commission is to set the framework for individual companies to undertake investment or other forms of industrial cooperation. It is for individual firms to decide with whom and how to cooperate. The Commission has a more direct role to play in cooperation involving more state controlled economies. Industrial cooperation benefits the recipient areas and European industry. In all areas direct investment by chemical companies will provide much needed capital for the host countries and ensure better allocation of resources. It also provides opportunities for access to and a presence on new fast growing markets.
84. No single industrial cooperation strategy is appropriate for all the different regions of the world: each region's specificity requires a particular regional orientation within a common set of institutional instruments. Outside the Transatlantic Business Dialogue and specific cooperation with Japan, three non-mutually-exclusive types of industrial cooperation can be highlighted : that with regions close to the EU, including Central and Eastern European Countries (CEECs)¹⁹, Russia and some Newly Independent States(NIS), and the Mediterranean; that with fast growing economies, which includes China, ASEAN and Latin America; and projects which improve access to raw materials including energy. Industrial cooperation is a feature within the PHARE and TACIS programmes and ECIP (European Community Investment Partners) and AL Invest for Latin America, and Med Invest for the Mediterranean. Furthermore, industrial actions in favour of the African, Caribbean and Pacific (ACP) countries are carried out under the "Lomé IV Convention". That Convention has a chapter on "Industrial development, manufacturing and processing", that provides inter alia for (i) industrial joint ventures between EU and ACP companies, (ii) support to "engineering, metallurgical and chemical industries", (iii) transfers of technologies, (iv) external investment in favour of ACP industrial companies, (v) training, (vi) research. Under the same Convention, the Centre for the Development of Industry (CDI) was established to foster the industrial development of the ACP countries.

Regions in close proximity

85. The pre-accession strategy, designed to prepare those countries of Central and Eastern Europe so desiring it for EU membership, defines the framework for structured dialogue between the EU and CEECs and provides a concrete vade-mecum for the exercise in legislative compatibility: the White Paper on the preparation of associated CEECs for integration into the EU internal market. The chemical industry has a direct role to play in the process. The Commission has developed contacts with CEECs in order to clarify certification procedures which were incompatible with EU procedures. Cooperation between EU and CEEC producers of detergents and cosmetics have allowed certain CEECs to better understand certification legislation in the EU and move to adopt similar legislation themselves. The Cosmetics Federation (COLIPA) organised a meeting with Eastern European national authorities and cosmetics producers in Prague in late 1995. The Fertilizer Manufacturers Association (EFMA) has also been involved in a project to encourage better fertiliser use in Russia.
86. **The Commission, together with the participation of the federations and companies concerned, will continue to provide technical assistance to the CEECs with legislation for future membership, in support of investment and development of harmonised institutional frameworks . EU industry will cooperate with industry in the CEECs and national administrations to ensure that such legislation is operated in such a way as to avoid unnecessary administrative burdens or barriers to trade, as well as exports from these countries distorted by lower levels of environmental protection in their chemical facilities. It will also pursue specific industrial cooperation themes in**

¹⁹See the Commission Communication on Industrial Cooperation with the CEECs, COM(95) 71 Final

the mixed committees set up with CEECs by the Association Agreements and develop industrial cooperation with the Mediterranean.

87. **Cooperative actions in support of management training and other areas for CEEC chemical companies in which CEFIC is already involved may continue to be financed by PHARE subject to the priorities of these countries. Industry will relaunch the EASTT technology for environment programme for CEECs with the objective of providing the best practice techniques and know-how to ensure environmental performance and standards in the pre-accession countries will be compatible with EU membership.**

Presence on fast-growing markets

88. China is a huge market with enormous potential. Many EU chemical companies are already investing in China but the Commission has a role to play to ensure China continues to welcome such investment. In order to facilitate and to promote investment one task of the Commission has been to encourage China to adopt regulation frameworks compatible with EU regulations. Some actions in the field of certification and quality have already been completed. COLIPA is cooperating with Chinese cosmetic producers on regulations for cosmetics.
89. **The Commission will develop industrial cooperation with China and other E. Asia countries and Latin America to ensure EU industry is well placed in their development and to take advantage of these fast growing markets. The main issues will revolve around chemical product legislation (especially for China), technology transfers, successful joint ventures and other forms of foreign direct investment. Environmental issues will be a growing concern and subject for industrial cooperation projects.**

Access to raw materials including energy

90. Industrial cooperation projects can improve access to raw materials. One possible set of projects would be to extend the western European petrochemical feedstock pipelines into Central and Eastern Europe and even into Russia. Gas pipelines originating in Russia could also be developed specifically to supply European chemical companies. There are ideas to develop gas supplies from the Gulf region. Industrial cooperation could involve the Gulf Cooperation Council (GCC) and Mediterranean countries, for example to bring such gas overland from Saudi Arabia to a North African port.
91. **The Commission will favour projects which improve access to raw materials and energy and put in place mechanisms to encourage EU companies to undertake such initiatives.**

IV. OPERATIONAL CONCLUSIONS AND WORK PROGRAMME

92. The EU chemical industry is the EU's second largest manufacturing industry and the world's most important producer of chemicals. It also accounts for 30% of RDT spending by the EU manufacturing sector. It must meet many challenges if it is to retain, let alone increase, its global competitiveness. The primary responsibility for the chemical industry's competitiveness lies with itself. The Commission and the Member States have to provide the adequate framework and, if needed, undertake specific actions, to enhance this competitiveness.
93. Grouped around the four priority areas of the Communication on an industrial competitiveness policy for the EU, a set of actions for the industry, the Commission and Member States have been identified. The pursuit of those actions will certainly help the competitiveness of the

European chemical industry and thus can constitute a model for the implementation of such policy in industries with similar characteristics and challenges.

94. To confront the challenge of improving the regulatory framework, the European Union will ensure that the legislative aspects of the Internal Market are consolidated and the problems caused by disparate national legislation be resolved. A formal set of principles will be applied at Union level for individual cases of classification, limitation or authorising schemes governing the marketing of chemicals. The principles will ensure that the Community decides whether to regulate, who will regulate and how such regulation should be done. In the same vein, environmental regulation will pay close attention to competitiveness always involving an analysis of costs and benefits and proper risk assessment in line with the Treaty. Where appropriate and feasible, international environmental regulation will be preferred to EU level action. Voluntary agreements will be studied on a case by case basis and a Community framework for them is being prepared.
95. To confront the challenge of ensuring effective competition, the Commission will analyse possible industry proposals to overcome structural overcapacity where this exists, in conformity with the rules of the Treaty. It will pursue liberalisation in the electricity and gas markets thereby affording the chemical and other industries more competitively priced energy. Within the WTO, the Commission will seek reduced tariff and non tariff barriers, paying particular attention to the problem of double pricing especially for new WTO members. The OECD as well as the WTO will see continued work on Distorting Investment Incentives as well as multilateral agreements on trade and competition. Chemicals will also feature in the Transatlantic Business Dialogue. The chemical industry is invited to convey to the Commission informations regarding the market access problems it encounters in third countries so that it can take steps to solve them.
96. To confront the challenge of assuring more intangible investment, industry, the Commission and Member States should concentrate efforts to reinforce innovation, RTD, education and the whole scientific culture. , As regards the EU RTD actions, the chemical industry will be better integrated into the existing Task Forces and more focused clusters. Intellectual property protection will be strengthened: the agrochemicals and biotechnology sectors will benefit from specific patenting improvements. Commission programmes ranging from the RTD Framework Programme to the Structural Funds, SOCRATES, and Leonardo da Vinci will intensify the education and training of scientists in Europe.
97. To confront the challenge of promoting more industrial cooperation, the Commission and industry will further develop the RISC information network and improve knowledge about and actions undertaken for SMEs in the chemical industry. Externally, industrial cooperation will be reinforced with the USA via the TABD and Japan via specific deregulation projects. Actions will also be pursued with chemical companies in : countries near to the EU, e.g. CEECs; fast growing economies, e.g. China; and energy and raw material rich countries e.g. the GCC and Russia.
98. Launching and implementing the actions identified in the above text implies a deepening and strengthening of the already existing relations between the varied representatives of the EU chemical industry (CEFIC, sectoral associations and, sometimes, individual firms), Member States and the Commission. A work programme should review initiatives in the main areas of action, e.g. internal market rules, environmental actions, internal and external competition issues, RTD, education and training, SMEs information/communication and cooperation with third countries.

Table 1 : Output, trade in 1994 (Ecu Billion)

	Output	Exports	Imports	Trade Balance
E U	316	67	41	26
U S A	287	43	28	15
Japan	196	20	17	3

Sources : CEFIC & Eurostat

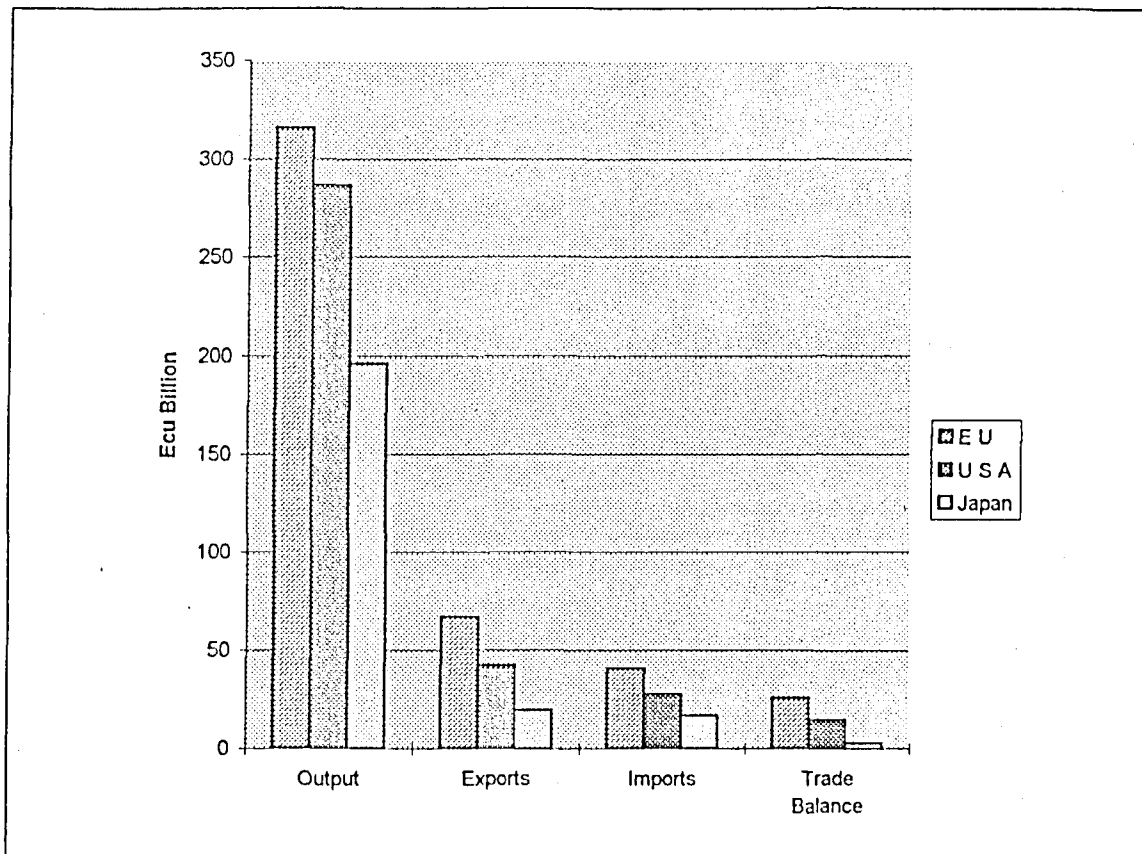


Table 2 : Top 30 chemical companies in the World (1994)

Company	Worldwide Turnover	
	in million ECU	in million US\$
1 HOECHST	25 714	30 586
2 BASF	22 625	26 911
3 BAYER	22 494	26 755
4 DU PONT	18 932	22 518
5 DOW	16 827	20 015
6 CIBA-GEIGY	13 771	16 380
7 RHONE POULENC	13 069	15 545
8 MERCK & Co	12 586	14 970
9 ELF GROUP	11 934	14 195
10 ICI	11 826	14 066
11 MITSUBISHI CHEMICAL	11 021	13 109
12 ASAHI CHEMICAL	10 983	13 063
13 AKZO NOBEL	10 261	12 204
14 SANDOZ	9 760	11 608
15 ROCHE	9 069	10 787
16 SHELL	8 705	10 354
17 SUMITOMO CHEMICAL	8 046	9 570
18 EXXON	8 024	9 544
19 PFIZER	6 962	8 281
20 MONSANTO	6 955	8 272
21 SOLVAY	6 588	7 836
22 ENICHEM	6 024	7 166
23 ZENECA	5 765	6 857
24 HULS	5 392	6 414
25 L'AIR LIQUIDE	4 808	5 719
26 LILLY, ELI	4 802	5 712
27 GENERAL ELECTRIC	4 740	5 638
28 MITSUI TOATSU	4 712	5 604
29 BOC	4 482	5 331
30 HENKEL	4 389	5 220

Sources : Chemical Insight & CEFIC

Table 3 : Employment (in thousands)

	EU	U S A	JAPAN
1980	1959.90	1107.40	409.30
1981	1890.90	1109.00	408.10
1982	1850.00	1075.10	405.00
1983	1799.50	1042.80	402.00
1984	1788.30	1049.00	395.90
1985	1780.40	1043.50	395.70
1986	1779.20	1021.00	396.30
1987	1767.60	1024.60	391.60
1988	1769.50	1057.30	390.60
1989	1790.90	1073.90	393.00
1990	1797.40	1086.10	401.00
1991	1897.90	1075.80	406.00
1992	1816.40	1084.00	415.00
1993	1734.10	1078.40	413.00
1994	1656.90	1053.90	410.00

Source : CEFIC

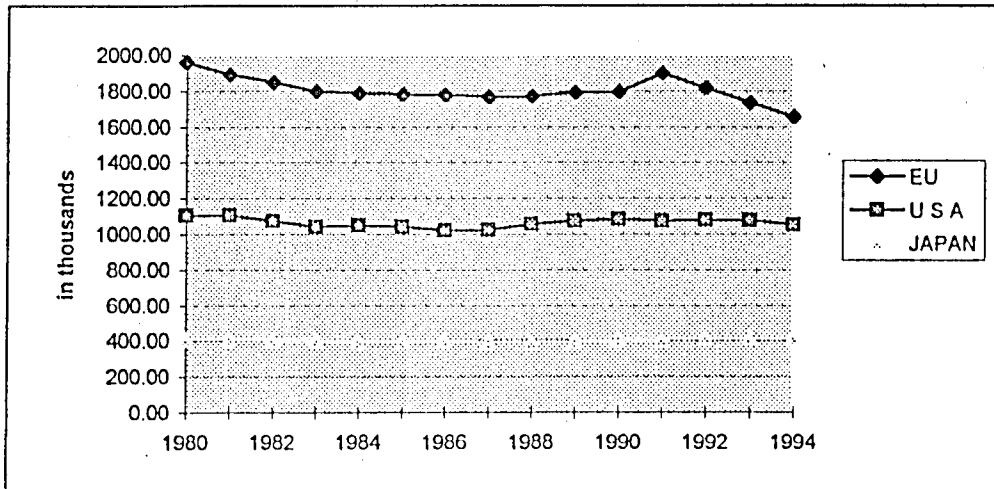


Table 4 : Growth rates

	1985-1994 (% p.a.)
EU Chemicals	3
EU Industry	1.7
EU GDP	2.4

Sources : CEFIC & Eurostat

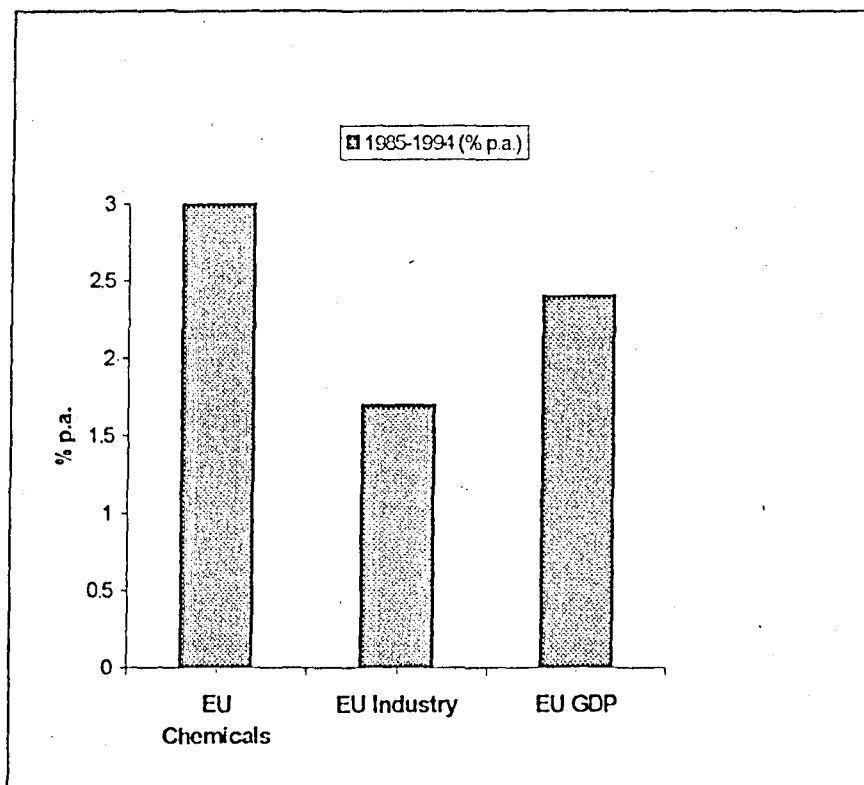


Table 5a : Most ingenious companies

Number of inventions in 1988/1989 (Source : Panorama 1993)

Worldwide	
Eastman Kodak (USA)	1014
Bayer (EU)	1198
Hoechst (EU)	1198
Bosch (EU)	1229
Fujitsu (JPN)	1289
BASF (EU)	1290
GE (USA)	1306
Canon (JPN)	1414
Philips (EU)	1541
Fuji (JPN)	1545
IBM (USA)	1623
Hitachi (JPN)	1723
Mitsubishi Electric (JPN)	1747
Siemens AG (EU)	1966
Toshiba (JPN)	2009

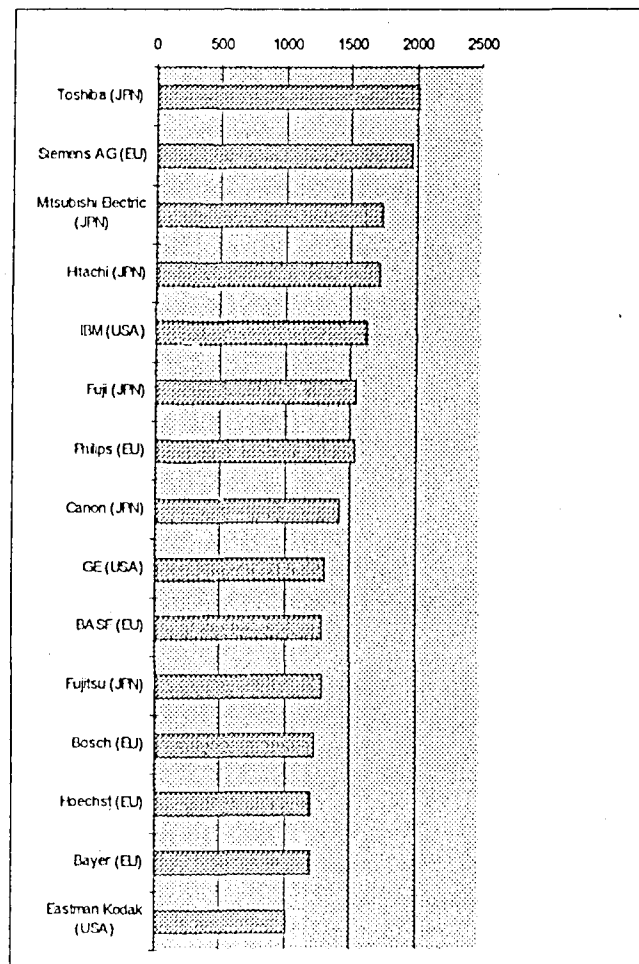


Table 5b : Most ingenious companies

Number of inventions in 1988/1989 (Source : Panorama 1993)

From Europe	
Alcatel (FR)	339
ABB (CH)	367
Rhône Poulenc (FR)	382
Shell (UK/NL))	424
Unilever (NL)	475
ICI (UK)	490
Henkel (D)	553
Thomson (FR)	557
Daimler (D)	685
Ciba Geigy AG (CH)	738
Bayer (D)	1198
Hoechst (D)	1198
Bosch (D)	1229
BASF (D)	1290
Philips (NL)	1541
Siemens AG (D)	1966

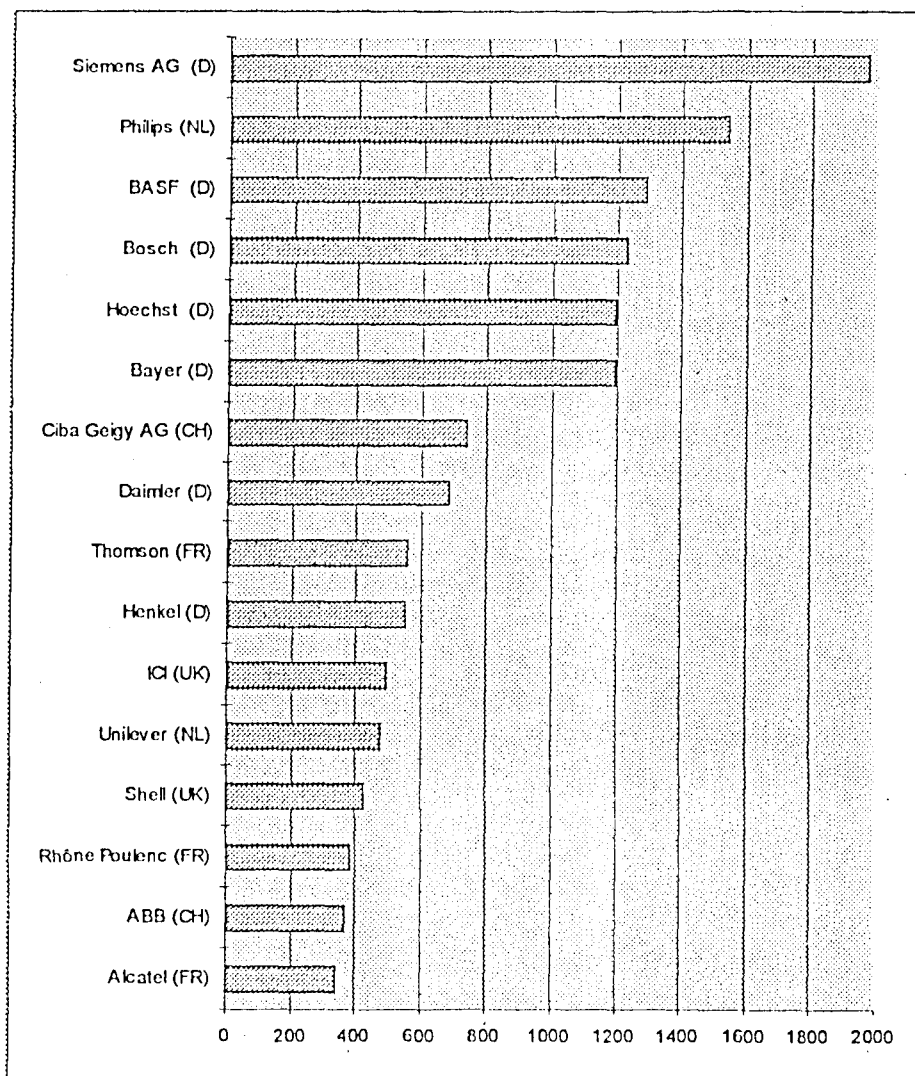
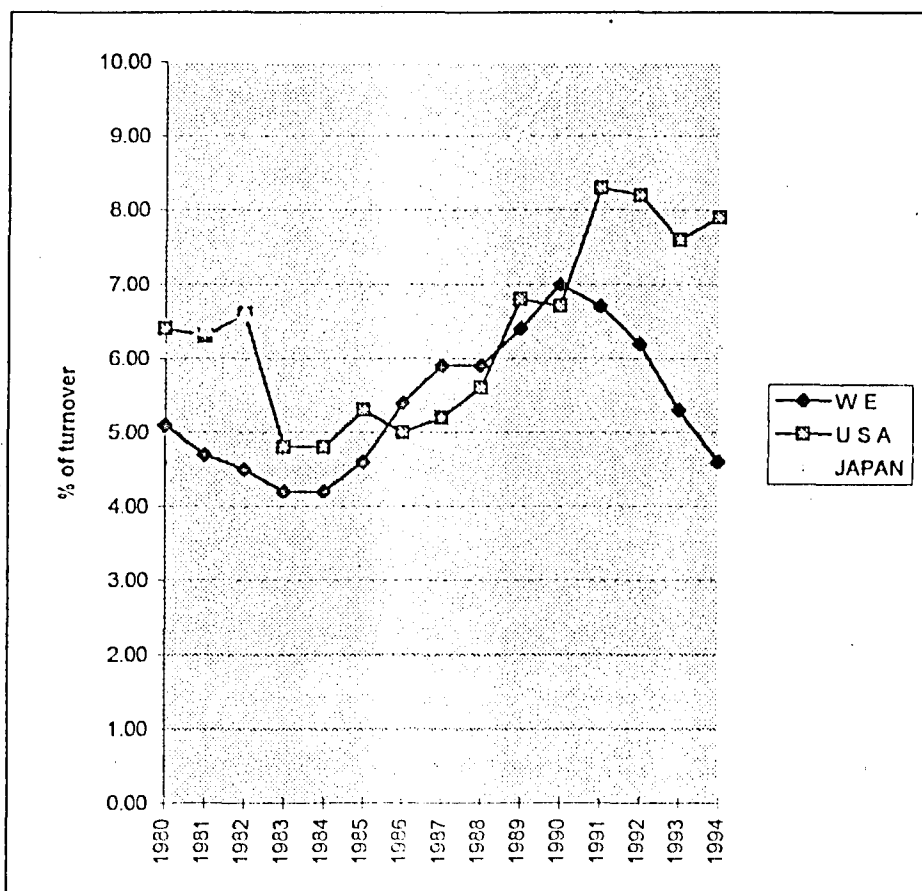


Table 6 : Capital spending (% of turnover)

	WE	USA	JAPAN
1980	5.10	6.40	6.10
1981	4.70	6.30	6.40
1982	4.50	6.60	6.60
1983	4.20	4.80	6.40
1984	4.20	4.80	6.40
1985	4.60	5.30	6.90
1986	5.40	5.00	7.00
1987	5.90	5.20	7.90
1988	5.90	5.60	8.50
1989	6.40	6.80	9.10
1990	7.00	6.70	9.90
1991	6.70	8.30	9.90
1992	6.20	8.20	9.60
1993	5.30	7.60	7.40
1994	4.60	7.90	6.20

Sources : ESCIMO & CEFIC



Annex
Application of principles for
Regulatory Impact Assessment
to the problem of nickel
allergy - an example

1. Introduction

Many people are allergic to nickel in jewellery products. In other words they suffer from soreness and inflammation of the ears when they wear cheap earrings, from soreness and inflammation of the arms when they wear cheap bracelets and watch-straps and so on. In addition to the effects of direct contact with cheap jewellery, many suffer soreness of the hands which keeps them away from work.

Nobody is allergic to nickel at birth. They usually become sensitised when they have their ears (or noses) pierced and nickel comes into contact with the wound. Once sensitised they may suffer from nickel allergy whenever they wear cheap jewellery.

Cheap costume jewellery is very popular especially among adolescents. The annual turnover of the industry in the EU is about 850 million ECU and much of this involves trade between Member States. It is an industry which is highly competitive and which relies on nickel because of its low cost and contribution to quality.

Because of the widespread use of costume jewellery, the incidence of nickel allergy is thought to affect about 30 million people in the EU. Not only does this cause a large amount of suffering, it also leads to substantial spending by public authorities in treating those affected and to significant costs to the economy as a result of working days lost, without including the additional costs arising from occupational exposure.

There are no rules applied outside the EU to the use of nickel in costume jewellery.

2. Why act?

It is necessary to act for a number of reasons. Firstly, there is a need to reduce the risk to public health, already affecting 30 million people. Secondly, the Internal Market in costume jewellery, worth several hundred million ECU/year, must not be allowed to fragment further - national rules on nickel are applied already by Denmark, Germany and Sweden and are being discussed in Italy. Thirdly, it is necessary to act for reasons of cost - treatment costs for the EU being estimated at 40 million ECU/year and the cost of working days lost is also thought to be substantial.

3. Who should act ?

Obviously nickel allergy is not an exclusively European problem. It affects the whole developed world. This being so the first choice would be to have the OECD take action.

There is, however, no consensus on the problem at the OECD level. Unanimity is required and at least two countries would oppose (USA, Switzerland).

Intervention must be at EU level to protect the Internal Market. The Commission should take the lead, and has done so (see 6 below)

4. What should be done ?

To decide what needs to be done it is necessary first of all to examine the risks.

The main risk is associated with the piercing of ears and noses. The use of nickel in piercing and healing should be stopped.

A secondary risk is associated with the wearing of costume jewellery. Research has shown that these products provoke an allergic reaction when nickel is released in large quantities through the action of sweat on the jewellery. There is no need to stop the use of nickel in costume jewellery altogether, though clearly something more than a warning label is needed on these products (experience has shown that adolescents often don't read labels).

In short the best way to control risk would seem to be the following:

- to ban the use of nickel for the piercing of ears and noses, and
- to impose a limit on the rate at which nickel is released from costume jewellery products

This is a feasible strategy as safe substitutes for nickel are available. However, before it can be adopted it is necessary to check that the advantages of the controls exceed the drawbacks.

The advantages are clear : 30 million people would be protected from the risks of nickel allergy, the internal market of several hundred million ECU/year would be preserved, the public authorities would save 40 million ECU/year and the economy would avoid the loss of many working days.

There are drawbacks, however, at the levels of consumers, industry and the state. Consumers will have to pay up to 15 % more for costume jewellery. EU industry may have to bear once-off investments of about 70 million ECU and may suffer increased operating costs of about 30 million ECU/year. Finally, the Commission will have to invest 150 000 ECU in developing test methods.

The advantages, however, would seem to more than offset the drawbacks.

5. How should it be done ?

An approach involving voluntary co-operation between the Commission and the costume jewellery industry would not be effective for several reasons. Firstly, there is no industry partner as the costume jewellery industry is not organised at Union level or even at national level. Secondly, voluntary controls are unlikely to be effective given that most costume jewellery originates outside the Union, there are many importers and there are millions of retail outlets.

The Commission needs to devise binding rules which can be enforced by national authorities. There is no need, however, to regulate the detailed design of all the various

products which might cause nickel allergy i. e. earrings, bracelets, watches and necklaces but also spectacles, buttons, buckles, catches, hair slides, zips etc.

What is needed is the following:

firstly, a Directive

- which bans the use of nickel in piercing; and
- which establishes a limit for nickel release for all products which come into direct and prolonged contact with the skin

and secondly, a set of harmonised test methods to enable the national authorities to easily and cheaply control these provisions.

6. Closing remarks

Directive 94/27 of the European Parliament and Council¹, based on the above described approach, was adopted unanimously by the Council in July 1994. It will enter into force 6 months after publication by CEN of three European Standards incorporating the test methods needed for control (latest estimate of entry into force is mid 1997).

¹OJ L188, 22 July 1994, p.1