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Report

drawn up on behalf of the Committee on Economic and Monetary Affairs

on the European petrochemical industry

Rapporteur : Mr Peter BEAZLEY

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Or. En.

English Edition

On 14 November 1982 the Committee on Economic and Monetary Affairs was authorized to draw up an own-initiative report on the European chemical industry.

On 21-22 September 1982 Mr BEAZLEY was appointed as rapporteur.

On 10 May 1983 the motion for a resolution on the European petrochemical industry (Doc. 1-174/82) was referred to the Committee on Economic and Monetary Affairs as the committee responsible and to the Committee on Social Affairs and Employment for its opinion.

On 21-22 November 1982 the Committee on Economic and Monetary Affairs decided to include the motion within the context of its report on the chemical industry.

The committee considered the draft report at its meetings on 15 February 1983, 3-4 November 1983 and 21-22 November 1983. At the latter meeting it decided to change the title of the report from 'the European chemical industry' to 'the European petrochemical industry.'

The committee on Social Affairs and Employment has decided against delivering an opinion.

At the same meeting it adopted the report on a unanimous vote.

Participated in the vote :

Mr MOREAU, chairman; Mr BEAZLEY, rapporteur; Mr BATTERSBY (replacing Mr Ferranti); Mr DELEROZOY; Mrs DESOUCHES; Mr DE GOEDE; Mr HERMAN; Mr KAZAZIS (replacing Mr Van Rompuy); Mr LEONARDI; Mr RADOUX (replacing Mr Wagner); Mr ROGALLA (replacing Mr Schinzel); Mrs THEOBALD-PAOLI; Mr VERGEER.

The depot was made on 23 November 1983.

C O N T E N T S

The Committee on Economic and Monetary Affairs hereby submits to the European Parliament the following motion for a resolution together with explanatory statement:

MOTION FOR A RESOLUTION

on the European chemical industry

The European Parliament,

- having regard to the motion for a resolution by Mrs LIZIN (Doc.1-174/82),

- having regard to the report by the Committee on Economic and Monetary Affairs (Doc. 1-1108/83)

The nature of the European chemical industry

1. Considers that a healthy and fully competitive chemical industry is essential to the economic and industrial structure of the European Community.

2. Acknowledges that the European chemical industry is a large established industry trading worldwide with a very extensive range of products, being the supplier of basic raw materials and auxiliary products to all other industries and to agriculture, whilst offering a wide range of pharmaceuticals, agro-chemicals and other consumer products direct to the public.

3. Considers that the European chemical industry is highly dependent for its success on an exceptionally heavy investment of money and skilled scientists and technicians in research and development into new products, processes and markets.

   Notes likewise that the European chemical industry is highly capital intensive and product and process and market orientated.

Acknowledges by the nature of the sector in which it operates and by its past record in financial matters and labour relations that it has a long-term interest in its own development through the best use of capital and labour.

4. Recognizes that there is strong competition between the individual Companies comprising the European chemical industry within the European Common Market, as well as in world markets.

5. Welcomes the fact that the European chemical industry has over a long period been one of the largest, the most stable and the most successful of European industries, being highly competitive in world markets. It remains and should continue to be a growth industry with a premium of approximately 0.5% above the current 2% level of European economic growth.

Notes that the European chemical industry produces about 41% of the market economy countries' consumption of chemicals (USA/Canada 31%, Japan 14%) and approximately 60% of world chemical exports (USA/Canada 18%, Japan 5%) and consumes approximately 53% of world imports (USA/Canada 9%, Japan 5%).

After eliminating Intra-European Community trade from the total, the European chemical industry produces approximately 32% of market economy countries' chemical exports and consumes approximately 15% of market economy countries' chemical imports.

6. Regrets the effects of unfair State aids, artificial pricing, and other distortions occurring in certain Member States to the competitive effect of market forces; such forces are essential to bring about the speedy restructuring of certain sectors of the industry, especially the petrochemical branch, where the majority of European chemical firms are independent from enterprise share holding companies competing in the Community with the locally established USA, Japanese and subsidiaries of other foreign chemical companies and with direct imports from third countries.

The petrochemical industry

7. Notes that the European petrochemical industry was developed during the Second World War and in post-war years to manufacture a wide range of heavy organic products from oil and gases which were previously based on coal.

8. Appreciates that these new feedstocks made possible the production of long chain molecular polymers (such as polythene, nylon, polyester, synthetic rubbers etc.) and other chemicals (such as synthetic detergents, ammonia, methanol etc.) in quantities and at costs which could never be approached by traditional processes based on coal.

9. Recognizes that these technologies for producing petrochemical feedstocks were originally developed in the USA by oil companies rather than by the traditional organic and inorganic chemical companies whose research in most cases developed the new organic end products.

Notes nevertheless that Europe, despite the disadvantage of not having a powerful indigenous oil industry like the USA, quickly developed the new technologies taking second place behind the USA and maintaining constantly a strong lead over the productions of Japan and the rest of the Free World taken together.

10. Notes that the fast growth of scale of manufacture of petrochemicals between 1950 and 1973 offset the inflationary tendencies of Western economies with continuously lower prices for its products and so enabled high quality polymers to take over large sections of traditional markets previously supplied by natural products like metals, wood, wool, cotton, rubber, fats and natural oils, etc.

Likewise notes that the tonnage of inorganics produced from naphtha, fuel oil and natural gas feedstock equals that in the organics field, and that this therefore accounts for 95% of ammonia production in the OECD countries of which some 80% is used in fertilizers.

Methanol production technology is likewise now based on petrochemical feedstocks. Sulphur recovery from natural gas and oil refineries plays an important part in sulphuric acid and fertilizer production.

11. Acknowledges that the onset of the oil crisis in 1973 which created the world recession affected particularly severely the petrochemical industry. The first and second 'oil shocks' removed from the petrochemical industry the possibility to offset inflation by further technical developments and scale increase, leaving the industry with some 30% overcapacity which was expected to continue for a long period.

12. Appreciates that the high revenues obtained by OPEC countries have enabled several to invest in their own petrochemical industry siting it alongside their refineries and oil wells and thereby obtaining similar advantages as the USA. OPEC producers would otherwise 'flare' the gaseous materials (i.e. methane and ethane) as waste products of no value.

13. Believes that when such developments come on stream progressively from the current time, but more significantly from 1985 onwards, the previous dominance of North America, Western Europe and Japan will be weakened. Whilst OPEC countries may have high operating costs for their refineries and petrochemical plants, they will be able to cost their oil or gas raw material - which is by far the greatest element of petrochemicals cost - at whatever level is necessary.

14. Considers that whilst much benefit has been obtained from reduction of uneconomic petrochemical capacity to date it is essential for Community-based chemical and oil companies operating in the petrochemical field to further reduce surplus capacity without delay. It is clear that by far the major surplus is in ethylene production but that this cannot be tackled on its own.

15. Whilst appreciating the concern of Member States to avoid further increases in unemployment, believes that the maintenance of surplus and uneconomic capacity is counter-productive and debilitates both the firms concerned and the economics of such Member States.

16. Believes that the responsibility for the closure of surplus capacity is that of the companies involved, who must reorientate the structure of their firms as they see fit, giving due consideration to their social responsibilities, to their workers and any wider considerations regarding the region in which they operate.

17. Considers that the role of DG III of the Commission should be to maintain a watching brief in what is likely to be a major restructuring of the European chemical industry.

Believes that the role of DG IV is an important one insofar as it can facilitate the restructuring and rehabilitation of the petrochemicl industry by ensuring that State aids are not used to delay or frustrate the operation.

Believes further that whilst it is impossible to foresee the exact form in which the reconversion and restructuring of the industry will take place, it is also necessary to remove excess capacity on a permanent basis. Such removal will leave in being a fully viable industry with acceptable levels of plant utilization generating satisfactory returns. Believes that it should be the concern of DG IV to ensure that in whatever form the production reduction takes place, the new structure maintains a fully competitive character but that there appears to be no likelihood of this not being the case bearing in mind the large number of companies of many different nationalities involved.

The future

18. Believes that without doubt the chemical industry will continue to play as important a role in the European economy as heretofore but that the process of adjustment in the petrochemical industry is however likely to have a more fundamental effect on the structure of the basic industry.

Considers that whilst European chemical firms are international in their operations they have in the past depended too heavily on a strong national home market which, prior to the completion of the Common Market, was protected.

19. Considers that with the European Common Market as the Home Market with no internal national barriers and little protection externally, greater need arises to increase the specialization of product ranges, so that major firms will concentrate their efforts more in sectors where they enjoy particular strengths.

Notes that the high cost of research and development in the chemical industry will continue to call for large size companies and large-scale production but that it is likely that the number operating in a particular sector may be reduced.

Considers however that, as the size and diversity of the chemical business in all sectors grows over the next decades, management advantages may be found in certain cases by further division of companies rather than greater mergers.

20. Instructs its President to forward this resolution together with the report by the committee to the Council and the Commission.

B

EXPLANATORY STATEMENT

Introduction - Turning Points in the Chemical Industry

1. General

The most vital - and most difficult - talent in life is the capability to recognise turning points. This is equally true in all walks of life and the history of the world is filled with the stories of those prophets who saw the light and were not believed and those who recognised the facts too late and lost the battle.

The difficulty, of course, lies in the amount of time which is necessary to evaluate the available facts and to assess the reaction of others to them. Recognition of significant change cannot therefore be immediate but undue delay is both costly and dangerous.

The chemical industry in its long history has passed through several distinctive phases when, after long periods of stability it has - either of its own initiative or through the pressures of the market or legislation - made significant changes to its structure and organisation. The present time is such a moment.

It is unnecessary in such a report to devote too much time and space to the history of the chemical industry. It is well known to all those who operate in it but perhaps less well known to politicians, administrators and the media - hence the following summary.

2. 19th Century Growth

Suffice it to say that from very ancient beginnings the chemical industry's scope and structure developed fast with the industrial revolution. It was called upon to produce a variety of known products on a mass scale to meet the ever-increasing demands of a fast growing industry in the first half of the 19th Century.

The chemical industry of the 18th Century which developed very fast in the 19th Century was an inorganic chemical industry based on minerals. In the last quarter of the 19th Century a new branch of the chemical industry began to emerge based on more complex technology. This was the synthetic organics sector derived from the element carbon combined with hydrogen and other elements to form literally millions of compounds.

The fast growth of industry led to a great expansion in world trade. Manufactured goods were exported for food and raw materials. In consequence the population of Britain and the leading European nations grew very fast as well. People flocked into towns from the countryside

for better jobs and housing. The population expansion was therefore an urbanised one which needed imported food. The opening up of the Pampas in Argentina and later of the U.S. and Canadian prairies supplemented the wheat which Europe had traditionally imported from Russia. Meat came from Argentina, Australia and New Zealand.
The chemical industry was called upon to meet greatly increasing demands from both industry and agriculture. Up to 1870 the basis of the chemical industry was the Leblanc process producing a variety of alkalis from salt, sulphuric acid and limestone, whilst related products based on sulphuric acid and sodium nitrate provided the acids, the chlorine and the nitro-compounds which industry and agriculture required. Synthetic fertilizers were being used to supplement natural ones even in the 1840's. The urban population needed sodium bicarbonate for its bakeries and fizzy drinks. The soap, paper, glass and textiles industries needed alkalis too and the chemical industry at that time was often referred to as the 'alkali trade'.
From these early days up to today the chemical industry was a supplier of 'raw materials' and auxiliary products to all other industry and to agriculture. Hence the swift growth of the iron and steel industry, of engineering and shipbuilding, of explosives for mining and of many other sectors, all placed their demands on the chemical industry.
Britain, the leading industrial power at that time and one of the leading producers of chemicals, could supply all its own needs and half of its production was exported mainly to the U.S.A. and to the Continent. The industry was located where the raw materials plus coal and water supplies were freely available especially within close range of a port. The companies making them were private firms led by an enterprising individual.

3. 1870 Turning Point - The Solvays and Alfred Nobel

However, a turning point came in 1870 when the two Belgians, Ernest and Alfred Solvay developed the ammonia-soda process successfully which could rival and eventually overtake the Leblanc process. This process played a major part in the structure and nature of the heavy chemical industry as it led to the formation of an international group of Solvay companies which from the start looked upon the world as its market and managed its affairs accordingly.
By the end of the 19th Century when the Castner Kellner electrolytic process provided caustic soda and cheap chlorine and the catalytic contact process produced very strong and pure sulphuric acid (oleum)

for the growing organics sector, most of the basic processes for the manufacture of the major inorganic chemicals had been established and the technology was widely understood.

In 1870 sweeping changes were made in the explosives industry whereby the 'black powder' of the Middle Ages - a mixture of sulphur, saltpetre and glycerine was overtaken by the invention of a Swede called Alfred Nobel. It was he who discovered a safe way of detonating nitroglycerine and of making it relatively safe to handle by absorbing it in Kieselguhr - a porous clay. His invention of the detonator and dynamite founded a group of companies in many countries, all locally financed and licenced to work his patents. Nobel held shares in these companies but did not have control.

The alkali producers and the explosives manufacturers were amongst the earliest entreprenures to be faced with business problems on a worldwide scale. Whilst there was almost certainly no contact between these two Groups they came to very similar conclusions about the best way to regulate their trades. This included market and profit sharing which was believed to be necessary to optimise the use of capital in fast expanding world markets. Such arrangements were not illegal at that time in either Europe or U.S.A. - the Sherman Anti-Trust Act only being passed in the U.S.A. in 1890.

Also in 1870 another major change in the chemical industry was taking place in the manufacture of dyestuffs. Traditional materials were rapidly being replaced by complex organic compounds synthesized from derivatives of coal tar. This was an entirely new technology in which the Germans soon took the lead from the British and French, where the earliest significant inventions had been made.

4. The German Organic Chemical Development in Dyestuffs and New Products

The Germans as the Swiss, benefited from the attention paid to science - especially chemical science - in their educational system and also to the close relationship between the German Universities and German industry. From this developed the chemical industry's dependence on research. In the 1870's this was certainly not the case in Great Britain and U.S.A., the world's two leading industrial nations. Thus well before the turn of the century the Germans had developed a very large dyestuffs industry with a most important export trade. The Germans did not need to form international groups like the explosive and the alkali makers because they became so predominant in the dyestuffs, holding some 80% of the world market before 1914.

The German companies, however, both within Germany and in export markets, regulated their affairs in ways which the German law both allowed and even protected. Units of greater and greater size were therefore made until finally the greatest combination of all, I.G. Farbenindustrie, was formed in 1925, which set in train the formation of Imperial Chemical Industries (I.C.I.) in Britain a year later.

However, up to 1914 there were no turning points. Instead the systems of production and trade regulation were developed more and more to cater for the fast expanding demand. On the fringe of the explosive industry in the U.K. there were attempts to develop artificial silk from nitro cellulose after the work done in France on cellulose acetate but the main future was to lie with viscose.

In Germany however, the chemical industry was poised just before the First World War for dramatic changes. The great dyestuffs companies secure in their domination of the world's dyestuffs markets and in the fields of organic chemistry such as drugs and photographic material, were ready to extend into any branch of the chemical industry whether organic or inorganic. In 1904 mergers between leading German dyestuffs producers had formed the industry into two great groups linked with each other by agreements to regulate competition. This foreshadowed the even greater concentrations of power in the chemical industry which were to follow in Germany, the U.S.A. and the United Kingdom during the Great War and afterwards.

German research was looking for new products aimed at opening up vast new markets like cellulose fibres, plastics and varnishes, insecticides, perfumes and pigments. The first phenol-formaldehyde thermosetting plastic resins were produced in 1907 and the first methyl butadiene synthetic rubber was in commercial production in 1912. Synthetic ammonia for fertilizers, explosives and chemical uses came into production in 1913.

Germany was gaining a monopolistic position in the chemical industry of the world. The outbreak of War in 1914 marked the next turning point which was to cause the most dramatic changes in both the scope and the structure of the world's chemical industry.

5. 1914 Turning Point and New Post-War Structures

The War naturally provided the opportunity in Britain to break the international relationships established by the Nobel Trust and at the same time to undertake a great deal of rationalisation of the individual firms producing chemicals or explosives. In Britain also,

it gave birth to the rather unhappy rationalisation of many dyestuffs manufacturers under the British Dyes Company with the largest - Levinsteins - outside it.
Technologically great stimulus was given to the search for synthetic substitutes for natural products. In particular the manufacture of synthetic ammonia, already established in Germany, was important to Britain both from the point of view of the production of fertilizers and in due course, of other applications especially the production of coal from oil by hydrogenation.
Finally, the War had an important effect on the structure of the chemical industry in the world outside Germany, replacing the specialized international groups like the Solvay Group for alkalis, and the Nobel Dynamite Trust for explosives by large nationally based Groups with as wide a range of chemical products as possible. The firms had to be very large in order to be able to raise the large capital required to finance extremely expensive research and development and the large scale production required by such firms. Only very large organisations could raise such huge amounts of capital and justify its employment. Germany had already set the pattern for the future in pre-War days and in 1916 by the amalgamation of Hoechst-Cassella-Kalle with Agfa-Bayer-BASF and two large independent firms in the I.G. der deutschen Teerfarbenfabriken it had produced the forerunner for the I.G. Farbenindustrie of 1925. U.S.A. and Britain were moving in the same direction. Dupont originally an explosives manufacturer, had expanded greatly during the War and another Group, the Allied Chemical and Dye Corporation was moving towards its formation in 1920.
In Britain the chemical industry was coalescing around Nobel industries, Brunner Mond, British Dyes (now the British Dyestuffs Corporation) and the United Alkali Company. These large groupings of 19th Century companies were to be consolidated in 1926 into the diverse multi-product Group - Imperial Chemical Industries Ltd.

The period 1925 saw the consolidation of the new style international companies. British companies from the earliest days had seen the British Empire as their natural market and whilst Britain and its Empire were less protected than U.S.A. and Germany, the demand of the British Dominions for competitive supplies led at an early stage to the establishment of large scale chemical and explosive manufacture in these territories. The newly established I.C.I. maintained its relationship with Dupont in the U.S.A. by means of Patents and Processes Agreements. This reduced the very heavy

cost of research for each firm and made them more competitive with the very powerful I.G. Farbenindustrie. Joint companies were also set up in South America and in Canada. However, the ever active U.S. Anti Trust Authorities decided during the Second World War that such agreements were inadmissible and they were completely dismantled shortly after World War II ended as were the joint companies in South America and Canada.

6. 1945 Turning Point - Anti Trust and Free Competition

In fact 1945 was a major turning point for the world's chemical industry. A clean sweep was made of all the previous agreements and the industry entered into fierce competition in all world markets. The great German Farbenindustrie was split up into its three major component parts - Hoechst, Bayer and BASF. The enormous progress that these firms have made under entirely independant managements despite all the difficulties faced in the early years of post-War Germany are clearly indicative of the dynamism which can be created by "breaking the mould" - particularly when the size of enterprises may become unwieldly. A new dynamic was equally instilled in the post-War I.C.I. capitalizing on its research and development success in plastics and fibres in the thirties and early post-War years and competing fist to fist in Europe and in all markets throughout the world. The same was true of other European and U.S. companies.

However, in this freely competitive world the growth of large State run chemical firms which did not necessarily have to face the same market discipline as private enterprise companies, was an increasingly disturbing feature.

The fast post-War market growth in basic heavy chemicals following wartime shortages gave a great stimulus initially to the world's chemical industry as it entered this new competitive era.

The late 1950's and 1960's brought tremendous benefit to the chemical industry when the inventions and discoveries especially in plastics and fibres based on the newly developed petrochemical industry took full advantage of the consumer boom.

Great advances were made at the same time in agro-chemicals and pharmaceuticals. Many new opportunities were created for both organic and inorganic chemicals but in the late 1960's and early 1970's it was specifically with the organic raw material products of the petrochemical industries where the problems were to arise.

7. The 1973 Energy Crisis - Origins of the Present Problem

Political problems in the Middle East, in Iran, in North Africa and in other oil producing countries in the 1950's and 1960's had led to the nationalisation of many Western oil fields and refineries. OPEC was formed in 1960 and following the 1967 War another petroleum exporting organisation, OAPEC, was formed.

Towards the end of the 1960's the Bretton-Woods agreement was proving impossible to be maintained. The different rates of growths of inflation of Western economies had led to a period of currency floating. The U.S. dollar following the Vietnam War was under pressure. The December 1969 Smithsonian Conference failed to stabilize Western currencies at new levels and on 15th August 1971 President Nixon attempted to protect the U.S. Dollar by making it non-convertible into gold and the U.S. market by adding 10% to its tariffs.

Already in 1971/72 the fast advance of the forward prices of Naphtha and oil related products foreshadowed the onset of the energy crisis in 1973.

The sudden and continued escalation of the price of oil and oil based products at a time when the optimistic forecasts of the petrochemical industry were just putting on stream a great number of large new plants created the next great turning point, which is the basis of the present unresolved crisis in the chemical industry.

Resolution of the 'crisis' in main problem areas

8. The Nature of the Problem

The effects of the energy crisis have been felt with great severity throughout the whole of the chemical industry. This is the case because the chemical industry with its very widespread range of products is the general supplier of raw materials and auxiliary products to all industries and to agriculture. Hence when all of industry is affected by a deep depression the demand for all products of the chemical industry is severely reduced. The chemical industry is furthermore heavily dependant on research and capital investment. Restriction of its products sales therefore has an even greater effect on its long term prospects than for some other industries. Likewise, the chemical industry is one of the major users of energy in its chemical processes. Thus the increase of some 19 times in the price of oil and the comparable increases in the cost of other sources of energy specifically to restrict demand has had a disproportionate effect. Nevertheless it has stimulated a much higher degree of energy saving by redesigning processes, control systems and fuel sources than is apparent in many other industries. Space does not permit for this report to deal with the nature of the problems and the possible solutions in each of the vastly diverse branches of the chemical industry. Its main concern is to consider the major problems of the European chemical industry only, concentrating on their solution and the effect which this may inevitably have on the industry's future structure, profitability, employment prospects and investment needs.

Of particular importance is the effect of the European Common Market on the industry and the part - if any - which the European Commission might play in its solution.

The major European chemical producers have from certainly the beginning of the second half of the 19th Century been world traders and in many cases international producers. Unlike many European industries theirs is not the problem of adapting a purely nationally structured industry to a European market. The creation of a European Common Market however, with no internal barriers - even no internal 'technical' barriers to trade - but with exceptionally low external barriers compared with those behind which its competitors reside, has not caused a major problem even at a time of deep recession. It is the lack of uniformity of the Common Market's economy between Member States which causes the most serious distortions.

Differences of growth rates, inflation rates, interest rates, taxation levels, productivity levels are all reflected in movement of currency parities. Whilst it is the habit of the industry to base its prices on the Deutschemark, its accounts are still prepared in National currencies.

Most serious is the different rate of State intervention of all types within the Community. In the extreme case enormously large private enterprise companies facing the market disciplines have to compete with nationalised chemical companies which receive vast State aids. Irrespective of how this affects profitability, one of its major distorting effects is the protection it gives to out-dated industrial structures, inefficient firms and processes. It is the enemy of change and - whatever its beneficient motives - it is a prime cause of the continued maintenance in production of a high percentage of the surplus capacity in the industry.

The dual role which the European Community has to play is therefore more likely to relate to the activities of D.G.IV - the Competition Policy - than to D.G.II or D.G.III. As succeeding sections of this report will show the most likely area in which solutions to the chemical industries' problems will be found is between the firms themselves rather than through Community Economic or Industrial policy. The main motivator will be the attrition of profits of current structures and the attraction of dis-investment in such areas together with re-investment in new structures and new areas. For unaided private enterprise companies, however, delayed such action has been to date - the rigours of market forces will certainly bring it about. The problem lies in the non-exposure of nationalised and State-aided companies. This is where D.G.IV must be much more active in applying Articles 92 to 102.

9. Petrochemicals - Fast Post-War Growth followed by Collapse

The early development of the organics branch of the Chemical Industry was based on coal and as previously noted developed first in the dyestuffs sector in the last decades of the 19th Century. This led to the development of a wide range of synthetic products such as pharmaceuticals, thermosetting plastics, early forms of synthetic rubber with simple plastics, artificial fibres and films being made from cellulose. The development of the long chain molecular polymer science was based on the extensive research done in the 1930's.

Between 1925 and 1939 I.G. Farben spent just over 7% of its turnover on research and development - more than it distributed in dividends. It employed 1,000 qualified R & D personnel and moved ahead in many new directions. This was the level which other major chemical firms had to match or to approach to participate significantly in the "Revolution of Polymer Science". Dupont was the first to produce Nylon 66. Its huge costs of R & D into synthetic materials can be measured by the fact that it took 8 years and cost US $ 50 million to bring nylon 66 into commercial production after the first industrial sized batch was produced. With similar intensity of R & D effort I.C.I. produced the first polythene and the first methylmethacrylete resins (Perspex) and later developed the polyester fibre and moulding resins. Improved new forms of synthetic rubber, of plastic polymers, like PVC and polystyrene, new synthetic resins and fibres like the acrylics, were developed.

However, it was in the U.S.A. that the introduction of petroleum as a raw meterial for the Chemical Industry in the 1920's first occurred. The large quantities of by-product gases from petrol manufacture led petroleum and chemical companies to develop processes to up grade these gases into valuable chemicals. In the 1930's commercial manufacture of organic chemicals especially solvents, was established against identical products made from older raw materials by the established chemical manufacturers. At the same time natural gas was first used as the raw material for the manufacture of ammonia for fertilizers.

It was to be this route which was to provide the feedstocks for the petrochemical industries after the Second World War had given a great stimulus to the replacement of many essential raw materials such as

rubber, fats and oils by synthetic organic products. By 1945 petroleum based organic chemicals in U.S.A. already produced one million tons of commercial products - four times the pre-War level and one third of the total output of organic chemicals.

The Western European development of petroleum based chemicals although started during the Second World War, remained small until 1950. The reasons for this were to prove to be significant in the petrochemical crisis of the 1970's and 1980's. Unlike America, Western Europe had most of its refineries sited close to oil fields which it had developed in the Middle East and in many distant places. U.S.A., self sufficient at that time, in oil, had the stimulus of a most powerful national oil industry and a very large and highly developed unified market for petroleum based chemical products.

The consumer boom of the late 1950's and the 1960's and the early 1970's vastly increased the demand for these new products. Raw materials produced by the older techniques had no chance of satisfying the demand nor could it any longer be supplied by refinery gases and other by-products. The base materials such as olefins and aromatics now had to be manufactured on a vast scale specially for chemical uses. So came about the very fast development of the petroleum based chemical manufacture in Western Europe with the old established international chemical manufacturers using the same petrochemical feedstocks and processes in direct competition with the oil companies. There could be little product differentiation in this petrochemical and plastic field. The oil companies were already competing with the original basic chemical producers in agro-chemicals and synthetic detergents. However, the area of competition whilst it included the raw materials for fibre production did not reach to the position where the oil companies became fibre manufacturers.

The dramatic growth of the 1950's and 1960's was due to the steep reductions in price which it was possible to introduce based on the fast developing technology in this area and the economies of scale afforded by the much larger sized plants being built. Plastics and synthetic fibres were replacing natural materials like wood, metal, glass, and natural fibres in more and more spheres as prices were reduced. The capital intensive nature of this industry compared with others which were more labour intensive, protected it from the inflation of costs experienced elsewhere.

With such prospects it was inevitable that when the oil producing countries in 1973 increased the price of hydrocarbon feedstocks dramatically, very substantial new investment in additional capacity was coming on stream and many more were on the drawing boards based on the existing market estimates. However, improved technology could no longer match the rate of the increased price of hydrocarbon raw materials. The price of the petrochemical end products had to be sharply and regularly increased with the consequence that market growth was halted.

It was not at first clear that the effect of the OPEC Cartel would plunge the world's economy into a long term structural crisis. Following the sharp drop in the Western world's economy in 1974 there was a false dawn of industrial recovery and in petrochemicals output in 1975. The market remained flat whilst new capacity authorized before 1973 continued to come on stream. With existing plant badly under-utilized, the profitability of the industry became very low.

The Iranian crisis of 1978 gave rise to the second oil shock increasing the price of oil sharply. A second false dawn was created when fears that feedstocks would become both short in supply and therefore expensive, led to a rapid but temporary increase in petrochemicals demands.

This was short-lived. A deeper recession than ever developed in the Western world and the Communist Bloc was similarly affected, especially as regards the Satellite States. Overall de-stocking caused a sharp fall in petrochemicals output in 1980 and despite slow growth in production in the last quarter of that year, by the third quarter of 1981 there were no signs of recovery.

It was thus that the petrochemical industry like many others had failed for nearly ten years to intepret the market signs sufficiently clearly to take the necessary actions to safeguard its capital , its shareholders and its workers. The oil refining industry has been left with some 33⅓ to 40% over-capacity with little chance of utilizing it until 1990, whilst the petrochemical industry has some 32% of over-capacity which cannot be used until 1992. No private enterprise firms can stand such weakening of their financial structures. The demand for solutions is therefore paramount.

10. The Building of Petrochemicals Plants in OPEC Countries

The exceptionally high revenues obtained by oil States between 1973 and today have caused them to search for suitable investments which will develop their countries assets, increase their revenue, earn foreign currencies and create a trained technical cadre amongst their work people. The Chemical Industry and particularly the petrochemical branch of it was the obvious one to put alongside their surplus supplies of oil and gas.

The Soviet Union had taken similar decisions many years earlier. The combined threat of these two most important oil and gas producers to create a petrochemical industry alongside their oil and gas wells clearly calls for careful reconsideration by European and even by U.S. and Canadian producers of the extent to which the structure of the petrochemical industry will thereby be changed.

So long as the oil and gas feedstock and energy costs to the local OPEC producer can represent only 60% to 70% of the cost of production in traditional producing nations, the entry of the 'conventional-energy-rich-nations' (CERN's) previously not involved in the petrochemical business, into production and sale of such products on world markets must have a significant effect.

Their raw material cost advantages must outweigh any other considerations. The technology is freely available from a great number of specialist construction companies licenced by oil or chemical firms, CERN's can easily attract technical and marketing management from the petrochemical companies of the free world which has suffered from the energy crisis. Technicians at all levels are equally available. So is the labour to build the plants from many parts of the Middle East, Indian Continent or further afield. Many oil and chemical companies from U.S.A., Western Europe and Japan have sold their technology and in certain cases they have set up joint companies to enable them to obtain petrochemical products at cheap prices from the most modern large scale plants being installed in CERN's and thereby to be able to close some of their own less efficient older plants. Meanwhile they can thereby contain the total volume of petrochemical products on world markets.

The size of the price advantage on feedstocks available in Saudi-Arabia for example, was illustrated by the U.S. Department of State when it showed that Petromin, a local supplier of natural gas, charge 50 cents per million British thermal units compared with the regulated price of gas in the U.S.A. of 1 $. When U.S. gas is de-regulated the advantage will be even greater.

A major problem is the large number of the CERN's who have virtually no local market for petrochemical products and who will sell as much as 90% of their production on world markets as raw materials, intermediary or semi-finished products. The price advantage is particularly significant in certain primary petrochemicals like ammonia, methanol and ethylene. Full details of comparative figures for Ethane, Naphtha, Methane and Ethylene, Methanol and Ammonia, are shown on pages 26 to 31 of the U.S. International Trade Commission's report on "The Probable Impact on the U.S. Petrochemical Industry of Expanding Petrochemical Industries in Conventional Energy Rich Nations".

Already the European fertilizer industry is suffering from the import of cheaply priced ammonia based nitrogeneous fertilizers from Third World countries and of course ethylene is the petrochemical product which is at the root of all the major surpluses in Europe.

The main conclusions of the U.S. International Trade Commission's report are:-

(a) The traditional petrochemical producing areas of the world including the U.S.A., Western Europe and Japan, are expected to have a lower future share of the world's production capacity for certain building block petrochemicals and as a result could have a lower future share of the world's net exports of these petrochemicals and derivitives.

The figures as percentages of capacity as CERN's capacity comes on stream is as follows:-

Exports shown as percentages of capacity

Area	Ethylene		Ammonia		Methanol	
	1980	1990	1980	1990	1980	1990
U.S.A.	35	29	18	13	25	19
Western Europe	33	27	16	12	26	19
Japan	12	10	3	2	9	6
Totals	80	66	37	27	60	44

As regards net world exports over the same period:-

Ethylene - U.S. moves from 45% in 1980 to being a net importer in 1990
Western Europe moves from 26% to 25%
Some individual countries however become net importers.
Japan from 10% to 1%
Total 71% to 25%

Ammonia - U.S.A. 8% in 1980 to net importer in 1990
Western Europe from 20% to less than 0.5%
Japan remains a net importer
Total moves from 25% to NIL

Methanol - U.S.A. 4% in 1980 to 2% in 1990
Western Europe 11% in 1980 to less than 0.5%
Japan net imported both years
Total 15% in 1980 to 2% in 1990

(b) The CERN countries most likely to develop world scale petrochemical plants in 1990 are Saudi-Arabia, Indonesia, Kuwait, Canada, Mexico, U.S.S.R. and China.
Between them these countries own 55.7% of Crude Petroleum Reserves, (Saudi-Arabia 24.2%, Kuwait 9.6%, U.S.S.R. 9.4%, Mexico 7.2%) and 53.6% of natural gas reserves (U.S.S.R. 41.0%, Saudi-Arabia 3.9%, Canada 3.2%, Mexico 2.5%).

(c) The CERN's are expected to have feedstocks and energy cost advantages through the use of previously flared natural gas.

(d) Canada, Mexico, U.S.S.R., and China are expected to have a higher future share of world petrochemical production for the major building block petrochemicals and therefore a higher net share of the world's petrochemicals exports.

World	Figs. in % of world production capacity					
	Ethylene		Ammonia		Methanol	
	1980	1990	1980	1990	1980	1990
Canada	3	6	2	3	3	7
Mexico	1	2	2	4	1	4
U.S.S.R.	5	7	22	28	15	17
China	1	3	12	10	2	2
+ Saudi-Arabia Indonesia and Kuwait	1	4	2	3	3	6
TOTAL	11	22	40	48	24	36

(e) World trade in ethylene and its derivitives is expected to grow and increasingly involve exports from the new petrochemical producing nations to other nations particularly the traditional petrochemical developed ones.
Net Trade Balances for 1980 and 1990 for ethylene in terms of ethylene equivalents (in thousands of metric tons)

Area	1980	1990
United States	1,380	-1,280
Canada	215	-1,815
Mexico	-264	185
Other Western Hemisphere	-320	-640
Western Europe	800	1,480
Japan	275	-352
Middle East	375	1,245
Africa	-195	365
Asia	-905	-2,825
U.S.S.R.	-100	375
China	-120	-515
Eastern Europe	-75	-805

The table indicates that the United States and Japan could become net importers of ethylene and its derivatives by 1990 although they were net exporters in 1980. They could be joined by many nations in Western Europe as petrochemical industry rationalization takes place, even though Western Europe is currently a net exporter. Nations in the Middle East and Africa and probably Mexico and Canada would be the sources of most of the imports. However, Canada's national feedstock and energy pricing policies may limit future exports, and exports from Mexico may be limited if internal potential markets develop sufficiently fast to absorb future production.
Ethylene production capacity located in seven leading CERN's could approximately double between 1980 and 1990.

(f) Ammonia and its derivatives are expected to continue to be widely traded, and net exports from the U.S.S.R., Mexico, Trinidad, and the Middle East to the United States, Western Europe, and Japan could increase.

The following table lists net trade balances (in thousands of metric tons) for 1980 and 1990 for nitrogen.

Area	1980	1990
United States	675	-3,670
Canada	875	2,080
Mexico	450	2,540
Trinidad	460	985
Other Western Hemisphere	180	180
Western Europe	1,725	25
Japan	-230	- 685
Middle East	910	1,180
Africa	-1,275	-2,080
Asia	-1,860	2,450
U.S.S.R.	2,820	9,275
China	-1,635	-1,730
Eastern Europe	455	185

The table indicates that the United States and some Western European nations could become net importers of nitrogen in 1990 although they were net exporters in 1980. They could receive exports from many other nations, all of which have plans to enlarge current capacities to produce ammonia and its derivatives. Large capacity additions are expected in Canada, Mexico, Trinidad, the Middle East, Asia, and the U.S.S.R.

Future supply demand scenarios that do not indicate a potential world nitrogen surplus are difficult to construct. A balanced scenario can be constructed only if future production capacity is decreased by certain planned facilities not being built and/or certain current operating production capacity being closed, and/or future consumption growth rates being above those expected by most observers. Ammonia and its derivatives have been emphasized in the petrochemical industry development plans of most CERN's.

Operating production capacity has already been closed in the United States; 36 ammonia plants were reportedly closed during the period from 1977-82. Industry sources see the potential for this trend to continue as new overseas facilities come on stream and natural gas prices are decontrolled in the United States.

(g) The extent of future world trade in methanol could depend on whether methanol becomes a major energy source.

The following table lists net trade balances for 1980 and the 1990 base scenario for methanol (in thousands of metric tons).

Area	1980	1990
United States	40	120
Canada	210	1,485
Mexico	50	875
Other Western Hemisphere	-40	615
Western Europe	125	0
Japan	-100	-250
Middle East	150	1,025
Africa	150	670
Asia	-50	400
U.S.S.R.	200	2,000
China	-40	0
Eastern Europe	200	800

Methanol has traditionally been used as a solvent and as a feedstock for the manufacture of other chemicals. However, while these markets are expected to continue to increase, it is the fuel market that offers the greatest future potential.

The base scenario data above for 1990 do not include any appreciable use of methanol as a fuel.

A more stable world market based on the expanded use of methanol as a fuel would be limited to its use in low-level petrol blends and as a feedstock for the manufacture of petrol additives capable of increasing the octane level of the petrol to which they are added.

Widespread use of methanol as a direct fuel and/or a feedstock for the manufacture of petrol would necessitate additional world methanol capacity. It is probable that under such a scenario a large part of the additional methanol production would be based on coal

11. Solutions to the European Petrochemical Problem and Their Effect on the Structure of the Chemical Industry

The petrochemical problem is a worldwide one and is not just restricted to Europe. This is because of the international character of the Chemical Industry and the extent to which exports play a vital part in the profitability of its investments.
The U.S. industry considers that no one action or combination of actions can provide a remedy for present or possible future problems. This is equally true of the European situation or the Japanese position. Furthermore, there is no question of the industry being organised even in Europe let alone in global terms to a single solution by a single body.

Each individual Company in the end will have to make its own decisions taking into account its expertise and assets in each department whether it be in natural resources, R & D, Production or Marketing, or any combination of these factors. In this latter regard petrochemicals Companies belonging to oil companies may well react differently from the traditional chemical companies which have a much wider product line. The I.C.I./B.P. deal is a perfect example of this in which the combination of petrochemical manufacture with its chlorine manufacture makes it natural for I.C.I. to specialize in PVC and the lack of a chlorine base in B.P. for that firm to specialize in ethylene derivitives like polythene.
Similarly certain European companies, for example Bayer and the Swiss industry, have restricted their interest in petrochemicals basicly to the extent to which its products can be used internally for a wide range of highly specialized products which are much less affected - if at all - by the pressure on selling "commodity" products.

On the other hand whereas Dupont have bought the oil company "Conoco" to join a traditional chemical company to an oil company, some other U.S. oil based firms are abandoning the production of plastics and high volume primary petrochemicals. Other U.S. firms are planning to close their U.S. petrochemical facilities and to import their requirements from joint companies which they have made with CERN's (Conventional Energy Rich Nations) in overseas countries which have access to cheap feedstock and cheap energy prices. Such U.S. firms are joined in their approach to the problem by Japanese firms both of which groups see in such joint ventures improved profits by matching the cheap raw material and energy costs of the one party with the high level technical and marketing skills of the other. Furthermore, in such deals the experienced technical and marketing firm can take from the cheap raw material producer the petrochemical product at whatever

stage is jointly decided, upgrading it appropriately if necessary in the advanced Company's factories in U.S.A. or Japan.

Large scale and long term projects such as Dr. Armin Hammer's Occidental Petroleum Company's ill-fated deal with U.S.S.R. exchanging phosphoric acid from his U.S. plants for the export from U.S.S.R. of the ammonia from the Soviet plants newly built with Western technology, is another way of improving competitivity. The closure of out-dated U.S. ammonia plants naturally is the consequence of such a deal.

Saudi-Arabia is a leading exponent of the joint company approach. It has set up special machinery to carry it out in the form of the Saudi-Arabian Basic Industries Co-operation (SABIC) and the Saudi Industrial Development Fund (SIDF). Other OPEC CERN's have similar organisations. Partners have been found predominantly in U.S.A., Japan, and Taiwan.

It is natural for other companies to turn to greater specialization as a way of improving their position. This is not an easy choice for traditional manufacturers with a wider range of basic chemical processes and products. At the extreme point "fine chemicals" is a highly specialized business demanding a very different form of management and marketing than the "commodity" business.

Some traditional basic firms may decide to withdraw totally from petrochemicals, leaving this to the oil companies and more heavily committed petrochemical firms.

Companies within the chemical industry have always been willing to accept suitable divisions in the fields in which they operate, according to the nature of their special skills in processes and products. Some therefore could improve their prospects by certain limitations of their ranges and increased purchasing from others.

A further type of solution to the problem is for some companies who are exceptionally strong in certain Research and Development fields to exploit completely new processing techniques like fermentation processes and biotechnology, etc.

Whilst in countries dominated by private enterprise companies the nature of competition is between individual companies, in those dominated by State Monopolies it is between countries. This is a particular danger in the petrochemical industry where the raw material cost is such a high proportion of the final price of a product.

However the State can intervene in many less obvious and more subtle ways, by price controls on raw materials or energy, in part-restrictions, State aids, local content legislation, export credits and trade mechanisms generally.

The Japanese industry indicates a particular way in which States can intervene for their own benefit but which causes distortion of the world market. The Japanese petrochemical industry is losing its competitivity because it is based on either imported naphtha feedstocks or made from imported petroleum. In the past the Government had permitted only the petroleum industry to import crude oil or petroleum based products such as naphtha. A domestic naphtha price above world level was maintained by law. In 1982 MITI - a government agency-laid down guide lines to change this. Petrochemical companies may now freely import and beginning in 1984 import duties on naphtha will be removed.

MITI also established at the end of 1982 "scrap ratios" for existing plants for ethylene and many other petrochemicals to facilitate their closure and removal. Production cartels were established for limited periods - 6 months from October 1982 to March 1983 for ethylene for example. Japanese cartels have previously existed for PVC and Low Density polythene, to control capacity utilisation and to prevent over-production.

The European Community chemical industry faces a unique problem. It manufacturers and trades within a home market composed of 10 nations living within a single tariff barrier but whose political, legislative, fiscal, economic and labour systems all differ. The effect of this on currency parity values and on rates of growth, inflation, and on interest rates has a very considerable effect on the basic costs of manufacturing products in different Member States. To overcome the problem of each Member State having a different currency, the chemical industry sells its goods within the EEC normally in DeutscheMark or in local currencies fixed to the DM. Whilst this helps to provide some market uniformity of price it still leaves costs on a varying basis.

Of more direct concern to the European chemical industry in solving its petrochemical problems and undertaking any other form of necessary restructuring, is the different attitudes of Member States' Governments to Industrial Policy. In France the heavy chemical industry is dominated by State Corporations and in 1982 several major companies were nationalized. The intention of the Government was stated to be the improvement of the competitiveness of the French chemical industry. The nationalized companies have been divided into three groups each

of which is expected to concentrate on improvements within their mutually exclusive and arbitrarily defined product sectors.
Their Chief Executives consider that they have been given a free hand to take what steps they believe to be necessary to achieve their objectives. The test will come when the needs of a product group demands the closure of a factory in a region where there may already be very high employment in, for example, the mining or textile industry.
The Italian Government now controls a very large part of that country's chemical industry. In the past its actions in supporting the building of enormous synthetic fibres plants in specially aided areas when the synthetic fibres business within the Community and throughout the world was already in great difficulties so that the major companies in other Member States were closing many of their plants, naturally gives rise to concern in regard to the problems of the petrochemical industry.
The Italian Government's present action in rationalizing their chemical industry by plant transfer between two major companies, is intended to eliminate the duplication of production facilities and excessive competitive marketing. The scope of the Italian Government's action reaches from primary and secondary chemical products to include speciality and fine chemicals. To this extent the objective may be a worthy one which private enterprise might succeed in attaining to a lesser extent by its own efforts. The fear - particularly within a Common Market - is the extent to which the Italian Government may be willing to further its plans to facilitate the success of the rationalization and to improve that industry's competitivity in the EEC and world markets by the continued grant of State aids.

These two examples which could be enlarged upon by the differences existing in other Member States, indicate that any form of direct European Community action would be most difficult to conceive and even more difficult to apply successfully. Hence the most suitable direct action would seem to lie with the chemical manufacturers themselves.
An objection to the part played by the European Commission in the case of the EEC synthetic fibres crisis has been that its well meant actions in fact protected the industry from the national attrition which market forces would have exerted on Companies' balance sheets and which would thus have forced a more complete and quicker solution to the problem.

The nature of the political problem is well understood, especially as it affects employment in particular regions of the Community. However the size and diversity of chemical companies already builds in a factor which enables them to continue in bad conditions which would destroy some other industries and may be longer than is economically desirable. The tradition of the chemical industry for having maintained excellent labour relations with its workers gives confidence that it can achieve major changes of this type with the minimum of hardship.

There therefore appears to be no case for D.G.III to be involved in 'crisis cartels' or Community schemes of imposed rationalization. There is however a most important role for D.G.IV to play in regard to the Community's Competition Policy.

Firstly the full use of its extensive powers in regard to the use of State aids by Member States must be employed. If not, the size and the nature of the distortions could delay the whole resolution of the industry's difficulties. It could expose the industry to a long period of costly utilisation of excess capacity, debilitating it against the natural advantages enjoyed by many CERN's. These nations will take a natural place in the market in any case, either on their own account or even worse in combination with Europe's American and Japanese competitors.

Secondly, D.G.IV must be satisfied that any restructuring of the trade meets the requirements of the Competition Policy in regard to concentrations and mergers and to dominant positions. In principle there should be no danger of this and it is in the positive rather than the negative sense that the proposition is made. National Competition Authorities give their approval to such rearrangements between companies, certainly those established in a single Member State. Mergers between companies established in different Member States is still a very difficult proposition because of the different management and legislative traditions involved and because of the inherent size problem.

Secrecy is naturally a vital element of such restructuring arrangements because of stock exchange values, etc. Delay can therefore be dangerous and may destroy a very necessary change. A means therefore of handling this problem and its dissemination to interested parties is most important.

Finally, D.G.IV - as D.G.III - must consider the problem in its international context as well as in its purely European one.

Numerous proposals exist within the European chemical industry itself such as the Gatti/Grenier proposals of the trade, and the Solvay/Mallat individual proposals. It is not the purpose of the writer to comment on them, other than to say that they are worthy attempts of a complex European chemical trade to identify and analyise its problems in considerable detail and to find ways of solving them. It is much to be complimented that the trade and the Commission has entered into such complete confidential discussions one with another. One danger of the proposals may be that they may apply a lowest denominator factor which exacerbates the problem more than is desirable. They may call for a degree of unanimity which is greater than may in the event be attainable and the doubt will always exist in such wide proposals that a plant which it has been agreed should be closed has really been removed and not just put into mothballs.

On the other hand the number of I.C.I./B.P. deals which can be arranged may not be enough or may not take place quickly enough to avoid unnecessary further suffering but it must be expected that the managements of both Public and Nationalized Chemical Companies will respond to their balance sheet responsibilities.

Finally, this is a major turning point in the chemical industries' history - both for the European as for all the chemical companies of all other nations. A new structure must be found which can be approved by the companies themselves, which gets the blessing of the European Commission and the National Competition Authorities and minimises the hardship to employees at all levels. It must be a European rather than a National reconstruction but it must be achieved in the international context into which it has to fit.

ANNEX

MOTION FOR A RESOLUTION
DOCUMENT 1-174/82
tabled by Mrs LIZIN

pursuant to Rule 47 of the Rules of Procedure

on the situation in the European petrochemicals industry

The European Parliament,

- having regard to the disastrous turn of events in the European petrochemicals industry,

- aware of the risks facing the weakest in a division of the markets between producers outside European control,

1. Believes that specific action must be taken promptly, on the basis of a report by the European Parliament;

2. Calls upon the Commission to initiate without delay high-level consultations with representatives of the workers in the industry;

3. Instructs its President to forward this resolution to the appropriate authorities.