

„GAPS IN TECHNOLOGY: PLASTICS“

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PREFACE AND CONCLUSIONS

A.) PREFACE

The Ministers responsible for science and technology in the OECD member states and Yugoslavia, at their second meeting in January 1966, recommended that the OECD should "be asked to strengthen its work and links between science and technology and, in particular, on the following subjects:

- Technologically advanced industrial sectors, whose economic development requires relatively large-scale research and development efforts, or may be influenced significantly by government-financed research and development;
- The effects of foreign investment on the development of national scientific and technological potential;
- The methods being used by Member governments to identify economic and technological sectors where it would be appropriate to encourage some degree of concentration of both industrial and governmental research and development effort;

- The experience of Member governments in the use of specific measures to stimulate technical innovation; such as civil development contracts, government procurement, technical information and advisory services for industry.”

The OECD Council referred the matter to the Committee for Science Policy, which established a special Working Group on Gaps in Technology between Member countries, under the Chairmanship of Dr. J. Spaey of Belgium, to study the problem. One of its principal tasks was to initiate studies on the problem of technological gaps in specific industrial areas.

It was decided to study nine sectors, which were considered representative of different types of industry. Six sector studies were carried out by the Committee for Science Policy: electronic components, electronic computers, non-ferrous metals, pharmaceuticals, plastics, scientific instruments. Three sector studies were carried out by the Committee for Industry: iron and steel, machine tools and man-made fibres.

In the case of the studies carried out under the responsibility of the Committee for Science Policy, including the one which is the subject of this Report, it was decided that a Group of Experts should prepare a report on each sector. These Groups of Experts were composed of national rapporteurs, nominated by the countries that wished to participate in the work of the sector concerned, and experts from industry and the universities.

A questionnaire was prepared to cover all sectors and sent to each of the participating countries, and the national rapporteurs collected and co-ordinated national replies. The data submitted by Member countries were supplemented by visits to firms, discussions with experts, and the analysis of available statistical data by the OECD Secretariat. On the basis of this information, the Secretariat prepared a first draft of a report, which was thoroughly discussed by the responsible Group of Experts, and finally agreed by the Group of Experts for submission to the Ministers of Science.

At their Third Meeting, in March 1968, the Ministers of Science recommended that the reports of the Groups of Experts should be published. It should be noted, however, that in the context of the constant and rapid evolution of industry, each report can only be considered as a preliminary assessment of a particular sector at a particular time.

In addition to the vast amount of information on the scientific, industrial and economic aspects of each sector that the Groups of Experts have been able to bring together, these studies have also been of value in the interest they have raised in scientific, industrial and academic circles.

The Council of the OECD has decided that this report should be published under the responsibility of the Group of Experts on the Plastics sector.

The Chairman of the Group was Mr. F. Frank, Ministerialdirigent, Bundesministerium für Wirtschaft, Bonn. Professor Dr. O. Horn, Farbwerke Höchst AG, Frankfurt-Höchst, acted as Vice-Chairman. Sector Rapporteurs from the following Member Countries have participated in the Group of Experts: Austria, Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, the

United Kingdom and the United States. In addition 11 Experts from OECD Countries have contributed to the work of the Expert group.

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B.) CONCLUSIONS

I.) MAIN CHARACTERISTICS OF THE SECTOR AND EVIDENCE OF THE EXISTENCE OF GAPS

The features of the plastics sector are of basic importance for the appreciation of the problem of technological gaps. In the first place, scale of production is critical. Some European countries were considered by the Group of Experts to have failed to attain the necessary minimum scale of production, which differs according to the type of product. This trend towards increased size of plant is led by the United States.

The second feature is that the plastics industry also depends largely on large-scale research and development. A substantial amount of research is being done, and in the view of the Group will continue to be done, in attempts to re-compose already existing plastics to develop new fields of application.

Against this background, the Group is of the opinion that no general technological or production gap exists between Europe and the United States in the field of bulk plastics. This is due to the fact that several major countries, including Germany, Italy, Japan, The United Kingdom and the United States, have strong technological and market positions in this field. The technology is largely international, and there is a rapid and effective circulation of basic scientific information between countries.

However, in the field of specialised plastics the United States have a definite lead over Europe, this being due partly to government-sponsored research projects on United States space and defence programmes. Plastics produced under these circumstances have up to now had only limited application and some have not been exploited commercially. Since no comparable research projects are being performed in Europe, there exists a definite gap in technology between the United States and European countries which, although now not commercially important, might at a later stage have significant market implications. To give a more definite assessment of the significance of this, it would be necessary to arrive at a judgement on whether these plastic materials will become mass products during the next decade.

There is no definite answer to this question, but the Group of Experts is of the view that no one of the newer plastics is likely to challenge the importance in tonnage or turnover of any of the existing large tonnage materials. As a group, the newer plastics will perhaps become very significant in terms of profitability. However, continuing significant metamorphoses are to be expected in the major existing families. Copolymerizing, blending, grafting and filling modifications are arriving with ever-increasing scientific commercial effect. This activity is distributed more or less

uniformly among the major plastics countries, but here important quantitative gaps between national plastics industries could open up.

II.) FURTHER DISPARITIES WHICH COULD LEAD TO GAPS IN THE FUTURE

The Group of Experts examined other disparities of an economic character which could significantly affect the position in the future.

A.) Profitability

It was noted that there are differences in profitability between the United States and Europe. These disparities are to a large degree due to:

(1) Market size

(a) Natural market barriers

Market size is one of the dominant factors as the size of an enterprise will depend on it. The total potential market is smaller in Europe due to a lower degree of industrialisation and to a weaker popular demand for plastic materials.

(b) Tariff barriers

Tariff barriers between EFTA and EEC as well as other European countries were found to be considerable, i.e. 20% or more. Many of the experts felt that if the American Selling price is not abolished, the 20% reduction in the Kennedy round is likely to be insufficient, and the development of larger markets would be retarded. Moreover, the disparity between the 40% plus Customs duties levied on Plastics by the United States, as compared with the 20% or less prevalent in other countries, tends to stress the American market position.

(c) Non-tariff barriers

In addition, certain non-tariff barriers exist such as differences in taxation, differences in patent systems, differences in regulations and standards (e.g. building and fire regulations, sanitary control and transport).

(2) Certain European labour laws and regulations

(3) Lower capital costs in the United States

(4) Larger differences between raw material prices and selling prices in the United States.

(5) More advanced managerial approach in the United States to, for instance: Research and Development investment planning and marketing.

B. Consumption Patterns

The willingness to accept new plastics products has an important impact on the consumption pattern in this industry, and pronounced differences have been found in the propensity of plastics consumption in their various fields of application.