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REPORT

drawn up on behalf of the Committee on Energy
and Research

on basic technological research in the automobile
industry

Rapporteur: Mr P. VERONESI

At its sitting of 16 November 1981 the European Parliament referred the motion for a resolution tabled by Mr BARBAGLI and others (Doc. 1-695/81) pursuant to Rule 47 of the Rules of Procedure, to the Committee on Energy and Research as the committee responsible and to the Committee on Economic and Monetary Affairs and the Committee on Transport for their opinions.

At its meeting of 17 March 1982 the Committee on Energy and Research decided to draw up a report and appointed Mr P. VERONESI rapporteur.

The committee considered the draft report at its meetings of 26 November 1982, 15 March 1983 and 20 April 1983.

At the last meeting it adopted the motion for a resolution unanimously.

The following took part in the vote: Mr Gallagher, acting chairman; Mr Ippolito, vice-chairman; Mr Veronesi, rapporteur; Mr Bombard (deputizing for Mr Adam), Mr Flanagan, Mr Fuchs, Mr Gautier, Mr Halligan, Mr Hoffman (deputizing for Mr Müller-Hermann), Mr Linkhor, Mr Moreland, Mr Normanton, Mr Pedini, Mr Petersen, Mr Purvis, Mr Rinsche, Mr Rogers (deputizing for Mrs Lizin), Mr Sälzer, Mr Travaglini (deputizing for Mr Sassano) and Mrs Viehoff (deputizing for Mr Markopoulos).

The Committee on Economic and Monetary Affairs decided not to deliver an opinion. The opinion of the Committee on Transport is attached.

The report was tabled on 25 April 1983.

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A

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

MOTION FOR A RESOLUTION

on basic technological research in the automobile industry

The European Parliament,

- having regard to the motion for a resolution by Mr BARBAGLI and others (Doc. 1-695/81),
- having regard to the motion for a resolution by Mr COTTRELL and others (Doc. 1-1042/81),
- having regard to the answer given by Vice-President DAVIGNON on behalf of the Commission (26 February 1982) to Written Question No. 1494/81 of 11 December 1981 by Mr MOREAU to the Commission of the European Communities,
- having regard to the oral question with debate by Mr BERKHOUWER and others (Doc. 1-149/82) of 21 April 1982,
- having regard to the motion for a resolution by Mr ALMIRANTE and others (Doc. 1-196/82),
- having regard to the motion for a resolution by Mr TRAVAGLINI and others (Doc. 1-224/81),
- having regard to the UNICE memorandum for a Community industrial strategy submitted on 15 September 1982 to the Vice-Presidents of the Commission, Mr ORTOLI and Mr DAVIGNON,
- having regard to its resolution submitted by the Committee on Energy and Research and annexed to the report by Mr LINKOHR (Doc. 1-654/82)¹,
- having regard to the report of the Committee on Energy and Research (Doc. 1-/82) and the opinion of the Committee on Transport (Doc. 1-235/83),

¹ OJ No. C 334, 20.12.1982, p. 94

- A - having regard to
- the outstanding economic and social significance of the automobile industry in the European Community,
 - the new challenges which the European industry must meet, particularly the need to develop more efficient vehicles while complying with stringent requirements governing safety, the emission of exhaust fumes and noise prevention,
 - the growing international competition from producers in areas outside Europe, Japan in particular, who for various reasons have appreciably lower production costs,
 - the need for the European automobile industry to maintain and improve its competitiveness not only on Community markets but also on export markets,
 - the low average profit levels of European producers caused by the economic recession and the keen competition from outside the Community,
 - the prospect of alarming social strains if the process of job shedding were to become more widespread.
- B - bearing in mind that
- to regain, retain and expand the market, the efforts to renew products and production processes must be continued and increased with a view to improving quality and efficiency and reducing costs
 - it is vital to prevent an erosion of Europe's technological lead in this sector

Basic research and development

1. Fully agrees with the widely held view that the international competitiveness of the European automobile industry must be maintained and constantly improved by means of technological progress;
2. Is convinced that this technological development can be achieved only by making use of new basic scientific knowledge which is the result of specific research projects;

3. Believes that the governments of Member States should create the fiscal conditions and harmonized legal requirements in which industry can respond to the principal objectives with which automobiles must comply (e.g. energy savings, environmental protection, product liability, health and safety at work) if they are to be competitive on world markets;
4. Believes that firms should define areas of basic research appropriate to their product requirements;
5. Requests concerted action by the Community in respect of research programmes undertaken in government research establishments in order to avoid unnecessary duplication;
6. Considers that, in this effort to improve product quality and with regard to basic research in particular, the European industries operating in the sector must work in close cooperation;
7. Believes that cooperation of this kind would not undermine the rules of the market and of free competition, since the basic research would by definition and content be a pre-industrial activity;
8. Is of the opinion that the national programmes of the Member States could be coordinated to good effect at European level and that it would be possible to encourage a profitable exchange of information on the results of these programmes;
9. Takes the view that, precisely because of its inherently pre-industrial nature, basic research could be conducted on the basis of cooperation between public research institutes (universities, scientific institutes, JRC, etc.,) and industrial laboratories, while the utilization of the results for the purposes of technological development should remain the sole prerogative of industrial undertakings;
10. Urges the involvement of small and medium-sized enterprises, particularly the component manufacturers, in the research programmes and the exploitation of the results;

Financing

11. Is convinced that there exists within the Community both the scientific, managerial and financial potential required to establish coordinated basic research in the automobile industry, and the general conditions needed for its success;
12. Considers that Community support may be given to basic research in the automobile industry where
 - (a) Community funds supplement, rather than replace, national budget expenditure in this field;
 - (b) the automobile industry itself puts sufficient effort into research;
 - (c) cooperation between the European automobile undertakings can be improved as a result;
13. Calls, therefore, initially for concerted action by the Community to promote cooperation in the European automobile industry in the field of basic research and expects the European automobile undertakings to put forward proposals for such joint projects;
14. Urges that the Commission's activities, which should take the form of indirect action, should be
 - (a) based on a realistic programme which is consistent with the objectives of general interest,
 - (b) accompanied by a strict budget estimate appropriate to the proposed objectives;
15. Claims the right to precise information on the commitments entered into by the Community and on their results;
16. Endorses, in particular, the spirit and letter of paragraph 6 of the resolution by Mr BARBAGLI and others;
17. Acknowledges that as few bureaucratic obstacles as possible must be placed in the way of any measures undertaken but that the rules on correct and transparent administrative procedures must be observed;

Political aspects

18. While supporting Community action and favouring cooperation between the various European industries, cannot conceal, in relation also to this particular case, the many uncertainties which similar past experiments in other sectors of production have raised, as a result of
 - (a) the failure to interpret in a uniform manner the concept of the 'pre-industrial phase',
 - (b) the lack of clear arrangements and rules for transferring the basic knowledge acquired to the technological development stage,
 - (c) the constant danger of divergencies in national or business interests between the various partners;

19. Calls once again on the community institutions to reflect critically on these aspects so that they may derive from past experience useful pointers for the definition of procedures and rules of conduct which will facilitate supranational Community cooperation;

20. Notes that Japanese and US automotive associates operating in the Community have access to technologies in the Community, and calls on the Commission to consult the industry in order to propose appropriate measures, if required in the industry's interest, to ensure a two-way flow in new automotive technologies between the Community, Japan and USA;

21. Urges, finally, the Community to take action to
 - (a) increase the cultural and scientific value of specific basic research,
 - (b) encourage the definition and implementation of closer links between industry and university research centres;

22. Instructs its President to forward this resolution to the Council and Commission of the European Communities.

EXPLANATORY STATEMENTI - INTRODUCTION

1. This report will concentrate on the specific and extremely important field of basic scientific research on the technology of the automobile industry

The rapporteur wishes, as a preliminary, to point out a difference between the description of the subject of this report, underlined above, and that of the motion for a resolution by Mr BARBAGLI and others from which the report derives.

The motion for a resolution refers to basic technological research in the automobile industry.

2. Although both these descriptions make quite clear the proposed objective and desired results, the rapporteur considers his description to be more appropriate and more precise.

This is not the place to dwell further on a semantic matter of this kind, although it is a problem which could usefully be investigated in greater depth, provided there was no unnecessary splitting of hairs.

The rapporteur's point of view will perhaps become clearer as the report develops. The following scheme may, however, be used as a reference:

- (a) Basic (or fundamental) research may be conducted in all scientific laboratories and makes use of the widest range of investigation techniques and methods, the approach to the problems varying in accordance with the different viewpoints. However, it is well known that, at least in Europe, such research is conducted primarily in universities and public research institutes.

When basic research is 'directed' towards particular areas by a particular 'client', it is described as 'specific'.

Long experience has shown that it is difficult to involve the universities ('temples of free research' or 'ivory towers') in specific basic research. The pressing requirements of modern industry and of

highly developed societies have lain siege to the 'university citadels'. This question will be taken up again later in more concrete and less figurative terms. What can be stated now is that the universities and public research institutes must be urged to commit themselves to specific basic research.

(b) The natural and irreplaceable location of research into technological development is in the centres of production, that is, in industry. This is where technology is created.

3. The scheme and distinctions indicated above may help to clarify the meaning of the term 'pre-industrial', which is intended to describe European cooperation in the field of basic research into the technological development - as regards products and production methods - of the automobile industry. It therefore follows that the task assigned to our committee by the motion for a resolution by Mr BARBAGLI and others is to assess whether it is in principle desirable for the Community to contribute, in cooperation with the industries concerned, to a basic research plan directed specifically at the technological development of the automobile industry.

The report will therefore follow the plan shown on the contents page and will include a brief description of the present situation in the automobile industry, a section devoted specifically to scientific research in this sector, a few relevant political considerations and a conclusion.

II - BRIEF REVIEW OF THE AUTOMOBILE INDUSTRY

4. It is well known that the automobile industry (in Europe and the world) is a production sector of major economic importance on account of the financial movements it involves, the size and wide distribution of the markets on which it operates and its social implications in terms of employment in the industry itself and, indirectly, in the mass of separate and widespread related industries.

The automobile sector now plays such a substantial and important role in modern industrial society that, in addition to those directly responsible for the economic management - private or public - of the undertakings, it now involves the governments of Europe and the possibility of state intervention.

5. There are two aspects to the severe world economic crisis, as reflected in the automobile industry:

(a) the stagnation or general decline in the market, with a consequent reduction in the average levels of production in the three principal (USA, EEC, Japan), which does not, however, effect all the undertakings in the sector to the same extent.

(b) the fierce competition on domestic and foreign markets.

6 At the end of 1980 and the beginning of 1981 Parliament discussed in depth the difficult and arduous conflict with the seasoned USA and Japanese industries, on the basis of the detailed analytical report by Mr BONACCINI. The resolution adopted on 13 January 1981 at the end of this debate sets out a number of guidelines to be followed at Community level with a view to restoring the competitive position of the European industries and consolidating their presence on the world markets.

Following this debate the various political groups in the European Parliament submitted a large number of motions for resolutions calling for the subject to be discussed further. The FILIPPI resolution, debated at the first October part-session this year, is the most recent to which reference should be made.

This report does not intend, even briefly, to cover again all the relevant arguments on the subject developed in previous parliamentary debates, since this would involve the futile repetition of analyses and points that are already extremely familiar. In substance, then, the rapporteur believes that all the relevant problems have been adequately investigated and also that a consistently realistic body of information has been established.

It should also be borne in mind that, further to the commitments made by Parliament at the end of the debate on the BONACCINI report in January 1981, an updated study of the situation is being carried out by the Committee on Economic and Monetary Affairs, on the basis of a document again to be drawn up by Mr BONACCINI.

7. As far as the general world situation in the car industry is concerned, the production figures for the three most important production areas for the five-year period 1977-1981 (statistics by ANFIA) are significant:

- USA; car production has fallen at an increasingly fast rate from 9,214,000 units in 1977 to 6,252,000 in 1981;
- Europe; following a stagnation in production between 1977 and 1979, when the figure was 11,341,000 cars, in 1980 and 1981 there was a steady decline to 8,696,000 cars;
- Japan; at a virtually steady or slightly increasing rate of growth production increased from fewer than 6,000,000 units in 1977 to 7,038,000 in 1980, while in 1981 the total number of cars produced was 6,974,000.

The production figures for 1982 and the corresponding percentage variations by comparison with 1981 are as follows:

- USA; 5,075,000 (-18.8%)
- EEC; 9,060,000 (+ 4.2%)
- Japan; 6,887,000 (-1.2%)

The monthly statistics so far available for 1983 seem to indicate that demand for cars is probably about to climb again from the bottom of the cycle of decline which began after the unprecedented record sales of a few years ago (the 1982 figures for Europe are significant here).

However, there is still no clear indication that the decline in the demand for commercial, and particularly heavy, vehicles is likely to end in the near future.

In recent years, the EEC and USA car industries have encountered particular difficulties not only because of stagnant and falling demand, but also as a result of fierce and aggressive competition from Japan (which has now, however, begun to feel the effects of recession).

A consequent effect on the motor industry over the same period has been a contraction of jobs in both the production and component sectors. Dismissals, early retirement and lay-offs have led to a considerable contraction of the work force employed in the car industry, although not always for the same reasons or on the same scale. Indeed, there has been an increase in employment in some Community car industries. Nevertheless, it seems clear that expanding the market and facing up to competition will continue to be key objectives in ensuring the proper protection of the Community's industries and the strategic measures that this requires.

8. This combination of competition from outside and a slack market has prompted two 'therapeutic' trends, which are short-term, very traditional, of doubtful effectiveness and clearly incompatible with all the canons of the free market:

- the first is the constant temptation to protectionism supported, for example, by the American producers through Mr WINDECKER, who is responsible for the study and research section of Ford (October 1982). Also significant is the legislative proposal (bill HA 1234) on 'domestic content', submitted to the US Congress by R. OTTINGER. The FILIPPI report also contained a similar proposal in attenuated form, restricting the application to a specific period, although its content was substantially modified by the final resolution adopted by Parliament.
- the second involves the sinking of massive support funds in the car sector, in order to protect employment, by credit institutions backed up by guarantees from the countries concerned (United Kingdom, France, FRG, USA, Japan and Italy).

This sector is of such importance that no government, even those run on strictly free-trade principles, has succeeded in evading the responsibility to take direct action. The problems facing Chrysler in the USA and the British Leyland affair have been tackled by means of substantial subsidies from public money, while in Japan there is a kind of two-way link between the car industry and government policy.

9. The proposals for strategic measures at Community level are sounder and more rational.

The bulk of these measures, which are reasonably considered to be the most suitable means of reviving the European car industry, are contained in the BONACCINI report and summarized in the accompanying resolution.

Further proposals followed.

(a) The fourth international automobile conference, organized by the Financial Times, was held in Geneva in March 1982 and attended by the major European and Japanese manufacturers (notable absentees, however, were the US firms Ford and General Motors). Taking as a starting point the age-old fact that large-scale economies have always been a key factor in the car industry and that the development of new products is now vastly expensive, proposals were again put forward at the conference, this time by those directly involved in production, for cooperation between the various manufacturers.

The fundamental point was that the car industry is now at a crossroads where it must choose between two policies :

- either conflict within the international oligopoly, which inevitably means strict protectionist measures,
- or the conclusion of supranational agreements.

(b) The symposium held by the Socialist Group of the European Parliament with the European trade unions in the metallurgical and mechanical industry also called for a global industrial strategy at European level, in which the car industry is of major importance. Recognizing that Community action could make an effective contribution to the efforts to modernize the car sector, the broad guidelines for a suitable strategy were laid down.

(c) Mr FRASER, Director of the SMMT (Society of Motor Manufacturers and Traders) in the United Kingdom and chairman of the EEC Coordinating Committee for the Automobile Industry, expressed quite different views on 22 April in Berlin at the European forum on the future of the car. The conference was organized by the Berlin Wissenschaftszentrum as part of the world programme concerning the future of the automobile industry, which was drawn up on the initiative of the MIT (Massachusetts Institute of Technology). Commenting on the MIT study, Mr FRASER stated that the car industry endorsed the Institute's aim of arousing political leaders to an awareness of current trends in the industry, its problems and the conditions under which it operates. In this sense such academic studies can be of use, provided they reflect the facts as they are and do not attempt to put forward political views. The industry does not want specific problems to be unjustifiably highlighted, nor does it want such studies to pro-

duce unwarranted pessimism, such as the extremely widespread fear of a substantial reduction in jobs as a result of the introduction of new technologies. 'It is in general impossible to draw up valid plans for all car manufacturers in the European Community and it is not for the governments to develop a strategy for the industry. Governments should create suitable conditions in which the industry can carry out regular adjustments with a view to improving its competitive position.'

Mr FRASER went on to point out that the industry had throughout its history pursued a process of adjustment and there was no reason to believe that future adjustments would be more costly than in the past. 'Studies will not add a great deal to this process. The pressure of competition and the economic situation require the manufacturers to introduce changes at a much faster rate than that at which studies can be produced.'

This summary is taken from a newspaper article and may not faithfully reflect Mr FRASER's views. The rapporteur nevertheless has reason to believe that these are personal views which are not shared by a substantial section of the industry in Europe.

10. Cooperation and agreements on joint production have been the keynotes of a strategy which has been adopted by virtually all the major car manufacturers since the years when the first symptoms of structural crisis in the sector began to emerge. Efforts have been made to establish links at both transnational and national level.

(a) at transnational level

- Volkswagen has concluded an agreement with Nissan and a research and production agreement with Renault
- in 1979 Renault acquired a proportion of the American Motors holdings and it has shares in Volvo
- in 1979 British Leyland contracted a business 'marriage' with Honda
- the major American industries do not shrink from business deals with their feared Japanese competitors; Chrysler holds shares in Mitsubishi and has an agreement for one million engines a year, while Ford has a substantial holding in Toyo Kogyo and General Motors in Isuzi, together with an agreement with Toyota for the production of 200,000 cars in the USA

- the Italian manufacturers have concluded agreements such as the Alfa-Nissan, Fiat-Peugeot and Innocenti-Daihatsu agreements

(b) At national level the following are of importance

- in Italy, the cooperation agreements between Fiat and Alfa
- in France, the merger of Peugeot with Citroen and Talbot
- in the FRG, the rescue and merger operations guaranteed directly by strong regional governments, for example in Bavaria for BMW and in Baden-Württemberg for Audi NSU.

11. However, recent events in the sector suggest that the agreements between European undertakings are precarious, while those between undertakings within the same country are becoming increasingly well established.

The simple customs union, which according to the political advocates of the agreement and the theorists who believed in its validity, should have led to major economies of scale through the integration of European undertakings, has not succeeded in achieving the proposed objectives. The measures taken by the EEC have formally united the markets but not the undertakings. Someone has written that 'the European automobile is still in the pits'. It seems that efforts to establish production at European level have been abandoned and that the opposing tendency, to restrict production to national level, is prevailing. A reference to this situation was made in the speech given recently by the Vice-President of Fiat in Como before the Committee on External Economic Relations of the European Parliament, which was meeting to discuss the problems facing the automobile industry in the Community. Having asserted 'that the European automobile industry has the potential to retain the supremacy as regards innovation which marked its origins' he added that 'cooperation must be built on clearly defined foundations with respect for mutual interests and in accordance with an approach which explicitly maintains, defends and strengthens the individual industrial systems'. He requested the European Community as soon as possible to find the will and the means to implement an industrial policy which will facilitate the achievement of this objective.

12. To conclude this general introduction to the specific matters brought to the attention of the Committee on Energy and Research, the rapporteur feels that two points may be made to summarise the situation.

- (a) Although the European and world car industry is caught in the vice of the more widespread economic crisis affecting the entire world, it is attempting to find ways of emerging from the trough of depression in which it finds itself. This process is taking place amid uncertainty as regards direction and prospects and under the shadow of many unknown factors and of major and alarming social risks: some positive signs of recovery do, however, seem to be emerging.

This problem is a constant concern of governments, managing directors and trade union organizations, the latter being legitimately and consistently committed to defend employment and jobs. Drastic and unilateral solutions which disregarded the consequences and implications of the measures adopted on the structure of society could have disastrous destabilizing effects on an unforeseeable scale.

- (b) Although measures to establish effective cooperation between undertakings at European level are proving difficult to implement, there is one aspect of the strategy for revival on which all those concerned are agreed.

It is generally believed, as explicitly stated in all bodies and at all the numerous conventions devoted to the crisis in the car industry, that one of the most reliable and effective, though perhaps not the only means of returning to growth is technological innovation at the level both of products and of production processes.

It is therefore essential to encourage specific scientific research on a massive scale, within which fruitful international cooperation would be feasible. Precisely for this purpose the six largest industries in the sector have set up a Joint Research Committee (JRC) responsible for investigating the strategic research areas suitable for joint action and commitment.

The third part of the explanatory statement is devoted to this subject.

III - TOWARDS BASIC RESEARCH SPECIFICALLY RELATED TO THE AUTOMOBILE INDUSTRY

1 - General

13. It will be remembered that the BONACCINI report stressed this aspect and felt that technological progress had a major role to play in the renewal and defence of European industries. The relevant basic arguments were appropriately recalled in the motion for a resolution tabled by Mr BARBAGLI and others.

This resolution also makes a valid reference to all the preceding documents

which considered and analysed the question of basic research specifically related to technological development for the automobile industry.

14. The motion for a resolution under consideration already has a formal structure and its contents and practical indications amply suffice as the basis for a parliamentary opinion. Our political body, the Committee on Energy and Research, could use the information provided to draw up its assessment of this subject. The committee could even merely have been asked to vote on the resolution.

It is not for us to identify and analyse the scientific topics to which the research should be devoted. Nor is it for the Commission to undertake such a task. The identification of the problems and any proposals must come from the industries concerned within the context of a series of general objectives which should in this case, be drawn up by the Commission.

15. These objectives have to a large extent been determined by the practical conditions in which the sector operates; some of them are listed below:
- because of the energy crisis it is essential to make energy savings and to use alternative fuels
 - the protection of the external and working environment requires production processes and products capable of reducing pollution
 - the scarcity of traditional raw materials and the need to reduce the weight of vehicles necessitate basic studies into new substitute materials for vehicle construction
 - the widespread use of motor vehicles, which has not been met by adequate adjustments to transport infrastructures, means that particular care must be devoted to vehicle safety and reliability
 - competition on the world markets is arousing particular interest in robots and computerization as a means of cutting production costs and increasing productivity
 - to realize the production capacity potential, a serious study must be made of measures, including scientific research measures, designed to protect employment and create new job opportunities.
16. The above remarks clearly reveal the importance of the supply-demand ratio in relation to scientific research for industrial activities in general and the automobile industry in particular. It may not be easy, but it is absolutely essential to discover and develop clear and efficient means of defining this ratio accurately. These means will not necessarily be identical for

every type of production (consumer goods, instruments, services). The protagonists in this investigation are producers, consumers, civil and political institutions and research workers. Their relative weight varies but it is the interaction between them which produces the supply-demand ratio.

The specific case in question seems to follow this pattern. Faced by difficulties on the market (consumers) and by social and environmental problems (civil and political institutions), the car manufacturers (producers) are putting forward specific ideas for strategic research into selected topics (research workers).

2 - Examples of research topics

17. Having made these preliminary remarks the rapporteur does not feel required to define in depth the specific scientific areas in which action should be taken - even if he were qualified to do so, which is not the case. His task should be to provide a brief summary review of the areas in which basic research in the automobile sector is most needed.

This digression is necessary in order to define in practical terms the 'basic' nature of the possible research topics, their strategic connotations and their fundamental role as a 'pre-industrial' activity.

For this purpose the rapporteur will refer to a number of statements on the automobile industry made at the Convention on relations between universities and industry, organized by the University of Florence in cooperation with Syracuse University (San Miniato, 24 and 25 November 1980).

The rapporteur has not been able to make use of a meeting organized by the Scuola Normale Superiore of the University of Pisa and the Fiat Research Centre, in cooperation with the JRC, on the need for research in the automobile industry, which would have been of great help in drawing up this report. The meeting, which was scheduled for the end of September 1982 (hence the delay in submitting the report, since the rapporteur wished to write it after the meeting), has been postponed until spring 1983.

18. Below, therefore, are listed a number of research topics.

- (a) Study of combustion chambers in reciprocating engines. The aim would be to devise a simulated model of the engine and to feed it through a computer; the model should be based on more thorough understanding of

the physical and chemical processes which occur during combustion in the chamber.

- (b) Instruments and monitoring systems for engines and vehicles. The complex operation of the engine makes it extremely difficult to monitor. The electronic techniques in current use must be refined by applying modern monitoring theories to models which simulate the dynamic response by the engine.
- (c) Corrosion and treatment of surface areas. Research must be carried out into materials to identify the types of material and the operating conditions needed to obtain maximum resistance and durability.
- (d) Alloys and polymers. This involves identifying materials which could replace those traditionally used and which would be safer and more economical.
- (e) Thermomechanical treatment of metal components. Research designed to improve the characteristics of metal structures in cars.
- (f) Manufacturing processes. There are basic problems in applying the theory on the optimum organization and internal layout of production plant.

This is clearly not an exhaustive list of possible areas of basic research and the examples quoted are merely intended to provide a practical illustration of the problem.

19. It is important to note that the automobile industry will be able to benefit from transfers of technology from a number of advanced sectors in which brilliant results have been achieved in recent years: aeronautics, the space industry, nuclear energy, data processing. This would be a valuable development and one rich in potential, particularly in a number of specific fields, whose practical implementation and success, however, are dependent on a careful scientific assessment and accurate study of the problems of adjustment.

IV - POLITICAL COMMENTS

1 - Cooperation with universities

20. In order to achieve basic research objectives of such importance, it is essential to obtain the cooperation of universities and scientific institutes.

The impetus towards improvements in quality as regards products and production processes, which has come both from the market and from other general external conditions, has altered the rhythm of technological development in the car sector. The days have gone when innovations resulted, more or less spontaneously, from the application of general scientific results achieved in total isolation from the industrial process and with no specific stimulus.

Nowadays, the industry identifies problems, indicates new requirements and requests specific basic research.

21. Cooperation between industry and universities, though showing signs of making significant progress, has in general not yet reached a satisfactory level in Europe. University research still tends to maintain an attitude of isolation and cultural superiority and is reluctant to accept commissions to carry out specific research.

There are various reasons for this situation which it is not appropriate to analyse in detail here. While recognizing the role of universities as institutes for basic, free research and as centres for the study of 'natural philosophy', they must accept new responsibilities in their relations with society and be encouraged to cooperate with industry.

The signs of change which are already apparent are being encouraged and supported and the Commission should take every opportunity to promote and develop this process.

Indeed, the rapporteur believes that the Commission should attempt to organize as a cultural measure a system of exchanges of experience and of discussions on scientific questions between universities and industry. On the basis of this system and with due respect for the need to protect 'industrial secrets', the Community could, at little expense and to its great advantage, sponsor seminars in universities for industrial research workers in universities and, similarly, seminars in industry for university research workers.

22. Finally, the rapporteur would like to confirm his belief, repeatedly expressed on other occasions, that the European Community possesses the cultural potential to meet, or not to fail in, the challenges facing it.

This also applies to basic research specifically related to automobile technology. Modern science was born in Europe as the offspring of the classical tradition and of major cultural phenomena such as the Renaissance

and the Enlightenment. This is mentioned not through foolish pride but in order to exorcize certain tendencies towards scientific Malthusianism, which accept with resignation that Europe is destined permanently to play a subordinate role.

2 - EEC financial contribution towards research for the automobile sector

23. In modern economic jargon reference is commonly made to industrial strategy. This term is intended to convey a sufficiently broad view of the organization of both production and marketing.

An industrial strategy may cover a single undertaking or an entire sector of production or a coordinated complex of interdependent production sectors. In practice a strategy in one production sector always involves other related industries.

Whatever the system of managing the economy - whether a market economy or not - any industrial strategy for declining production sectors in the more advanced countries is determined by the macroeconomic context in which it is to be implemented and implies a planning policy in which the public authorities must be involved.

24. One sector in which state institutions have a more direct responsibility to take action is that of scientific research.

Ever since the Renaissance individual countries have provided direct support from public funds to university culture and scientific research, since they realized that this was the best way to capitalize on a heritage which was precious not only in prestige but also in economic terms.

This approach was consolidated with the emergence of modern industry, which has provided much vigorous stimulus to research (it gave rise to modern thermodynamics for example).

Over the last hundred years industrial and economic development has proceeded apace, assisted in a fundamental and decisive manner by scientific progress. As a result the attention and responsibility of the public authorities has been increasingly drawn to the question of organizing and supporting scientific research, which, while retaining its 'natural philosophy' connotations, has been enriched by problems and subjects more directly linked to industry and the economy.

25. This premise should lead to the logical conclusion that there is nothing extraordinary or new about a possible Community commitment to support basic research specifically related to the automobile industry.

It is worth repeating that this sector of industry is of such importance in economic and social terms that the public authorities must, within the limits of their powers, be involved in it.

To put it another way, it must be remembered that the Community as a whole has for a long time now borne the cost of investment in infrastructures. The public 'higher tertiary sector' includes precisely universities and public research laboratories.

26. To conclude, the rapporteur believes that the Commission should, on behalf of the Community, draw up a specific proposal committing the Community to provide financial support for basic research for the automobile industry.
27. The rapporteur would like to follow this explicit declaration with a number of critical comments which are not designed to undermine or jeopardize this declaration but to enable the Committee on Energy and Research to take a decision on the basis of a more general picture of the problems under consideration.

3 - Critical comments

28. An issue which has been discussed in recent years and which is still argued passionately concerns whether, in addition to commitments in the 'higher tertiary sector' referred to above, the calculation of public aid should include the cost of the 'external diseconomies' produced by industrial activities as a result of environmental pollution, the spread of occupational diseases, transportation of the labour force, shortcomings due to usage of the products (traffic jams, diseases of iatrogenic origin, etc.).

The cost of these diseconomies, which is gradually rising, is never taken into account when assessing industrial productivity (ratio between volume of production and total costs). Certain theorists have asserted that if productivity is assessed in more complete macroeconomic terms (a procedure which is extremely difficult and only roughly quantifiable) we are already experiencing a decline in 'technological output'.

29. However, there is also the parallel but opposite argument put forward by the industry, which stresses the positive effects of the bonuses accruing from research. The basic point is that a scientific and technological heritage developed within undertakings and consisting of knowledge, ideas and production processes, is not always used in its entirety solely by the producer but constitutes an asset available to society as a whole; its contribution should therefore be included in the calculation of productivity.

In many cases this heritage is acquired and used over long periods (scientific creativity and the resulting technological innovation do not take place to a schedule that can be predicted and tightly planned) while the related costs are felt immediately. This increases the burden on the industry and reduces the productivity index.

Industry, including the automobile industry, is therefore also appealing for a financial contribution towards the cost of translating knowledge into technology. This goes beyond support for basic research and would be more difficult, if not impossible, for the public taxpayer to control.

One of the comments made by critical theorists in this field concerns the compatibility of this appeal with the free-trade concept of the economy.

30. Our committee is therefore required to take a decision on an extremely delicate question of principle. The rapporteur considers it important for the Commission to make its position and views quite clear to Parliament before any practical decision is taken.

31. The rapporteur also wishes to draw the committee's attention to certain points already expressed in similar circumstances (ten-year plan for a strategy for the development of data-processing).

(a) There are still uncertainties concerning the action taken on proposals such as that put forward in the resolution by Mr BARBAGLI and others, uncertainties connected with similar previous experiences in other production sectors, resulting from

- the failure to interpret in a uniform manner the concept of the 'pre-industrial phase'
- the undefined political and economic status of the subjects and the lack of methodology, which should define this concept
- the lack of clear arrangements and rules for transferring the basic knowledge acquired to the technological development stage

- the constant danger of divergencies in national (as with EURATOM) or business interests between the various partners.

(b) The Community institutions have so far failed to reflect with sufficient attention and thoroughness on the unsatisfactory nature of past experience. It is essential to carry out an unbiased critical review to identify those aspects which would be of use in defining procedures and rules of conduct aimed at facilitating and ensuring the effectiveness of supranational cooperation within the Community.

32. Although the Committee on Energy and research has fully discussed the LINKOHR report, the rapporteur feels that the Community should once more be urged to take action to

- (a) increase the cultural and scientific value of specific basic research
- (b) encourage the definition and implementation of closer links between industry and university research centres.

V - CONCLUSIONS

33. The motion for a resolution by Mr BARBAGLI and others can in principle be accepted.

We cannot afford to disregard, evade or underestimate the problems raised by this document. Parliament has taken them up on several occasions and called on the Commission to entrust the Community with responsibility for tackling them on the basis of cooperation at European level.

For this purpose the Commission must provide for this specific case more precise and detailed information on the proposed financial commitments and the practical mechanisms to be used to implement them.

Production of motor vehicles (in 1,000 units)1. EEC

	PASSENGER CARS	COMMERCIAL VEHICLES	ALL MOTOR VEHICLES
1978	10,114	1,258	11,372
1979	10,109	1,316	11,425
1980	9,135	1,402	10,537
1981	8,696	1,177	9,873
1982	9,055	1,153	10,208

2. USA

	PASSENGER CARS	COMMERCIAL VEHICLES	ALL MOTOR VEHICLES
1978	9,177	3,722	12,899
1979	8,434	3,046	11,480
1980	6,376	1,637	8,013
1981	6,253	1,680	7,933
1982	5,073	1,911	6,984

3. JAPAN

	PASSENGER CARS	COMMERCIAL VEHICLES	ALL MOTOR VEHICLES
1978	5,748	3,187	8,935
1979	6,176	3,460	9,636
1980	7,038	4,005	11,043
1981	6,974	4,206	11,180
1982	6,887	3,850	10,737

MOTION FOR A RESOLUTION (DOCUMENT 1-695/81)

tabled by Mr BARBAGLI, Mr LIGIOS, Mr NARDUCCI, Mrs CASSANMAGNAGO CERRETTI, Mr BERSANI, Mr COSTANZO, Mr COLLESELLI, Mr GIUMMARRA and Mr GHERGO pursuant to Rule 47 of the Rules of Procedure on basic technological research in the automobile industry

The European Parliament

- having regard to the resolution on the situation of the European automobile industry adopted by the European Parliament on 13/1/81, the report of its committee and the minutes of the proceedings of the relevant parliamentary debate;
- having regard in particular to the following paragraphs from the aforementioned resolution:
 - para. (6) In order to speed up the adoption of the most appropriate common measures, requests the Commission to conduct, as rapidly as possible, a survey of the effects of Community regulations on energy saving, safety and pollution;
 - para.(19) Expresses concern at the fact that Community research and development activity may not be up to the level of that of the leading third country competitors and considers that the Community should assist such activity by playing a direct part in 'non-competitive' research as well as in basic research in this sector;
 - para.(20) Calls for encouragement and support to improve production with a view to increasing productivity;
 - para.(21) Lays particular stress on energy saving, the use of energy sources other than hydrocarbons and the search for alternative materials;
 - para.(22) Points out that the requisite technological innovations must also be directed towards increasing the safety of consumers and workers and towards improving both working and living conditions;
 - para.(23) Calls for thorough studies of the precise costs involved and of the combination of priorities that may prove to be necessary;
 - para.(24) Urgently calls for an end to be put to the fragmentation of the Community industries by encouraging fuller co-operation through joint programmes covering research and experimentation;

- having regard to the Community document 'L'avenir de l'industrie automobile dans la communauté' of 31.11.76 which at that early stage called for co-operation in basic research, having due consideration for the rules of competition;
- having regard to EEC document 'The situation in the European automobile industry' published by D.G. III in 1978 which made a further appeal for a Community research programme in the automobile industry;
- having regard to the Community document on the car industry of 11.6.81, 'Structure et perspective de l'industrie automobile européenne';
- having regard to the opinion of the Economic and Social Committee of 1.7.81. on 'The Automobile industry' (Doc. IND/153; CES 769/81);
- having regard to the fact that at present the EEC is promoting several different R & D programmes in sectors which have a potential or direct effect on the automobile industry, (e.g. energy saving, materials, the environment, etc.);
- having regard to the fact that the Community's involvement in basic research in the automobile industry must be increased and rationalized by co-ordinating the considerable untapped resources of industry as well as those of universities and public research institutes;
- having regard to the fact that the economic crisis at present affecting the automobile industry calls for urgent and immediate measures but that this does not dispense with the need for ensuring the long term survival of the European automobile industry in the 'post crisis' years, by taking appropriate steps in specific areas outside the strictly economic sphere.

Support for basic technological research in the automobile industry

- (1) Considers that the Community should give active support to basic research in the automobile sector with a particular view to fostering co-operation between the automobile industries of the Member States;

The general role of and urgent need for basic technological research in the automobile industry

- (2) Considers that this support must be given without further delay for the precise reason that basic technological research can, on a medium and long-term basis, lead to a general improvement of the manufacturing process and the goods produced, help the European automobile industry to solve its present economic difficulties and, beyond that, secure its survival against foreign competition in the 1990's;

Co-operation between industry and universities

- (3) Bearing in mind that basic technological research in Europe is carried out both by individual industries and consortia as well as in universities and public research institutes, it is hoped that as soon as the preliminary programmes have been drawn up, the Community will marshal and promote co-operation between all available resources in order to identify and solve eventual problems;

Cases outside the Community

- (4) Requests that more attention be paid to the increasingly aggressive competition that is being mounted, even in the domain of basic technological research by countries outside the Community, such as the United States of America and Japan;

Objectives and areas of priority

- (5) Requests that the support for basic technological research should begin with a statement of the major objectives and priorities (such as the conservation of resources, lower production costs, maintaining safety and quality standards both for the products themselves and in the matter of working conditions and the environment) and then go on to spell out the main areas of interest; there is a strong case for examining the feasibility of transferring technological resources from other key industries (implying subsequent adjustment and research into possible applications); these key industries, such as the aircraft and aviation sector, nuclear energy and informatics, have a vital role to play in helping the automobile industry to cope with the major new problems posed by recent demands for energy saving, lighter components, better quality, reliability, safety and respect for the environment;

Aspects relating to the protection of industrial property

- (6) Requests that as a first priority, consideration should be given to the question of the industrial ownership of research findings which have practical applications with the aim of drafting regulations which, while being suitably flexible, still ensure that the findings of the research are safeguarded for the benefit of Community industries and that the use of this valuable information as a bargaining counter in industrial and trade negotiations with industries outside the Community is properly controlled;

Operational aspects of the Community's support

- (7) Requests that financial support be immediately accorded for basic technological research in the automobile industry by drawing up a coherent programme and allocating an independent budget as in the case of indirect action; further requests that as a parallel measure, a review of that part of the R and D programmes at present being financed by the EEC (in the sectors of energy conservation, raw materials, steel, the environment, informatics, urban planning etc.) which has been or could be earmarked for the automobile industry so that it can be re-assessed, streamlined and expanded until such time as the objective of integration has been achieved;

Antitrust aspects

- (8) Recommends that the procedure for granting Community approval be simplified so that in the case of projects involving international co-operation in basic technological research, this can, if possible, be given a matter of course since co-operation can bring technical and economic benefits of a general nature and has no adverse effect on free industrial competition;
- (9) Instructs its President to forward this resolution to the Council and Commission of the European Communities.

OPINION OF THE COMMITTEE ON TRANSPORT

Draftsman: Mr SEEFELD

On 10 February 1983 the Committee on Transport was asked to submit an opinion.

At its meeting of 16 February 1983, the Committee on Transport decided to draw up an opinion and at its meeting of 17 February 1983 it appointed its chairman, Mr Horst SEEFELD, draftsman.

It considered the draft opinion at its meeting of 25 April 1983 and adopted it unanimously.

The following took part in the vote: Mr Seefeld, chairman and draftsman; Mr Carossino and Mr Kaloyannis, vice-chairmen; Mr Albers, Mr Buttafuoco, Mr Cardia, Mr Key, Mr Klinkenborg, Mr Martin, Mr Loo (deputizing for Mr Gabert), Mrs Scarmoni and Mr Ziagas (deputizing for Mr Galakos).

1. When considering if and how the European Community should encourage basic technological research in the automobile industry, we must examine various interrelated aspects of policy on transport, industry and therefore also employment, in addition to issues relating specifically to research policy. In accordance with its terms of reference the Committee on Transport will focus its attention in this opinion on the transport policy aspects. It will also touch on issues relating to policy on industry and research where these have a direct bearing on the achievement of transport policy objectives.
2. The car is the most widely used mode of transport in the Community today in terms of the numbers of persons and the quantity of goods transported per kilometre. It is obvious, therefore, that future technological improvements in this mode of transport, affecting not only cars but also lorries and buses, are of great importance to enable us to provide the necessary services to ensure safe, fast, economical transport. Although, for reasons connected with transport policy, the future of certain long-distance (e.g. transalpine) transport links lies more with rail than road, the car should still be of considerable importance.
3. It is of vital importance to the Community economy as a whole for transport to keep pace with the very latest technological developments. Europe's past position as a leading economic power was largely due to its intricate and highly developed transport system. The need to remain in the forefront of technological progress is therefore all the greater today if we are to withstand worldwide competition.
4. These considerations are inextricably linked with the fact that constant technological advances are also essential to protect exports from the Community car industry. Thousands of jobs in both the car manufacturing industry and in the primary and supply industries can only be maintained if Europe remains competitive at international level.
5. We can only keep our place at the forefront of technological progress if we ensure that continuous - and successful - basic research is carried out. It must be assumed, however, that in the present state of economic

crisis, the Community car industry is no longer in a position to carry out and, in particular to finance an adequate level of basic research. In view of the worldwide competition and its effect on each individual, it would be appropriate for basic research to be supported and promoted using Community funds. Transport policy provides a number of reasons for this approach.

6. We are, of course, referring to applied scientific research which is not directly concerned with the concept of cost/benefit but does take specific external objectives into account, rather than to basic research in the theoretical sense.
7. It would be possible to provide a series of transport policy objectives for this research as many problems relating to road transport are directly linked with vehicle design specifications, e.g. safety for road use, degree of environmental pollution, energy consumption and the working conditions of employees in the transport industry. It is also conceivable that improvements to the design specifications of vehicles might improve traffic flow.
8. As regards safety in road use, there has been no adequate evaluation of accident statistics, analysis of the most common accident sites or the incidence of typical injuries at Community level to date. However, such information would form the basis for improving the safety of vehicle construction to a uniform Community standard.
9. In the same way, greater safety could be achieved by carrying out research into ways of reducing the cost of additional safety devices in vehicles, e.g. ABS braking systems or air bags. At present these safety systems are so expensive that they are well beyond the means of the vast majority of motorists.
10. As regards the more rational use of energy, new designs produced in the last few years have shown that significant improvements can be achieved. Further research would pave the way for further progress along these very positive lines. This research should also cover the commercial vehicles sector (lorries and buses).

11. A great deal of research remains to be done on reducing the environmental pollution caused by road traffic. Processes for reducing the level of pollutants emitted have in fact been developed as a result of more stringent specifications, particularly in the USA. However, they are too expensive and involve too great an increase in energy consumption. The lead content of petrol is a serious problem facing those concerned with the protection of public health and substitutes must be developed or constructive solutions found to make it possible to eliminate lead from petrol without causing too many disadvantages.
12. Tyre noise is another problem for which no solution has been found. It is possible to reduce the level of traffic noise by building protective walls but genuine solutions can only be found at the source of the noise itself.
13. Those employed in the transport industry, particularly drivers of vehicles, are subjected to many different kinds of stress which have an adverse effect both on their health and on road safety. Part of this is the nervous stress generated by a constant bombardment of irritations and traffic information. The development of suitable support systems and particularly further development of the use of electronic systems in vehicles could provide some relief.
14. The development of suitable protection systems (air filters) could substantially reduce the health hazards for drivers caused by pollutants (exhaust gases, tyre swarf) which most road users, even today, merely suffer in silence.
15. Basic research in the automobile sector must also cover the control of traffic flow by means of electronic systems. Progress in this field would increase average transport speeds and carrying capacities whilst reducing road hazards and rationalizing the use of energy.
16. In view of the complex international relationships of the automobile sector worldwide, research in this area would need to take account of circumstances and developments throughout the world. Given the high costs involved, an effort should be made to avoid parallel research and Community

companies should have greater access to the results of research carried out in the USA and Japan. Similarly, research carried out in the Community should take account from the outset of legislation either pending or in force.

17. We must, of course, give consideration to suitable forms of financial support for this type of basic research. One specific prerequisite should be that the automobile industry is required to bear part of the financial burden of these projects in view of the benefit which it will derive from the results of this research. One possibility would be to set up Community projects with financial contributions from companies in the automobile sector and from public sources.

18. Conclusions

The European Parliament should advocate support for basic research in the automobile sector. The automobile industry must bear its share of the financial burden of this research which should be coordinated with research carried out in industrialized countries outside the Community. Basic research in this sector must, in particular, be harmonized with the objectives of the common transport policy and should be concerned with:

- road safety
- reduction of environmental pollution
- reducing energy consumption
- improving working conditions for employees in the transport industry and
- optimizing traffic flow.