II

(Acts whose publication is not obligatory)

COMMISSION

COMMISSION DECISION

of 8 June 1994

declaring the compatibility of a concentration with the common market

(Case No IV/M. 269 — Shell/Montecatini)

(Only the English text is authentic)

(94/811/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings [1], and in particular Article 8 (2) thereof,

Having regard to the Commission decision of 7 February 1994 to initiative proceedings in this case,

Having given the undertakings concerned the opportunity to make known their views on the objections raised by the Commission,

Having regard to the opinion of the Advisory Committee on Concentration [2],

Whereas :

(1) These proceedings concern a proposed joint venture in the polyolefins sector (Sophia) between Shell Petroleum NV (hereinafter referred to as 'Shell') and Montedison Nederland NV (hereinafter referred to as 'Montedison') which was notified to the Commission on 4 January 1994 pursuant to Article 4 of Regulation (EEC) No 4064/89 (hereinafter referred to as 'the Merger Regulation').

(2) On 26 January 1994 the Commission decided to continue the suspension of the notified concentration pursuant to Article 7 (2) of the Merger Regulation, and on 7 February 1994, initiated proceedings in this case pursuant to Article 6 (1) (c) of that Regulation.

I. THE PARTIES AND THE OPERATION

The parties

(3) Shell is a holding company within the Royal Dutch/Shell group of companies. Montedison belongs to the Ferruzzi group of companies. Its polyolefins interests are owned by Montecatini Nederland BV through two subsidiaries, Himont Incorporation (polyolefins) and Mopletan Spa (downstream applications).

The operation as notified

(4) Under the original concentration plan notified to the Commission, Montedison would transfer to sophia, which is to be owned 50 % by Shell and 50 % by Montedison, all of its polyolefins interest word-wide, including production and marketing assets, intellectual property rights and R&D facilities, as well as all upstream and downstream activities. Montedison would retain only residual activities in one of the markets of the joint venture, namely the rights to license the Spheripol process

[1] OJ No L 395, 30. 12. 1989, p. 1. (Corrigendum : OJ No L 257, 21. 9. 1990, p. 13).
[2] OJ No C 366, 22. 12. 1994, p. 3.

for the manufacture of polypropylene (hereinafter referred to as 'PP') to third parties in the United States of America. As to its pre-existing joint ventures in the PP production sector, Montefina Himont/Petrofina) and NSP (Himont/Statoil), under the original concentration plan, Montedison would either transfer Himont's shareholding to the other joint-venture partner (i.e. Petrofina or Statoil) or Himont's interests would be owned by Sophia.

(5) Shell would contribute to the jont venture the major part of its world-wide PP and polythylene (hereiafter referred to as 'PE') business. Shell would retain outside the joint venture :

— its polyolefins business in the United States of America (a PP production plant and 50 % participation in a joint venture between Shell and Union Carbide Corporation (hereinafter referred to as 'UCC') operating a PP plant at Seadrift, Texas),

— its interests in three joint ventures, one of which, ROW, is in Europe. ROW is a joint venture between Shell and BASF engaged in the production and sale of a wide range of olefins and polyolefins,

— all its existing upstream interests, in particular steam crackers producing ethylene and propylene with the exception of the Aubette platform at Berre in France,

— certain downstream activities (Wavin BV and Symalit AG),

— its non-polyolefins polymer interests.

The operation as subsequently amended

(6) Following the Commission's Communication pursuant to Article 18 of the Merger Regulation and in order to meet the competition concerns expressed therein, the parties amended the original concentration plan by entering into commitments *vis-à-vis* the Commission set out in recitals 116 to 119. Upon fulfilment of these commitments, the original operation would be modified as follows :

— Montedison's world-wide PP technology business would remain outside Sophia by its transfer to a company (Technipol) under the sole ownership and control of Montedison. Technipol's assets would *inter alia* comprise Montedison's world-wide PP technology licensing business — including licensing contracts, the exercise of the corresponding intellectual property rights, sales, marketing and support staff — the corresponding R&D staff and facilites relating to both process and catalyst technology, as well as a PP pilot plant for PP technology development and testing.

— Montedison/Himont would withdraw from Montefina and would sell its shareholding therein to Petrofina or a third party.

— Montedison would contribute to Sophia its remaining world-wide polyolefins interests, including its world-wide assets relating to the production and sale of PP, and its world-wide activities in other polyolefins sectors, including all upstream and downstream assets. Shell's contribution to Sophia would be as originally planned.

— Technipol would have all the financial or other resources necessary to enable it to conduct its business on an on-going, viable and competitive basis, independent of Sophia and Shell. Any relationship between Sophia or Shell on the one hand and Technipol on the other hand would be on arm's length basis and on normal commercial terms.

II. COMMUNITY DIMENSION

(7) The proposed concentration has a Community dimension. In 1992, the combined aggregate world-wide turnover of Shell and Montedison was more than ECU 5 000 million and each of the undertakings achieved more than ECU 250 million of their turnover in the Community. The parties did not achieve more than two-thirds of their Community-wide turnover in one and the same Member State.

III. CONCENTRATION

(8) The notified operation, as amended on the basis of the undertakings given by the parties, is a concentration within the meaning of Article 3 of the Merger Regulation, because, as explained below, Sophia will perform, on a lastings basis, all the functions of an autonomous economic entity and there will be no appreciable scope for coordination of the competitive behaviour of the parents between themselves or with the joint venture within the meaning of that Article.

Joint control

(9) Sophia will be owned 50 % by Shell and 50 % by Montedison. The joint-venture agreement provides that major decisions must be approved by both parties. These include : the overall annual capital budget, fundamental changes to the joint venture's policy or strategy, borrowings in excess of US $ [...] (1) per annum, investments or investments in excess of US $ [...] million and entering into or extending feedstock arrangements. Therefore Shell and Montedison have joint control over Sophia.

(10) Shell is expected to assume a leading role in the management of the entreprise, because *inter alia* it will have the final say on the appointment of the Chief Executive Officer of the joint venture and the Shell-nominated directors will be able to decide all general matters except for those of fundamental or strategic importance.

Joint venture performing on a lasting basis all the functions of an autonomous economic entity

(11) Sophia will have all the assets and resources necessary to enable in to perform all the functions of an autonomous economic entity in the polyolefins sector. With regard in particular to the PP production sector, although Montedison's PP technology business will remain outside the joint venture, this does not negate the character of the joint venture as an autonomous economic entity on the PP technology but operate under licence by a pp technology provider. Moreover, Sophia will continue to employ its existing PP technology and the extent that it may need to purchase technological improvements or other technical services from Technipol, it is provided in the commitments given by the parties that this will be undertaken on an arm's length basis and on normal commercial conditions.

Absence of coordination of competitive behaviour

(12) Sophia will be active in the following sectors : production and sale of PP ; production and sale of PE and PE technology ; production and sale of ethylene and propylene ; and downstream activities in the areas of film and fibres. According to the amendments introduced to the original concentration plan, Sophia will not remain active on the market for PP technology as defined in this Decision, because Montedison's world-wide technology business will be transferred to Technipol and Shell's existing activities on the PP technology market, wich are based on its cooperation with UCC, will not be contributed to Sophia.

(13) As stated above, Montedison will contribute to Sophia all of its world-wide polyolefin interests, with the exeption of its PP technology business, and will thus withdraw from the markets of the joint venture. Sophia's other parent, Shell will remain active in some of the joint venture's markets, since it will retain certain of its polyolefin interests outside Sophia. However, since Shell will assume the overall industrial responsability for the joint venture, there is, in this respect, no appreciable scope for coordination between Shell and Sophia within the meaning of Article 3 (2) of the Merger Regulation.

(14) Following the concentration, Sophia's parents will remain active on the market for PP technology, Montedison through Technipol and Shell as a contributor to the Unipol PP technology that combines UCC's process and Shell's catalysts. Although this market is situated upstream from the joint venture's market for the production and sale of PP, the Commision considers that the parents would coordinate their behaviour with regard to PP technology licensing within the meaning of Article 3 (2) of the Merger Regulation.

(15) In the specific circumstances of this particular case, there are a number of factors indicating that the parents' ownership of Sophia would not be likely to lead to the coordination of their competitive behaviour on the PP technology market. The turnover of the business to be transferred to Technipol represents only a small percentage of Montedison's total annual PP turnover approximately [...], and it is even Smaller in terms of Sophia's total turnover. Moreover, according to the parties' commitment, Technipol will be operated completely independently of Sophia and Shell and will have sufficient own financial resources. Shell will have no share-

(1) Blanks between square brackets indicate professional secrets deleted pursuant to Article 17 (2) of the Merger Regulation.

holding in Technipol, so that 100 % of Technipol's profits will accrue to Montedison [...]. Consequently, Montedison, which will alone control Technipol's commercial strategy would seem to have a genuine interest in continuing an active licensing policy in order to maximize the return on its investment in Technipol.

(16) At the same time it must be acknowledged that the other parent of Sophia, Shell also conducts a PP technology licensing business, However, the relationship between the two technologies, Spheripol and Unipol, will be a distant one. Whereas Montedison's licensing business will be directly conducted through a fully-owned and controlled subsidiary, Shell's activities on that market will be based on a cooperation agreement with a third party, UCC, which shares control of these activities whith Shell and which, subsequent to the concentration, would continue to have an interest in active licensing. Shell Oil would also seem to have an interest in active licensing, since it has made substantial investments in a new catalyst plant for the Unipol technology [...]. With respect to Shell, it is currently using Unipol in some of its own PP plants and would this seem to have an incentive to maintain the viability of that technology.

(17) Futhermore, from the financial perspective, Shell has no interest in Montedison's PP technology business and Montedison has none in Shell's PP technology business with UCC. In The PP technology market there is a relatively limited number of contracts each with high value (of the order of ECU 10 million). The incentive to win an individual licensing contract is, as a result, strong. In a bidding situation for new PP licensing contracts, each of Unipol and Spheripol would therefore have an interest to bid and thus compete against the other, since it is only in the event of a contract award that the successful licensor will receive any licensing income and thus realize a return on its investment.

In the specific circumstances of this case, it appears therefore that coordination between the parents within the meaning of Article 3 (2) of the Merger Regulation is not likely to occur.

IV. COMPETITIVE ASSESSMENT OF CONCENTRATION AS NOTIFIED

(18) The present analysis relates to the competitive effects of the concentration as notified to the Commission. According to the original concentration plan, the businesses contributed to the joint venture would relate to the following economic sectors : production and sale of PP and PP technology ; production and sale of PE and PE technology ; production and sale of ethylene and propylene ; production and sale of flexible films for consumer goods packaging, flexible films for good packaging, melt spun fibres, non-women fibres, and tapes/fibrillated tapes.

(19) There is no overlap between the activities of the parties with regard to : (i) ethylene and propylene (upstream markets in relation to polyethylene and polypropylene), because Montedison does not produce ethylene and has no free market sales of propylene ; (ii) dowstream activities (flexible films for consumer goods packaging ; flexible films for good packaging ; melt spun fibres ; non-woven fibres ; and tapes/fibrillated tapes).

(20) PE is one of the businesses contributed to Sophia. PE is derived from ethylene through polymerization. There are three different types of PE, high density polyethylene (hereinafter referred to as 'HDPE'), low density polyethylene (hereinafter referred to as 'LDPE') and linear low density polyethylene (hereinafter referred to as 'LLDPE'). According to the notifying parties, the market, while LDPE and LLPDE should be considered to form another relevant product market. As to the geographic market definition, it appears that the production and sale of PE takes place throughout western Europe, with both customers and suppliers being located throughout the region. It is not, however, necessary to decide on the exact product and geographic market definition in this case, because, as exlained below, even on the basis of a narrow market definition in this case, because, as explained below, even on the basis of a narrow market definition the proposed concentration will not create or reinforce a dominant position in the common market or substantial part thereof.

(21) Shell produces LDPE and LLDPE. Its market share in western Europe in terms of capacity is below 10 %. Montedison has not yet started producing PE, [...] and its strenght in this area lies in PE process technology (Spherilene), which it will contribute to the joint venture. However, it does not appear that dominance will be created for the following reasons : (i) with regard to the production and sale of PE, there are number of other players more important than Shell, including companies such as Enichem, BP, Borealis and Dow Chemical ; and (ii) with regard to PE technology, alternative technologies are available, such as that offered by UCC, which can be regarded as adequate alternatives.

(22) In the light of the above, the following analysis will focus on the effects of the concentration on the market for the production and sale of PP and the market for PP technology.

A. Product market definition

(i) *Production and sale of PP*

(23) PP belongs to the category of polyolefins, that is a family of thermoplastics derived from a particular group of base chemicals known as olefins, which also includes PE and polybutelene (PB). Olefins are typically derived from oil or natural gas. The production of polyolefins involves the following main stages. In the first stage, hydrocarbon feedstocks for base chemicals (naphtha, ethane, etc.) are obtained from oil or natural gas. The base chemicals such as olefins (e. g. ethylene and propylene) are then produced by means of steam cracking or dehydrogenation. Polyolefins are derived from olefins through polymerization, a process during which monomers (olefins) are reacted with each other to produce long chains of a repeated series of monomers (polymers). Polyolefins are further processed by the plastics industry to manufacture a wide range of consumer goods, including films, fibres, moulded and extruded products.

(24) PP is used by the plastics processing industry for a large number of applications, the most important of which are film, fibres, automotive components such as bumpers and dashboard systems, domestic appliances, garden furniture, crates, cases and pails, caps, closures and thin-walled packaging containers, waste and chemical pipe applications, tapes and sheets used in packaging and construction, food packaging. The special characteristics of PP include the lowest density of all thermoplastics, easier colouring, high temperature resistance, high frictional resistance, more flexible design.

(25) According to the notifying parties, although there is some degree of fringe substitutability between PP and PE, especially HDPE, or other materials, PP is not fully substitutable by other materials for all applications. The Commission's investigations also confirm that PP is not sufficiently substitutable by other thermoplastics or other materials for most applications because of its special properties and its advantageous cost/performance ratio. Therefore, the relevant product market is the market for the production and sale of PP.

(26) There are three main types or families of PP, namely homopolymers, which account for approximately 70 to 75 % of PP consumption, random copolymers which account for approximately 5 % of PP consumption and impact or block copolymers which account for approximately 25 % of PP consumption. The properties and end uses of the three types of PP are not the same. Homopolymers are made in commodity and speciality grades. They are more rigid and have better resistance than copolymers but their impact strength is inferior. Block copolymers are particularly suitable for applications where very high impact strength is required (such as in the automotive sector). PP random copolymers are mainly used in films (document folders, packaging and laminating, heat sealable layers) due to their transparency, good resistance to heat distortion and ease of processing. On the supply side, all three types of PP are made by polymerizing propylene, although ethylene is also added during the polymerization of impact and random copolymers. Homopolymers and random copolymers are produced in the same reactor (homopolymer reactor), but a second reactor (copolymer reactor) is needed for the production of block copolymers. Since not all PP plants are equipped with a copolymerization reactor, there appears to be limited supply-side substitutability between block copolymers and other types of PP, with the result that block copolymers may be considered as a separate product market. This question can, however, be left open, because regardless of a broader or narrower market definition, as explained below, the assessment of the effects of the merger does not change.

(27) Within these three different families of PP there are a variety of different grades. There are a number of distinguishing factors between PP grades, including viscosity as measured by the melt flow ratio, the presence of different chemicals and additives, molecular weight distribution, crystallinity and morphology. Speciality grades are often developed at the request of or in cooperation with customers. Since PP grades differ in terms of their characteristics, price and intended use, they are not interchangeable from a demand-side point of view. On the other hand, it appears, that within each family of PP (i. e. homopolymers, block copolymers and random copolymers), PP manufacturers can relatively easily switch production from one grade of PP to another by varying the conditions of polymerization (reactor pressure, temperature), or by using different additives. Economic considerations play a role in this respect, but it appears that PP plants can be operated in a way which avoids unnecessary switches between different grades and thus

minimizes the production of off-grade material. Due to the very high degree of supply-side substitutability, it therefore appears that, within each PP family, different grades cannot be regarded as constituting separate relevant product markets.

(ii) *PP technology*

(28) PP is made by polymerizing liquid propylene (bulk polymerization) or propylene gas (gas-phase polymerization). For the production of certain types of PP, ethylene (or another monomer) is added either at the onset of polymerization (random copolymers) or at a later stage (block or impact copolymers). Additives or modifiers may also be added to further enhance or change certain characteristics of the polymer desirable for specific applications. In all cases, the polymerization of propylene in order to produce PP involves at least the following elements: (i) the raw material, propylene; (ii) a suitable catalyst, that is a chemical substance used in polymerization to promote the chemical reaction without being itself affected by it; (iii) the technology and know-how necessary for the use of the catalyst in polymerization; and (iv) the process technology and know-how necessary to design and use equipment in which polymerization takes place.

(29) Following the development of the basic catalysts for PP production in the 1950s, PP catalyst, process and product technology has advanced in the last 30 years largely due to catalyst improvements. The transition from the old slurry processes to the more advanced bulk and gas-phase processes was a consequence of important innovations in the area of catalysts. In particular, this resulted in substantially higher catalyst yield. In the early 1960s a kilogram of catalyst yielded about 1 000 kgs of polymer, while catalyst developments have improved that yield to between 20 000 and 50 000 kgs of polymer. Similar improvements have been the development of superior properties of the PP and the simplification of the process by reduction of the polymerization steps (e. g. the increase in catalyst yield reduced the catalyst quantity left in the reactor to such an extent that removal of catalyst residue became unnecessary).

(30) Substantial research is currently carried out mainly in the area of 'advanced materials', i. e. materials extending or combining the characteristics of different polyolefins and thus suitable for certain specific applications. However, it is not expected that a fundamentally new PP resin production process will be developed and commercialized within the next 10 years. A number of companies are also currently working on a new generation of catalysts, namely metallocenes. It cannot be precisely predicted at the moment how widely this new generation of catalysts will be used. Current research in this area is aimed at enhancing the properties of PP for certain specific applications (e. g. syndiotactic PP) within the context of existing PP processes. According to industry sources, several years' more research and development will be required before the innovative potential of these catalysts can be fully exploited. In any case, it appears that metallocene catalysts will not be fully commercialized for at least another five to seven years. As regards Himont's own research and development efforts, they are mainly concentrated on advanced materials combining properties belonging to different polymers on the basis of its newly developed Catalloy and Hivalloy technology.

Intellectual property rights

(31) The development of new or improved PP technologies is patented or otherwise protected by intellectual property rights. A PP manufacturer who has not developed his own technology will operate under a licence from a PP technology provider on the basis of which technical information (know-how) relating to both the process and the catalyst will be disclosed and immunity under the relevant patents will be granted. In return, the licensee is obliged to treat all technical information as confidential and proprietary information unless it is or becomes public knowledge.

(32) In the area of intellectual property rights, ownership of patents for the basic invention as well as subsequent improvements may prove to be a barrier to entry into the technology market. Improvements can themselves represent a significant technological breakthrought (e. g. the introduction of electron donors that resulted in a substantial increase in the catalyst yield). These patents can delay or even indefinitely postpone new entry by operators who seek to develop new technology that does not infringe them. In this respect, the risk of lengthy and expensive patent litigation would seriously undermine future licensing activities, because both the licensor and the licensee could be sued by the owner of the intellectual property right for patent infringement. A non-assertion agreement with the initial patent holder would remove this uncertainty but this in fact makes potential entry and its conditions dependent on the patent holder's consent.

Market structure

(33) There is a significant amount of licensing activity in the PP industry, PP manufacturers being either licensors or licensees of PP technology. This licensing activity takes place in a market separate from that for the production of PP. Customers in this market are PP producers who need the technology required to manufacture PP and suppliers are as a rule PP manufacturers (although UCC is not an active PP supplier) who have developed and are willing to license PP technology.

Suppliers

(34) On the supply side, the provider of technology discloses to the customer the techical knowledge necessary to design, construct and operate a plant for the production of PP and allows him to sell the PP produced by giving him and his customers immunities under the relevant patents. Refinements or optimizations of the technology but not revolutionary improvements are normally communicated to the licensee from time to time. This basic service is accompanied by associated services such as technical support, customer assistance or engineering services — in some cases the plant itself is constructed by the licensor. The catalyst included in the package is either provided directly by the licensor or manufactured by the licensee under licence from and on the basis or technical knowledge communicated by the licensor.

Customers

(35) On the demand side, customers are normaly PP manufacturers who do not have their own PP technology. In view of the substantial costs represented by original research and development, the prior expertise needed and the uncertain results of development work, a number of PP producers prefer not to develop their own R&D and therefore need a licence from companies who have the required technology.

(36) Companies with in-house R&D may also be potential customers. For instance, companies who have developed their own catalysts may need to obtain a patent settlement agreement or a bare patent licence before they are allowed freely to operate these catalysts and, in any event, they lack a process for the manufacture of PP which they need to license from a third party. Moreover, since for technical reasons, the harmonization of separate catalyst and process technologies to achieve efficient production is complicated and expensive, the practice of such companies is to purchase initially an overall technology package and to seek subsequently to replace the licensor's catalyst. As a result, these companies are, in the Commission's view, on the market for PP technology. Even companies who have developed their own PP process and catalyst combination may select another technology package if it is more efficient or better suited to their product requierements.

(37) Customers for licences may be new entrants to the PP industry or existing licensees who want to expand their current PP capacity. Provisions of existing licensing agreements regarding future capacity expansion vary. In some cases the licensee has the option, in return for additional royalties, to use licensed technology for a capacity increase at the same plant, while in other cases this option also covers a capacity increase realized by the construction of new plants within the territory of the agreement (usually one or several countries). In any event, the Commission considers that the option holder is impervious to the relative merits of other market alternatives . On the contrary, the value of the option is precisely determined by these alternatives. If effective competition on the market for PP technology licensing means that a different licensing contract is more attractive, the option holder will not exercise the option and will purchase another licence. Alternatively the option holder may renegotiate the terms of the option with the original licensor on terms that are more favourable and reflect the competitive pressure from the other licensing contract. In conclusion, an option holder is, in the Commission's view on the market for technology licensing and benefits from the presence of effective competition therein.

(38) PP manufacturers naturally benefit from the availability of high-performance and cost-effective technologies. Access to technology is of itself vital, because otherwise new entry or capacity expansion by existing players dependent on technology licensing cannot be realized. The selection of a technology for a plant has long-term implications given the substantial costs involved and the 20 to 30 year life time of a plant once built. Competition on the technology market ensures that the best outcome in terms of price, quality and other competitive parameters is reached with regard to an indispensable element of PP production.

Demand for licences

(39) An increase in actual or expected demand for PP leads to plant expansion and to a demand for licences. In practice demand has tended to concentrate within certain periods ('licensing rounds') due to the simultaneous decision of a number of producers to expand their capacity on the basis of demand forecasts. However, a more limited amount of licensing activity also takes place between those periods. A 'licensing round' took place from 1985 to 1989. Licensing activity was subsequently reduced due to excess PP capacity in the industry.

(40) According to industry sources, over the next 10 years the world PP market is projected to grow at an average rate of 6 to 7 % per annum. The western European and the North American markets are projected to grow at a rate of 5 to 6 % per annum, while in the rest of the world growth is projected at 10 to 15 % per annum. As a result, it is expected that additional PP capacity will be needed in the industry. Expansion of current PP capacity can take different forms, including de-bottlenecking of existing plants or construction of new plants, depending *inter alia* on the size of the planned increase (e.g. expansion through de-bottlenecking may have capacity limitations) and the strategy of the companies concerned (e.g. a company planning to act as a player in several countries may choose to built a plant in a different location to its existing one). In any case it is expected that the need for capacity expansion will lead to a substantial increase in the demand for technology licences world-wide. A number of companies already have concrete plans for expansion and they have started considering the available technologies with a view to obtaining a licence. The question of demand for licences in western Europe in particular will be dealt with below.

'Process-plus-catalyst' package

(41) As a rule PP technology is developed and licensed as a package made up of a polymerization process and a catalyst. The role of the catalyst in polymerization is important, because it determines the properties of the PP. The design of the process is influenced by the catalyst to be used and the introduction of a different catalyst will normally affect the resulting product range.

(42) In practice some licencees of a PP package have developed their own catalyst in order to change the properties of the final product for certain specific applications. However, this does not imply that, for the purposes of product market definition, a distinction should be made between process and catalyst. It has been the practice of licencees to purchase an overall technology package and to seek to develop catalysts that can complement or replace the catalyst originally licensed only subsequent to the purchase of the initial package. According to the Commission's investigations, if PP manufactures wished to build a new plant today, they would also normally seek a single licence comprising the whole package as opposed to separate licences for the process and the catalyst. This is the case because catalyst development normally takes at least several years (typically a minimum of three to five years), requires considerable R&D expenditure and substantial prior technological expertise and is risky. Moreover, the licensor's perfomance guarantee will only cover the 'process-and-catalyst' package as originally licensed. On the basis of the above, and notwithstanding the possibility that some PP licences may wish to purchase process and catalyst technology separately, the Commission considers that, for the purposes of this decision, the definition of the relevant product market for PP technology can be based on the package represented by 'process-and-catalyst' technology.

Slurry processes distinguished from advanced gas-phase or bulk processes

(43) Gas-phase and bulk processes are a more simplified and efficient PP production route compared with the older slurry processes which were widely used in the industry until the 1980s. Bulk and gas-phase processes involve fewer processing steps, because the use of a high-efficiency catalyst makes it unnecessary to remove catalyst residue or the atactic component of the final polymer. Other advantages of the bulk and gas-phase processes include lower energy consumption, lower capital investment per tonne of capacity and better environmental protection. Some producers still continue to operate the older, existing slurry plants (about 25 % of total western European PP capacity), usually in combination with a performance-enhancing high-yield/high-stereospecificity catalyst since these plants are fully depreciated. However, no new slurry plants are being built. According to the Commission's investigations, if PP producers wished to expand their PP production capacity by building a new plant today,

they would seek to obtain a licence for a new generation process — bulk or gas-phase — as opposed to an old slurry process. It appears, therefore, that the relevant product market for PP technology should be defined on the basis of advanced technology only (bulk and gas-phase) and that slurry technology should be excluded from this definition.

Conclusion

(44) On the basis of the above, it appears that the licensing of advanced PP technology and other associated services as defined above constitute a distinct product market upon which the effects of the proposed joint venture should be assessed. This is an upstream market in relation to the market for the production and sale of PP. Dominance in the PP technology market would enable a PP technology provider to exercise market power with regard to an essential element of PP production.

B. Geographic market definition

(i) *Manufacture and sale of PP*

(45) According to the Commission's enquiries, many customers purchase PP from several sources located in different Member States, rather than purchasing solely from one supplier. On the other hand, customers for PP in western Europe rely on producers with plants located within that area for the vast majority of their supplies.

(46) In their replies to the Commission's questionnaires, customers stated that PP transport costs have an important influence on the choice of supplier. Transport costs depend *inter alia* on the mode of transportation and the location of the customer *vis-à-vis* the location of the supplier. The main mode of transportation of PP is by truck and, to a lesser extent, by rail, sea or the combined use of sea/truck and truck/rail modes, with the destination of the shipment influencing the choice of transportation mode to reduce costs based on the most efficient means of transportation.

(47) PP is usually supplied either in bulk truckloads by road tankers or the same tonnage is packaged in 25 kg polyethylene sacks stacked on pallets and shrink-wrapped. Transport costs are also substantially affected by the availability of return loading of the vehicle (i.e. the possibility of back-hauling), as well as local country regulations and the competitive hauling situation.

(48) According to the replies to the Commission's questionnaires, transport costs are sufficiently high that customers do not consider producers from outside western Europe, e.g. the United States of America or Japan, to be alternative sources of supply. In addition, it appears that current import duties — amounting to 12,5 % on imports from developed countries, to be gradually reduced to 6,5 % within a period of five years starting from 1995 insulate the western European market to some extent and that the need for after-sales technical support also limits the geographical choice of suppliers. It appears, therefore, that the relevant geographic market for the production and sale of PP is western Europe.

(ii) *PP technology*

(49) Competition in the licensing of PP technology takes place on a wider geographic market than competition in the manufacture and sales of PP itself, specifically, on a world-wide basis. Licensors of PP technology can compete for business wherever a potential customer seeks to license technology and these licensors can offer their technology to customers located anywhere in the world.

(50) The licensing of the package of PP technology generally includes certain input from R&D and technical personnel of the licensor who will be on-site at the new plant of the licensee and such technical staff will always be required to travel to new plant sites. The costs of providing technical personnel at the new plant during start-up and subsequent technical support are generally borne by the licensee and they do not appear to be sufficiently substantial to deter a potential license from choosing a licensor not located within his geographical area.

(51) Licensors are generally active world-wide, and although as explained above the intensity of their activity depends on their position in the downstream PP market, this does not affect the conclusion that the market for licensing of PP technology is a world market.

C. The effects of the concentration as notified

(52) Dominance on the technology market have a restraining effect on the PP industry's future plans and opportunities for expansion and would thus have negative repercussions on the downstream

market for the production and sale of PP. Therefore, the Commission will assess first the competitive effects of the joint venture on the market for PP technology.

(i) *PP technology*

(53) As indicated above, PP technology is, as a rule, developed and licensed as a package involving a production process and a catalyst. The two leading package technologies in the PP industry, accounting for about [...](1) of plant capacity under licence, are the Spheripol technology licensed by Himont and the Unipol technology which combines a process developed by UCC and a catalyst developed by Shell.

(54) Himont, Montedison's subsidiary, has been at the forefront of PP technology (both process and catalyst) since the early years of PP production. Himont research goes back to the development and commercial exploitation of the first industrial process for the production of PP based on the modification of Ziegler's catalyst in 1954 by Nobel Prize Winner Giulio Natta, a consultant to Himont's research team at Ferrara. Himont's Spheripol process is currently the most widely licensed PP technology. It is a hybrid process consisting of a first-stage loop reactor (bulk polymerization) for the production of homopolymers and random copolymers and a second-stage gas-phase reactor for the production of impact copolymers operating in series with the first reactor. On the basis of a 1975 agreement, Himont and the Japanese company Mitsui Petrochemical Industries (hereinafter referred as 'Mitsui') jointly developed catalysts that resulted in high product yield and high stereospecificity (HY/HS catalysts). Subsequently, both parties have continued their collaboration on HY/HS catalysts. Today each party has its own process technology, Spheripol (Himont) ans Hypol-stirred bed reactor (Mitsui), but both use jointly developed catalysts. The licensing activities of the parties with regard to both the Hypol and Spheripol process as well as related catalysts are the object of a Research and Development Cooperation Agreement between himont and Mitsui which is further analysed below.

(1) Between 50 and 75 %.

The Shell Oil/UCC relationship

(55) Shell has developed its own PP process, Lippshac, but has not licensed it to third parties, other than joint ventures in which Shell has an interest. On the other hand, shell contributes its high-yield SHAC catalysts to a joint venture with UCC, which includes a PP plant in seadrift, Texas. The basis of the cooperation between Shell and UCC is a Cooperative Undertaking Agreement (hereinafter referred to as 'the CUA') signed in 1983 between UCC and Shell Chemical, a division of Shell Oil Company. Shell Oil is a US company controlled by Shell Petroleum Incorporation, a 100 % subsidiary of the Royal Dutch/Shell group of companies.

(56) According to the CUA, which expires in [...], the purpose of the agreement is to combine UCC's fluidized-bed process and Shell's SHAC catalyst with a view to developing a PP technology package and licensing it to third parties. The abovementioned seadrift demonstration plant [...] is used as a [...] manufacturing facility [...]. UCC is not otherwise active in PP production and relies on Shell Oil for PP market know-how. The initial laboratory experiments relating to the original SHAC catalyst took place [...]. The resulting technology package, Unipol, has been to date the main competitor of Himont's Spheripol technology.

(57) Shell Oil's contribution to the current Unipol technology package is important. Shell Oil supplies the catalysts used in the Unipol package and is responsible for their improvement. It is involved in the marketing of the Unipol technology, including technical presentation of the catalyst to potential customers. Finally, it provides customer support/technical assistance with regard to the catalyst, prices the catalyst, invoices catalyst sales and shares licensing revenues with UCC.

(58) As a result of joint venture between Shell and Montedison as originally notified, two fully-owned subsidiaries of the Royal Dutch/Shell group of companies would be linked with the two leading PP package technologies in the industry. In particular, Shell would be the industrial leader of Sophia which, under the original concentration plan, would develop and market the Spheripol technology whilst at the same time Shell Oil would provide the catalyst used in the Unipol technology package.

(59) According to Shell, Shell Oil is managed as an autonomous entity within the Royal Dutch/Shell group and competes with the other subsidiaries of that group. Whilst it could appear that Shell Oil may have conducted its business with a certain degree of autonomy in relation to the Royal Dutch/Shell group, from the point of view of the application of the Merger Regulation, the parties' argument cannot be accepted on structural grounds. Under the provisions of that Regulation, a fully-owned subsidiary must be considered to fall under the ultimate control of the parent company of the group.

(60) In the particular case, Royal Dutch/Shell's control over the competitive behaviour of its two subsidiaries would have an important effect on the PP technology market. Prior to the concentration the rivalry between Spheripol and Unipol was the main competitive relationship on the market. Subsequent to the original concentration, these two technologies would no longer be sufficiently independent of each other, since Himont's PP technology business would have been included in Sophia.

Market shares

(61) Spheripol and Unipol are two leading technologies in the PP industry. Out of the total number of non-slurry PP technology (bulk and gas-phase) licences granted to date, Himont licensees account for about [...](1) of world-wide PP plant capacity operating under licence (excluding licences to licensor's own plants and to joint ventures in which the licensor has a 50 % or more interest), Unipol licensees for about [...](1), BASF licensees for about [...](2), Mitsui licensees for about [...](2) and others (Sumitomo, Acomo) for about [...](3).

(62) The notifying parties have argued that these high market shares reflect the relative success of Spheripol and Unipol in the 1980s and are not a reliable indicator of future market power. However, the high market shares of the two technologies are confirmed by recent licensing decisions. Out of the total number of licences granted in the last five years world-wide, Himont licensees account for about [...](1) of world-wide PP plant capacity, Unipol licensees for about [...](1), BASF licensees for about [...](2), Mitsui licensees for about [...](2) and others (Sumitomo, Amoco) for about [...](3).It is the view of the Commission that these high market shares reflect the importance of Spheripol and Unipol as a competitive force on the technology market due to a variety of factors that are analysed below.

Arguments put forward by the parties

(63) According to the parties, the concentration will not create or strengthen dominance because :

1. as to the supply side : (i) the supply of PP technology is competitive today and will remain so ; (ii) the technology market is inherently volatile and fast changing. New entry is possible and likely ;

2. as to the demand side : (i) there is likely to be no or only minimal demand for new licences in western Europe until the end of the century ; (ii) in western Europe most current and potential licenses are increasingly technologically sophisticated.

(64) For the reasons explained below, however, the Commission considers that :

1. as to the supply side : (i) other advanced technologies currently offered for licence do not appear to be able significantly to constrain the parties' competitive behaviour ; (ii) although the technology market is to some extent dynamic, new entry is not likely to occur in a manner capable of constraining quickly and significantly the exercise of market power ;

2. as the demand side : (i) it is expected that demand for licences in western Europe until the end of the century will be significant ; (ii) the technological sophistication of western European producers cannot significantly constrain the exercise of market power by a dominant technology provider.

Criteria for selection of technology

(65) In their replies to the Commission's questionnaires, PP manufacturers identified a number of factors which are considered to be important when selecting a PP technology :

(1) Between 25 and 50 %.
(2) Between 10 and 25 %.
(3) Below 10 %.

(i) Product range/product characteristics : a technology must be suited to the product needs of the prospective licensee based on his strategy to gain access to or reinforce his presence in different PP market segments. In well-developed markets, such as Western Europe, all product types and a number of identified grades within each product type will normally be required by manufacturers building new plants. In this context, it is important that plants operating on the basis of the technology under consideration do exist and have already produced a number of commercial grades approved on the marketplace. In this respect, a distinction in sometimes made between, on the one hand, the capability of a technology to produce a number of grades because of its ability to manufacture PP with properties that these grades have and, on the other hand, the fact that a technology has already developed a number of commercially qualified grades sold in the marketplace. It appears that for a potential licensee the second criterion is important when assessing the comparative merits of alternative technologies. To a prospective licensee the existence of commercially qualified grades produced on the basis of a technology is a reassurance that he will have the possibility to enter a new market on an equal footing with established players or to continue serving its existing customers without having to go through the risky and time-consuming process of re-qualifying grades.

(ii) Simplicity of operation including flexibility in switching between different grades.

(iii) Cost/performance ratio evaluated on the basis of the expenditure needed for the construction of the plant and operating costs including royalties.

(iv) Track record of licensor, proven value of his technology : the existence of a large number of plants operating on the basis of a technology and serving various PP market segments or geographic markets is a guarantee that that technology is capable of producing commercially qualified and accepted grades. Moreover, a prospective licensee would be able futher to asses the value of the technology by visiting a number of operating plants of various capacities designed by the licensor and by using prior licensees as reference contacts. As a result, the risk factor in the selection process would be minimized. This is important, since licensing decisions involve substantial investment costs and are made for the lifetime of the plant (20 to 30 years). Even sophisticated licensees such as Western European PP producers regard the track record of the licensor as a significant factor in the selection process.

(v) Proven ability to construct larger plants. The size of a plant is important for the realization of economies of scale. In Western Europe for instance, new plants would today normally have a capacity of at least 120 000 to 160 000 tonnes and in a number of cases even larger plants would be required.

(vi) A large licensing pool in the context of which improvements to the licensed technology can be exchanged. Although sophisticated licensees with in-house technology may decide not to participate in a licensing pool so that they will not be obliged to communicate their own improvements in return, a large licensing pool appears to be important for less sophisticated licensees who rely on the licensor for technology updates. Communication of improvements appears to be particulary important with regard to the application of the catalyst used.

Advantages of Spheripol and Unipol

(66) The final choice in each case will result from a global judgment balancing the respective advantages of the various technologies. It appears, in this context, that Spheripol and Unipol are the two technologies that best combine the above elements and are generally considered to be broadly equivalent alternatives. Spheripol and Unipol have the most extensive grade coverage, they enjoy the best commercial track record, they have constructed a number of plants of various sizes operating on the market and they are truly global licensors with presence in and knowledge of the specificities of different geographic markets and of the product needs of licensees. Active competition between Spheripol and Unipol has been in the past the main driving force on PP technology market.

(67) The large number of licences that Spheripol and Unipol granted to date is important in terms of licensing revenue which can support their licensors' future research and development efforts in the area of PP technology. In addition, it appears that there are advantages in choosing the technology already used in existing plants for an expansion of capacity. These advantages are technological — e.g. knowledge of the capabilities and operation of the technology — or other — e.g. avoidance of delays due to the need to retrain staff and re-qualify grades for established customers — and they translate into cost saving and optimal production results for the potential licensee. Provided that the technology used in existing plants in up-to-date and suited to the licensee's future product range, it appears that 'installed capacity' has an influence on future licensing decisions and tends to reinforce the current market position of established players. On that basis, existing Spheripol and Unipol licensees may have a disincentive to switch to alternative technology providers.

Patent rights

(68) Himont is the owner or co-owner of all important patents for the basic intervention as well as subsequent improvements of the current generation of PP catalysts, namely supported catalysts, The exercise of patent rights may act as a barrier to entry into the PP technology market. In practice, there has been a series of patent disputes between Himont and new or potential catalyst producers regarding the validity of the latter's catalysts under Himont's patents. In all cases, these catalyst producers, including [...], have found it necessary to conclude non-assertion agreements with Himont in return for the payment of a lump sum or a percentage of the royalties obtained from the future sale of the catalyst, in order to avoid the risk of patent litigation. The duration of Himont's improvement patents in the area of supported catalysts which extend into the next century will continue to enable Himont to influence the possibility and conditions of new entry and thus entrench its current position on the technology market.

Views of PP manufacturers

(69) According to the Commission's investigations, Spheripol and Unipol are perceived as the two leading technologies in the industry and a number of PP manufacturers would be concerned if competition were eliminated between them. Spheripol and Unipol are considered to be commercially proven technologies, well known in the market and fully available for licence. They are relatively straightforward processes with a full product range and proven ability to construct plants with adequate economies of scale. Although alternatives were available, continued competition between Spheripol and Unipol was important and should be safeguarded. Other technologies were either more appropriate for speciality end uses, more complex processes with a less advantageous cost/performance ratio, not fully proven on the market place, or not fully available for licence.

(70) The concern was expressed that, as a result of the concentration, two different companies of Shell would be involved in two major packages and that the risk of restriction of the available technologies could not therefore be discarded. This restriction would be all the more significant, because Himont already controlled to a very large extent catalyst developments on the basis of its patents. Licensees would depend to a large extent on a single company for their technology and catalyst supply. Moreover, the joint venture would gain an additional competitive advantage through access to technology information and feedback from the much larger licensing pool of both leading technologies.

(71) The combination of the technological strength of Shell and Himont and the established position of their technologies on the market would place other licensors at a significant competitive disadvantage. *Inter alia* a newcomer would have to overcome the following obstacles: (i) lack of history in the market related to established reputations; (ii) development of adequate infrastructure (R&D, engineering support); (iii) development of catalyst production points with back-up supply capability. Moreover, the licensees' familiarity with Spheripol and Unipol combined with the provisions of existing agreements that give licensees the option to increase capacity in the same or new plants may also act a disincentive for them to switch to alternative technology providers.

Competition from other advanced technology providers

(72) Apart from Spheripol and Unipol, the notifying parties identified the following providers of advanced PP technology packages today: Mitsui, BASF, Amoco/Chisso and Sumitomo. The Commission considers that the mere existence of alternative technologies does not constitute adequate grounds for concluding that no dominance will be created on the technology market as a result of the concentration. Dominance is the ability to behave to a significant extent independently of one's competitors and customers. It is the view of the Commission based on its investigations in this case that for the reasons explained below, these alternative technology providers are not likely to form a significant constraint on the exercise of market power created by the concentration in the short to medium term.

(73) One of these technology providers accounting for about [...] (1) of licensed capacity, namely Mitsui, cannot, in the Commission's opinion, be regarded as a fully independent competitor likely significantly to constrain Himont's behaviour. Mitsui offers its Hypol process for licence together with catalysts jointly developed with Himont. Since 1975 Mitsui is involved in a Research and Development Cooperation Agreement with Himont concerning Hypol and Spheripol as well as related catalysts. Under the current version of this agreement [...], the parties cooperate on virtually all aspects of technology development and licensing [...].

(74) The agreement provides [...].

(75) This agreement is an expression of the long-standing cooperation arrangements between Himont and Mitsui and of the common economic interests and incentives that they share in the area of PP technology. This seems to be borne out by the fact that Mitsui has not secured a single licence in western Europe to date. On the basis of the above, it does not appear that Mitsui can be considered as an effective competitor likely significantly to constrain Himont's competitive behaviour.

(1) Between 10 and 25 %.

(76) Other existing licensors include BASF, Amoco and Sumitomo. BASF currently offers a gas-phase process (vertical stirred bed reactor) for license. The older version of the BASF technology became commercially available in 1974. The product range has since been broadened, especially since the incorporation of a proprietary supported catalyst in the BASF technology package in 1991, [...]. BASF has not granted any licences in western Europe since 1978. Its only licensee in Europe is ICI, whose PP business BASF has recently acquired.

(77) Sumitomo has developed a bulk process as well as a more recent gas-phase process (fluid bed reactor). Its bulk process became available for licence in the early 1980s and its gas process in the mid-1980s. Sumitomo has a very limited number of licensees world-wide for both processes.

(78) Amoco began development work on a gas-phase process in the 1970s in collaboration with Chisso Corporation of Japan. The first Amoco plants using the earlier version of this technology was built in the late 1970s. The Amoco/Chisso technology which is currently offered for license is an improved version of the earlier technology based on the development of a proprietary high activity catalyst in the 1980s [...].

(79) Although the Commission would not question the credibility of the abovementioned alternative technology suppliers from a purely technological perspective, and leaving aside contractual and other relationships with the notifying parties, it appears that these technology suppliers are not likely to significantly constrain the market power of Spheripol and Unipol for the following reasons. First, alternative technologies have a more limited number of qualified grades than Spheripol or Unipol both on the whole and within each specific PP family. In addition, some of these technologies are better suited for the manufacture of certain PP products and their grade coverage is correspondingly much weaker in other areas. This can be explained by the licensor's prior expertise and the product requirements of the geographical areas where he is mainly active. These technologies are as a result perceived to be less flexible by prospective licensees. By comparison Spheripol and Unipol have a more balanced grade coverage.

(80) Second, it was mentioned above that today prospective licensees may require larger plants in the interest of substantial economies of scale. According to the Commission's enquiries, the capital cost of a 200 kt plant is only approximately one and a half that of a 100 kt plant. In this respect, it is important to note that some of these alternative technologies have design capacity limitations compared with Spheripol or Unipol which prevent them from satisfying the requirements of some potential licensees.

(81) Third, in view of the limited number of their licensees to date these alternative technologies lack references and a proven commercial record in the market place. In some cases presence in the market but limited success in licensing can even be seen an indication of a market preference for unipol and Spheripol. In other cases where an improved version of a technology has only recently become available, lack of market knowledge of the technology works to the advantage of established players.

(82) Fourth, it appears that at least some of these alternative technology providers do not consider PP technology licensing as a core business in the context of their total operations. As a result, these companies have not pursued in the past an aggressive licensing policy. There is no indication that the current strategy of these companies in the PP licensing sector will change in the future.

(83) Finally, the ability of alternative technology providers to compete against Spheripol and Unipol could be limited by the following factors : (i) lack of catalyst production points sufficient to satisfy future demand for licences ; (ii) relatively small size of licensing infrastructure that could limit a licensor's ability to offer services required by prospective customers, including e.g. engineering services, training, start-up and technical assistance, customer support in product development.

(84) On the basis of the above it appears that other existing technology providers are not likely significantly to constrain the parties' power to behave to a significant degree independently of their competitors.

Potential entry

(85) A number of companies are currently engaged in R&D in the PP sector. The focus of this research depends on the expertise and financial or other resources of the company. In most cases, research will tend to focus on market-driven product differentation, while a company with a substantial fundamental research effort, such as Himont, may also develop new products or processes which can supersede existing technologies and create new market opportunities. A number of companies are currently working on a new generation of catalysts, metallocenes. However, this does not affect the Commission's competition assessment in this case, since the potential of metallocenes cannot be precisely determined and in any case it is not expected to be fully exploited in the short to medium term.

(86) The parties argue that there are a number of potential entrants who could, within a very short period of time enter the PP technology market. According to the parties, potential entrants can be : (i) PP producers with in-house technology who could decide to develop and license a technology package ; or (ii) PE technology suppliers who could, within a short period of time, adapt their PE process and catalysts, in order to license their technology for PP resin production.

(87) The parties argue that a number of PP producers are technologically sophisticated and have substantial financial resources. According to the parties, technological sophistication facilitates new entry. It is true that a number of PP producers have their own in-house R&D. However, according to the Commission's investigations, it does not appear likely that a new PP technology package will become available on the market in the short to medium term for the following reasons.

(88) Some of the PP producers who are mentioned as potential entrants have only developed or are in the process of developing their own catalysts for use in conjunction with a technology package that they have licensed. These producers have not developed nor are in the process of developing a process with the result that their entry into the market with a new technology package is not likely in the short to medium term. A small number of PP producers are currently developing both a process and a cata-

lyst, but research and development work has not yet been completed with the result that entry is uncertain or will at least be delayed for a considerable period of time. Patent issues will also have to be considered and until the vital question of the validity of patent claims has been resolved, entry will be further delayed or even indefinitely postponed.

(89) In the very few cases where proprietary technologies already exist but are not currently licensed, these technologies are subject to one or more of the handicaps mentioned in recitals 72 *et seq.* For instance, were new entry to occur, the lack of track record of the new entrant would pose the same difficulties as for existing alternative providers in competing against Spheripol and Unipol.

(90) As far as PE technology providers are concerned, although it is technically possible to adapt certain PE technology to manufacture PP, according to the Commission's investigations, entry by PE manufacturers into the PP technology market is not likely in the short to medium term for the following reasons : (i) the length of time required for development, commercialization, including grade qualification, and commercial acceptance ; (ii) obstacles likely to deter potential entry, including catalyst selection, the need to develop a technology capable of competing with established licensors, the costs involved in develop a technology capable of competing with established licensors, the costs involved in development and commercialization, the difficulty of entering an established market as a new entrant and gaining market acceptance, and not least the uncertain return in relation to one's investment.

(91) It appears therefore that potential entry into the technology market that could significantly constrain market power would not be likely in the short to medium term.

Demand for new licences in western Europe

(92) In the light of the continuing growth of PP demand — which is in fact the fastest growing sector in the pastics business — and the results of the Commission's market enquiries, the Commission has concluded that there will be demand for PP technology licences in western Europe in the period running up to the year 2000. This view was contested by the parties. In particular, the parties submitted a report prepared by independent business consultants in order to demonstrate there would be negligible, if any, demand for PP technology licences up to the year 2000.

(93) The essential parameters governing the forecast contained in the report were that : (i) current (i.e. 1993) PP capacity in western Europe is [...] million tonnes per annum ; (ii) current capacity utilization is [...] ; (iii) demand for PP is expected to grow at [...] per annum, which the report indicated lay in the range of other industry commentators ; (iv) de-bottlenecking (net of plant closure) could increase the existing pool of capacity to 6,5 million tonnes per annum. Using these parameters the report calculated that 'to bring the supply/demand balance to [...] operating levels about six new plants will be required by 2000'.

(94) Although the Commission does not think it would be necessary, having regard to the following assessment, to challenge the forecast parameters and methodology it is, however, inclined to the view that the report has a greater tendency to underestimate than overestimate the likely future demand for PP technology licences. This view is based on three considerations.

(95) First, in the light of other technical information made available to the Commission and the allowance made in the report itself, the size of future plant closures would seem to be underestimated so that the net capacity increase due to de-bottlenecking may be overstated. Secondly, it would appear that the report asumes that the current net PP exports amounting to 300 000 tonnes will completely disappear. If net exports were to remain at their current level, this would correspond to demand for an additional two PP plants. Thirdly, and more importantly, the report fails to take into consideration the very long lead time required for negotiation of a technology licence before the corresponding new PP plant comes on stream. The parties themselves have pointed out that 'based on industry practice, ... PP technology licences are granted some four years before a new PP plant is commissioned' (point 6.9 of the parties' Response to the Commission's Statement of 28 March 1994). As a result, a forecast for demand for PP technology licences in the period up to the year 2000 would logically have to consider what would be the likely demand for PP up to the year 2004 and not 2000.

(96) Nevertheless, these points can be left aside since it is sufficient to assess the nature of the PP technology licensing demand arising from the report conclusions in more detail. The conclusion of the report is that six new plants each having a capacity of about 160 kilotonnes per annum will be

required. However, the report and parties go on to consider that this will not give rise to demand for PP technology licensing, because two of the six plants will be constructed by producers already having their own technology, a further three plants will be built by producers enjoying an option under existing PP technology licensing contracts to increase capacity on broadly pre-ordained terms, and the sixth producer would be interested in a PP technology licence but the terms and conditions of his licence are likely already to have been determined.

(97) The Commission disagrees with this line of reasoning. First, even on the basis of the information submitted by the parties there is doubt as to which producers will undertake the required expansion. A second report by different industry consultants submitted by the parties and assessing which companies were most likely to build new plants considered expansion likely by two companies not mentioned in the first report. In any event, it is a matter for each market player to decide individually whether or not it will increase capacity in the expectation of acquiring a share of the expected growth in PP demand in western Europe. In this regard the continued availability of effective competition in the PP technology licensing market is a crucial factor since the large majority of western European PP producers are potential customers for technology licences.

(98) Secondly, as regards contractual options to increase production, the Commission notes that not all of the PP producers with claimed licensing technology options do in fact enjoy such an option. In any case, as explained above, the Commission considers that the mere existence of an option does not imply that the option holder is not on the market for technology licensing. An option holder is likely to compare offers from other technology providers before making his choice and thus benefits from the presence of effective competition on the technology market,

(99) In conclusion, the Commission considers that, the analysis carried out above using the material submitted by the parties, demonstrates that significant demand for PP technology licensing can be expected in the near future. In fact, according to the Commission's market enquiries, some PP producers in western Europe are already interested in new PP technology licensing.

Sophisticated buyers as countervailing power to a dominant firm

(100) The parties argue that potential customers for PP technology in western Europe are predominantly technologically sophisticated with substantial financial resources. As a result, in the event that a dominant technology provider tried to exercise market power, PP producers would have a powerful incentive to take action in order to avoid the costs of dominance. However, in the Commission's view, the ability of these producers to exercise countervailing power to a dominant technology provider should not be overestimated.

(101) The Commission considers that the development of proprietary technologies as an alternative to buying licences is at most a long-term solution for a very small number of players in view, *inter alia*, of the length of time and substantial investments required for successful completion of development work. In most cases research and development efforts of PP producers are normally related to catalyst improvement. These producers would still require a matched process which they are unlikely to develop in the short to medium term. More importantly, the validity of catalyst improvements under pre-existing patent rights may have to be settled and past experience demonstrates the importance of such rights. In conclusion, the Commission considers that technological sophistication could not act as a significant constraint on the exercise of market power by a dominant technology provider in the short to medium term.

Conclusion

(102) In the light of the above, the Commission concluded that the original concentration would lead to the creation of a dominant position as a result of which effective competition would be significantly impeded on the market for PP technology. Dominance on the technology market might have a restraining effect on the PP industry's future plans and opportunities for expansion. It would deprive PP manufacturers of the benefits of competition with regard to price, quality and other parameters with negative repercussions on the PP production market. However, in view of the commitments offered by the parties regarding the establishment of Montedison's separate Technipol subsidiary (see recital 116) the Commission's concerns regarding Sophia's acquisition of a dominant position on the PP technology market have been resolved.

(ii) *Production and sale of PP*

(103) The joint venture will be the world leader in the PP market with a global capacity of [...] million tonnes, representing approximately [...](1) of PP world-wide capacity. It will also be the leading supplier of PP in western Europe accounting for about [...](2) of capacity and about [...](2) of free sales (i.e. sales excluding captive use).

(104) Subsequent to the concentration there will be more than 10 producers of PP in western Europe apart from the merged entity. However, Sophia's market share will be more than double the market share of its next competitor, Borealis (about [...](1) of capacity and about [...](1) of free sales). In terms of capacity, Hoechst will account for about [...](3), PCD/OMV and Appryl for abourt [...](3) each, BASF and ICI together for about [...](1). Other suppliers of the western European market, each with a share [...](3), will include Amoco, Petrofina, Exxon, Repsol, DSM, Vestolen and Solvay.

(105) As to the impact of the merged entity on the production of different types of PP, the PP businesses of Montedison and Shell are largely complementary: [...] of Shell's free market sales are in commodity homopolymers, while [...] of Montedison's sales are in speciality homopolymers and copolymers. In block copolymers, which as indicated above, could be considered to form part of a distinct product market within PP, there is some overlap between the activities of the parties. However, their combined market share in this area does not exceed their abovementioned share of the entire PP market. Therefore, the following analysis will focus on the effects of the concentration on the market for the production and sale of PP taken as a whole.

Joint venture links between PP producers

(106) In view of the increasing degree of concentration on the market for the production and sale of PP, it is appropriate to take into consideration the joint-venture links between Montedison and Shell on the one hand and other producers on the other hand. Montedison and Shell have a number of joint ventures with other polyolefin producers, three of them which relate to PP: Montefina, a joint-venture between Montedison's subsidiary, Himont and Petrofina with a capacity of about 380 kts/y, NSP (Himont/Statoil) with a capacity of about 200 kts/y and ROW (Shell/BASF) with a PP capacity of about 200 kts/y. Each of these joint ventures is based on a 50 % participation by the respective parent companies.

(107) Through their joint-venture links the parties may be able to influence the competitive behaviour of their joint-venture partners, who are important competitors on the PP production market and thus strenghten their position on that market — the total capacity of the PP producers involved in Montefina, NSP and ROW will account for [...](4) of western European capacity ([...](4) including BASF/ICI). [...].

(108) In any event, it appears that in the case of Montefina in particular, subsequent to the concentration Sophia would be able to exert a considerable restraining influence on Petrofina's competitive behaviour. Montefina is a 50/50 production joint venture created in 1976 to produce PP using technology licensed by Montedison. It currently has two production lines in Feluy, Belgium, whose output is shared by the parents and independently marketed by each of them. Petrofina's total PP production in western Europe comes from Montefina so that Petrofina's competitive position could be critically influenced by the behaviour of its new joint-venture partner.

(109) According to Petrofina, the Shell/Montedison transaction would be likely to cause a potential conflict of interest among the three Montefina parents. [...]. Petrofina believes that only a separation of Montefina from Sophia would remedy this non-competitive situation.

(110) [...]. Under the Montefina shareholding agreement, all important decisions must be agreed to between Himont and Montedison (or its successor in the joint venture). In the Commission's view, this enables Montedison to influence production and other important decisions in the context of the joint venture. With regard to the exchange of technological information, [...] it is the Commission's view that access by Montedison or Shell personnel

(1) Between 10 and 25 %.
(2) Between 25 and 50 %.
(3) Below 10 %.
(4) Between 50 and 75 %.

at Montefina to Petrofina's technological information in the context of the joint venture remains and could act as a disincentive to the use of Fina's technology by Petrofina.

Other factors reinforcing Sophia's position on the PP production market

(111) The merged entity will combine on the one hand Himont's technological leadership and success in the development of new products and advanced polyolefin materials and on the other hand Shell's strong world wide presence as one of the largest petrochemical companies, feedstock availability and considerable financial resources. These to a large extent complementary strengths of the two partners will create a particularly powerful combination. Sophia will be able to offer the broadest product line in the industry, including all families of PP products and a very large variety of PP grades used in a wide range of applications. It will have the financial resources, strengthened by its technology position and licensing income, to focus on the development of specialized products and advanced materials. It could also use general profits to subsidize niche markets. The geographic spread and size of its existing plants are such that Sophia would enjoy particularly competitive production costs and efficient distribution in many geographic locations. In addition, it will have considerable advantages *vis-à-vis* its competitors because of the size of its sales and marketing organization and in particular its position with regard to technology.

(112) The merged entity will combine the substantial assets and expertise of its parent companies and will have a leading position on the PP technology market, as explained above. The ability to spread R&D costs over a large production base would place the parties at a considerable advantage in relation to other PP producers. The parties' advantageous position will be further strengthened as older PP products are replaced by new products with superior properties.

(113) Even more importantly, by controlling the two world-wide leading technologies, Sophia would be able to determine the pace of future development on the PP production market, because its licensing policy would be insufficiently controlled by other competitors. Sophia could thus for instance charge supra-competitive royalties or otherwise exercise market power. All innovation and product development could be retained for use by Sophia, since there would be no competitive pressure to license other PP producers. Sophia could thus negatively affect the conditions of competition on the PP production market.

Conclusion

(114) Although the combined market share of the parties is not itself very high, its considerable gap with the market share of the next largest competitor, combined with a number of other factors, that is the network of joint ventures, Sophia's high level of product coverage and especially Sophia's leading position in technology, will substantially reinforce the parties' position on that market. All these factors led the Commission to entertain serious doubts as to the possible creation of a dominant position on the PP production market. However, the Commission's concerns regarding Sophia's acquisition of a dominant position on the technology market have been resolved by the commitments offered by the parties regarding the establishment of Montedison's separate Technipol subsidiary (see recital 116). Moreover, the parties have also offered a commitment specifically relating to the PP production market, namely the dissolution of the Montefina joint venture. Accordingly, in view of those commitments the Commission considers that there is no longer any room for serious concerns as to the creation of a dominant position on this market.

V. MODIFICATIONS TO THE ORIGINAL CONCENTRATION PLAN

(i) The undertakings entered into by the parties

(115) Following the Commission's communication pursuant to Article 18 of the Merger Regulation, and in order to remove the competition concerns expressed into the following commitments *vis-à-vis* the Commission :

(116) *PP technology undertaking*

'The notifying parties undertake the following :

Himont's existing PP technology business will remain outside Sophia by its transfer to a company, either new or existing, under the sole control of Montedison (The "Technipol Company"). Shell will have no financial investment in the Technipol Company. The Technipol Company will be

established at the latest within [...] of the Commission's compatibility decision. In the intervening period, the PP technology business will be conducted and kept separate from both Shell and Sophia. This company will be a separate, full-functioning company capable of conducting PP technology business or an ongoing, viable and competitive basis enjoying its own financial resources and capable of continued independent PP technology development. It will be endowed with the following assets and charasteristics :

(i) the existing world-wide PP technology licensing business (including the irrevocable and exclusive right to licence the corresponding intellectual property rights, and the existing sales/marketing/support staff). The existing PP licensing contracts and related PP catalyst supply contracts will be transferred to the Technipol Company. To the extent that the transfer of such contract requires the consent of licensees, Montedison will use all reasonable endeavours in good faith to obtain such consent. The revenue from any transferred contracts will accrue to the Technipol Company [...]. The Technipol Company will be given sufficient resources to finance its R&D efforts. To the extent that such contracts are not transferred, Sophia will subcontract (subject to contractual constraints) in arm's length terms the performance of its obligations under those contracts to the Technipol Company ;

(ii) the corresponding R&D staff and R&D facilities regarding all aspects of the PP technology business including licensing support, technological updating and further development of the PP technology (R&D relates to both PP process and catalyst technology) ;

(iii) the Technipol Company will own the intellectual property rights that are the fruits of its own research in PP technology, including in PP catalysts. However, this will not prevent the Technipol Company from entering into sponsored research contracts on usual industry terms. The Technipol Company will also have the exclusive right to enforce the intellectual property rights licensed to it by Sophia, and in particular to decide whether to pursue infringement proceedings against third parties (subject to legal constraints and requirements).

(iv) Sophia will dedicate exclusively to the Technipol Company such proportion of its catalyst manufacturing capacity as is required by the Technipol Company to supply the needs of its PP technology licensees. Sophia will accordingly manufacture PP catalysts on a toll manufacturing basis on terms and conditions that are customary in the industry. Sophia will not offer for sale such catalysts to any other third party. The Technipol Company and its licensees may obtain PP catalysts from third parties ;

(v) the existing PP pilot plant for PP technology development and testing as well as access to a full scale PP production plant ;

(vi) Sophia may purchase technological improvements to existing PP technology employed by Sophia, other technical services, catalysts or technology from the Technipol Company but only on an arm's length basis and on commercial terms equivalent to those offered to licensees ; and

(vii) neither Sophia nor Shell shall have access to Technipol Company's privileged information of the type that would not be made available to a competitor, in particular regarding business and commercial secrets such as pricing, customer lists and negotiations, sales data.

References to PP technology in these untertakings shall mean Himont's PP process and catalyst technology as currently licensed and any developments in PP technology.'

(117) *PP production undertaking*

'Montedison undertakes the following concerning the Montefina joint venture :

(i) Withdrawal of Himont from Montefina within [...] of the Commission's compatibility decision. This period may be extended by the Commission if the Commission is satisfied that despite *bona fide* efforts by Montedison, Montedison has not been able to sell its investment in Montefina. Each request for an extension shall be duly motivated.

(ii) Montedison, on behalf of the Technipol Company, shall reaffirm Montefina's right to the benefit of the most favoured licensee clause as regards the catalyst supply and the licence agreements. [...]

No provision of any new licence and no other intellectual property right of Himont or of Sophia shall be construed so as to prevent or hinder Montefina or Petrofina from entering into merger or alliance discussions with a third party, provided that Montefina or Petrofina shall protect the Technipol Company's, Himont's and Sophia's legitimate intellectual property rights and business and commercial secrets.

(iii) The operations of Montefina will be kept separate from those of Sophia. During the period prior to formal withdrawal, Himont's rights in Montefina will be exercised by Montedison. No person on the Sophia payroll or agent of Sophia shall be present on the Feluy site except with Montefina's prior consent.

During the withdrawal period as well as thereafter, knowledge of the business and commercial secrets of Petrofina and Montedison acquired through the common operation of Montefina shall remain secret and in no circumstances be communicated to Sophia or any other party except any *bona fide* potential purchaser of Montedison's interest in Montefina and its advisers. In particular, no data files, business records or other confidential documents relating to Montefina shall be transferred to Sophia.

(iv) During the transitional period, Montedison shall undertake every effort consistent with the past functioning of the plant to ensure the smooth, efficient and commercial operation of Montefina, compatible with the reasonable interest of both parties and provided *bona fide* efforts are made by Petrofina to such effect.

(v) A detailed report shall be provided by Montedison at three monthly intervals on the state of progress of sale negotiations and the withdrawal implementation.'

(118) *Review of PP technology remedy*

'The parties reserve their rights under Community law to request the Commission to review the whole or any specific undertakings relating to PP technology set out above, [...].'

(119) *Implementation of undertakings*

'These undertakings will take effect from the date of the Commission's decision under Article 8 (2) of Regulation (EEC) No 4064/89.'

(ii) Assessment of the undertakings

(120) These undertakings have been taken into account by the Commission in its assessment of the effects of the proposed concentration. As explained above, were the operation to be implemented as notified, both leading PP technologies, Unipol and Spheripol would fall within the decisive influence of a single decision centre, namely Shell. However, the implementation of the parties' commitment relating to PP technology will change this anti-competitive situation. Montedison's world-wide PP technology business will be transferred to a separate company, Technipol, which will be structurally and financially independent of Sophia and Shell. Technipol will be endowed with all the necessary assets and characteristics enabling it to operate as an on-going, viable and competitive business. Montedison's PP process and catalyst technology, whether already developed or in the process of development, will be transferred to Technipol. Technipol will be responsible for the licensing, updating and further development of such technology. Any relationship between Technipol and Sophia will be on an arm's length basis and on terms equivalent to those offered to third parties. In particular, Technipol will be expected to undertake its own research efforts in the area of PP process and catalyst technology thus securing its future as an active licensor.

(121) As described above, the Commision considers that the PP technology commitment offered by the parties will have the result that the business of one of the two leading PP technologies will fall outside the field of influence of Shell and will be able to remain an independent and viable competitor on the market. In order to ensure effective implementation of this commitment, the Commission considers it essential to be kept informed by the parties of progress made in this respect on the basis of quarterly reports prior to the establishment of Technipol and annual reports for the succeeding three years. The nature of these reports is described below.

The first quarterly report on the implementation of the PP technology commitment shall be submitted within four months of the date of this Decision. The report shall describe *inter alia* the detailed steps taken to establish the Technipol company, the expected financial resources of the company, its envisaged tangible and intangible assets and the likely staff resources divided into R&D, scientific and other staff. Letters or documentation sent to existing licensees describing the establishment of Technipol and correspondence relating to the endeavours taken to encourage licensees to transfer existing licence contracts to Technipol shall be appended to the report.

The second quarterly report shall be submitted after the establishment of Technipol and within seven months of the date of this Decision. This report shall take the same form as the first quarterly report except it shall relate to definitive financial resources, assets and staff, etc. In particular, details shall be provided of licence contracts transferred, not transferred (stating the reason therefor) and those pending. The expected financial income accruing to these contracts shall be identified. The financial remuneration provided to Sophia for transferred contracts shall be specified. A copy of the company's opening balance sheet and business plan shall be appended.

For the next three years, an annual report on Technipol shall be submitted within three months of the end of each financial year. These reports shall include :

— a copy of the annual accounts including balance sheets and profit and loss account for the year in question,

— separate identification of licensing revenue for contracts transferred and new contracts gained since establishment,

— details of other income including research sponsored by third parties,

— R&D expenditure and facilities,

— intellectual property rights,

— employee numbers subdivided into R&D, scientific and other staff,

— catalyst sales in volume and value terms,

— a summary of the company's commercial and scientific activities during the year.

Finally, the Commission has taken note of the parties' statement regarding the review of the technology remedy (point 3 of the parties' commitment) and confirms its willingness to undertake such review in accordance with Community competition law.

(122) The parties' PP technology commitment also has considerable relevance for the assessment of Sophia's position on the PP production market, where the Commission identified potential competition problems arising from Sophia's size, joint-venture links and especially its dominance on the PP technology market. The PP technology remedy along with the parties' commitment regarding Montefina, which will enable Montefina effectively to compete with Sophia, will have the result that the Commission's concerns in relation to the PP production market will also be resolved.

VI. FINAL CONCLUSION

(123) For the reasons outlined above, the Commission considers that the proposed concentration, as subsequently amended by the inclusion of the commitments offered by the parties, would not lead to the creation or reinforcement of a dominant position on the markets for PP technology and PP production and sale, as a result of which effective competition would be significantly impeded in the common market within the meaning of Article 2 (3) of the Merger Regulation. The concentration can therefore be declared compatible with the common market subject to full compliance with conditions and obligations within the meaning of Article 8 (2) of the Merger Regulation.

(124) This Decision is without prejudice to the application of the general Community competition rules to pre-existing joint ventures and pre-existing contractual arrangements between the parties to the proposed concentration and third parties, in particular with respect to the implementation of the parties' commitments relating to the future of the Montefina joint venture,

HAS ADOPTED THIS DECISION:

Article 1

Subject to the conditions and obligations contained in the parties' commitments *vis-à-vis* the Commission set out in recital 116 of this Decision, the notified concentration between Shell and Montedison is declared compatible with the common market.

Article 2

The parties are required to keep the Commission informed of the implementation of the commitments set out in recital 116 of this Decision on the basis of the quarterly and annual reports described in recital 121 of this Decision.

Article 3

This Decision is addressed to:

Shell Petroleum NV,
30 Carel van Bylandtlaan,
NL — The Hague,
and
Montedison Nederland NV,
c/o Montecatini SpA,
Foro Buonaparte 31,
I-20121 Milano.

Done at Brussels, 8 June 1994.

For the Commission
Karel VAN MIERT
Member of the Commission