II

(Acts whose publication is not obligatory)

COMMISSION

COMMISSION DECISION

of 18 January 2000

declaring a concentration to be compatible with the common market and the EEA Agreement

(Case COMP/M.1630 — Air Liquide/BOC)

(notified under document number C(2000) 62)

(Only the English text is authentic)

(Text with EEA relevance)

(2004/269/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to the Agreement on the European Economic Area, and in particular Article 57(2)(a) thereof,

Having regard to Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings [1], as last amended by Regulation (EC) No 1310/97 [2], and in particular Article 8(2) thereof,

Having regard to the Commission's decision of 16 September 1999 to initiate 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 Concentrations [3],

Whereas:

(1) On 16 August 1999, the Commission received a notification pursuant to Article 4 of Regulation (EEC) No 4064/89 (the merger Regulation) of a proposed concentration whereby the undertaking Air Liquide SA (Air Liquide) acquires control within the meaning of Article 3(1)(b) of the merger Regulation of parts of the undertaking The BOC Group plc (BOC) by way of a public bid to be implemented jointly with the undertaking Air Products and Chemicals Inc. (Air Products) and the subsequent division of the businesses and assets of BOC.

(2) On 16 September 1999 the Commission decided in accordance with Article 6(1)(c) of the merger Regulation and Article 57 of the EEA Agreement to initiate proceedings in this case.

(3) The Advisory Committee discussed the draft of this Decision on 5 January 2000.

I. THE PARTIES

(4) Air Liquide is an international group active in the field of industrial gases and related businesses, cogeneration

[1] OJ L 395, 30.12.1989, p. 1; corrected version in OJ L 257, 21.9.1990, p. 13.
[2] OJ L 180, 9.7.1997, p. 1.
[3] OJ C 79, 30.3.2004.

of electricity and steam, engineering, welding and cutting equipment and consumables, diving and medical equipment and services related to those products. The company supplies industrial gases to various industries including iron, steel, refining, chemicals, glass, electronics, paper pulp, metallurgy, food processing, health care and aerospace industries. Air Liquide is the world's largest producer and distributor of industrial gases in terms of turnover.

(5) BOC is involved in the production and distribution of industrial gases and related equipment, distribution services and vacuum technology. The company produces and markets the main atmospheric gases (nitrogen, oxygen and argon), hydrogen, carbon dioxide, helium, acetylene, liquefied petroleum gas and speciality gases. In terms of turnover, BOC is the world's second largest producer and distributor of industrial gases.

II. **THE OPERATION AND THE CONCENTRATION**

A. *THE NOTIFIED ACQUISITION OF PARTS OF BOC*

(6) On 13 July 1999, Air Liquide and Air Products announced a joint pre-conditional recommended cash offer under rule 2.5 of the United Kingdom Takeover Code for all shares in BOC through Bidco, a corporate vehicle established for the purpose of the acquisition. Upon obtaining regulatory approval, including that of the European Commission, the companies are obliged to proceed to post an offer to the shareholders.

(7) Air Liquide and Air Products have agreed to divide the businesses and assets of BOC after completion of the bid (Agreement of 2 July 1999, as amended on 7 July 1999 (the Agreement)). In accordance with the agreed plan for that division, Air Liquide will acquire BOC's operations within the EEA (in the United Kingdom and Ireland) as well as certain operations outside the EEA. Air Products will acquire the remaining BOC operations. With respect to BOC's intellectual property, consisting of patented and non-patented technology including software, Air Liquide and Air Products intend to make arrangements to give both undertakings equal access to that intellectual property (section 9 of the Agreement).

(8) The present notification concerns only those businesses and assets of BOC that Air Liquide proposes to acquire, in particular the assets located in the United Kingdom and Ireland.

B. *PREVIOUS ACQUISITIONS*

(9) In January 1999, Air Liquide acquired the industrial gases businesses of BOC in France, Belgium, the Netherlands and Germany. Those acquisitions were notified to the Bundeskartellamt ([4]) (German Federal Cartel Authority) and the Conseil de la concurrence ([5]) (Belgian Competition Service). Those competition authorities cleared the acquisition. The acquisition was also notified to the Nederlandse Mededingsautoriteit ([6]) (Dutch Competition Authority), which issued a 'no jurisdiction'-decision.

(10) Given that the transactions referred to in paragraph 9 all took place within a two-year period between the same undertakings, they will be treated as one and the same concentration under the present procedure pursuant to the second subparagraph of Article 5(2) of the merger Regulation.

III. **COMMUNITY DIMENSION**

(11) Air Liquide and BOC have a combined aggregate worldwide turnover of more than EUR 5 000 million ([7]) (EUR 6 146 million for Air Liquide ([8]) in 1998 and approximately EUR 1 949 million for BOC ([9]) in 1998). The aggregate Community wide turnover of each party exceeds EUR 250 million (EUR […](*) million for Air Liquide ([10]) in 1998 and EUR […]* million for BOC in 1998) and neither of the undertakings concerned achieves more than two-thirds of its aggregate Community-wide turnover in one and the same Member State. The notified concentration therefore has a Community dimension.

(*) Parts of this text have been edited to ensure that confidential information is not disclosed; those parts are enclosed in square brackets and marked with an asterisk.

([4]) Case B3-168/98 of 16.12.1998.

([5]) Case 98/0050 of 12.1.1999.

([6]) Case 1182/4b.84 of 29.12.1998.

([7]) Turnover calculated in accordance with Article 5(1) of the merger Regulation and the Commission Notice on the calculation of turnover (OJ C 66, 2.3.1998, p. 25). To the extent that figures include turnover for the period before 1 January 1999, they are calculated on the basis of average ECU exchange rates and translated into EUR on a one-for-one basis.

([8]) The turnover figure for Air Liquide includes the turnover of the business acquired from BOC in 1999 in France, Germany, Belgium and the Netherlands (EUR […]* million).

([9]) The turnover figure for BOC includes turnover for the gases businesses to be acquired by Air Liquide.

([10]) See footnote 8.

IV. ASSESSMENT UNDER ARTICLE 2 OF THE MERGER REGULATION

A. *RELEVANT PRODUCT MARKETS*

1. INDUSTRIAL GASES

(12) The businesses of Air Liquide and BOC mainly overlap in the production and distribution of industrial gases. Industrial gases are all gases used in manufacturing processes, research, healthcare and related applications. The parties produce and distribute atmospheric gases (air gases) and non-atmospheric gases (gases produced from sources other than air).

(13) Atmospheric gases are nitrogen (around 78 % of the air), oxygen (around 21 % of the air) and argon (around 0,9 % of the air). The rare gases Krypton, Neon, Xenon together account for around one thousandth of the air. The production of air gases is mainly based on cryogenic air separation technology, which involves a multi-step and relatively complex process. Air is liquefied at very low temperatures and then separated into its components, which are removed at different levels in distillation columns. Other air separation processes include pressure swing adsorption (PSA) and vacuum pressure swing adsorption (VPSA). Both processes produce either oxygen or nitrogen. Membrane separation is used mainly for the production of nitrogen.

(14) Hydrogen is abundant in hydrocarbons (petroleum and its by-products) and is mainly produced by steam reformation of natural gas, or naphtha or by other chemical means (usually hydrocracking). Hydrogen is also manufactured by oil and chemical companies. Carbon dioxide is mainly produced from natural wells or from the combustion of hydrocarbons. Thus, industrial gases companies often buy carbon dioxide from chemical and petrochemical companies. Acetylene is a gaseous hydrocarbon generally produced from the reaction of calcium carbide with water or extracted from chemical sources.

(15) Helium is obtained from natural gas with a helium content of 0,3 % or more (helium rich natural gas). The production process includes the extraction of crude helium (which contains approximately 65 % helium and 35 % nitrogen) and the purification (refining) in order to obtain pure helium (99,995 % or higher purity). The notifying party considers that a separate market exists for the wholesale of helium. The Commission's investigations have confirmed that there is a wholesale market for the supply of refined helium to retailers for resale.

(16) The parties to the concentration also sell so-called speciality gases, which comprise mainly refrigeration, electronic and lighting gases. Speciality gases contain various chemical molecules required by the electronics industry to manufacture semiconductors to be used in the different steps of the manufacturing process (so-called electronic speciality gases — ESGs): for example Silane (SiH_4) is used for deposition of a layer of pure silicon or silicon oxide on the surface of the wafer, Arsine (ASH_3) and Phosphine (PH_3) for doping (addition of dopants on the surface of the wafer in order to change semiconductor properties), Nitrogentrifluoride (NF_3), Hexafluoroethane (C_2F_6) and Carbontetrafluoride (CF_4) for etching (in order to remove materials on the surface of the wafer to create the integrated circuit pattern), Tungstenhexafluoride (WF_6) for metal deposition and Hexafluoroethane and Nitrogentrifluoride as cleaning agents.

(17) The principal uses of industrial gases are set out in table 1.

Table 1

Description of primary industrial gases and their use

Nitrogen	**Oxygen**	**Argon**
Purging of all types	Steel making	Welding
Oil and gas operations	Non-ferrous melting	Steel making
Heat treatments	Waste water treatment	Light tubes
Glass making	Gas welding, cutting	Metals
Insert packaging	Breathing gases	Electronics components
Silo atmospheres	Rocket fuel oxidant	
Food transports	Brick making	**Helium**

Description of primary industrial gases and their use		
Steel making	Odour control	
Electronic components	Tea fermentation	Welding
Tissue freezing	Glass making	Balloons
Artificial insemination	Pulp and paper	Leak detection
Food freezing	Ozone	MRI
Shrink fitting	Coal gasification	Cyrogenic cooling
Molding deflashing	Electronic components	Breathing gases
Scrap reclamation		
Die cooling	**Carbon Dioxide**	**Hydrogen**
Steelworks equipment cooling		
Solvent recovery	Food freezing	Furnace atmospheres
Air pollution abatement	Beverages	Glass making
Chemical manufacture	Oil wells	Chemicals manufacture
Blow mold cooling	Plant growth	Power station equipment cooling
Mine safety	Fire extinguishers	Rocket fuel
	Waste treatment	Margarine manufacture
	Mold setting	Electronic components
	Metals fabrication	
	Tobacco expansion	

Source: NatWest Securities, 'Industrial Gases 2000'.

(18) The industry generally shares the view that each gas constitutes a separate product market. Certain gases can, in principle, be substituted by others for specific uses, for example, carbon dioxide and argon for welding. However, customers generally do not consider substitution to be a realistic option. The replies to the Commission inquiry received indicate that for most applications, price differences and the degree of integration of a particular gas with the customers' specific application processes largely exclude substitution between gases in practice.

(19) Therefore, for the purpose of this case, the Commission considers that oxygen, nitrogen, argon, hydrogen, carbon dioxide, acetylene, wholesale helium and electronic speciality gases constitute separate product markets.

2. SUPPLY METHODS

(20) Industrial gases are supplied in different forms (gaseous or liquid) and via different distribution channels (tonnage, bulk and cylinders).

(21) Tonnage sales take place where demand for air gases involves large quantities of oxygen and nitrogen. Customers are mainly industrial users (for instance in the petrochemical/chemical, steel, refining and glass industries).

(22) Supplies take place through dedicated production plants installed on the customer's site ('on-site' air separation units) or by means of pipeline links. In the first case, air separation units are built on or close to the site of the customer and are dedicated to the requirements of that customer ([11]). The products are delivered in gaseous form directly from the supplying plant through a pipe connecting the plant to the industrial site of the customer. The supplier owns the on-site plants and operates them on the basis of a long-term contract (up to 15 years). It provides ongoing maintenance and support. In geographical areas where the density of customers makes it economically viable to link air separation units to each other, a pipeline network may be built (e.g. Northern France, Belgium and the Netherlands). Each gas (oxygen or nitrogen) is delivered through a specific pipe. According to the notifying

([11]) In certain cases, other customers may also be served from this air separation unit.

party, these methods of supply are without alternative for volumes between 100 tonnes per day, or 3 000 m^3/hour, and more than 2 000 tonnes per day (tpd), or 60 000 m^3/h.

(23) On-site air separation plants (mostly non-cryogenic, sometimes also cryogenic) are also used to satisfy demand for oxygen or nitrogen from 20 to 100 tpd, that is to say in a range that could also be supplied in bulk. Smaller on-site units often produce either nitrogen or oxygen, larger units produce both together.

(24) The quantities of gas that may be supplied in bulk are not as large as in the tonnage business. Except for hydrogen, which is mainly produced and transported in gaseous form, the gases delivered in bulk are generally produced in liquid form. Liquefaction plants can also be constructed on the same site as tonnage plants, thus avoiding investment in a pipeline between the two. The liquid gases are then transported by road or rail tanker from the supplier's plant to the site of the customer, where they are stored, before being used in liquid form or transformed into gaseous form. Each gas is transported and stored in specific dedicated equipment (air gases, in particular, require transport in low temperature cryogenic trailers).

(25) Delivery in cylinders is used when the quantities requested by the customers are small, ranging from one m^3/month to 1 000 m^3/month (above this quantity, the customer's demand would best be served in bulk). All gases are produced and filled in cylinders in gaseous form, except carbon dioxide, which is delivered in liquid form. Cylinders may be filled at, and distributed from, the supplier's production plant or, alternatively, liquid gases may be transported in tankers to cylinder filling centres in order to be transformed into compressed gas. From there, cylinders in various sizes holding gas under pressure are transported either directly to the customer, or to depots from which the supply to retail customers is carried out. The more important cylinder customers will usually be served directly by the industrial gases company, whereas smaller customers will be supplied by the depot holder. Although the volumes of cylinder gases are limited, their importance in terms of revenue is considerable because of the significantly higher prices and related charges that go with cylinder sales.

(26) The industry generally views these three different distribution methods as separate product markets, and the Commission has taken the same view in previous cases. Prices for gases, cost of transportation and rent and possible safety and other charges differ depending on which form of delivery is used.

(27) The Commission therefore considers that the tonnage, bulk and cylinder supply of oxygen and nitrogen, the bulk and cylinder supply of argon (including argon mixtures), hydrogen, carbon dioxide and acetylene, the wholesale supply of helium and the supply of electronic speciality gases constitute the relevant product markets. It should be noted, however, that those markets may nonetheless be inter-related. In particular, a strong position on the tonnage market will often confer competitive advantages on the bulk market and vice versa.

B. *RELEVANT GEOGRAPHIC MARKETS*

1. TONNAGE

(28) The notifying party argues that the relevant market should be qualified as worldwide. The Commission notes that the notifying party's position is inconsistent with its assertions throughout the procedure as well as its own internal assessment. Throughout the procedure, the notifying party has stressed that none of BOC's businesses and operations in the United States and other parts of the world, which the notifying party plans to acquire, have any effect on competition within the EEA. Those statements clearly contradict the notion of a world market. Furthermore, the Commission has reviewed an internal document in which the notifying party analysed the competition law aspects of the planned acquisition. That document assesses the planned transaction's impact in a reference area not wider than Europe. No mention is made of a wider reference area, for example a world market ([12]). The Commission concludes that the position taken by the notifying party at the oral hearing contradicts its usual assessment of the relevant geographic market.

(29) At the oral hearing, the notifying party submitted that industrial gases companies are technically able to construct on-site separation plants anywhere in the

([12]) Air Liquide document of 2 June 1999 (submitted to the Federal Trade Commission as part of the HSR filing). The relevant text reads: 'Consequences of the transaction: Tonnage — on a national basis, no overlap of parties' activities; on a European basis, combined share would exceed 40 %'. The text goes on to assess the transaction's impact 'in the EU territory'.

world. The notifying party infers that the market should be seen as worldwide. However, the mere fact that a supplier has the technological ability to provide certain goods worldwide is not in itself sufficient to justify that conclusion. Rather, in a market in which long-term supply contracts are put out to tender, the analysis should focus on whether suppliers do actually compete for such contracts in the same geographic area, and whether suppliers compete under homogenous conditions in different geographic areas.

(30) The Commission's investigation has confirmed that a distinct group of industrial gases companies, which are established within the EEA, are competing for tonnage supply contracts within the EEA on a regular basis, namely AGA, Air Liquide, Air Products, BOC, Linde, Messer, Praxair and, to a limited extent, smaller companies such as SIAD and SOL. In contrast, a number of companies established in other regions of the world are not active in the EEA. Firstly, the notifying party stated that the following companies have the capability (technology and know-how) to construct air separation units: Hitachi, Kobe Steel, PSI, Cryogenmash, Kaifeng, Sechuan Air Sep, Hang Yang and Cosmodyne. The Commission has found no indications that tonnage customers in the EEA have requested offers from or are supplied by those companies. Secondly, some major industrial gas suppliers, such as Nippon Sanso and Airgas, do not actively compete for tonnage contracts in the EEA. It cannot be argued that technological and regulatory barriers would, in theory, not prevent non-European companies from becoming active in Europe. The advantage conferred by an established presence and existing customer preferences renders this highly unlikely.

(31) Not only is the notifying party correct in asserting that the 'bidding' for tonnage contracts takes place on a worldwide basis. Industrial gases companies compete for such contracts on the basis of an established presence in the EEA. Industrial gases companies normally establish or acquire a local subsidiary or joint venture in a region in which they intend to become active. Such local subsidiaries are responsible for penetrating a regional market, compiling and submitting offers and providing ongoing customer relations and technical support once a contract has been concluded. Several industrial gases companies have confirmed that they compete for tonnage contracts in a given region only if they have established a local presence in that region. AGA has stated that it does not make offers outside the areas in which it has an established market presence (Europe, the Midwest of the United States and Brazil); the company does not contemplate stand-alone activities. Linde has indicated that it cannot compete for on-site contracts in the long term without local presence through a subsidiary. Messer has confirmed that it usually invests in on-site projects through a local subsidiary or joint venture.

(32) Praxair and Air Products, the only non-European industrial gases companies active in Europe, have established European headquarters from which they conduct most of their tonnage business in Europe. Praxair has stated that it has a local team of engineers in the EEA (located in Oevel, Belgium) which is responsible for obtaining on-site contracts, designing of on-site projects and carrying out such contracts. Global plant designs are usually adapted to the EEA market in order to include as many local components as possible. Plant maintenance, major repairs in case of plant breakdown and plant upgrade during the contract term are carried out by this European representation. Staff from outside Europe are rarely involved in the negotiation of contracts and maintenance of ongoing customer relations. Air Products has confirmed that it operates its European tonnage business in a similar fashion.

(33) Customers have also confirmed that assessment. None of the customers contacted by the Commission has a tonnage contract with any industrial gases company other than those companies established in Europe. Only one customer has indicated that it contacts other companies as well as the above when awarding a tonnage contract. The Commission concludes that from the perspective of European tonnage customers, only suppliers with an established presence in the EEA are eligible.

(34) Furthermore, the Commission's investigation has shown that while the conditions of competition in the tonnage market are homogenous within the EEA, those conditions are appreciably different in other areas of the world. The EEA must therefore be distinguished from other regions of the world.

(35) Firstly, price competition for tonnage contracts is determined by objective factors that differ in different regions of the world. Tonnage contracts establish long-term supply relationships of up to 15 years between a supplier and a customer. Each tonnage contract requires the supplier to make a high capital investment, sometimes in excess of EUR 200 million. The expected return on the capital invested is a decisive criterion for how an industrial gases company can compete on price in a given region. Each supplier will determine the expected return on capital in relation to the perceived risk in a given region. Due to the long-term nature of the contracts and the high investment involved, currency risks, but also, more generally, the economic and political framework in a given region or country, are particularly important. Industrial gases companies establish thresholds for the expected minimum return on investment. Those

thresholds differ for the various geographic regions in which the gases companies compete for tonnage contracts. In regions or countries with a higher perceived risk, companies will usually add a premium to the expected minimum return. In addition, smaller industrial gases companies are often forced to finance the initial investment in part by seeking loans locally through their local subsidiaries. In this case, the price they can offer also depends on the different financing conditions in different regions and countries. All those elements together result in regional differences in price setting. The notifying party has stressed that 'Europe is an attractive, risk-free zone' whilst acknowledging that the relevant risks vary enormously in other parts of the world. The variation of currency risks is obvious. Competitors have confirmed this assessment.

(36) Secondly, the industry generally distinguishes between developing markets and mature markets. With respect to the tonnage market, the notifying party stated in its notification that 'one must distinguish between mature markets which are highly industrialised and structured, such as the European Union, and developing markets, where industrial development and industrial gas usages and applications are still in the process of expansion, for example, in south-east Asia'. That distinction is also made in the parties' internal documents which the Commission has reviewed. At the oral hearing, BOC stated that it is able to achieve significantly higher returns in developing markets. Furthermore, conditions of demand also differ in different world regions. The notifying party stated at the hearing that the rate of self production is 11 % in the United States, 21 % in Europe and 78 % in Asia.

(37) Finally, the Commission has not, to date, qualified a market with characteristics similar to those of the tonnage market as worldwide. In earlier decisions, the Commission has found the markets for certain commodities traded mainly at commodity exchanges to be worldwide ([13]). However, the industrial gases in question are supplied in a different manner, namely through tailor-made on-site plants under varying conditions and in accordance with customer-specific requirements. World markets have also been accepted for large engineered or high-tech products which are, or can be, transported to customers around the world ([14]). However, the present product market does not concern the supply of such equipment. The tonnage supply of industrial gases on the basis of long-term contracts should be distinguished from the sale of air separation plants. The latter are one-off engineering projects that are based on a different relationship with the customer.

(38) The Commission therefore concludes that the geographic reference market for the tonnage supply of industrial gases is the EEA.

2. BULK AND CYLINDER GASES

(39) The investigations in this Case and the parallel Case COMP/M.1641 — Linde/AGA, have confirmed that, except for certain high purity and high value gases (including helium and electronics speciality gases) and, to a lesser extent, carbon dioxide, industrial gases cannot normally be economically distributed to customers located more than approximately 200 kilometres from the production facility. For an individual production facility, the catchment area is, therefore, defined as a circle with that radius centred on the facility. However, in the larger Member States those catchment areas are normally connected in such a way as to overlap and cover the whole Member State without saps. Furthermore, suppliers often enter into swap arrangements with each other, in order to reduce transportation costs. The notifying party has submitted lists of its swap agreements, which show that it has concluded such agreements for bulk and cylinder gases in all EEA countries in which it is active. The competitive relationship, between at least the large suppliers in the bulk and cylinder markets, is therefore not limited to regional competition but is nationwide. The geographic markets for bulk and cylinder gases are limited to the individual Member States. There are different distribution systems in the different Member States. The market structure in neighbouring Member States is completely different. For instance, in the various markets for bulk and cylinder gases in France,

([13]) Platinum — Decision of 24 April 1997 in Case No IV/M.619 — Gencor/Lonrho, OJ L 11, 14.1.1997, p. 30; primary aluminium — Decision of 28 May 1998 in Case No IV/M.1161 — Alcoa/Alumax; silicon — Decision of 26 January 1999 in Case No IV/M.1330 — Pechiney/Samancor; for other minerals see Decision of 7 December 1995 in Case No IV/M.660 — RTZ/CRA.

([14]) Large commercial jet aircraft — Decision of 30 July 1997 in Case No IV/M.877 — Boeing/McDonnell Douglas, OJ L 336, 8.12.1997, p. 16; magnet train systems — Decision of 9 March 1998 in Case No IV/M.987 — Transrapid; electronic connectors — Decision of 8 October 1998 in Case No IV/M.1314 — Framatome/Berg Electronics; pulp dryers — Decision of 8 February 1999 in Case No IV/M.1379 — Valmet/Rauma.

Air Liquide has market shares in the order of […]* to […]*, whilst its market shares in Germany are essentially around […]*. Furthermore, data submitted by the notifying party show significant price differences between different Member States. This has been confirmed by third parties' data. The Commission therefore concludes that the markets for bulk and cylinder gases are generally not wider than national in scope (except for certain high purity and high value gases).

3. HELIUM

(40) Helium is extracted from natural gas, refined and liquefied at a limited number of sites which are located in the United States (Kansas, Oklahoma, Texas and Wyoming), Algeria (Bethouia), Poland (Odolanov) and western Russia (Orenburg). Refined helium is transported from the production sites to resellers and to retail customers, using special transportation equipment (cryogenic transport containers). The EEA is mainly supplied with helium from sources located within Europe (Poland) or close to Europe (Algeria, western Russia).

(41) Helium is supplied to the EEA from all of the above sources, however, the sources located near Europe (Algeria, Poland, and Russia) supply other world regions to only a very limited extent. The Commission estimates that approximately 75 % of the helium demand in the EEA is currently supplied from the sources located near Europe. The imports from the United States vary over time, given that they sometimes occur under large single wholesale contracts. If, as the notifying party argues, a second source for refined helium in Algeria becomes operational in the medium term, it can be expected that imports from the United States will be reduced considerably. No helium is supplied to the United States from Algeria, Poland and Russia.

(42) While liquid helium can, technically, be transported over long distances, a number of factors impede such long distance transportation (beyond mere transport costs, such as freight and freight forwarding costs, import/export costs and container rental). Helium is a very volatile product. Very low temperatures (below −269 °C) have to be maintained during the entire transportation period in order to keep the gas liquid. The greater the time involved in shipment, the more helium gas is produced as the liquid helium warms. This inevitably means that more product losses occur over longer transport distances. An internal study submitted by one industrial gases company states that a container from Algeria or Poland can carry up to 40 % more liquid helium than a container from the United States, due to the shorter transportation time. Apart from the cost of the product lost, additional cooling costs have to be incurred in order to minimise heat leaks as the transport distance increases. Such costs relate, in particular, to liquid nitrogen/helium used to fill liquid container shields in order to keep the product cool. Moreover, if containers have warmed due to a longer transportation time they have to be cooled down before being reused (if the containers are rented, cool-down charges are incurred).

(43) The most important cost factor for the transport of helium is the number of cryogenic containers needed and the corresponding investment. The notifying party has stated that the round trip of a helium container from the United States to Europe takes 40 days, from Algeria 16 days and from eastern Europe 18 days. As the travel time increases, the number of round trips for which a container is used each year decreases. On the basis of those figures, the utilisation rate of a container used for United States imports is […]* times lower than for Algeria and […]* times lower than for Eastern Europe. A larger number of containers is therefore needed for transportation from the United States and the fixed costs increase considerably in relation to the value of the product transported.

(44) On the demand side, wholesale customers (in particular smaller industrial gases companies) view the availability of liquid helium from sources located close to the market (that is to say the area where demand takes place) as critical. Apart from the disadvantages resulting from long-distance transportation, the need to maximise security of supply and minimise the risk of disruption must be taken into account. Helium is a key product which industrial gases companies, even smaller ones, consider to be an essential element of their portfolio. On the supply side, even suppliers that have access to refined helium in the United States none the less seek to supply European customers with helium sourced in Algeria, Poland and Russia, insofar as is possible, even if they have to purchase that helium from competitors. They import helium produced in-house in the United States only insofar as they cannot meet demand from sources located closer. Furthermore, if wholesalers were able to compete under homogenous conditions throughout the world, most of the EEA helium demand would be supplied from the United States helium sources, which account for more than 80 % of the world capacity. That is not the case.

(45) The investigation has revealed nothing to indicate that market prices for refined helium are set at the world level. In particular, there are no trade flows from Algeria, Poland or Russia to the United States (which represents approximately 60 % of the global helium consumption) and limited trade flows from Algeria to other parts of the world. Outside Europe, therefore,

helium from those sources does not (or does so to only a limited extent) compete with helium from the United States. Data submitted by the main wholesalers indicate that the helium wholesale prices in the EEA have, on average, been more than 12 % higher than the average world prices from 1996 to 1999.

(46) Certain characteristics which have led the Commission to accept world markets in previous cases are not present in this case. World markets for commodities, such as certain metals and minerals, have normally been found to exist where prices are set on commodity or metal exchanges or are linked to the trading on such exchanges ([15]). As indicated, no similar price setting mechanism exists for refined helium. Prices for helium are set under individual wholesale contracts and not as global market prices.

(47) While these elements suggest that there is a reference market that comprises the wholesale of refined helium to the EEA, the definite market delineation can be left open since the notified operation also raises competition concerns if the wholesale market is considered to be worldwide.

4. ELECTRONIC SPECIALITY GASES

(48) The notifying party claims that the relevant geographic market for speciality gases supplied in cylinders to the electronics industry is at least EEA-wide, if not worldwide in scope. Electronic speciality gases are produced by chemical companies (and in some instances also by industrial gases companies), purchased, processed and packaged by industrial gases companies and, finally, sold to customers in the electronics industry (in particular producers of semiconductors). The notifying party argues that its activities in this field, namely the 'transfilling' of electronic speciality gases and the supply of those products to the end customers, are merely those of a distributor.

(49) According to the Commission's inquiries, the supply of base gases by their producers to the industrial gases companies should be distinguished from the supply of processed gases, related services and associated products by industrial gases companies to the end-customers. The main industrial gases companies, such as Air Products, Praxair, Air Liquide and BOC, have one 'transfill centre' in the EEA from which they serve their customers within the EEA. Customers are usually not supplied from transfill centres outside the EEA. 'Transfilling' describes the production (that is to say purification, mixing and filling) of electronic speciality gases according to detailed customer specifications in highly specialised processes. Each individual gas specification undergoes a certification process that can last up to two years. Certifications relate to the specific production site (transfill centre) from which the final gas mix is sourced. Furthermore, electronic speciality gases have to be delivered and handled in specialised containers (for instance in order to maintain purity levels or handle toxic gases). A review of Air Liquide's and BOC's marketing publications confirms that such specialised packaging forms a constituent part of their product offerings. That service is also performed at the level of 'transfill' centres at EEA level. The value added in the production and distribution of electronic speciality gases is therefore generated at EEA level where gases companies operate their 'transfill' activities.

(50) The importance of having a presence within the EEA, by establishing and operating European production capacity, is illustrated by the fact that, until recently, Nippon Sanso, a significant supplier of electronic speciality gases in the United States, has had virtually no activities within the EEA. The company has only recently been able to enter the European market by setting up a European joint venture with Messer.

(51) Although the ability to deal with a semiconductor company globally may be an advantage, the market investigation conducted by the Commission has shown that purchase decisions are currently still made by end customers at a more local level. The notifying party submits that although the supplies of electronic speciality gases to the semiconductor industry are often discussed at the customer's corporate level, the actual purchase orders for electronic speciality gases are decided, managed and issued at the local site, taking account of specific factors.

(52) The Commission therefore concludes that the market for electronic speciality gases is the EEA.

([15]) Platinum — Decision of 24 April 1997 in Case No IV/M.619 — Gencor/Lonrho (OJ L 11, 14.1.1997, p. 30) primary aluminium — Decision of 28 May 1998 in Case No IV/M.1161 — Alcoa/Alumax; for other minerals see Decision of 7 December 1995 in Case No IV/M.660 — RTZ/CRA.

C. *COMPETITIVE ASSESSMENT*

1. TONNAGE MARKETS FOR AIR GASES

(a) ***Market structure***

Air Liquide/BOC would have by far the highest market shares in the European tonnage markets for air gases.

(53) The market shares of the parties and competitors in the European tonnage market are set out in table 2 ([16]):

Table 2

European tonnage market for standard air gases

Gas	Air Liquide	BOC	Combined	Air Products	AGA	Linde	Messer	Praxair	Others
Oxygen	[…]*	[…]*	[…]*	5-10 %	5-10 %	15-20 %	10-15 %	< 5 %	< 5 %
Nitrogen	[…]*	[…]*	[…]*	10-15 %	< 5 %	15-20 %	5-10 %	5-10 %	5-10 %

(54) The proposed concentration would create by far the largest tonnage supplier of standard air gases in Europe. The combined entity would hold almost […]* of the market for tonnage oxygen and nitrogen. Furthermore, all competitors are significantly weaker. In the oxygen market, the next largest supplier, Linde, does not reach […]* of Air Liquide/BOC's sales. In the nitrogen market, the remaining supply is even more dispersed, with no competitor reaching […]* of Air Liquide/BOC's sales.

(55) Air Liquide/BOC's combined strength becomes even more apparent if the number of on-site supply contracts won is taken as a criterion for their market position ([17]) as set out in table 3:

Table 3

On-site contracts won (last five years)

	Percentage
Air Liquide	[…]*
BOC	[…]*
Combined	[…]*
AGA	< 20
Air Products	< 20
Linde	< 20
Messer	< 20
Praxair	< 20
Total	100

([16]) Figures for 1998. The market share calculation is based on turnover data (value sales) provided by the suppliers of tonnage gases. Due to the nature of tonnage contracts, value data represent the market position of suppliers more accurately than volume data. For instance, given that take-or-pay arrangements or non-volume-related facility fees are often used, the actual strength of a supplier in relation to its customers and competitors is better reflected by the revenue earned than by the quantities of gases supplied. The parties' combined market share would, in any case, not differ substantially if the calculation were based on volume figures (oxygen — […]*; nitrogen — […]*).

([17]) The table lists on-site supply contracts for oxygen and nitrogen won during the last five years in the EEA, based on data provided by the parties and by competitors. For the purpose of this comparison, contracts for more than 100 tonnes per day were counted (in line with the distinction proposed by the notifying party, p. 20 of the notification). If smaller volume contracts were to be included, the parties' position would be even stronger. Air Liquide, in particular, is the leading European supplier of small on-site nitrogen facilities.

(56) It should be noted that the figures in table 3 cover only contracts for the on-site supply of gases. Pipeline supply contracts have not been systematically included. Given that Air Liquide is by far the leading European pipeline supplier, table 3 probably understates the number of contracts it has won.

(57) In its notification, Air Liquide submits that 'a producer's share of tonnage sales is simply irrelevant' for analysing the structure of the market because it considers the tonnage market to be a 'bidding market'. Instead, the notifying party suggests relying on the number of players as a measure for assessing competition. In the present context, the following considerations are sufficient. Firstly, unless there is specific evidence that the pattern of the past no longer reflects the present situation, it is reasonable to assume that a supplier's market share is indicative of its strength. Secondly, the number of contracts awarded confirms the market share analysis.

As the incumbent supplier with by far the largest number of supply relationships, the combined entity would have an established market position and would enjoy a clear lead over its competitors

(58) During the procedure, the notifying party has stressed that the 'contestability' of the tonnage market would ensure a competition. However, the notion that the contest for each tonnage contract starts 'at zero', and that even suppliers with no sales at all can compete on equal terms, cannot be accepted. The investigation has shown that the dynamics of competition for tonnage contracts are such that the incumbent supplier is in the best position to compete for a renewed contract. An established market position does therefore reflect a supplier's market power. The Commission notes that if the combined position of Air Liquide and BOC is measured by counting the number of contracts recently won (in order to assess the extent to which they are 'incumbents'), their joint position is even stronger than in terms of sales turnover (see table 3). Judging from the number of contracts won, no competitor enjoys a remotely similar position.

(59) The incumbent contract holder's advantage is based on the following factors.

(60) The supply of tonnage gases typically involves a close working relationship between the customer and its present supplier. The incumbent supplier knows when the current supply contract will expire and is therefore best placed to offer a renewal at an early stage. By virtue of its ongoing working relationship with the customer, the incumbent will also usually be the first to learn of that customer's intention to extend or modify an existing supply agreement. When customers plan a new contract or a change to an existing contract, they will, in most cases, seek advice from their current supplier in defining the terms of the new supply arrangement (for example a new on-site plant, a capacity extension etc.). Incumbent suppliers are thus often involved at the project planning stage, and will consequently almost always be included amongst the industrial gases companies from which an offer is requested. Since they have detailed knowledge of the customer, they have an advantage in responding to such a request and in the subsequent negotiations. All those elements lead to the conclusion that a customer will not change its supplier unless a competitor submits an offer which is advantageous, rather than merely equivalent.

(61) If an on-site contract comes up for renewal, the incumbent supplier will usually be able to offer more advantageous financial terms (discounts etc.) for the follow-on contract because, in most cases, its initial investment in the on-site plant will have been fully written off. Even where that is not the case, the incumbent supplier can normally propose more favourable conditions by reusing equipment already installed in its existing facility ([18]). The incumbent is also best placed to make the most economical offer if the customer's demand evolves in such a way as to necessitate a change to the on-site contract before expiry of the contractual term. For instance, if additional capacity is required, the incumbent can offer either to extend the capacity of the existing plant or, alternatively, to build a single new plant for the aggregate capacity. Any competitor could only offer to build a second additional plant on the same site, an obviously less economical solution. Even where a customer's demand is so high that it requires a second plant on the same site, it will normally prefer to use the same supplier in order to reduce its administrative costs and operate the two plants in a coordinated, and therefore more economical, way.

(62) Most customers contacted by the Commission have confirmed the incumbent's advantage. Competitors have also confirmed that they are more likely to gain contract extensions or renewals from existing customers. The

([18]) For instance certain utilities such as pipes etc. Other competitors have to charge the cost of such equipment, the incumbent does not. Customer files reviewed during the investigation illustrate how such savings lead to a procurement decision in favour of the incumbent.

same conclusion can be drawn from the bidding histories submitted by industrial gases companies. For instance, the list of renewals/extensions of existing contracts won by BOC illustrates the importance of the incumbent's relationship with its customers.

(63) Finally, a BOC document assessing the position of BOC Process Systems in the on-site market confirms that analysis. The following statements are made in that document ([19]): 'Mature strongholds can be difficult to break into using traditional commercial approaches where incumbency is strong. (…) Much of the potential growth in developed countries will be difficult to access for BOC because of incumbency exclusion. (…) Leveraging of existing customers will generate "natural" growth.'

The proposed concentration would remove an important competitor

(64) By acquiring BOC, Air Liquide would remove the third largest competitor in terms of market share from the EEA tonnage market. The elimination of BOC as a competitive force would result in significant deterioration of the market structure.

(65) It can be concluded from BOC's own data that the company has been competing actively for tonnage supply contracts across the EEA, namely, in addition to the United Kingdom, other key industrial regions in Belgium, the Netherlands, Italy, France, Germany and Spain. It is to be noted that, in the past, BOC has mainly submitted offers for very large on-site plants (some with a planned capacity of up to 120 000 m^3/h). The number of competitors able to plan and carry out such large projects is particularly limited. The proposed concentration would remove one of those few competitors.

(66) By removing one of the leading on-site suppliers, the proposed concentration would reduce the potential for competition in the European tonnage market. The presence of credible competitors is particularly important in a market where very large projects are awarded, contracts cover long terms, the number of eligible suppliers is already limited and customers rely on the contract award procedures as the only means of ensuring reasonably competitive terms. BOC is one of the leading tonnage suppliers worldwide and in Europe, with strengths in all relevant areas. BOC is considered to have competitive process technology (cryogenic air separation technology as well as vacuum/pressure swing adsorption technology) and is a leader in some technologies (for instance with respect to small and medium sized oxygen plant technology, that is to say the line of ICO generators). Given that on-site supply can be extremely capital intensive, BOC is one of the few suppliers capable of financing the investment associated with large projects. Industry analysts consider BOC to have strong capabilities with respect to large on-site plant project execution ([20]). To summarise, BOC can be considered to be one of the industrial gases companies with strong competitive potential. The removal of its competitive potential, in an already concentrated market, would further reduce customer choice.

The planned transaction would combine an entrenched position in the United Kingdom with an entrenched position in France and strong positions in other key regions in Europe

(67) According to figures provided by the notifying party, which have been confirmed by the Commission's inquiries, BOC provides […]* of tonnage oxygen and the same proportion of tonnage nitrogen in the United Kingdom ([21]).

(68) According to its own estimates, Air Liquide is currently providing by far the largest proportion of tonnage gases in France ([…]* of oxygen and […]* of nitrogen). Its position in Belgium is similarly strong. Air Liquide has a less strong, but still significant, presence in other countries, in particular in Italy and Spain.

(b) ***Specific strengths***

(69) The Commission accepts that, in addition to market share, other parameters can also be used in assessing a tonnage supplier's market power. The investigation has shown that, with reference to each of those additional aspects the combined entity would be the strongest supplier. Some of the combined entity's strengths would be derived from Air Liquide's already strong position, and increased by adding BOC's position. Others would result from the combination of important tonnage suppliers in Europe, creating a supplier that would be superior to any competitor. If all those elements are considered together, the notified operation would create a market structure in which the strongest supplier, in

([19]) 'BOC process systems: Global situation analysis'; document submitted to the Federal Trade Commission as part of the HSR filing.

([20]) NatWest Securities, 'Industrial Gases 2000', February 1997, p. 73.

([21]) There is no tonnage supply in Ireland.

terms of the parties' combined market position, would also be the strongest with respect to other key competitive parameters. Confronted by the combined entity's comprehensive strength, the remaining industrial gases suppliers would be at a severe disadvantage in competing for tonnage contracts.

Air Liquide/BOC would have an established infrastructure throughout the EEA

(70) In their respective home countries (France and the United Kingdom/Ireland), Air Liquide and BOC have production facilities for industrial gases and extensive infrastructures for the distribution of those gases in bulk and cylinders (see recitals 165 and 177). Those networks give both companies superior production capacities and superior access to bulk and cylinder customers. The planned transaction would combine these networks.

(71) Air Liquide also has an established production and distribution infrastructure in a number of other European countries (the Benelux countries, Denmark, Germany, Greece, Italy, Portugal, Spain and Sweden). That pan-European infrastructure comprises stand-alone production plants (liquid gases plants), dedicated plants (plants dedicated to one or several customers) with excess production capacity for the bulk or cylinder markets, small on-site production plants and cylinder-filling facilities. Table 4 sets out Air Liquide's European production and distribution network in countries outside France ([22]). In each of the countries listed in table 4, Air Liquide has established cylinder-filling facilities in line with the size of the market concerned (the only exception being Finland where only dedicated plants exist). In the majority of countries, the cylinder-filling network covers the full range of gases, including a number of facilities capable of filling high-value gases with a higher transportation radius (argon, argon mixtures and other gases including speciality gases).

(72) Local production and distribution infrastructures do confer competitive advantages. A local production capacity for liquid gases facilitates the provision of back-up for small and medium-sized tonnage plants. Where such back-up can be provided out of captive production, the supplier does not have to enter into arrangements for the purchase of merchant liquid on the market or otherwise have to guarantee penalty payments to the customer. Each of those alternatives would impose an additional cost, putting the tonnage supplier at a competitive disadvantage. A local distribution infrastructure allows a tonnage supplier to create a dedicated on-site plant required for a tonnage contract with capacity exceeding the demand of the tonnage customer. The extra capacity (so-called 'piggy back' production) is then liquefied and sold on the bulk or cylinder markets. The cost advantage for the tonnage supply results from economies of scale in the investment (as well as the additional income from bulk and cylinder sales). Those cost advantages can only be achieved where a 'route to the market' is ensured via a company's own distribution network. Finally, a local infrastructure facilitates the maintenance and support of on-site plants as well as other aspects of customer service.

(73) In its reply to the statement of objections, the notifying party disputes the importance of a local production and distribution infrastructure for back-up and excess liquid sales. However, at the beginning of the procedure, the notifying party stressed the importance of a local infrastructure, allowing liquid back-up and 'piggy back' production, for establishing a tonnage business. In a study submitted later during the procedure, the notifying party stated that liquid back-up deliveries were relevant only for customers whose requirements amount to 200 to 500 tpd or less. In its reply to the statement of objections, the notifying party seems to suggest that even for customers above 200 tpd, back-up deliveries in bulk may become inappropriate. The Commission finds that that claim is not credible.

(74) The Commission maintains that a dense network of liquid gas production facilities is advantageous in providing back-up for on-site plants. Where liquid plants are located close to on-site plants, a lower number of tanker trailers are needed to supply a given quantity of liquid gases. This renders emergency back-up more feasible, even for larger quantities, and less costly. The notifying party has, in any case, confirmed in its notification that a back-up and service infrastructure is important for smaller on-site plants. The supply through such plants is highly profitable and fast growing.

(75) It is recognised that back-up can also be provided by co-producing liquid gases at the on-site plant and storing them in a tank, a method that is open to any competitor. However, in its reply to the statement of objections, the notifying party presented an alternative way of ensuring back-up that is favourable for a supplier with a large market presence. When production capacity is increased or old plants are renewed, it may be possible to keep old plants or their parts in order to provide spare capacity. This back-up method is suitable for large quantities. For instance, Air Liquide's […]* tpd

([22]) Only in countries to which bulk deliveries could be carried out from French production sites (Belgium, the Netherlands, Luxembourg and to a lesser degree Germany) has a less important local production capability been put in place.

tonnage plant in Antwerp is backed-up by an old […]* tpd plant which is kept in reserve. This back-up method favours strong incumbent suppliers, such as the combined entity, which already have a large number of tonnage plants in place.

(76) According to the notifying party, the Commission also overestimates the importance of simultaneous (piggy back) production of liquid gases for sale on the bulk market. In particular, the notifying party has indicated that the number of its tonnage contracts which include such simultaneous production has decreased. That development may be explained by Air Liquide's large existing bulk capacity in an extended production infrastructure. Competitors (AGA, Linde, Praxair) attribute more importance to simultaneous production in tonnage plants than the notifying party. Although it appears that under current market conditions the importance of simultaneous liquid production may be decreasing, the co-production of tonnage and liquid gases still offers a significant cost advantage. According to the notifying party, the cost of operating a combined tonnage and liquid plant is […]* lower than the combination of a stand-alone tonnage plant and a stand-alone liquefier.

(77) By creating a single supplier with a superior production and distribution infrastructure, the proposed concentration would afford Air Liquide/BOC a structural advantage in competing for tonnage contracts. On the basis of data provided by the other competitors, it can be concluded that none of their production and distribution infrastructures would have a similar geographic coverage. None of Air Liquide/BOC's competitors would therefore enjoy the same advantage.

The combined entity could build on the position of the leading European operator of pipelines

(78) Industrial gases companies pursue, to a varying degree, a strategy of linking their own production sites with their customers' sites through pipelines. Such an approach is used, in particular, in regions where clusters of volume users of industrial gases are located, such as steel producers, chemical companies, paper or glass manufacturers and others (so-called 'industrial basins'). Two kinds of pipelines can be distinguished, namely 'local distribution pipelines' and 'interconnecting pipelines'. Local distribution pipelines are the primary structure. They connect an industrial gases company's air separation plant(s) with the sites of gases users (customers) within an 'industrial basin'. Such local distribution pipelines usually have a high transfer capacity sufficient to satisfy the demand of multiple customers ([23]). Their overall length is limited by the geographic dimensions of the industrial region concerned. Interconnecting pipelines constitute a secondary structure. Such pipelines link local pipeline networks in different industrial regions, sometimes over significant distances, creating a larger regional network. Interconnecting pipelines sometimes (but not always) have a lower transfer capacity than local distribution pipelines ([24]).

(79) The main industrial gases companies' European pipeline networks can be summarised as set out in table 5:

Table 5

Pipelines (km)

		Air Liquide	BOC	Combined	AGA	Air Products	Linde	Messer	Praxair
Local distribution pipelines	Oxygen	[…]*	[…]*	[…]*	0	< 200	< 200	< 550	< 50
	Nitrogen	[…]*	[…]*	[…]*					
Interconnecting pipelines	Oxygen	[…]*							
	Nitrogen	[…]*							
Total		[…]*	[…]*	[…]*	0	< 200	< 200	< 550	< 50

([23]) Some of Air Liquide's local distribution pipelines have a capacity of up to […]* tpd for oxygen and […]* tpd for nitrogen. Few pipelines have a capacity below […]* tpd.

([24]) In Air Liquide's large pipeline network in Northern France/Belgium, the transfer capacity of interconnecting pipelines ranges from […]* to […]* tpd for oxygen whereas nitrogen pipelines are limited to […]* tpd.

(80) In continental Europe, Air Liquide controls an extensive network of local distribution pipelines in important 'industrial basins': the Antwerp region, the Liège region, the Mons-Charleroi region (all in Belgium/The Netherlands), the Dunkerque region, the Fos-sur-Mer region, the Metz region, the Le Havre region (all in France), the Limito region and the Padova region (all in Italy). No other industrial gases company has access to pipelines in more than one or two confined regions (Air Products — Gent/Terneuzen; Messer — Ruhrgebiet; Linde — Leuna/Buna and Ruhrgebiet; Praxair — Spain). Some competitors' networks are negligible in comparison to Air Liquide's. Furthermore, Air Liquide is the only company to control extensive interconnecting pipelines (northern France/Belgium). In the United Kingdom, BOC controls pipeline grids in important industrial regions (Sheffield, Scunthorpe, Teeside, Grangemouth, Margham and Southampton). No competitor has access to pipeline grids similar to those of Air Liquide.

(81) The control of a pipeline network affords the owner structural advantages which are not available to competitors. Firstly, economies of scale can be achieved by constructing larger air separation units that feed a regional pipeline network than would be possible if individual units had to be built for each customer. Indeed, Air Liquide and BOC have been able to feed their pipeline grids from very large air separation units (ASUs) with oxygen capacities sometimes above […]* tpd, in Air Liquide's case even up to […]* tpd. Return on capital, and production and operating costs are therefore more advantageous. Secondly, the ability to construct larger plants allows the development of a large production capacity in a given region. This also improves the cost base for the production of bulk (liquid) gases that constitute a further source of income. Thirdly, the additional capital investment in connecting a new customer to an existing pipeline is limited compared to the construction of a dedicated plant on the customer site (the only alternative open to competitors). Pipeline coverage of an industrial region with multiple gases users is therefore a considerable advantage in competing for potential customers. Fourthly, the control of interconnecting pipelines allows partial back-up in the event of plant breakdown, even if the interconnecting pipelines' capacity is insufficient to fully supply a local group of customers. In view of the cost of liquid back-up, this advantage can be considerable. Interconnecting pipelines also allow the balancing of the production of the various plants feeding a pipeline system, thereby facilitating a more even capacity utilisation.

(82) In its reply to the statement of objections, the notifying party states that the Commission has misunderstood the role of pipelines in the tonnage market. The notifying party states that production capacity, not pipeline length, is the key factor in terms of tonnage activity. However, as set out in recital 81, the specific strength of a pipeline operator arises precisely from the fact that it can build up a superior capacity on the basis of a pipeline network. Air Liquide's position in the industrial triangle Rotterdam-Mons/Charleroi-Liège demonstrates this advantage. Air Liquide's air separation units, linked by its regional pipeline system, account for […]* of the entire industry capacity in this region (this rises to […]* if Air Liquide's air separation unit in Dunkerque, which is also linked to the pipeline system, is added). Air Liquide's capacity exceeds that of all competitors together, even though Air Products, Praxair and Linde have made significant investments in that region. The notifying party further argues that industrial gas pipelines are not distribution pipelines. However, local distribution pipelines, the primary pipeline structure, serve precisely to distribute industrial gases to customers.

(83) BOC's internal analysis also contradicts the notifying party's statements. A BOC document which analyses the position of BOC Process Systems on the on-site market ranks Air Liquide as the only industrial gases company whose 'pipeline grid strength' is 'very high' ([25]). The document also states that pipeline operators 'attempt to lock in business via pipeline grids' and that 'pipeline grids remain powerful profit drivers'.

(84) A pipeline connection can have benefits for a customer, such as the ability to meet demand peaks and easier back-up. Under competitive conditions, the pipeline operator's lower costs would, in theory, be passed on to customers, leading to lower prices. However, there is risk that the creation of strong and exclusive control over pipeline networks will, in the long term, create a situation in which competitors can and will no longer compete for customers. This will ultimately be to the disadvantage of customers, as the incumbent pipeline supplier is no longer forced by competition to pass on lower costs.

(85) Firstly, the strong structural advantages which result from Air Liquide/BOC's control of a large pipeline network could be used as leverage against competitors to the extent that the latter could be excluded from winning tonnage contracts in the regions concerned (foreclosure). Any competitor without access to the pipeline network would have to offer the customer a

([25]) 'BOC process systems: Global situation analysis'; document submitted to the Federal Trade Commission as part of the HSR filing.

new dedicated on-site plant. Because of the substantially lower investment and cost related to a pipeline link, the incumbent pipeline supplier can undercut any such offer. It is economically rational for the incumbent to do so in order to prevent any other supplier from gaining a foothold in the controlled area. Furthermore, a situation will be created in which the pipeline supplier is no longer forced by competition to pass on a large part of its efficiency gains to its customers. It is constrained only by substantially more expensive on-site offers. Cost savings will therefore be passed on only insofar as is necessary to meet such offers.

(86) Secondly, once customers have taken the initial decision in favour of a pipeline contract, they risk becoming 'locked in'. The strong position of an incumbent pipeline supplier will remove a large degree of choice from customers seeking to renew a contract or extend capacity. While each customer could, in principle, seek offers from alternative suppliers, pipeline customers have indicated that, in reality, their choice becomes limited. For shorter renewal periods and limited capacity slight, alternative suppliers may simply find that their chances of success are too reduced to warrant making an offer. The customer's only choice is often therefore to fall back on its existing supplier. The customer's negotiating position is further weakened by the fact that any cost transparency is lost. An individual customer is no longer in a position to monitor a dedicated on-site plant, because it is supplied through a complex system jointly with other companies ([26]).

(87) The Commission concludes that the combined entity would be able to rely on Air Liquide's considerable pipeline coverage, as one element of its market power. In this respect, the combined entity would be superior to its competitors, having exclusive control of distribution pipelines […]* times longer than all of its competitors' pipelines taken together. It would derive that position mainly from Air Liquide's existing pipeline network, although the proposed concentration would add pipeline grids in industrial regions in the United Kingdom. The structural advantage, which Air Liquide/BOC would enjoy in the areas covered by their pipelines, would allow them to concentrate on other areas. No other supplier would be able to compete in a similar way.

([26]) Anecdotal evidence gathered during the investigation illustrates how a pipeline customer's position can deteriorate. For instance, in the case of one pipeline contract reviewed, various anti-competitive clauses, such as an exclusivity clause, a duration of more than 15 years and a so-called 'English clause' (obligation on the customer to submit competing offers to the incumbent supplier) were added during extensions of a long-term contractual relationship.

The combined entity could use its dominant positions in the bulk markets in France, the United Kingdom and Ireland as leverage

(88) For the description of Air Liquide's and BOC's dominant positions in the markets for bulk and cylinder gases in France and the United Kingdom/Ireland, reference can be made to recitals 152 to 183. Recitals 89 to 91 describe how those dominant positions could be used as leverage in competing for tonnage customers.

(89) An industrial gases supplier which has an established bulk supply relationship with a customer is normally best placed to judge the customer's demand. At the borderline between the tonnage and bulk markets, demand can be fulfilled by both on-site and liquid supply. The parties are increasingly supplying customers with a demand of 20 to 100 tpd through small on-site plants (for nitrogen, Air Liquide has almost […]* such contracts in France and BOC more than […]* in the United Kingdom; for oxygen, PSA, VPSA and even cryogenic plants can also be built around or below 100 tpd). Where this is the case, or where a customer's demand grows, the incumbent supplier can use its existing bulk contract as leverage in seeking an tonnage contract. If it is foreseeable that a customer's demand will justify tonnage supply at the end of the current bulk contract, the incumbent will almost always be the first to be able to propose a tonnage solution because of its knowledge of the customer's needs. In making and negotiating its offer, it will be able to build on the established relationship with the customer. If a customer's demand moves into the tonnage range during the term of a bulk contract, the incumbent will, by definition, be the only supplier able to offer tonnage supply.

(90) The possibility of 'moving' certain bulk customers to tonnage supply gives the incumbent supplier a logistical flexibility that represents an overall cost advantage. For instance, when acquiring a new tonnage customer, the incumbent may be able to build a larger on-site plant in order to gain excess capacity for the bulk market. By linking a new customer to a pipeline, the incumbent may improve the capacity utilisation of that pipeline grid. On the other hand, if the incumbent has limited liquid gases production capacity in a given region, for

instance in a growing market, moving a bulk customer to tonnage would relieve the situation.

(91) In theory it could be argued that other industrial gases companies may also be able to build on existing bulk supply contracts in order to obtain tonnage orders. However, since they have very strong (dominant) positions as bulk suppliers in their respective home markets, Air Liquide and BOC are particularly well placed to use bulk customer relationships as leverage in seeking tonnage contracts. In a more balanced market, many customers, in particular large companies, may have more than one bulk supplier, or they may change bulk suppliers more frequently. A company that dominates a national bulk market is likely to be the only choice for many customers. By combining strong positions in several important bulk markets, the notified transaction would combine the advantages enjoyed by Air Liquide and BOC as a result of their dominance.

The proposed transaction would combine two competitors with leading technology and project execution capability

(92) There is consensus in the industry that technology is an important factor, allowing a supplier to differentiate itself from competitors. In the tonnage sector, production technology (process technology) is a key competitive parameter. The supply of industrial gases using large on-site facilities is highly capital-intensive and advanced process technology can offer a supplier a cost advantage, for instance in terms of power consumption, reduced emissions and capital expenditure. The notifying party confirmed the importance of process technology in its reply to the statement of objections.

(93) The strong R & D potential of Air Liquide and BOC is illustrated by their R & D expenditure and facilities. In 1998, Air Liquide had a total R & D budget of EUR […]* million. It employed […]* researchers in […]* research centres, made […]* inventions and filed […]* patent applications. Air Liquide has […]* industrial partnership agreements and […]* international cooperation agreements with universities. Air Liquide's engineering division ([…]* staff worldwide) designs and builds gases plants. In 1998, BOC's total R & D expenditure was EUR […]* million. It employs more than […]* researchers in […]* main and a number of smaller research centres, covering process systems as well as key industries such as the electronics industry (BOC Edwards). It has also a large number of ongoing R & D cooperation agreements with third parties. BOC has concentrated its worldwide plant engineering capability in the process systems line of business.

(94) Air Liquide and BOC have comprehensive state-of-the-art plant construction technology and, importantly, engineering know-how. Both companies are leaders, for instance, in the production of high purity gases for the electronics industry. Air Products has confirmed that BOC is very competitive with respect to smaller plants in the 150 to 350 tpd range. Even though cryogenic production technology used for large on-site plants may not change fundamentally in the near future, the ability to make and implement continuous improvements is an important asset. Air Liquide would acquire unlimited access to all of BOC's process-technology and plant engineering know-how. The Commission has to assume that Air Liquide would also acquire BOC's related R & D centre, which is located in the United States (in addition to the BOC Edwards research centre in the United Kingdom).

(95) The capability to plan, manage and execute large on-site projects is at least as important as a broad portfolio of technologies. Air Liquide and BOC belong to the group of four industrial gases companies considered by industry analysts to be leading in this respect. For instance, […]* of the world's largest oxygen plants (over […]* tpd capacity) are built by Air Liquide.

(96) Both companies also have leading non-cryogenic production technology, in particular, in advanced VPSA generator technology. Air Liquide is the world's leading provider of small membrane generators which are capable of producing nitrogen with a 99,9 % level of purity. Those technologies make it possible to extend the on-site business into the area of smaller-volume users (below 100 tpd), a strategy pursued successfully by Air Liquide in the past (almost […]* small on-site contracts).

(97) The combined entity would be a leader in other areas, for instance the co-generation of gases, electricity and steam (so-called 'expanded offer'). It would also be best placed amongst its competitors to serve customers in key industries, such as the electronics industry where high volume contracts can be won. Air Liquide has focused […]* of its R & D on this sector, and leads the industry in offering a comprehensive 'total gases and chemicals management', including logistics, detection, monitoring, recycling and customer process integration. BOC has gained considerable exposure to the electronics sector through its BOC Edwards subsidiary. Both companies offer the electronics industry a

comprehensive product range covering the on-site production of high purity standard gases, speciality gases and customer process equipment.

The combined strong global presence of Air Liquide/BOC would offer further advantages with respect to multinational customers

(98) Air Liquide pursues a strategy of accompanying its large tonnage customers (leading industrial companies) in the supply of gases throughout the world. Air Liquide's 1998 Annual Report sets out that strategy: 'Air Liquide pursues its global expansion to accompany and serve its customers throughout the world.' Such partnerships are 'made possible by Air Liquide's global presence.' BOC, having operations in more than 50 countries, is generally considered to have the most comprehensive global coverage of all the industrial gases companies. Its global orientation has resulted in the recent reorganisation of its operations in four global 'lines of business'.

(99) Customers' replies indicate that global presence is not a prerequisite in order to compete for tonnage supply contracts, because most customers seek the best supply solution in a given regional market. However, global presence may give an industrial gases company a competitive advantage with respect to multinational customers. Having established a business relationship with a customer and proved its reliability in one region, the industrial gases company will have a reference when competing for a tonnage supply contract in another region. A gases company with global coverage is also better placed to offer a customer concessions (for example discounts) in one country in exchange for a new contract in another. In particular, according to market participants, the ability to operate on a global basis represents an advantage in dealing with customer companies in the electronics industry. Industrial gases companies with limited global exposure, such as Linde, Messer and AGA, are at a disadvantage in competing for such customers.

(c) ***Position of competitors***

The merged entity's power would be a disincentive for any vigorous activity by the remaining competitors

(100) Air Liquide/BOC would be the strongest tonnage supplier in all relevant respects. Some of its strengths are of a general nature (technology, project execution capability and multi-country infrastructure). In addition, the combined entity would have particular regional strengths (strong regional supply positions, control of pipeline networks, and dominance in national bulk markets).

(101) None of the remaining competitors share Air Liquide/BOC's overall strengths. Because the competitors lag behind in those general areas, they would also have less incentive to attempt to make substantial inroads into Air Liquide/BOC's regional strongholds, where they would face particularly strong resistance. The combination of regional strengths with general strengths in one entity could therefore lead to the *de facto* partitioning of the EEA market into a single large western European area controlled entirely by Air Liquide/BOC, on the one hand, and the rest of the EEA, on the other.

(102) Multi-market contacts between Air Liquide/BOC and its competitors serve to further discourage competition. Each of the remaining competitors competes against Air Liquide/BOC in national bulk and/or cylinder markets in which Air Liquide/BOC are also strong (see, for instance, table 9). Each competitor would therefore have an incentive to defer aggressive competition in order to avoid exposing itself to counter-action by Air Liquide/BOC.

Most remaining tonnage suppliers are considered by market participants to be 'second tier' competitors

(103) For a general assessment of the competitive strength of the remaining tonnage suppliers, it is useful to consider the views of the industrial gases companies themselves. In an internal study prepared by Air Products, which does not only relate to the tonnage market ([27]), a distinction is made between 'first tier' and 'second tier' industrial gases companies. Air Liquide, BOC, Air Products and Praxair belong to the first group; Linde, AGA and Messer to the second. It should be noted that in that analysis, Linde, AGA and Messer lag behind with respect to 'large, on-site plant project execution capabilities', amongst other things. Industry analysts share this assessment ([28]).

(104) None of the remaining competitors share Air Liquide/BOC's specific strengths in the tonnage market (Europe-wide infrastructure, control of a large pipeline network, strong regional positions, and strong position in national bulk markets) to a similar extent.

([27]) 'Industrial Gas Industry Overview', May 1999, submitted to the United States Federal Trade Commission as part of Air Product's HSR filing.

([28]) NatWest Securities, 'Industrial Gases 2000', February 1997, p. 73.

The links created between Air Liquide and Air Products by the joint acquisition and division of BOC would further reduce the incentive to compete

(105) Air Products has a limited market share in Europe (5 to 10 % for oxygen and 10 to 15 % for nitrogen), although it can be considered as one of the leading companies in terms of production technology and on-site plant project execution ([29]).

(106) The links between Air Liquide and Air Products that would be created by the joint acquisition and division of BOC make it likely that Air Products would not pursue aggressive competition against Air Liquide/BOC (see recitals 223 to 243).

The Linde/AGA merger, if completed, would not reduce the anti-competitive effects of the proposed concentration

(107) In terms of market share, Linde is the next most important competitor (15 to 20 % for oxygen and 15 to 20 % for nitrogen). If it acquires AGA, its market share will increase to 25 to 30 % for oxygen and 15 to 20 % for nitrogen. However, the gap between its market share and that of Air Liquide/BOC will still be considerable, namely […]* for oxygen and […]* for nitrogen.

(108) Linde is generally considered to be one of the leading companies with regard to production technology (process technology) for cryogenic air separation plants. Linde has significant in-house engineering capability. However, in some areas it lacks technology. For instance, it has no competitive membrane air separation technology for nitrogen production, a profitable and growing sector. The merger with AGA will add nothing to Linde's technological competence because AGA does not have any genuine plant engineering expertise. In fact, AGA currently uses Linde technology under licence.

(109) In its reply to the statement of objections, the notifying party stressed Linde's plant construction capability and plant sale activities, in particular with respect to large cryogenic air separation units. Linde AG is a diversified corporation which operates its industrial gases business as one of four business divisions (Werksgruppen). On-site air separation units are not constructed by Linde's industrial gases department (Werksgruppe Technische Gase), which, since November 1999, is a separate subsidiary of Linde AG, but by Linde's engineering and construction department (Werksgruppe Anlagenbau). Linde's Werksgruppe Anlagenbau also carries out engineering projects in a range of sectors unrelated to technical gases. It has, in the past, provided cryogenic air separation units to the Werksgruppe Technische Gase as well as to other industrial gases companies. In that respect Linde's Werksgruppe Anlagenbau acts like any other engineering company. Linde stated at the oral hearing that it sees no reason why its plant sale activities should strengthen its gases supply activities.

(110) It would appear, therefore, that Linde's plant construction and plant sale activities do nothing more than ensure that its cryogenic technology is generally available to other industrial gases companies. By acting as an equipment supplier to other industrial gases companies, Linde will not enhance its own chances of winning tonnage supply contracts directly. The supply of equipment, through engineering contracts, and the supply of gases, under long-term supply relationships, belong to different product markets in which different competitive strengths are required. For instance, Linde does not have access to any large pipeline network. This limits its chances of winning new tonnage customers in key industrial regions where other competitors have pipeline networks and constitutes a strategic disadvantage.

(111) In competing for tonnage supply contracts, the capability to plan, execute and manage large on-site projects is at least as important as technological expertise. Industry analysts consider that Linde falls behind the 'first tier' industrial gases companies in that respect ([30]). The fact that Linde has won and implemented a comparatively small number of large on-site contracts during the last five years (see table 3) appears to confirm that assessment ([31]). In the past it preferred to license its technology to other industrial gases companies, or to build plants as a subcontractor for other companies. That suggests that Linde has adopted a rather cautious policy with respect to directly implementing projects.

(112) In assessing the competitive force that Linde/AGA would exercise, the fact that Linde/AGA would have certain regional strengths should be taken into account. Like Air Liquide/BOC, although on a smaller scale, Linde/AGA would have a strong position in certain

([29]) See footnote 28.

([30]) See footnote 29.

([31]) Linde has, however, won a larger number of small on-site contracts (under 100 tpd).

'home' territories (Austria, Scandinavia and certain regions within Germany). There is a risk that Linde/AGA would concentrate on those regions where it enjoys specific competitive advantages and lower risk, thereby reducing the overall level of competition.

Messer and Praxair are unlikely to present effective competition

(113) Neither Messer nor Praxair share Air Liquide/BOC's specific strengths to the same extent.

(114) Messer falls significantly behind in terms of market share (10 to 15 % for oxygen and 5 to 10 % for nitrogen) and number of contracts won (see table 3). Although it has plant construction expertise, Messer faces strategic disadvantages compared to Air Liquide/BOC. The fact that it is considerably smaller than the industry leaders Air Liquide/BOC and other major players (for example Air Products) is an additional disadvantage, particularly in competing for large projects which require large financial investments. Having increased its level of debt significantly in recent years, Messer may lack the financial strength to invest in on-site supply projects on a significant scale in the future. Messer also lacks global exposure.

(115) Praxair's position in Europe is limited (market share less than 5 % for oxygen and 5 to 10 % for nitrogen). The company's strengths are mainly in the American markets.

(116) In assessing future competition by Praxair in the EEA tonnage market, it is necessary to assess Praxair's economic incentives to compete vigorously. Praxair stated at the oral hearing that, in spite of its technological capabilities, it has not been able to acquire a significant market share in Europe. The company perceives its chances of winning contracts as small against the competition of large incumbent suppliers. It stated that it is not likely to make major investments in order to expand its European presence in the future. It appears that although Praxair has technological capability it considers it to be economically rational to give preference to investments in other regions of the world in which it perceives a higher potential for growth. On that basis, it is not likely that Praxair would challenge the parties' combined position in the EEA tonnage market to such an extent as to remove their dominance.

(d) ***Position of customers and award of contracts***

Highly concentrated supply faces a much less concentrated demand

(117) Customers in the European tonnage market already face a highly concentrated supply structure. Few (not more than seven) suppliers of tonnage gases are currently present in the market. Their number could be reduced to five. Of those, some are clearly less qualified than others.

(118) The proposed concentration would further reduce customer choice. The elimination of BOC as an independent competitive force would further narrow the supply structure, not only because of the reduction in the number of competitors but, more importantly, because one of the few leading tonnage suppliers would be removed. BOC is one of the few 'first-tier' industrial gases companies with leading technology, strong investment capability and project execution expertise.

(119) The demand side, on the other hand, is less concentrated. A range of industries require oxygen and nitrogen in tonnage form, for instance the steel, metal (ferrous and non-ferrous), chemical, petrochemical, refining, electronics and glass industries. In each of those industries a significant number of (potential) customers exist. More than 100 different customers have made requests for large on-site plant offers (above 100 tpd capacity) during the last few years in Europe. If the demand for smaller (but still significant) on-site plants at the borderline between bulk and tonnage supply (20 to 100 tpd capacity) were to be included, the number of customers would be even higher.

(120) In the steel and chemical/petrochemical industries large customers exist. The notifying party argues that some of those customer companies are larger than Air Liquide. It is not clear, however, how the size of a customer can increase its bargaining power. Purchaser power is not a function of the size of a company but of the respective degrees of concentration of supply and demand. No single customer accounts for an important share of the tonnage supply in the EEA and the degree of concentration on the purchaser side is significantly lower than on the supply side.

Not all customers concentrate their procurement at headquarter level or can exercise bargaining power by using the volumes purchased as leverage

(121) In its notification, Air Liquide states that tonnage customers are essentially a few large worldwide companies (steel, chemicals and refining) and generally have centralised purchasing functions. It also states that the customers' gas requirements are for high volumes and that those customers are therefore able to exercise very strong bargaining power vis-à-vis gas suppliers.

(122) However, the Commission's inquiries have not confirmed that tonnage customers are limited to a few large multinational companies. Moreover, even companies which have centralised procurement have expressed the view that they face an uphill battle in matching the power of their gases suppliers.

(123) In some industries the cost of industrial gases constitutes a higher proportion of the customers' production costs than in others. For instance, the quantities of oxygen and argon supplied to a steel mill will be very large and will also be a significant part of the steel mill's variable costs. However, the quantities of oxygen and nitrogen supplied to the production site of a chemical company may still be large in absolute terms, but constitute only a relatively small part of the customer's costs. According to the notifying party, oxygen and nitrogen typically represent approximately 3 % of the cost of the products they are necessary to produce. In most cases, the customer's operations are dependent on the supply of a fixed quantity of gases and the cost of any interruption of the supply may be very high. Those elements indicate that demand tends to be price-inelastic. Therefore, the mere fact that the purchase of large quantities does not mean that customers will be able to exercise bargaining power vis-à-vis gas suppliers.

(124) The introduction of the 'expanded offer' or 'utility island' concept which mainly involves the co-generation of electricity and steam will result in lower costs for both the industrial gases supplier and the customer, but will also reduce the customer's bargaining power. By not only supplying gases, but also co-generating electricity and steam, the industrial gases company can satisfy its own need for electricity (in order to run the on-site plant), as well as the customer's need for steam (typically required by chemical companies). Air Liquide pioneered this method and has so far had the greatest success in implementing it. The nature of such a comprehensive utility supply has more in common with a joint venture than a traditional supply agreement. While the customer may benefit from the outsourcing of utilities, it will find it more difficult to sever the symbiotic relationship with the industrial gases company once the contract expires. The customer's bargaining power will eventually be diminished.

The existing contract award procedures are insufficient to constrain the parties' strength

(125) In its notification, Air Liquide submits that the tonnage market is a 'bidding market' and that presence of any co-bidder (even just one) is therefore sufficient to ensure a competitive outcome. However, the notifying party's definition of a 'bidding market' is not clear. If this term is meant to characterise a formal bidding process, the usual award procedure in the tonnage market clearly falls short of such a process. In a typical bidding situation, for instance in the area of public procurement, invitations to bid are published in such a way that all competitors are informed. Competitors are able to submit bids on the basis of the same information under the same conditions, and the award decision is taken after evaluation of those bids.

(126) The Commission's investigation has shown that a more differentiated view of the award procedure for large on-site contracts should be taken. No standardised tender procedure exists. The elements set out in recitals 127, 128 and 129 have been raised as typical by customers and competitors.

(127) Planning of an on-site plant and design of the terms of reference. Air Liquide itself has stated that industrial gases companies (the potential suppliers) are often involved in a dialogue with their (potential) customers at the project design stage. A customer company will often seek the advice of industrial gases companies in planning a tonnage solution. This will often be the case when large, customised onsite plants are needed, given the complexity of such projects in terms of technology as well as project planning and management ([32]). In such cases most customers rely on the advice of a competent industrial gases company in order to identify and specify the best technical solution for the required capacity, purity and flow rate, the alternatives and

([32]) Where smaller on-site plants, based on standard technology (PSA, VPSA, small cryogenic), are needed, the customer may be more able to specify the terms of reference without advice from an industrial gases company. In particular, large multinational companies may be able to draw on their experience with other such plants at different sites, particularly if those plants are not customised to meet specific needs.

parameters for the plant design, appropriate back-up solutions, environmental considerations etc. This initial dialogue can last for a prolonged period of time, up to 18 months, during which meetings are held at expert/engineer level and detailed technical discussions take place. The process results in a customized solution for the specific customer site. At least one potential supplier will therefore make a significant input in defining the terms of reference for a large on-site plant. This process comes close to joint project development.

(128) Requests for offers. Customers have confirmed that calls for tender for on-site supply are not normally published. Most customers contact one or several industrial gases companies (mainly in writing, but also orally) and request an offer. The terms of reference vary from a broad description to full details.

(129) Decision-making and additional negotiations. Once offers have been received, additional negotiations will often take place with the incumbent supplier (on the basis of the terms of other offers submitted) or with other competitors that have responded (on the basis of the incumbent's and other offers). On that basis, the customer will take the procurement decision.

(130) On the basis of those elements, the Commission's assessment of whether the contract award procedures could constrain the parties' market power is set out in recitals 131 to 144 :

(131) It must first be noted that the tendering procedures used by tonnage customers are with few exceptions not objective tendering procedures, with objective and clearly laid down criteria to award a contract (e.g. lowest price), but simply negotiation procedures which are conducted to a varying degree with different suppliers.

(132) In most negotiation procedures competitors have the possibility of modifying their offers and offering different conditions during the course of the negotiations. The examples provided by the notifying party confirm this view. According to the notifying party, this allows customers to play off suppliers against each other in order to obtain a better deal. However, various elements of the negotiation procedure limit that possibility.

(133) Firstly, it will often be the incumbent whom the customer will select for advice on the specifications of the new plant and the terms of reference, since the incumbent has an established working relationship with that customer ([33]). Therefore, the usual award process often involves the incumbent at an earlier stage than competitors. The proposed on-site solution is often one which the incumbent has co-designed and which corresponds to its capabilities.

(134) The incumbent is able to make the most economical offer by benefiting from its existing supply relationship and the initial investment made. That is the case both where an on-site arrangement comes up for renewal and where extensions or modifications to existing agreements are required (for details recitals 58 to 61). This bias against outside competitors may limit the incentive for other suppliers to compete as fiercely as they would do in a bidding process in which they could bid on equal terms (or to bid at all), as confirmed by responses from some customers ([34]).

(135) Indeed, most customers contacted replied that the incumbent enjoys an advantage in bidding for an on-site supply contract, in particular where extensions have to be made to an existing supply arrangement.

(136) In some situations, the bias towards the incumbent may be so pronounced that a customer will find it difficult to obtain competing offers. This tends to be the case if the contract to be awarded is not attractive enough and the chances of success are too limited to warrant the investment in making an offer. Such a situation arises where a customer seeks to add limited capacity to an existing supply arrangement (for instance, the customer has one on-site supply contract with the incumbent for 1 200 tpd oxygen and needs additional supply of 350 tpd). Where a customer has a pipeline supply contract, the chances of outside competitors are also reduced (for details see recitals 85 and 86). In such situations, competitors may simply find it unattractive to bid

([33]) In principle, it is conceivable that a customer seeks alternative advice on the project design from several potential suppliers. However, it can be assumed that only very large companies would resort to such a strategy. During the investigation, no case was found in which that approach was used.

([34]) There may, of course, be exceptions, such as large 'prestige' projects, which several gases companies will be eager to win. This assessment reflects the general tendency.

against the odds and the customer will have little choice but to fall back on its current supplier. Individual customers have confirmed this concern.

(137) Secondly, while calls for tender for large on-site projects may become known to all suppliers capable of making an offer, that is not always the case with respect to the larger number of medium-sized or smaller contract opportunities. In those cases, only a limited number of competitors are able to make an offer because customers typically do not publish calls for tender and often do not contact the entire spectrum of potential suppliers. However, the incumbent is normally requested to make an offer.

(138) Thirdly, suppliers need a significant amount of information about the customers, their operations and requirements in order to prepare their offers. The notifying party has stressed that tonnage contracts are normally tailored to the customer's specific needs. That knowledge puts the supplier in a good position to assess the options open to the customer (for example, replacement, refurbishment or deferral of the contract) and the customer's costs associated with each option. In the course of the negotiations that follow, the supplier can gather further information. The possession of such information enables the supplier to evaluate the risk that a given project will be abandoned, deferred or scaled down or that the customer will switch to an entirely new plant instead of extending the existing arrangement. That knowledge enables a supplier to adjust its price accordingly. Customers can therefore have bargaining power only for marginal projects.

(139) This degree of transparency of the customers' options and the suppliers' ability to adjust to the customers' behaviour distinguishes the prevailing negotiation procedure in the tonnage market from classical bidding procedures. The latter are designed to avoid this kind of transparency in order to strengthen the customers' position and ensure effective competition between suppliers on a level playing field.

(140) Fourthly, the history of the tonnage market suggests that it is not easy for customers to switch between suppliers. There is no evidence that the parties' market shares have been subject to wide variations. The existence of strong regional positions also contradicts the notifying party's view. Both Air Liquide and BOC have consistently held very large parts of the tonnage supply in their 'home' territories (see recitals 67 and 68). If the outcome of each contract award procedure was entirely open, one would expect the parties' market positions to be much less stable. This has not been the case.

(141) The notifying party has quoted several Commission decisions in merger cases in support of its opinion that the use of tendering procedures would reduce the competition concerns normally arising from high market shares.

(142) In its reply to the statement of objections the notifying party refers to the Commission's Decision of 12 December 1996 in Case No IV/M.692 — Electrowatt/Landis. However, the relevant statements in that decision related to small markets which were characterised by the entry of new competitors and by a degree of technological innovation (electronic components) that would make market share variations likely. None of those elements are present here.

(143) In the same context, the notifying party quotes the Commission's Decision of 23 October 1998 in Case No IV/M.1298 — Kodak/Imation. However, in that decision, the existence of tendering procedures was only one of several factors taken into account in determining whether the operation would create a single or collective dominant position. A more relevant factor was that any increase in prices was likely to accelerate the customers' switch to a different technology, in particular to digital systems. In the present case, there are no competing technologies that could constrain the parties in a similar way.

(144) The Commission concludes that the prevailing contract award procedures are not in themselves sufficient to ensure that each potential supplier can bid on equal terms and receive equal treatment during the procedure. The result of such procedures depends on different factors such as the strength of the suppliers in the market. Where one supplier, such as the combined entity after the proposed concentration, has a much stronger position than others, such a procedure allows the dominant supplier to benefit from its position in order to adapt its offer to those of its competitors and, therefore, further weaken their position. The increased imbalance in favour of the combined entity Air Liquide/BOC would further diminish the effectiveness of the existing award procedures. On the basis of those considerations, the Commission considers the prevailing award procedures to be insufficient to constrain the parties' market power.

Customers have limited cost transparency and will not normally resort to self-production

(145) The notifying party argues that customers always have the option of investing in the purchase of an air separation plant and operating it themselves. Purchasing

gases and purchasing air separation plants are therefore two equal and substitutable ways for the customer to satisfy its needs. According to the notifying party, most customers have, at one time or another, owned and operated air separation plants. The customers are therefore in an excellent position to calculate costs of production, to benchmark gas prices and to insist on and obtain the lowest possible gas prices.

(146) The Commission's investigation has not confirmed those statements. When asked whether they consider self-production to be a viable alternative, most customers replied negatively. There are plausible reasons for this. Firstly, companies in most customer industries pursue a policy of outsourcing non-core tasks. To make a major capital investment for the production of one raw material would go against that trend ([35]). Secondly, few customers have the expertise and personnel to operate and maintain large air separation units, in particular as the relevant technology is constantly evolving. Customers are not normally able to operate on-site plants as economically as industrial gases companies because they do not benefit from the sale of excess liquid production. Thirdly, customers would not be able to control the subsequent implications of their initial investment decision. Each time the customer required a capacity extension, a purity upgrade or any other modification to the existing plant, it would have to make additional investments. In view of those factors, a customer's threat to switch to self-production, if made during contract negotiations, is hardly credible.

(147) In particular, there is no justification for stating that plant purchase and tonnage supply of gases are 'equal and substitutable' ways for a customer to satisfy its needs. In its reply to the statement of objections, the notifying party describes how, in a tonnage contract, the risk associated with the large investment is shared ('underwritten') by the customer and the supplier. If a customer opted to purchase a plant, it would have to bear that risk alone.

(148) The data submitted by the notifying party contradict its statement that customers are generally likely to purchase air separation units and switch to self-production. Of […]* offers submitted by Air Liquide in Europe during the last five years, self-production was considered by the customers in only […]* cases. Furthermore, out of […]* requests for plant sale offers, the customers decided to actually acquire a plant in only […]* cases whereas they concluded a conventional gases supply contract in […]* cases. In the light of those data, anecdotal examples of self-production cannot be considered to be representative. A BOC market analysis states that captive production may be decreasing by up to 2 % per year and the acquisition of captive plants by industrial gases companies may account for one third of the market growth ([36]). Air Liquide's 1998 Annual Report confirms that development by stating: 'The iron and steel industry provides a good illustration of the current trend in outsourcing oxygen production.' Overall, the tendency is for self-production to decrease rather than increase.

(149) Most customers replied that they did not have self-production of industrial gases so far, that they had no detailed knowledge of their supplier's cost structure and that they were not or were only partly able to recalculate the price offered by a tonnage supplier. It may be that customers establish benchmarks of industrial gas prices in contract negotiations, but their ability to verify the supplier's costs in each individual case remains limited. Where a customer has operated an air separation unit in the past, the knowledge derived is probably of limited value given that the relevant technology evolves and each large on-site plant is a customised solution.

(e) ***Conclusion on the tonnage market***

(150) The proposed concentration would change the structure of the EEA tonnage market. It would significantly increase Air Liquide's market share, creating by far the largest tonnage supplier and enhancing its lead over its competitors. The competitive potential of a large and competent industrial gases company would be removed. The new entity would have a stronger regional presence throughout Europe that could be use as leverage in competing for new contracts. It would be able to rely on additional strengths not available to its competitors. The notified operation would combine the know how and technology of two leading competitors, as well as their R & D capabilities. Because of its size, the new entity would be better positioned to compete in a capital intensive market that requires large investments. The fact that it would be much larger than most of its competitors would discourage vigorous competition.

([35]) That view is shared by industry analysts, see for instance NatWest Securities, 'Industrial Gases 2000', February 1997, p. 79.

([36]) 'BOC process systems: Global situation analysis'; document submitted to the Federal Trade Commission as part of the HSR filing.

(151) The Commission therefore concludes that the proposed concentration would create a dominant position on the market for the tonnage supply of oxygen and nitrogen in the EEA.

2. BULK AND CYLINDER MARKETS

(152) The proposed concentration would raise significant competition concerns because it would combine dominant positions in different national markets, resulting in:

— the increased ability of the combined entity to eliminate or reduce actual and potential competition from third parties, and

— the elimination of actual and potential competition between the parties.

(153) In addition, the proposed concentration would create significant disincentives for Air Products, as the main competitor of Air Liquide/BOC, to compete vigorously with Air Liquide/BOC in these markets.

(a) ***Dominant position of BOC in the United Kingdom and Ireland***

BOC has, for most gases, by far the highest market shares in the bulk and cylinder markets in the United Kingdom and Ireland

(154) The market shares of BOC and its main competitors on the markets for bulk and cylinder gases in the United Kingdom and Ireland are set out in tables 6 and 7 respectively ([37]).

Table 6

United Kingdom

	BOC	Air Products	Messer	Linde	Others
Bulk					
Oxygen	[…]*	25-30 %	< 5 %	< 5 %	
Nitrogen	[…]*	35-40 %	< 5 %	< 5 %	
Argon	[…]*	15-20 %	< 5 %	< 5 %	
CO_2	[…]*	< 5 %	50-55 %		35-40 % (Hydrogas)
Hydrogen	[…]*	55-60 %	< 5 %		
Cylinders					
Oxygen	[…]*	10-15 %	< 5 %	< 5 %	
Nitrogen	[…]*	25-30 %	5-10 %	5-10 %	< 5 %
Argon/Argon mixtures	[…]*	20-25 %	< 5 %	5-10 %	
Acetylene	[…]*	15-20 %	< 5 %	< 5 %	< 5 % (AGA)
CO_2	[…]*	5-10 %	35-40 %	< 5 %	
Hydrogen	[…]*	30-35 %	< 5 %	5-10 %	

([37]) Figures for 1998, based on the companies' turnover for the products in question.

Table 7

Ireland

	BOC	Air Products
Bulk		
Oxygen	[…]*	< 5 %
Nitrogen	[…]*	< 5 %
Argon	[…]*	40-45 %
CO_2	[…]*	
Hydrogen	[…]*	25-30 %
Cylinders		
Oxygen	[…]*	15-20 %
Nitrogen	[…]*	25-30 %
Argon/Argon mixtures	[…]*	25-30 %
Acetylene	[…]*	10-15 %
CO_2	[…]*	< 5 %
Hydrogen	[…]*	15-20 %

(155) In Ireland, BOC has high market shares for all gases. In the United Kingdom, BOC has high market shares in particular for the atmospheric bulk gases (oxygen, nitrogen and argon) and all cylinder gases.

(156) BOC has a limited number of competitors. In the United Kingdom, only three other large industrial gases companies are present, two of which have limited market shares (Messer and Linde). In Ireland, competition is limited to Air Products. Air Products, as the only significant competitor in both countries, occupies a much weaker position in terms of market share in most segments. The gap between BOC and Air Products in Ireland is pronounced for every relevant gas except argon, which is a low-volume and high-value gas. Air Product's market share is equal to that of BOC only with respect to bulk hydrogen in the United Kingdom, a product that is traded.

(157) In its reply to the Commission's statement of objections, the notifying party argues that BOC's market shares for bulk and cylinder atmospheric gases and for acetylene have undergone a continued decline during the last years.

(158) While the Commission acknowledges that BOC may have experienced some losses of market share in the past, it finds the arguments presented are not sufficient to rebut its finding of dominance in the bulk and cylinder markets in the United Kingdom and Ireland.

(159) Firstly, in the past BOC held very high market shares in the bulk and cylinder markets in the United Kingdom and Ireland, amounting to near monopoly positions in some markets in the United Kingdom and in most markets in Ireland. Even in a market dominated by one supplier that has captured a very large part of the supply, market share can be lost to some degree over an extended period of time. That fact alone does not rule out continuing dominance.

(160) Secondly, despite the loss of market share following the entry of some newcomers into the market, BOC's market share has consistently remained high. In the United Kingdom, BOC's share of the market for bulk oxygen, nitrogen and argon as well as oxygen, nitrogen, argon/argon mixtures, acetylene, carbon dioxide and hydrogen supplied in cylinders has been consistently high ([…]*). BOC's share of the market for bulk and cylinder gases in Ireland has consistently been even higher ([…]*). There have been no large market share variations in the past that would suggest that BOC's high market shares might decrease substantially in the foreseeable future.

(161) The supplemental market share data presented by BOC at a late stage in the procedure is inconsistent with the data provided in the notification which, according to the notifying party, represented best estimates based on actual BOC data. The Commission does not have sufficient knowledge of the basis for calculating those market shares and the methodology used. In any case, even if the assessment were based on the market share estimates provided at a later stage, they would not refute the Commission's finding of dominance in the markets concerned.

(162) The notifying party also challenges the Commission's findings on dominance on the United Kingdom bulk market by reference to declining prices. It submits that, since 1985, the price for bulk oxygen, nitrogen and argon in the United Kingdom has continuously declined. The notifying party has not provided any further information as to the basis for the figures underlying that conclusion.

(163) However, the notifying party stated in its reply to the statement of objections that technical developments have brought about a reduction in the investment required for air separation units (about […]* in 15 years) and a reduction in the average power consumption (about […]* in 15 years), so that the cost of production of liquid oxygen and liquid nitrogen has

decreased (by […]* in 15 years, also due to a decrease in the cost of power). Such a decrease in production and energy costs has also been reported in industry analyses concerning this sector. The Commission therefore considers that the price development largely reflects the reduction in production and energy costs. Although transport costs may have increased, the Commission notes, however, that the transport costs for the largest incumbent supplier, BOC, must be lower than for any competitor. BOC can rely on the densest production and distribution network in the United Kingdom and Ireland. It therefore has to cover less distance between production sites and filling stations and between filling stations and customers. Calculations submitted by the notifying party confirm that assessment ([38]).

(164) The Commission therefore finds that the consistently high market shares held by BOC in the bulk and cylinder markets for atmospheric gases and acetylene in the United Kingdom and Ireland, in particular when compared with the competitors' much lower market shares, are in themselves indicative of dominance in these markets.

BOC has the most extensive production and distribution network in the United Kingdom/Ireland

(165) BOC has the most extensive infrastructure for the production and distribution of atmospheric gases in the United Kingdom and Ireland. The company has […]* merchant air separation units in Great Britain and […]* in Ireland. Each of these production facilities also serve as a distribution point for bulk gases, but BOC has […]* additional bulk gas distribution facilities in Great Britain. BOC also has an acetylene plant in Great Britain. BOC therefore has the densest and most well balanced network of bulk gases production and distribution locations. Furthermore, BOC has an extended cylinder distribution infrastructure in Ireland ([…]* cylinder filling facilities compared to one for its competitors). It should also be noted that BOC has been able to place a significant number of small nitrogen on-site plants (more than […]*) with customers that would otherwise require liquid nitrogen supply. On the basis of data provided by competitors, the Commission concludes that no competitor has a similarly extensive production and distribution infrastructure in Great Britain and Ireland. Therefore, BOC's overall logistical position is such that it allows the company to maintain, if not to reinforce, its dominance.

BOC has a very strong presence in the tonnage sector in the United Kingdom

(166) BOC controls by far the largest part of the supply of atmospheric gases in large quantities in the United Kingdom (tonnage supply) ([39]). According to figures provided by the notifying party, which have been confirmed by the Commission's inquiries, BOC provides […]* of tonnage oxygen and the same proportion of tonnage nitrogen. Its strong position in the tonnage segment is reinforced by its control of the most extensive pipeline grids in the United Kingdom.

(167) BOC's strong position in the tonnage segment entails additional advantages in the bulk market because each time BOC wins a tonnage contract it can, in principle, decide to use the new on-site plant for the simultaneous production of liquid gases (so-called 'piggy back' production). BOC can thus constantly renew its production capacity. Furthermore, liquid gases produced simultaneously with tonnage gases have lower production costs because of the economies of scale achieved in a larger plant. In its reply to the statement of objections and at the oral hearing, the notifying party disputed such an advantage and considered that 'piggy back' production does not reflect the present tendencies in bulk production. That view is not, however, supported by all competitors, some of which claim that over-sizing an on-site plant still affords an additional advantage to a gas supplier in the bulk market.

(168) The control of pipeline networks confers additional structural advantages, which are not available to other competitors, not only in the tonnage market, but also in the market for bulk gases. The Commission investigation has confirmed that there is, in principle, no obstacle to the use of a pipeline for supplying the quantities of gases normally provided in bulk. Thus, unlike competitors without access to pipeline networks, BOC can substitute high-cost bulk supply by granting suitable customers access to its pipelines. This is confirmed by examples submitted by BOC.

(b) ***Dominant position of Air Liquide in France***

Air Liquide has by far the highest market shares in the French bulk and cylinder markets

(169) The market shares of Air Liquide and its competitors in the bulk and cylinder markets in France are set out in table 8:

([38]) Annex A.11 to the reply to the statement of objections.

([39]) There is no tonnage supply in Ireland.

Table 8

France

	Air Liquide	AGA	Air Products	Praxair	Messer	Linde	Others
Bulk							
Oxygen	[…]*	15-20 %	10-15 %	5-10 %	< 5 %	< 5 %	
Nitrogen	[…]*	5-10 %	10-15 %	< 5 %	5-10 %	< 5 %	10-15 %
Argon	[…]*	10-15 %	5-10 %	5-10 %	5-10 %	5-10 %	
Carbon dioxide	[…]*	< 5 %			25-30 %		<5 %
Hydrogen	[…]*		15-20 %		< 5 %		
Cylinders							
Oxygen	[…]*	20-25 %	< 5 %		< 5 %	< 5 %	
Nitrogen	[…]*	15-20 %	5-10 %		5-10 %	< 5 %	
Argon/Argon mixtures	[…]*	15-20 %	5-10 %		5-10 %	< 5 %	
Acetylene	[…]*	10-15 %		<5 %	< 5 %	< 5 %	10-15 %
Carbon dioxide	[…]*	10-15 %	< 5 %		10-15 %	< 5 %	
Hydrogen	[…]*	10-15 %	< 5 %			5-10 %	

(170) Table 8 shows that Air Liquide holds by far the highest shares in all markets. Competition is fragmented, with no competitor reaching […]* of Air Liquide's market share in any segment and most being significantly weaker in the remaining markets. AGA, as the strongest competitor, exceeds 20 % only with respect to oxygen in cylinders (where Air Liquide has a market share of […]*).

(171) In its reply to the Commission's statement of objections and at the oral hearing, the notifying party submitted that the Commission's analysis did not take account of its declining market shares for bulk and cylinder gases in France over the past 20 years. Secondly, it argued that prices for bulk oxygen, nitrogen and argon/argon mixtures have decreased and costs of bulk production increased.

(172) With regard to the cylinder market, the data provided by the notifying party following the hearing suggests that the market shares for cylinder oxygen and acetylene have declined only slightly during the last 10 years and have remained relatively constant during the last three years, whereas the market share for argon shows even seems to be increasing. Prices for these cylinder gases have increased relatively constantly over the last 10 years by […]*.

(173) The evidence put forward by the notifying party to challenge the Commission's findings on dominance in the bulk and cylinder markets in France is not convincing.

(174) Firstly, with regard to market shares, Air Liquide enjoyed a near monopoly position in the French bulk and cylinder markets in the past (for instance […]* for liquid oxygen and nitrogen together in 1975). Despite some market share losses, Air Liquide's market shares have constantly remained high (approximately […]*) for both bulk and cylinder gases. There have been no sudden large losses of market share in the past that would suggest that Air Liquide's high market shares might be reduced substantially in the foreseeable future.

(175) Secondly, with respect to costs, the basis on which the alleged increases have been calculated is not clear. The notifying party stated in its reply to the statement of objections that technical developments, during the past 15 years, have contributed to considerable cost savings

of […]* in the production of liquid oxygen and nitrogen. The Commission therefore considers that the price development largely reflects the reduction in production and energy costs. Even if transport costs for a supplier such as Air Liquide with a dense infrastructure and distribution network in France have risen, these costs would be lower than those of a competitor with a less dense infrastructure and distribution network.

(176) The Commission concludes that the repartition of market shares described in recitals 169 to 175 is in itself indicative of dominance by Air Liquide in the bulk and cylinder markets in France.

Air Liquide has the most extensive production and distribution network in France

(177) Air Liquide operates […]* air separation units producing liquid oxygen and nitrogen and […]* air separation units producing liquid argon in France. Air Liquide also operates […]* hydrogen and carbon dioxide plants and […]* acetylene plants in France. In terms of cylinder distribution infrastructure, Air Liquide has […]* cylinder filling facilities, of which […]* are capable of filling standard air gases, […]* acetylene, […]* carbon dioxide, […]* hydrogen and at least […]* speciality gases. Air Liquide has a comprehensive network of more than […]* resellers covering all regions.

(178) On the basis of data provided by competitors, the Commission concludes that no competitor has a similarly extensive production and distribution infrastructure in France. In its reply to the Commission's statement of objections Air Liquide argues that its production capacity of Air Liquide of bulk oxygen and nitrogen currently barely exceeds that of all its competitors taken together. The Commission is not convinced by this argument. Although the figures provided by the notifying party suggest that in 1983 the overall production capacity of the competitors of bulk oxygen and nitrogen was considerably lower than that of Air Liquide, there has been no further increase in the production capacity of the competitors in relation to the production capacity of Air Liquide over the last five years.

(179) In addition, Air Liquide has […]* small on-site facilities for the production of nitrogen and can be considered to have a unique position in this segment. Overall, Air Liquide has superior access to customers in France, a factor that reinforces its dominance.

Air Liquide has a very strong presence in the tonnage sector in France

(180) According to its own estimates, Air Liquide is currently providing by far the largest proportion of tonnage gases in France ([…]* of oxygen and […]* of nitrogen). Furthermore, Air Liquide operates unique networks of pipelines in key industrial regions of France, Belgium and the Netherlands ([40]).

(181) In its reply to the statement of objections and at the oral hearing the notifying party disputed such an advantage and considered that 'piggy back' production does not reflect the present tendencies in bulk production. This view is not, however, supported by all competitors, some of which claim that 'piggy back' production still affords an additional advantage to a gas supplier in the bulk market. Indeed, Air Liquide has confirmed that […]* of its plants in Europe ([…]* out of […]) have over-capacity for liquid oxygen and nitrogen to be sold in the bulk market. The notifying party estimates that the proportion of Air Liquide's and BOC's total bulk sales supplied by on-site plants with over-capacity has remained constant over the last five years: […]* (1998), […]* (1997) and […]* (1994 to 1996).

(182) The Commission concludes that a very strong position in the adjacent tonnage segment further strengthens Air Liquide's position in the bulk market.

(c) ***Strengthening of dominant positions***

(aa) **Combination of dominant positions**

The proposed concentration would combine dominant positions in three national markets

(183) In France and the United Kingdom/Ireland, the proposed transaction would bring together two incumbent suppliers which, prior to the transaction:

— provide the full range of industrial gases products,

— have very high market shares in the markets for bulk and cylinder gases,

([40]) Oxygen pipelines — […]** km; nitrogen pipelines — […]** km.

— have extensive national production capacities and distribution networks as well as the best cost basis,

— have a well-established customer base and preferential access to customers, and

— have historically established, strong positions in their respective 'home' markets (and adjacent countries), amounting to dominance.

(184) If the proposed concentration were allowed to go ahead as notified, the result would be dominance by one single supplier in the second and third largest industrial gases markets in Europe (France and the United Kingdom). The combined entity would be dominant in an area that accounts for approximately […]* of the European demand for industrial gases ([41]).

The proposed concentration would combine the parties' dominant position with strong positions in other countries

(185) In addition to its dominance in an extended geographic area covering large markets in western Europe, the combined entity would have access to markets in a number of other countries in which its actual and potential competitors are active, resulting in multi-market contacts. The combined entity would have high market shares notably in Belgium, Denmark, Greece, Italy, Portugal, Spain and Sweden. In Germany, the largest European industrial gases market, the combined entity's market position would be less strong, but still significant.

(186) The market shares of Air Liquide/BOC in some other countries are set out in table 9:

Table 9

Air Liquide/BOC market shares in other countries

	Belgium	Denmark	Germany	Greece	Italy	Portugal	Spain	Sweden
Bulk								
Oxygen	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	
Nitrogen	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	
Argon	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	
Carbon dioxide	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	
Hydrogen	[…]*	[…]*	[…]*		[…]*		[…]*	
Cylinders								
Oxygen	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*
Nitrogen								
Argon/Argon mixtures	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*
Acetylene								
Carbon dioxide	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*	[…]*
Hydrogen								

([41]) Overall, the combined entity would supply approximately […]** of the European demand for industrial gases.

(187) Air Liquide has a production and distribution infrastructure for industrial gases in each of the countries in table 9, even those where its market share does not indicate dominance. For further details see table 4.

(188) In its reply to the statement of objections the notifying party contests the relevance of the market shares for bulk and cylinders in other European countries for the assessment of its position on the bulk and cylinder markets in France, the United Kingdom and Ireland. The Commission finds, however, that the market shares presented in table 9 give an indication of the position of Air Liquide and BOC in various European bulk and cylinder markets, and are thus useful for the overall assessment of the present transaction.

(bb) **Increased ability to eliminate or substantially reduce actual and potential competition from third parties**

By combining their respective dominant positions, Air Liquide/BOC would become even less vulnerable to competition in France, the United Kingdom and Ireland

(189) The proposed transaction would bring a much larger area under the control of one player rather than two, thus giving the combined entity additional leverage against rivals in France, the United Kingdom and Ireland.

(190) Firstly, the two dominant incumbents would no longer be actual and potential competitors. The combination of their businesses would strengthen the parties' technological and financial resources in their respective home markets. Those factors alone act as a deterrent to foreign competitors and would increase barriers to entry.

(191) Secondly, each of the parties would benefit from the anti-competitive effects of the strategies pursued in the territory of the other. Before the transaction, for instance, if BOC had countered entry into the United Kingdom market by a competitor (for instance, Linde), it would have reduced its profitability and therefore become more vulnerable to (actual or potential) competition by other parties (for instance, Messer or Praxair). Thus, before the transaction, any entry into the United Kingdom market would have improved the competitive structure of that market. After the transaction, a third party establishing a presence in the United Kingdom would have a substantially smaller impact on the market structure.

(192) Thirdly, the proposed transaction would increase the ability of the combined entity to increase competitors' risks and costs in entering the bulk and cylinder markets in France, the United Kingdom and Ireland. Any entrant into another incumbent's stronghold normally incurs substantial sunk costs in investing in infrastructure which are not necessarily recoverable due to the incumbent's strong incentive to engage in marginal or sub-marginal price competition in order to prevent the entrant from establishing a foothold. Before the transaction, entrants to the United Kingdom, for example, would have faced the financial risk of entering into the United Kingdom market only. After the transaction, most entrants would face a more powerful incumbent in the United Kingdom and their investments in France could consequently face greater risks. The same applies for new entrants in France and their possible investments in the United Kingdom. Indeed, after the proposed concentration, the combined entity would be capable of singling out entrants for concerted counter-action in either France, the United Kingdom or Ireland.

(193) Fourthly, the proposed transaction would give the combined entity increased potential for retaliation in its competitors' home markets. Before the transaction, at least BOC's ability to counter market entry in the United Kingdom or Ireland by retaliating in the entrant's home market, was limited by the fact that it lacked a suitable production and distribution infrastructure in many Continental European markets. After the transaction, the combined entity would have an increased capability of countering entry into the United Kingdom bulk and cylinder markets using Air Liquide's strong position and established infrastructure in continental Europe. For instance, the combined entity, unlike BOC previously, would be in a position to use its presence in Germany in order to deter the recent entrants, Linde and Messer, from pursuing aggressive competition in the United Kingdom.

The combination of dominant positions would enable the merged entity to use a secure captive home market as leverage against its competitors

(194) By combining dominant positions in an extended area, the combined entity would be in a unique position to compete for customers within that area. Because the area controlled by the combined entity would include two large markets (France and the United Kingdom), it is more likely that multinational customers would have businesses, and therefore industrial gases demand, in both markets. If, for example, a United Kingdom customer had demand for industrial gases at another of its plants in France, the combined entity would be able

to offer discounted rates, or make other types of concessions in the United Kingdom market in exchange for that customer's business in France. The combined entity would thus be in a position to use its position in the United Kingdom as leverage in order to strengthen its position in France, and vice versa. While such practices may not always be unlawful, the possibility of engaging in such conduct raises competition concerns where a supplier is dominant. By creating a situation in which the combined entity Air Liquide/BOC could compete on the basis of dominant positions in two countries, the proposed transaction would enable it to use a dominant position in one country in order to strengthen a dominant position in another.

(195) The combined entity would be well placed to use its strongholds in its home markets as a base to attack other markets, either its competitors' home markets or smaller geographic markets in which a number of industrial gases companies are competing. It would be able to increase its market shares in those markets by undercutting its competitors, because of its strengthened financial position resulting from profits generated on its strong home markets, namely the difficult-to-enter French, United Kingdom and Irish markets. At present, the two parties individually are more constrained from engaging in such conduct than they would be after the transaction. In theory, either BOC or Air Liquide could use its respective home markets as a base to compete in other countries. However, that possibility is currently limited by the moderating effect of potential competition by the other party (reciprocal moderation). For instance, BOC is currently constrained in using its control of the United Kingdom and Irish markets in order to extract higher prices from customers because it would face the risk of Air Liquide entering its home countries. Air Liquide is better placed than other competitors to enter the United Kingdom market. The proposed transaction would remove the existing constraints, and the combined entity would have more freedom in this respect.

(cc) **Elimination of actual and potential competition between Air Liquide and BOC**

By acquiring BOC's bulk and cylinder operations in continental Europe, Air Liquide would eliminate BOC as an actual and potential competitor in its home market

(196) Prior to the proposed concentration as notified, BOC had entered the bulk and cylinder markets for certain atmospheric gases in Belgium and the Netherlands, having established a tonnage plant at Terneuzen, which produced liquid oxygen, nitrogen and argon for the bulk market and a cylinder filling plant at Herenthout, capable of filling a wide range of industrial gases. Both facilities supplied customers in Belgium and the Netherlands using BOC-owned delivery vehicles. Both facilities also supplied BOC's cylinder gases business in Germany, based at Bopfingen. In Belgium, a country in which Air Liquide has a strong position, BOC evolved into a significant entrant for certain gases (bulk argon — […]; bulk carbon dioxide — less than […]*; cylinder oxygen — less than […]*; cylinder argon — […]*) until the operations were sold to Air Liquide late last year.

(197) The geographic reference market for certain high-value gases such as bulk argon and, possibly, cylinder argon, which can be transported over larger distances than standard air gases, appears not to be limited to Belgium but to cover an area comprising some parts of Northern France. The fact that Air Liquide imports liquid argon from France would support that view. The acquisition of BOC's Continental European operations therefore strengthens Air Liquide's dominant position in France not only by removing an actual competitor, but also by adding that competitor's market share to Air Liquide's own dominant position.

(198) Insofar as Belgium is a market distinct from France, namely for those gases that can be transported less economically over large distances, Air Liquide would strengthen its dominant position in France by eliminating potential competition in the French market and actual competition in an adjacent market. Firstly, BOC must be seen to be a potential competitor in France, having demonstrated that it can establish a bulk and cylinder gases business in continental Europe. Secondly, the elimination of BOC's position in continental Europe would relieve Air Liquide of the competitive pressure arising from BOC's presence in a market adjacent to its home base. Thirdly, by removing a competitor in the Belgium market and acquiring that competitor's additional market share, Air Liquide would become an even stronger player in Belgium, where it has already captured a large part of the market. Air Liquide would thus be able to counter other potential entrants into its home market more effectively in a neighbouring country from which entry into the French market could easily be attempted, for instance by supplying the industrial regions of Northern France.

(199) In its reply to the Commission's statement of objections the notifying party argues that BOC's operations in Belgium and the Netherlands were limited in scope and that their acquisition by Air Liquide did not therefore lead to any relevant change of the competitive

conditions on the French bulk and cylinder markets. However, upon examination of the business data for those operations, that argument must be rejected. BOC's tonnage business was secured by long-term contracts continuing until at least […]* and […]* respectively. BOC's bulk business has been benefiting from strong volume growth in liquid sales. Profitability has improved each year ([42]) and in the financial year 1998/1999 an operating profit was achieved. The business generates substantial cash flows. BOC's cylinder business has grown at healthy annual rates and has reduced its operating losses continuously over the past years ([43]). When comparing the financial data provided by BOC with data provided by competitors for market entries attempted under similar circumstances, the turnover and profitability evolution is in line with what is to be expected during the start-up period. It is therefore legitimate to argue that BOC's businesses in these markets were viable. BOC has stated that it planned to dispose of its Continental European businesses following a review of its global operations.

(200) The present transaction would strengthen Air Liquide's dominant position in France because it would eliminate BOC as an actual and potential competitor in France. It is this permanent and structural change in the market, and not a business decision by one competitor, that raises the competition concern.

The proposed concentration would eliminate Air Liquide as the most credible potential competitor in the United Kingdom and Ireland

(201) Air Liquide represents one of the strongest potential entrants in BOC's national home markets. Competitors have stressed that Air Liquide would have been best placed amongst all industrial gases companies to make inroads into the United Kingdom market ([44]). Once the parties have merged, this competitive pressure would be lost. This would be true irrespective of whether or not Air Liquide was already active in BOC's home market.

(202) In its reply to the statement of objections, the notifying party admits that a dominant supplier can be restrained in the exercise of its market power by potential competition from other undertakings which could realistically enter the market. The notifying party disputes that any potential entrant has had any such effect in the United Kingdom. However, individual customers have indicated a different view.

(203) Air Liquide argues that its qualification as a potential competitor is purely theoretical because it has never tried to penetrate the United Kingdom market and is less likely to do so now that others have entered the market. However, a project study submitted to the Commission shows that Air Liquide has contemplated supplying bulk and cylinder gases in the United Kingdom when consulted by a customer ([45]). Moreover, Air Liquide concedes that Messer has been able to overcome the entry barriers to the United Kingdom bulk and cylinder markets, without however offering reasons why Air Liquide should not realistically be able to enter the United Kingdom market itself. Indeed, Air Liquide has the most successful history in entering other European markets of all industrial gases companies. By stating at the oral hearing that its absence from the United Kingdom is a business decision, Air Liquide has acknowledged that no objective factors would have prevented it from entering the United Kingdom market.

(204) Finally, the notifying party stated at the oral hearing that, as a similarly large industrial gases company, Praxair should be considered an equally credible potential competitor in the United Kingdom. However, the notifying party has not explained why a company that has most of its operations on the American continent and a limited presence in Europe should be as credible an entrant as Air Liquide, the strongest industrial gases supplier in Europe.

The examples of Linde and Messer have shown that competitors based in continental Europe can enter the United Kingdom market

(205) Green-field market entry is possible in the cylinder and bulk markets and has been accomplished in the United Kingdom. In principle, a number of ways to enter a foreign market exist:

— exporting industrial gases to the target country,

— establishing an own production capacity in the target country, for instance by acquiring customers for large on-site production plants,

([42]) During the financial years 1994/1995 to 1998/1999 (tonnage and bulk business accounted for together).
([43]) During the financial years 1994/1995 to 1998/1999.
([44]) […]*.
([45]) Note for Air Liquide's Comité des Projets Europe of 28 January 1997 concerning a call for tender by an electronics company for bulk gases (nitrogen, oxygen and argon), cylinder gases (helium and hydrogen) and equipment in which Air Liquide participated.

— initially establishing a distribution infrastructure and sourcing industrial gases on the merchant market before setting up an own production capacity,

— acquiring a small local supplier and expanding the acquired supplier's distribution network and customer base.

(206) Market entry can be effected without importing the full range of industrial gases where such importation would not be not possible or economically viable. In this case, a market entrant will normally proceed as follows. Initially, the entrant will set up one or several cylinder depots and distribution points. Standard atmospheric gases will be purchased from, and filled into cylinders by local suppliers. High value gases, such as acetylene, gases mixtures, pure and speciality gases and liquid argon will be imported. Competitors have confirmed that such imports have taken place in order to sustain market entry in the United Kingdom. As a second step, once a certain number of customers have been acquired, the entrant will set up a facility to fill standard gases (oxygen, nitrogen, argon, argon mixtures and carbon dioxide) into cylinders. The liquid gases required will be purchased on the merchant market. High value gases will either continue to be imported or be purchased from local suppliers. On the basis of this extended distribution structure, the entrant will, as a third step construct an air separation unit of a limited size (for example 15 to 40 million m^3/year for oxygen/nitrogen) and additional transfill facilities in the target country. This will enable the entrant to acquire and supply bulk customers.

(207) Alternatively, an industrial gases company can enter a foreign market by acquiring a small local supplier, adding other products and expanding its infrastructure and customer base. Once this initial step has been taken, the entrant is in a position to establish or extend its own production and distribution capacity by proceeding as described in paragraph 206.

(208) The examples of Linde and Messer confirm that it is possible to enter the cylinder and bulk markets in the United Kingdom and acquire limited market shares. Linde entered the United Kingdom market in 1992, and has since gained market shares in the cylinder segment of less than 5 % of oxygen, 5 to 10 % for nitrogen, less than 5 % for acetylene, 5 to 10 % for argon and argon mixtures and 5 to 10 % for hydrogen. Messer entered the United Kingdom market by acquiring a small supplier of carbon dioxide and extending the acquired distribution infrastructure. The company subsequently built a stand-alone air separation plant at Eggsborough (initially jointly with AGA). In the cylinder gases segment, it has gained market shares of 5 to 10 % for nitrogen, less than 5 % for argon/argon mixtures and 35 to 40 % for carbon dioxide. In the bulk segment, Messer has market shares of less than 5 % for oxygen, less than 5 % for nitrogen and less than 5 % for argon.

Air Liquide, as the number one in Europe and the world, is the most credible potential entrant to the United Kingdom market

(209) In the markets for cylinder and bulk gases, the main barriers to entry consist of the capital investment and operating expenses involved in establishing and sustaining a production and distribution infrastructure, in the acquisition of a sufficient customer base to justify that expenditure, and in the financing of operative losses during a start-up period until the newly established business becomes profitable.

(210) Investment and operating costs vary depending on which method of market entry is chosen. If a new entrant chooses to bid for on-site tonnage contracts, with the intention of over-sizing the production facility and selling excess capacity to bulk or cylinder customers, a substantial up-front investment is required. In most cases, the cost incurred will be recovered over the duration of the contract, given that on-site supply contracts typically run for a period of 10 to 15 years. However, only a limited number of large industrial gases companies have the financial resources (and more generally, the project management capability) to launch such large projects. If the entrant chooses to first establish a cylinder distribution infrastructure and subsequently extend its business into the bulk market, the initial capital investment (establishment of a cylinder depot and a filling facility) will be in the range of EUR 2 to 3 million. However, the construction of an air separation unit and related further transfill centres will require a substantially higher investment, in the order of EUR 50 to 60 million. In addition, operating costs and transport costs for gases that have to be imported will be incurred on a continuous basis. In principle, similar costs will be incurred in the long term if an entrant acquires a small local supplier and tries to expand the acquired infrastructure.

(211) A newly established industrial gases business often takes a certain period of time to become profitable. The need to sustain operative losses during this start-up period constitutes an additional barrier to entry. If market entry occurs, incumbent suppliers may attempt to prevent the entrant from establishing a significant foothold in their home market by seeking to undercut the entrant's prices in the area in which the entry takes place. Competitors have provided examples of how BOC has pursued this strategy in order to deny them entry to the United Kingdom market. This means that the entrant will have to be able to finance an operative loss during a start-up period.

(212) Large industrial gases companies are therefore better able to enter a market already dominated by an incumbent than smaller suppliers. Large companies are more likely to have the financial strength, the logistical and technological resources and the strategic planning ability to make the necessary investments and sustain market entry against aggressive counter-action by a locally dominant incumbent. In the case of the United Kingdom, this assessment is borne out by the observation that two large competitors based abroad, Linde and Messer, have been more successful in gaining market share than small start-up entrants, even though the latter were operating from within the United Kingdom (for instance Energas and Medigas).

(213) Against this background, Air Liquide, as the leading industrial gas company in Europe, possesses specific strengths making it the foreign competitor most suited and most likely to enter the United Kingdom market.

(214) Air Liquide has a strong capability to establish a production and distribution infrastructure in foreign markets. This is demonstrated by the fact that Air Liquide has successfully established a production and distribution network for industrial gases in a range of European countries, comprising stand-alone production plants (bulk gases plants), dedicated plants (plants dedicated to one or several customers) with excess production capacity for the bulk market, small on-site production plants and cylinder filling facilities. Table 4 sets out Air Liquide's European production and distribution network in countries outside France. The following conclusions can be drawn:

— in markets remote from its home base (France) to which bulk deliveries are not economical, Air Liquide has established its own production capacity, either by constructing stand-alone plants or by building excess capacity into dedicated tonnage plants. Only in countries to which bulk deliveries could be carried out from French production sites (Belgium, the Netherlands, Luxembourg and, to a lesser degree, Germany) has a less important local production capability been put in place,

— in all of the countries in which a stand-alone production capacity was installed, Air Liquide has established cylinder filling facilities in line with the size of the market concerned (the only exception being Finland, where only dedicated plants exist). In the majority of countries, the cylinder filling network covers the full range of gases, including a number of facilities capable of filling high-value gases with a higher transportation radius (argon, argon mixtures, acetylene and other gases including speciality gases),

— in addition, Air Liquide has been able to make substantial inroads into foreign markets by offering and installing small on-site production facilities for standard gases (oxygen and nitrogen). It should be noted that customers in countries remote from Air Liquide's home base can be, and have been, supplied using this technology.

(215) Air Liquide is generally recognised by competitors and industry analysts as the leading supplier of industrial gases through dedicated on-site (tonnage) plants. Its strong Europe-wide position in the tonnage market increases Air Liquide's ability to enter foreign bulk and cylinder markets, unrivalled by any competitor. Air Liquide has previously pursued a policy of over-sizing such dedicated tonnage plants, with the aim of selling excess capacity on the bulk and cylinder markets. Indeed, this type of simultaneous gaseous and liquid production represented […]* of Air Liquide's total liquid oxygen and nitrogen production in the EEA in 1998.

(216) Air Liquide has considerable financial strength enabling it to sustain start-up losses. It is the industry leader in terms of turnover as well as capital expenditure. Air Liquide's history of entry into the cylinder and bulk markets in other European countries (Belgium, Denmark, Germany, Greece, Italy, Netherlands, Portugal, Spain and Sweden) confirms that the company is able to bear the financial burden of market entry. It has been able to do so, in particular, in those countries where local suppliers present strong competition (for instance in Germany, Italy and Sweden). Air Liquide is the only European competitor able to rely on a very strong position, amounting to dominance, in a home market for bulk and cylinder gases of considerable size (France).

(217) Air Liquide has leading technological expertise allowing it to enter foreign markets more effectively. There is consensus in the industry that technology, in particular application technology, is one of the main drivers of competition in the bulk and cylinder gases markets, given that the products are largely homogenous and new customers can be acquired by offering new or more economical application solutions, thereby reducing the customer's costs and increasing productivity. If market entry is attempted, the ability to offer new application solutions becomes even more important. Any entrant faces limits with respect to acquiring customers by offering low prices, since the entrant's production cost base will initially be less advantageous than that of an incumbent, and the incumbent may try

to match the prices offered by the entrant ([46]). Therefore, an entrant's ability to compete on applications technology is often vital in order to extend its customer base. It is generally accepted that Air Liquide possesses advanced technological expertise and enjoys a leading position with respect to application technologies ([47]).

(218) Furthermore, Air Liquide is a leading provider of specific technologies that can be offered to customers remote from the entrant's home base (for example small on-site production facilities for oxygen and nitrogen based on VPSA and membrane technology). Air Liquide has demonstrated how this technology can be marketed successfully, by placing approximately […]* small on-site contracts with customers in the Community outside France ([48]). Given that the quantities of gases supplied using small on-site facilities often correspond to a demand that would otherwise be fulfilled through bulk deliveries, the ability to offer this technology gives an entrant an additional advantage in acquiring bulk customers.

(219) The analysis of Air Liquide's specific competitive strengths confirms that Air Liquide is well placed to enter the United Kingdom cylinder and bulk markets. Furthermore Air Liquide is better placed than any other competitor to successfully sustain such market entry. While Linde and Messer have established a limited presence in the United Kingdom cylinder and bulk markets, their competitive strength, especially if weighed against BOC's market power, is much more limited than the competition Air Liquide could mount in the United Kingdom and Ireland. Indeed, neither of those two companies has, in the past, been able to establish itself in other European countries to the same extent as Air Liquide. Other competitors (Praxair, AGA), are significantly smaller in terms of size, overall market share and production as well as distribution infrastructure in Europe ([49]). Neither company is as well placed as Air Liquide to enter the United Kingdom and Irish markets. No other large industrial gases companies exist that could enter the United Kingdom and Irish markets. Air Liquide is therefore the only credible potential competitor.

(220) In conclusion, potential competition in the markets for cylinder and bulk gases in the United Kingdom and Ireland largely depends on Air Liquide's continuing presence as an independent competitor. Once the incumbent (BOC) and the strongest potential entrant (Air Liquide) were merged, this competitive pressure would be lost.

The absence of Air Liquide in the United Kingdom market to date has to be seen as a strategic decision, which could be reversed at any time

(221) There is consensus in the industry that an industrial gas company's decision to enter a foreign market is a strategic business decision. Any industrial gas company that wishes to grow in the long term cannot do so without expanding its geographic market coverage. This is best demonstrated by Air Liquide's history of expansion in Europe and worldwide, in particular in countries that are remote from its home base. Competitors have unanimously stressed that each industrial gas company, in pursuing its expansion strategy, will weigh the investments required and the risks involved. Given that Air Liquide would have been best placed to expand its operations into the United Kingdom and Ireland, it has to be concluded that the decision not to do so to date is one that could have been reversed. Indeed, Air Liquide has considered becoming active in the United Kingdom market in the past (see recital 203).

(222) It should be stressed that the Commission's objections are not directed against Air Liquide's business strategy to date which may have been to not (yet) launch substantial activities in the United Kingdom and Ireland. Rather, the specific competition concerns arising from the proposed concentration relate to the elimination of the most credible potential competitor in the markets concerned. Irrespective of whether the competitor concerned has previously been willing to launch effective competition, the proposed concentration would permanently remove the possibility of such competition taking place. The proposed concentration would thus permanently eliminate potential competition and thereby strengthen BOC's existing dominant position in the markets concerned. The likely result would be that the combined entity (Air Liquide/BOC) would be able to perpetually dominate the markets for cylinder and bulk gases in the United Kingdom and Ireland.

([46]) According to competitors who have entered the United Kingdom market, BOC has, in the past, indeed pursued the strategy of matching their prices by reciprocal price reductions.

([47]) Air Liquide has gained leading expertise in key, high technology application areas such as the electronics and chemical industries (NatWest Securities, 'Industrial Gases 2000', February 1997, pp. 45 and 73). […]* of Air Liquide's R & D expenditure are focused on improving the technologies associated with the application of industrial gases in the customers' industries. For example, applications in the field of […]* account for […]* of Air Liquide's R&D (figures provided by the notifying party).'

([48]) Figures provided by the notifying party, until end 1998.

([49]) AGA has sold its limited operations in the United Kingdom.

(d) ***Disincentives for Air Products to compete vigorously with Air Liquide/BOC in the bulk and cylinder markets in the United Kingdom, Ireland and France***

(223) This section concerns the structure of the planned joint takeover and division of BOC, as foreseen in the Agreement between Air Liquide and Air Products of 2 July 1999 (incorporating amendments made on 7 July 1999 (the Agreement)), in terms of the allocation of BOC's R & D facilities, intellectual property and know-how as well as the links created between Air Liquide and its main competitor in the United Kingdom and Ireland, Air Products, as a result of that allocation. The creation of significant ongoing links between Air Liquide and Air Products would be a major incentive for Air Products not to compete vigorously with Air Liquide/BOC. This would, in particular, have an impact on the market position of Air Liquide/BOC on the bulk and cylinder markets in the United Kingdom and Ireland. In the United Kingdom, apart from Air Products the only competitors of BOC in nearly all of those markets are Messer and Linde. The position of those two competitors is, however, insignificant in most United Kingdom bulk and cylinder markets. A reduced intensity of competition by Air Products, resulting from links with Air Liquide, would therefore further strengthen Air Liquide/BOC's dominant position. The same is true of the Irish markets where Air Products is BOC's only competitor.

(224) The links created by the planned transaction between Air Liquide and Air Products are, however, not only relevant for assessing the market power of Air Liquide in the bulk and cylinder markets following the proposed acquisition but are also relevant for the assessment of Air Liquide's market power in the tonnage market and the possibility of joint dominance by Air Liquide and Air Products in the markets for helium and electronic speciality gases.

(aa) **Technology of BOC**

(225) BOC is one of the major producers of industrial gases in the world and has developed significant technical knowledge, in particular, in the field of application technology for electronics, glass, environmental, food, cryogenics, chemical and petroleum, metals, pulp and paper and medical industries, which is developed close to and often together with the customer. Research and development in the field of application technology includes resolving technological problems relating to the customers' production costs, product quality, operational productivity and environmental performance.

(226) The position of BOC has been relatively strong in the supply of smaller non-cryogenic nitrogen and oxygen generators, and the company has subsequently focused its research and development efforts more and more on the production of large on-site cryogenic plants. The supply of industrial gases using large on-site facilities is highly capital intensive, and an advanced process technology can offer the supplier a competitive advantage in terms of the required power consumption and capital cost of the plant. Industry analysts estimate ([50]) that due to advanced process technology cryogenic air separation costs (per unit output) have fallen in excess of 25 % and non-cryogenic technology eliminating delivery costs for medium volume gas consumers has resulted in an overall cost reduction of 28 to 50 % over the past 20 years. The research and development of on-site plants carried out by BOC has concentrated on reducing the plants' consumption of electricity and improving and simplifying the systems for cooling, liquefying and separating the air in the production process. BOC has also developed advanced technology relating to the production of high purity gases and systems for the electronics industry, including the introduction of several ultra-high purity grades of gases, new dry pumps, exhaust management systems and temperature systems introduced for semiconductor applications.

(227) BOC employs more than […]* researchers in […]* main research centres a number of smaller research centres, covering process systems as well as key industries such as the electronics industry (BOC Edwards). BOC has a large number of ongoing R & D cooperation agreements with third parties worldwide, in particular in the field of electronics, food and the environment. Most of BOC's research and development work relating to industrial gases is undertaken in the United States, and some in the North Pacific, Australia and South Africa. The technical centre at Murray Hill in the United States is the primary gases technology facility supporting the gases businesses. To some extent, development work is also conducted at customer sites. Research and development work by BOC Edwards focusing on the semiconductor industry is conducted in the United Kingdom.

(228) The Commission's investigation has confirmed that BOC possesses a wide range of patents, trademarks and know-how relating to both process and application technologies.

(bb) **Allocation of BOC's intellectual property and know-how between Air Liquide and Air Products**

(229) The effect of the planned joint takeover and division of BOC would be that the intellectual property (IP) of BOC

([50]) NatWest Securities, 'Industrial Gases 2000', February 1997, p. 57.

would be shared by Air Liquide and Air Products on equal terms. IP refers in this context to patents, patent applications, technology, know-how (including operational know-how), trade secrets, copyrights, software, trademarks, trade names and other intellectual property owned by BOC or its affiliates.

(230) The Agreement sets out the procedure according to which the assets, business and IP of BOC are to be allocated between Air Liquide and Air Products (together the 'Parties'). […]*

(231) […]*.

(232) […]*.

(233) […]*.

(cc) **Links between Air Liquide and Air Products**

(234) The planned transaction, as provided for the Agreement, presents some specific characteristics in so far as it involves two competitors making a joint bid to acquire parts of a further competitor. From a competition point of view, the structure of the present joint bid is problematic as it is evident that, in order to be able to bid for, and subsequently split up BOC, both Air Liquide and Air Products may have to acquire extensive knowledge of BOC's activities and have extensive contact with each other. This may endanger the confidentiality of information relating to each other's operations, and thus effective competition between the companies.

(235) […]*.

(236) […]*.

(237) […]*.

(238) […]*.

(239) […]*.

(240) […]*.

(241) […]*.

(242) […]*.

(dd) **Conclusion on the links created by the proposed transaction**

(243) […]*.

(e) ***Conclusion on the bulk and cylinder markets***

(244) The Commission therefore concludes that the notified operation and the transactions considered together with the notified operation would strengthen Air Liquide's dominant position in the bulk markets for oxygen, nitrogen and argon and in the cylinder markets for oxygen, nitrogen, argon/argon mixtures, acetylene, carbon dioxide and hydrogen in France, as a result of which effective competition would be significantly impeded in the common market or in a substantial part of it.

(245) The notified operation would also strengthen BOC's dominant position in the bulk markets for oxygen, nitrogen and argon in the United Kingdom, the cylinder markets for oxygen, nitrogen, argon/argon mixtures, acetylene, carbon dioxide and hydrogen in the United Kingdom, the bulk markets for oxygen, nitrogen, argon, carbon dioxide and hydrogen in Ireland, and the cylinder markets for oxygen, nitrogen, argon/argon mixtures, acetylene, carbon dioxide and hydrogen in Ireland, as a result of which effective competition would be significantly impeded in the common market or in a substantial part of it.

3. FUTURE DEVELOPMENT AND POTENTIAL COMPETITION

The proposed operation would increase the barriers to entry to the tonnage markets in the EEA and the bulk and cylinder markets in France, the United Kingdom and Ireland

(246) The tonnage markets in the EEA, as well as the bulk and cylinder markets in France, the United Kingdom and Ireland, are already characterised by high entry barriers due to the high investments and the expertise required. Cryogenic gas production plants and more recently non-cryogenic on-site equipment are capital intensive. According to the notifying Party, capital intensity usually ranges from […]* to […]* for an industrial gases business based on air separation plants. For both the tonnage markets in the EEA and the bulk and cylinder markets in France, the United Kingdom and Ireland, the currently high degree of concentration is an additional barrier to market entry.

(247) There have been no significant market entries into the tonnage markets in the EEA and into the bulk and cylinder markets in France, the United Kingdom and Ireland in the last five years. As a result of the operation, the level of concentration in the tonnage markets in the EEA would be further increased by a considerable degree. The combined market position of Air Liquide and BOC and their specific strengths would make it even more difficult for newcomers to enter the EEA tonnage markets in the future. As regards the bulk and cylinder markets, the proposed concentration would lead to the elimination of the most credible potential competitor in the markets in the United Kingdom and Ireland, thus strengthening BOC's already dominant position in the markets concerned. The proposed concentration would also further strengthen Air Liquide's existing dominant position in the bulk and cylinder markets in France.

(248) Therefore, it cannot be anticipated that Air Liquide/BOC's room for manoeuvre would be restricted by potential competition either in the tonnage markets in the EEA or in the bulk and cylinder markets in France, the United Kingdom and Ireland. By combining existing dominant positions in the bulk and cylinder markets, the notified operation raises the concern that an extended area would be perpetually dominated by one single entity.

4. HELIUM

(a) ***Market structure***

Access to refined helium is limited to four industrial gases companies which also act as wholesalers

(249) Helium-rich natural gases ([51]) are the only source from which helium can be extracted economically. The number of helium-rich natural gas deposits is limited. Known reserves are located in the United States (Kansas, Oklahoma, Texas and Wyoming), Algeria (Bethouia), Poland (Odolanov) and western Russia (Orenburg). Only a small number of facilities exist for the extraction of crude helium and production of pure helium (refining).

(250) In Algeria, Air Liquide and Air Products, through their jointly-owned subsidiary Helap SA, have a production joint venture (Helios) with Sonatrach, a company owned by the Algerian state. The helium refining capacity of Helios amounts to up to […]* mmcf/yr. The entire production of refined helium is committed to Air Liquide and Air Products under a long-term contract (total production in 1998 — approximately […]* mmcf; to Air Liquide — approximately […]* mmcf; to Air Products — approximately […]* mmcf).

([51]) Defined as those containing at least 0,3 % helium.

(251) In Russia, approximately […]* mmcf of the helium refining capacity at Orenburg is committed to BOC and Messer […]* (total capacity approximately […]* mmcf/yr). The helium refining capacity in Poland is entirely committed to BOC (approximately […]* mmcf/yr). Air Liquide would acquire BOC's rights under these contracts.

(252) In the United States, the following companies extract crude helium from natural gas but do not have a captive refining capability: Coastal Field Services, Amoco, Crescendo Resources, Duke Energy, Enron Corp., KN Energy Inc., Mobil, Phillips Gas Corporation, Pioneer Natural Resources Co., Williams Field Services. The Commission's inquiries have shown that those companies, with one minor exception, have committed their crude helium to BOC, Air Products and Praxair under long-term supply contracts. BOC, Air Products and Praxair refine this crude helium. The crude helium production capacity committed amounted to approximately 3 220 mmcf in 1998, and the amounts supplied, to approximately 2 400 mmcf. Approximately 65 % of the United States crude helium production capacity (4 800 mmcf) were thus committed to BOC, Air Products and Praxair.

(253) BOC, Air Products and Praxair are the only industrial gases companies to have a captive helium refining capacity in the United States. BOC owns and operates the world's third largest refining plant at Otis, Kansas (estimated capacity […]* mmcf/yr), which would be acquired by Air Liquide. Air Products refines helium at Liberal, Kansas and Sherman, Texas (estimated capacity < 1 000 mmcf in 1998, upgrade to 1 500 mmcf expected in 2000). Praxair has plants at Bushton, Kansas and Ulysses, Kansas (estimated capacity 1 500 mmcf/yr) ([52]). Those companies together have a total refining capacity of […]* mmcf/yr.

(254) The remainder of the United States crude helium is extracted and refined by the following companies: CIG Resources, Exxon, Keyes Helium Company, Nitrotec Energy Corporation, Union Pacific Resources Inc. and Unocal Corporation. In 1998, the crude helium capacity of those companies was up to 1 580 mmcf, and their refining capacity up to 1 640 mmcf, with Exxon accounting for the largest part (up to 1 200 mmcf/yr) ([53]). The Commission's inquiries have shown that almost all of those companies, in particular Exxon, have committed their refined helium to Air Liquide, BOC, Air Products and Praxair on the basis of long-term supply contracts (with the exception of two companies whose refining capacity does not exceed 165 mmcf). Approximately 1310 mmcf of refined helium were supplied under those contracts in 1998. Air Liquide, BOC, Air Products and Praxair distribute and market this refined helium.

([52]) *Source:* Chemical Economics Handbook, Helium Data Summary, 1998.

([53]) *Source:* Chemical Economics Handbook, Helium Data Summary, 1998.

(255) The Commission concludes that only four industrial gases companies, namely Air Liquide, BOC, Air Products and Praxair, refine helium or participate in the refining of helium. In addition, practically all the helium refined by other companies is committed to the same four industrial gases companies under long-term contracts. Air Liquide, BOC, Air Products and Praxair control access to almost the entire production of refined helium. Those companies provide helium at the wholesale level to retailers, including all other industrial gases companies, using their own distribution infrastructure.

Air Liquide/BOC and Air Products would control most helium sources located close to Europe and most of the European refining capacity

(256) As indicated above, Air Liquide and Air Products jointly control the supply of helium from Algeria. According to the notifying Party, […]* of Algerian helium is shipped to the EEA. The Commission estimates that Air Liquide's/Air Products' Algerian joint venture supplies approximately […]* of the helium consumed in the EEA. By acquiring BOC's helium operations, Air Liquide would gain control over the helium supply from Poland and […]* of the helium supply from Russia ([…]*). BOC, from its sources in Poland and Russia, supplies approximately 15 to 20 % of the EEA consumption. After the transaction, two companies (Air Liquide and Air Products) would control the access to almost all helium sources located close to Europe. The two companies would control, in approximately equal parts, almost […]* of the refining capacity located near Europe.

(257) The fact that all helium wholesalers seek to gain access to the helium sources near Europe illustrates their significance for supplying the EEA. Even companies with a large captive production capacity in the United States (Air Products, Praxair, BOC) import only those quantities from the United States which they cannot source locally. For instance, […]* purchases helium produced in Algeria from Air Liquide.

Air Liquide/BOC and Air Products would have high combined market shares

(258) Helium is sold at the wholesale level to distributors (including most other industrial gases companies). The Commission's estimate of the market shares in the wholesale market are set out in table 10 ([54]).

Table 10

Market shares in the wholesale market for helium

	Air Liquide	BOC	Air Products	Praxair	Messer	Linde	Others
EEA	[…]*	[…]*	25-30 %	15-20 %	< 5 %	—	—
World	[…]*	[…]*	15-20 %	25-30 %	< 1 %	—	—

(259) At the wholesale level, Air Liquide/BOC and Air Products would have a combined market share of […]* for the supply of helium to the EEA and […]* worldwide.

(260) Air Liquide has stated that it is not a helium wholesaler. However, this statement contradicts the information provided by Air Liquide during the procedure. According to that information, Air Liquide had sales to wholesale customers in the EEA of […]* mmcf in 1998 ([…]* mmcf excluding a back-to-back agreement) and of […]* mmcf worldwide. Even if the quantities supplied under the back-to-back agreement are excluded, Air Liquide's wholesale market share still amounted to […]* in the EEA in 1998. Air Liquide/BOC's and Air Product's combined market share would still be […]*.

(261) The proposed concentration would leave Praxair as the only remaining competitor at the wholesale level. The Commission considers that, in the absence of BOC as a further competitor, Praxair would have little incentive to challenge Air Liquide and Air Products. For the supply to the EEA, […]* sources Algerian helium from Air Liquide under a back-to-back agreement and, therefore, at a similar or higher cost. That arrangement does not favour vigorous competition. It is unlikely that Praxair would use helium from its captive United States production in order to compete with Air Liquide or Air Products on price, due to higher investment costs (if own containers are used) and transport costs. At the world level, it is fair to consider that Praxair also has few incentives to present vigorous competition. Praxair, like the other helium wholesalers, benefits from the flexibility of its captive helium production in the United States. Its refining plants are linked to a pipeline and storage system operated by the United States Government's Bureau of Land Management (BLM). This system offers the possibility of storing excess crude

([54]) Figures for 1998 on the basis of volumes.

helium and cutting back the production of refined helium. Thus, Praxair would not be prevented from adapting its production and distribution of refined helium to reductions in demand and price rises. Messer is active as a wholesaler only to a very limited degree. All other competitors are only retailers and depend entirely on the other industrial gases companies for their supply of helium.

(262) Air Liquide has further stated that those market shares are not a relevant indication of the competitive conditions in the helium business because it considers 'independent refiners' of helium to be more important wholesalers. However, the Commission does not consider it to be correct to qualify the companies which have a refining business but no distribution capability (see recital 254) as wholesalers. These companies supply wholesalers under long-term contracts but do not themselves act as wholesalers. The question whether such refiners are likely to enter the helium wholesale business would also have to be answered in the negative. As the notifying Party rightly states, those companies produce helium only as a by-product of their natural gas business. They are not involved in the industrial gases business, and have no distribution capability and no existing customer relations. In order to build up a container fleet comparable to that of Air Liquide, such a company would have to make an investment of EUR 45 to 50 million (for […]* transport containers). Indeed, even large producers of refined helium, such as Exxon, have not, in the past, acted as wholesale distributors of helium.

The proposed concentration would reduce the number of vertically integrated helium suppliers with a full distribution infrastructure to three

(263) After the planned transaction, only three companies (Air Liquide/BOC, Air Products and Praxair) would have in-house production of helium and be fully vertically integrated. Moreover, only those three companies would have an extensive helium distribution infrastructure in Europe and worldwide. Within Europe, Air Liquide/BOC and Air Products would also have the largest number of transport containers (both above […]*) and transfill centres (above […]*). According to the Commission's inquiries, Messer and Linde have a smaller but still significant distribution infrastructure. The other industrial gases companies fall behind. Worldwide, Air Liquide/BOC would have a fleet of more than […]* large cryogenic transport containers (11 000 gallons or larger). According to the Commission's inquiries, only Air Products would have a similar worldwide distribution capacity. Praxair has a significant but smaller number of transport containers worldwide. Messer's distribution capacity is insignificant in comparison.

Conclusion on the market structure

(264) The Commission considers the control of access to refined helium to be indicative of Air Liquide/BOC's and Air Product's market power. The Commission estimates that Air Liquide/BOC and Air Products together control the access to approximately […]* of the helium refining capacity worldwide. They would control the access to all helium sources near Europe. Their high combined market shares confirm their strong position.

(b) ***Position of other industrial gases companies***

The position of other industrial gases companies is weak because they depend on Air Liquide/BOC and Air Products for the supply of helium

(265) None of the other industrial gases companies in Europe or worldwide have a captive helium production capability or contractual access to refined helium ([55]). They depend entirely on the supply of refined helium by the four large companies. In Europe, competitors depend largely on Air Liquide/BOC and Air Products which together control […]* of helium imports to the EEA. This situation creates the risk that other industrial gases companies could be prevented from competing in the helium retail market. Indeed, most companies contacted by the Commission have raised this concern.

(266) The potential threat of market foreclosure must be seen as a serious obstacle to competition. Industrial gases companies have stressed that helium is a strategic product that each supplier must offer in its portfolio. This is true irrespective of whether the gas supplier is large or relatively minor in terms of size. Indeed, even smaller, regionally active gas suppliers purchase helium for resale.

The high investment in the necessary production and distribution facilities further reduces the likelihood of a competitive challenge

(267) The investment necessary to establish helium extraction and refining capability is considerable. A crude helium extraction plant is normally linked to natural gas processing. Competitors have estimated the cost of such

([55]) The only exception is Messer's rights in the Orenburg source.

a plant to be EUR 50 to 100 million (on a stand-alone basis). The investment in a refining plant can be up to EUR […]* million for a large plant ([…]*) and can be estimated to be EUR 10 to 30 million for a medium-sized facility (up to 350 mmcf/yr). Moreover, substantial investments are required to establish a helium storage, transport and distribution infrastructure. Standard 30 000 gallons (3 mmcf) storage tanks, as installed at most liquefaction facilities, cost up to EUR 0,9 million (purchase and installation). Standard 11 000 gallon transport containers cost up to EUR 0,75 million. In order to create a container fleet comparable in size to that of the three leading helium suppliers (Air Liquide/BOC, Air Products and Praxair), any competitor would have to purchase at least […]* (additional) containers. The cost of a helium transfill centre (used to transfer helium from large containers into smaller ones used for retailing) has been estimated at EUR 1 to 1,5 million. Any competitor would have to build new transfill centres.

(268) Irrespective of whether a competitor can afford to make those substantial investments, it is unlikely that it will gain access to sufficient quantities of helium in order to justify the necessary expenditure. Crude helium is typically committed to the four large companies under long-term and exclusive contracts. It is highly unlikely that any newcomer would be able to displace one of the four incumbents. The companies that already have extensive distribution infrastructures in place (Air Liquide/BOC, Air Products and to a lesser degree Praxair) would remain the most likely purchasers of refined helium from independent producers. Even if an independent helium refiner, for instance Exxon, decided to commit part of its refined helium production to a newcomer, the quantities concerned would be limited. It is unlikely that the purchase of such limited quantities alone, without in-house production of sufficient quantities, would allow a newcomer to constrain the joint market power of Air Liquide/BOC and Air Products.

Air Products controls the only supplier of cryogenic helium transport containers

(269) The only producer and supplier of large (11 000 gallon) cryogenic transport containers for helium is Gardner Cryogenics, a United States-based subsidiary of Air Products. Cryogenic containers manufactured by this company keep liquid helium at the necessary low temperature to allow long-distance transport. They are the only containers used for the overseas transport of helium. The Commission assumes that no other company can currently produce such containers. Large industrial gases companies (including Air Liquide) have confirmed that they do not have the manufacturing capability to produce such tanks.

(c) ***Creation of a joint dominant position***

Significant links exist between Air Liquide/BOC and Air Products

(270) […]*.

(271) […]*.

(272) […]*.

The proposed concentration would remove an important competitor

(273) BOC has considerable helium wholesales in the EEA ([…]* market share) and worldwide ([…]* market share). In terms of revenue, BOC is the second largest helium supplier worldwide ([56]). It controls approximately […]* of the European and […]* of the world's refining capacity and has one of the most extensive distribution infrastructures in terms of transport containers and transfill centres.

(274) BOC currently supplies approximately […]* of the EEA helium demand from its sources in Poland and Russia. The notified operation would eliminate the competitive pressure that results from BOC's independent access to refining capacity in Poland and Russia. The fact that BOC also has a production capacity in the United States at its Otis, Kansas plant means that BOC's competitive potential as a helium wholesaler does not depend entirely on its continued access to the Polish and Russian sources. The removal of BOC as an independent competitor would therefore significantly reduce the competitive constraints on Air Liquide and Air Products.

After the proposed concentration, Air Liquide/BOC and Air Products would have similar cost structures

(275) Crude helium is extracted from natural gas using cryogenic extraction processes. Pressure-swing adsorption is mainly used for the purification (refining) of the crude helium. The pure helium is subsequently liquefied, filled into large cryogenic containers (11 000 to 30 000 gallons) and either stored for a limited period of time or shipped immediately.

([56]) *Source:* Competitor's estimates.

(276) Insofar as Air Liquide and Air Products source helium in Algeria, both companies have identical cost structures. In the United States, Air Liquide/BOC would operate BOC's Otis, Kansas helium refining plant (capacity up to […]* mmcf/yr). Air Products operates refining plants at Liberal, Kansas and Sherman, Texas (total capacity currently less than 1 000 mmcf/yr) ([57]). These facilities have a similar capacity and are supplied with natural gas from a cluster of fields located in Kansas, Oklahoma and Texas. The Commission considers that Air Liquide/BOC and Air Products have similar production costs ([58]).

(277) Distribution costs are also similar. Cryogenic transport containers are produced by only one company worldwide (Gardner Cryogenics) and are provided to all gases companies at the same cost. The costs of transfill centres are also similar. On the basis of the data provided by the companies concerned, Air Liquide/BOC and Air Products would have similarly extensive transfill and container networks worldwide and in Europe.

Helium is a homogenous product that is offered in a highly transparent market

(278) Refined helium is a homogenous product which is produced in accordance with an international quality standard (grade A helium of 99,995 % or higher purity). Industrial gases companies view helium as a commodity-type product that is traded amongst themselves and with other retailers. They purchase helium from each other and are therefore well informed about prices.

(279) A number of factors ensure that the market is highly transparent. The number of vertically integrated helium wholesalers is small (only three after the transaction). Air Liquide/BOC and Air Products mainly source helium at the same or similar sites and under similar conditions. Production technology is not evolving rapidly as installed plants may be upgraded, but are not frequently replaced. Distribution equipment is standardised and largely identical. The transparency of the production process is illustrated by the internal study of an industrial gases company reviewed by the Commission ([59]). In that study, the industrial gases company concerned analyses precisely the cost position of each of its competitors at each of their sources, whether those sources are captive production or third Party supply.

Wholesale customers have limited countervailing purchasing power

(280) The customers in the wholesale market, that is to say retailers, in general other industrial gases companies, usually have a limited ability to counterbalance Air Liquide/BOC's and Air Products' joint supplier power. They rely on helium as a key product for their own retail offering. The fact that they compete with Air Liquide/BOC and Air Products in retail markets for industrial gases aggravates this constraint. Other industrial gases companies face not only the possibility of market foreclosure but also disadvantages in other markets. It should also be noted that many customers are smaller regional retailers. Even larger companies have voiced concern.

(d) ***Conclusion***

(281) The Commission concludes that the notified operation would create a joint dominant position in the market for the wholesale supply of helium to the EEA. The Commission considers that the same conclusion would have to be drawn should the wholesale market be qualified as worldwide.

5. ELECTRONIC SPECIALITY GASES

(a) ***Current market structure***

The European market for electronic speciality gases is already highly concentrated with Air Liquide, Air Products and BOC as the leading suppliers

(282) Electronic speciality gases are essentially produced by chemical companies in the United States and in Asia. Industrial gases companies produce these gases only to a limited extent, in particular where they also have chemical activities, for instance Air Products. However, the chemical companies do not distribute the gases to the end users, which are mainly semiconductor manufacturers. The distribution is carried out by the industrial gases companies. By contrast, chemical companies are not considered to be equivalent suppliers

([57]) *Source:* Chemical Economics Handbook, Helium Data Summary, 1998.

([58]) This is confirmed by a BOC analysis 'Global Helium Strategy', 29 August 1997 (provided to the Federal Trade Commission as part of the HSR filing).

([59]) See footnote 58.

because they not normally have the know-how and facilities for transfilling and analysing electronic speciality gases including the treatment of cylinders.

(283) At the oral hearing, the notifying Party argued that industrial gases companies are merely distributors of electronic speciality gases without real market power. However, industrial gases companies which distribute electronic speciality gases, such as Air Products, Praxair, Air Liquide and BOC, provide key services and goods which cannot be supplied by the gases' producers. Their role is essential and goes beyond that of mere distributors. Firstly, the purification, mixing and filling of electronic speciality gases, according to detailed customer specifications, are highly specialised processes that are performed in 'transfill centres' operated by the industrial gases companies. Each individual gas specification undergoes a certification process that can last up to two years. The producers of electronic speciality gases, such as chemical companies, do not have such 'transfill' capabilities. Secondly, electronic speciality gases are transported and delivered in specialised containers which are also offered only by gases companies. Thirdly, semiconductor manufacturers also require high purity atmospheric gases and helium, for instance as plasma gases or for oxidation and reduction processes. They increasingly source those gases together with electronic speciality gases. Fourthly, industrial gases companies often design, install and certify equipment (gas systems), such as piping, gas cabinets (for the handling of toxic gases) and so forth. Air Liquide's and BOC's offerings cover a range of such products.

(284) On the basis of the figures collected in the Commission's investigation, the value of the market for electronic speciality gases in the EEA was approximately EUR 80 million in 1998. The partition of market shares in terms of value was as follows:

Air Liquide	between […]* % and […]* %
Air Products	between 20 % and 30 %
BOC	between […]* % and […]* %
Praxair	between 10 % and 20 %
Messer	less than 10 %
Linde	less than 10 %
AGA	less than 10 %.

(285) The three leading suppliers Air Liquide, Air Products and BOC accounted together for more than […]* of the market. There was a clear gap between BOC as the third largest supplier and Praxair as the fourth. The other remaining suppliers played only a minor role.

Their global presence and technological competence confer a strong competitive advantage on the leading suppliers

(286) Air Liquide, Air Products, BOC and Praxair are the global players in the market for electronic speciality gases. Unlike the other competitors, each of these companies operates production sites (transfill centres) in the EEA, the United States and the Far East. However, the global presence of Air Liquide, Air Products and BOC is more important than that of Praxair.

(287) It is estimated that in terms of total gas sales for the electronic sector (also including, for example, bulk air gases) Air Products' global market share is between 22 and 25 %, Air Liquide's share, between […]* and […]*, and BOC's share, between […]* and […]* whilst Praxair's share is only between 7 and 9 % ([60]). The strong global presence of the three leading suppliers gives them a significant competitive advantage on the European market. Although, according to the notifying Party, the actual purchase orders for electronic speciality gases are decided, managed and issued by the local site of the customer taking into consideration specific local factors, account should be taken of the fact that the large semiconductor manufacturers operate on a global basis. Where a supplier of electronic speciality gases has a strong worldwide presence, it can offer global consistency in the quality of the gases supplied to the semiconductor manufacturers worldwide.

(288) Air Liquide, Air Products and BOC are also considered to be the leading competitors with respect to technology for electronic speciality gases. Air Liquide and Air Products are, furthermore, leading in providing so called 'Total Gas and Chemicals Management (TGCM) services' which include safety environment management, on-site maintenance, quality monitoring, control and supervision, electronic speciality gases cylinder changes, point of use analysis and inventory management. Air Liquide has approximately […]* TGCM' service centres worldwide and the Air Products Megasys teams manage […]* facilities for […]* different customers in […]* countries.

(289) More generally, it can be concluded that Air Products and Air Liquide and, to a significant extent, BOC, focus on the electronics sector. Air Products achieves 17 % of its total sales in this sector and Air Liquide, […]* BOC achieves […]* of its sales in electronics whilst this sector accounts for only 5 % of Praxair's sales.

([60]) These market share figures concerning the electronic speciality gases are presented in a number of articles published in specialised periodicals concerning the gas and chemical industry.

(b) ***Situation after the concentration***

Two competitors, Air Liquide and Air Products, would account for more than […]* of the market

(290) Since the European activities of BOC would be taken over by Air Liquide, Air Liquide would become the clear market leader for electronic speciality gases in the EEA, with a market share of between […]* and […]*. Air Liquide and Air Products would together have a market share of more than […]*. The remaining market would be fragmented.

(291) On a global basis, Air Liquide and Air Products would probably be on a more or less equal footing, […]*.

In addition to the narrow market structure, the pooling of technology resulting from the concentration would be a further disincentive for competition between Air Liquide and Air Products

(292) It is true that there are some 30 different electronic speciality gases used in the production process of semiconductor components. However, the different gases themselves are homogenous products. To the extent that the industrial gases companies do not produce the gases themselves, they purchase them from the same chemical companies. Therefore, and because of the very limited number of competitors, the market is also transparent. In those circumstances, a market structure where two suppliers have a combined market share of […]** is already a strong incentive for parallel behaviour.

(293) In addition to the very narrow market structure, the planned joint takeover and division of BOC would create significant links between Air Liquide and Air Products. In particular the pooling of BOC's technology could lead to permanent cooperation, which would be a further disincentive for competition between the two companies. In these circumstances, it has to be anticipated that there would be no effective competition between Air Liquide and Air Products in the market for electronic speciality gases after the proposed concentration.

Conclusion on the market position of Air Liquide/BOC and Air Products

(294) Given their high combined market share, their global presence and their leadership in technology, it must be concluded that Air Liquide/BOC and Air Products would together be able to act to a significant extent independently of their competitors and their customers.

It is unlikely that new competitors would enter the market

(295) There are considerable barriers to entry to the market for electronic speciality gases. A supplier of gases must meet the specific requirements of the semiconductor industry resulting from the complex production process for computer chips and the characteristics of the gases. Suppliers must guarantee a particularly high degree of purity, which requires, *inter alia*, the handling of equipment under clean room conditions. They must be able to offer the full range of products. Furthermore, it should be noted that a number of electronic speciality gases are highly poisonous. The transfilling, storage and transport of these gases therefore requires specific safety procedures. For those reasons, a supplier of electronic speciality gases needs experience in handling those gases as well as specific know-how and technology.

V. COMMITMENTS SUBMITTED BY THE NOTIFYING PARTY AND MODIFICATIONS TO THE OPERATION

(296) On 21 December 1999 the notifying Party submitted commitments in order to remove the competition concerns identified by the Commission. In summary, the commitments comprise the following elements:

(a) divestiture of tonnage assets and businesses including on-site plant facilities, pipelines, all related tonnage customer contracts and the operating, maintenance and support personnel related to such facilities. The following tonnage plants will be divested: Runcorn, Sheerness, Cardiff, Brinsworth, Fawley (all United Kingdom), Pardies, Tarnos (both France), Mons (Belgium) and Terneuzen (Netherlands). The total tonnage divestitures (United Kingdom and continental Europe) represent annual sales of approximately […]* tpd and EUR […]* million of oxygen and nitrogen;

(b) divestiture of bulk facilities and businesses associated with certain of the tonnage facilities (Brinsworth, Fawley, Pardies, Mons and Terneuzen). The assets and businesses to be divested include the bulk production and storage facilities, the associated bulk distribution equipment (road tankers), the bulk tanks located on the customers' premises as well as the personnel for sales, technical support, distribution and customer service, in addition to the customer bulk contracts. The United Kingdom bulk divestitures represent a total of approximately […]* tpd of liquid oxygen, nitrogen and argon sold and total annual sales of liquid oxygen, nitrogen and argon of approximately EUR […]* million. The Continental bulk divestitures represent approximately […]* tpd of liquid oxygen and

nitrogen sold and total annual sales of liquid oxygen, nitrogen and argon of approximately EUR […]* million and together with the bulk business of Carboxique (a 100 % subsidiary of Air Liquide) of approximately EUR […]* million;

(c) divestiture of cylinder assets and businesses including certain cylinder fill plant facilities, associated cylinders, distribution equipment (trucks) as well as production and distribution personnel, in addition to contracts with customers. In particular, the following cylinder fill plants will be divested: Brinsworth, Bristol (including an acetylene production plant) and Ipswich (all United Kingdom), Bobigny and Hauconcourt (both France). Cylinder divestitures in the United Kingdom represent sales of approximately EUR […]** million. Cylinder divestitures in France represent sales of approximately EUR […]** million, coming from the divestiture of cylinder gases business of Carboxique;

(d) divestiture of the contracts for liquid helium supply that BOC currently has in Russia and Poland, together with appropriate distribution infrastructure (transport containers). The total divested contracts represent approximately […]* mmcf per year. For liquid helium that Air Liquide/BOC purchase in the United States access will be granted to other industrial gases companies (including existing BOC wholesale customers) under resale agreements which in all material conditions, including price and duration, are identical to the purchasing agreements to which Air Liquide/BOC are Parties (back-to-back agreements). The back-to-back agreements will be up to a total amount of […]* mmcf per year. For the helium sourced from Algeria, Air Liquide will appoint an independent third Party to manage Air Liquide's 50 % holding in the joint venture with Air Products, in order to ensure that there are no ongoing links with Air Products. Air Products has undertaken to use its rights in the joint venture to formalise Air Liquide's compliance with this commitment;

(e) divestiture of the transfill facility for electronic speciality gases owned and operated by Air Liquide in France together with a licence of the technology necessary to operate the transfill plant, all relevant customer information and current purchase orders. Air Liquide undertakes to ensure, within the scope of its existing sourcing agreements, continuity of sourcing electronic speciality gases from existing manufacturers to that transfill facility for a period of two years following the divestment;

(f) licensing of all of BOC's patented technology (process and applications technology) to third Parties who request such licensed rights under reasonable and non-discriminatory conditions.

(297) The divestiture of tonnage oxygen and nitrogen businesses will reduce Air Liquide/BOC's market share in the EEA to approximately […]*. The divestiture accounts for approximately […]* of the market share that Air Liquide would otherwise have acquired. The business to be divested in the United Kingdom comprises five tonnage plants, two with associated bulk businesses. The business to be divested in France, Belgium and the Netherlands comprises four tonnage plants, three with associated bulk businesses. The divestments will limit the market power accruing to Air Liquide. Given that substantial pipelines will be divested together with one of the plants, the combined entity's position as a pipeline operator will be less strong than before the transaction. Air Liquide will acquire a less strong regional position in the United Kingdom that is less liable to be used as leverage against competitors, not only because of the tonnage divestments but also because of the bulk divestments which will weaken its position in the United Kingdom bulk markets. The commitment to license patented BOC technology to third Parties will lessen the concerns arising from the combination of technologies. Moreover, the Commission considers that an acquirer will be able to present additional competition in the EEA tonnage market. The divestment of bulk, cylinder and distribution facilities will give the acquirer(s) access to a related bulk and cylinder infrastructure and will create the possibility of operating the divested tonnage assets as part of an integrated gases business.

(298) In view of these elements the Commission considers that the proposed commitments remove the fear that a dominant position in the EEA tonnage market will be created.

(299) The divestiture package for the bulk gases oxygen, nitrogen and argon in the United Kingdom represents approximately […]* of the markets for these three gases. The liquefiers in Brinsworth and Fawley can supply customers in most regions in Southern and Northern England. The Commission considers that these facilities, together with related customer contracts, personnel and equipment, will enable a new entrant or a smaller existing competitor to present effective competition in the United Kingdom bulk market.

(300) The divestiture package for the cylinder gases in the United Kingdom represents approximately […]* of the relevant markets for oxygen, argon/argon mixtures and acetylene and covers other cylinder gases. Besides the reduction of actual market share, the divestment of three production facilities will give the acquirer the flexibility to fill those or other gases depending on demand. The three cylinder-filling centres are located so as to allow a significant coverage of the United Kingdom market. The divestiture of the bulk gases

production facilities in Brinsworth and Fawley is also necessary to supply those filling centres. Acetylene is produced at a plant in Bristol, which will also be divested. The distribution infrastructure to be divested comprises personnel, collect centres, agents' contracts and equipment. It is reasonable to suppose that these divestments will enable a new entrant to compete effectively in the United Kingdom cylinders markets.

(301) The Commission considers that the proposed commitments will remove the operation's anti-competitive effects in the United Kingdom bulk and cylinder markets concerned, by substantially reducing the acquired market position and allowing the entry of a significant competitor. It is likely that the new competitor's market position (approximately […]* for bulk gases and approximately […]* for cylinder gases) will be more significant than that which Air Liquide could have acquired initially had it entered the United Kingdom market. The Commission also considers that the presence of one or several new competitors in the United Kingdom will enhance the chances of those competitors also becoming active in Ireland. This outweighs the effect of the removal of Air Liquide as a potential competitor in Ireland.

(302) The size of the divestments relating to the bulk and cylinder markets in France exceeds the BOC businesses which Air Liquide acquired prior to the notified operation. The Commission considers that the divestments will remove the concentration's anti-competitive effects in the French bulk and cylinder markets concerned.

(303) The divestiture package relating to the helium wholesale market ensures that Air Liquide will not acquire access to the supply of refined helium from Russia and Poland. In order to enable a new wholesale supplier to replace BOC's competitive potential to a comparable extent, it is also necessary for that entrant to obtain access to refined helium supplied from a further source, namely in the United States. The ability to spread supply risks over different, unrelated sources ensures competitivity in the wholesale market. This commitment is thus intended to re-establish the competitive potential that existed before the operation. Furthermore, the link between Air Liquide and Air Products that currently exists through their joint venture in Algeria will be removed.

(304) With respect to the market for electronic speciality gases, the divestiture will cover one of Air Liquide/BOC's two transfill facilities in the EEA. Together with the personnel and technologies relating to electronic speciality gases transfilling, continued product supplies and ongoing customer orders, the divestiture will enable another industrial gases company to compete effectively in the EEA-market for electronic speciality gases.

(305) The Commission therefore considers that the proposed commitments will remove the fear that collective dominant positions would be created on the markets for wholesale helium and electronic speciality gases.

(306) Furthermore, Air Liquide's commitments of 21 December 1999 comprise the following elements:

(a) […]*.

(b) […]*.

(c) […]*.

(d) […]*.

(e) […]*.

[…]*.

(307) The Commission considers that the commitments of 21 December 1999 (as amended on 7 January 2000) will, if acted upon in their entirety, eliminate the risk that ongoing links between Air Liquide and Air Products will contribute to the creation or strengthening of dominant positions by Air Liquide/BOC in the tonnage, bulk and cylinder markets and the creation of collective dominant positions by Air Liquide/BOC and Air Products in the markets for wholesale helium and electronic speciality gases.

VI. **FINAL CONCLUSION**

(308) In view of the foregoing, the notified concentration should be declared compatible with the common market pursuant to Article 8(2) of the merger Regulation and with the functioning of the EEA Agreement pursuant to Article 57 thereof, subject to the condition of full compliance with the commitments given by Air Liquide to the Commission on 21 December 1999 (as amended on 7 January 2000) which are set out in the Annex,

HAS ADOPTED THIS DECISION:

Article 1

The operation notified to the Commission on 16 August 1999 whereby Air Liquide SA will acquire sole control of parts of The BOC Group plc by way of a public bid to be implemented jointly with Air Products and Chemicals Inc. is hereby declared compatible with the common market and the functioning of the EEA Agreement, subject to the condition of full compliance with the commitments given by Air Liquide SA to the Commission on 21 December 1999 (as amended on 7 January 2000) which are set out in the Annex.

Article 2

This Decision is addressed to:

Air Liquide SA
75, Quai d'Orsay
F-75321 Paris Cedex 07

Done at Brussels, 18 January 2000.

For the Commission
Mario MONTI
Member of the Commission

ANNEX

[…]*.