

***Case No COMP/M.4141 -
LINDE / BOC***

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**REGULATION (EC) No 139/2004
MERGER PROCEDURE**

Article 6(2) NON-OPPOSITION
Date: 06/06/2006

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COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 06.06.2006

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PUBLIC VERSION

MERGER PROCEDURE
ARTICLE 6(1)(b) and 6(2) DECISION

In the published version of this decision, some information has been omitted pursuant to Article 17(2) of Council Regulation (EC) No 139/2004 concerning non-disclosure of business secrets and other confidential information. The omissions are shown thus [...]. Where possible the information omitted has been replaced by ranges of figures or a general description.

To the notifying party

Dear Sir/Madam,

Subject: Case No COMP/M.4141 - Linde/BOC
Notification of 6 April 2006 pursuant to Article 4 of Council Regulation No 139/2004

1. On 06/04/2006, the Commission received a notification of a proposed concentration pursuant to Article 4 of Council Regulation (EC) No 139/2004¹ (“the Merger Regulation”) by which the undertaking Linde AG (“Linde”, Germany) acquires within the meaning of Article 3(1)(b) of the Council Regulation control of the whole of the undertaking The BOC Group plc (“BOC”, United Kingdom) by way of purchase of shares.
2. On 27 April 2006 the Polish Office of Competition and Consumer Protection (OCCP) has submitted a request for referral pursuant to Art. 9(2)a of the Merger Regulation as a result of which the deadline of the first phase was extended to 6 June 2006. The OCCP took the position that the concentration threatens to significantly affect competition on a number of national markets in Poland, in particular the bulk and cylinder supply of various industrial gases, helium retail supply as well as the supply of calibration mixtures and refrigerants. By letter dated 18 May 2006, the OCCP withdrew its request for referral against the background of remedies which had been submitted by the parties meanwhile and which completely removed the OCCP’s concerns.
3. On 11 May 2006, the parties to the concentration submitted undertakings. The proposed commitments were designed to eliminate the serious doubts identified by the Commission, in accordance with Article 6(2) of the Merger Regulation. After examination of the notification and in the light of these undertakings, the Commission has concluded that the operation falls within the scope of the Merger Regulation and

1 OJ L 24, 29.1.2004 p. 1

does not raise serious doubts as to its compatibility with the common market and the EEA agreement.

I. THE PARTIES

4. Both Linde and BOC offer a broad range of gases worldwide to customers in a wide variety of different industries. The gases cover standard industrial gases, such as oxygen, nitrogen and argon; medical gases, such as oxygen for medical use and nitrous oxide; specialty gases, such as various refrigerants and calibration mixtures, and helium. Linde is moreover active in the industrial gases plant construction business and the manufacturing of forklift trucks and warehouse equipment. BOC has furthermore some activities in the logistics sector.
5. Linde is a publicly-listed company whose shares are traded on all German stock exchanges (Berlin, Düsseldorf, Frankfurt (Main), Hamburg, Munich, Stuttgart), as well as on the SWX in Zurich. No shareholder has direct or indirect control over Linde. BOC is a public limited company registered in England. BOC is the parent company of the BOC group of companies and is not controlled by any other company or person.

II. THE CONCENTRATION

6. Linde intends to acquire 100% of BOC's shares. On 6 March 2006, the parties formally announced that they have reached agreement on the terms of a recommended cash acquisition by Linde of the entire issued share capital of BOC to be implemented by means of a court-approved scheme of arrangement under section 425 of the UK Companies Act 1985.
7. Linde will therefore acquire sole control of BOC. The notified transaction consequently constitutes a concentration within the meaning of Art. 3(1)(b) of the Merger Regulation.

III. COMMUNITY DIMENSION

8. Linde and BOC have a combined aggregate worldwide turnover of more than EUR 5,000 million (EUR 9,501.5 million for Linde in 2005 and EUR [6.5-7.5] billion for BOC in 2005). The aggregate Community wide turnover of each party exceeds EUR 250 million (EUR [...] million for Linde in 2005 and EUR [...] million for BOC in 2005). They do not achieve more than two-thirds of their turnover in one and the same Member State. The notified operation therefore has a Community dimension.

IV. COMPETITIVE ASSESSMENT

9. The businesses of Linde and BOC overlap in the production and distribution of industrial, medical and specialty gases. Linde is moreover active in the engineering and the construction of plants for the production of industrial gases.

A. RELEVANT PRODUCT MARKETS

1. Description

Industrial gases

10. Industrial gases comprise all the gases and mixtures of gases provided by gas suppliers for various industry and research applications. The most commonly used industrial gases are oxygen, nitrogen, hydrogen, argon, carbon dioxide, acetylene, carbon monoxide and helium as well as mixtures thereof, such as the so-called syngas, which is a mixture of hydrogen and carbon monoxide.
11. Industrial gases can be obtained from the air (atmospheric gases) and from synthetic processes or natural sources (non-atmospheric gases). Atmospheric gases are extracted from the air mainly by using cryogenic air separation technology. Air is composed of 20.95% oxygen, 78.09% nitrogen, 0.93% argon and 0.03% of other noble gases such as neon, krypton or xenon. Acetylene and hydrogen are produced by chemical processes. Carbon monoxide is produced in combination with hydrogen, by reforming hydrocarbons, generally natural gas. Carbon dioxide comes from natural sources or occurs as a by-product of other chemical processes. Helium is extracted from natural sources (natural gas).
12. The following table summarises the main uses of oxygen, nitrogen, argon, hydrogen, carbon dioxide, acetylene, carbon monoxide and helium.

Gas	Used in the following industries
Oxygen	Metallurgy (steel production), chemicals, metalworking (cutting and welding), paper (bleaching), glass (melting), electronics, waste water purification, fish farming
Nitrogen	Electronics, chemicals, food (improving shelf life by protecting from oxygen and cryogenic freezing), metalworking (pressing of aluminium parts), building (soil freezing, cooling for the setting of concrete, shielding of prestressing steels against oxidation)
Argon	Metallurgy (steel production), metalworking (shielding of weld seams against oxidation), electronics (shielding of semiconductors against impurities), inflation of air bags
Hydrogen	Chemicals (purification), food (edible oil production), glass (grinding)
Carbon Monoxide	Environmental monitoring systems, industrial hygiene gas mixtures, semiconductor fabrication, manufacturing of metal carbonyls, polycarbonate, polyurethane and oxy-alcohol.

Carbon dioxide	Metalworking (shielding of weld seams against oxidation), steel production, chemicals, drinks manufacturing, food (cryogenic freezing), dry ice, waste water purification (neutralisation of alkaline wastes)
Acetylene	Metalworking (cutting and welding), glass (lubrication of moulds)
Helium	Aerospace, lifting gas for balloons, health care

Medical gases

13. Some gases used for industrial purposes are also used for medical applications. These gases are mainly oxygen, nitrogen, carbon dioxide and nitrous oxide (N₂O). The market investigation shows that the demand-side substitutability with so-called industrial gases is limited since the customers concerned, for instance hospitals, can use only the gases that have the label “medical”, which ensures the quality and traceability of the gases used.
14. The parties submit that there is a high supply-side substitutability since medical gases, be they in bulk or in cylinders are produced in the same plants and from the same sources as industrial gases. According to the parties, the only difference between them is that medical gases undergo certain regulatory requirements with regard to filling, testing and labelling, *e.g.*, for product recall purposes as well as procedures and analysis proving that they comply with the regulatory level of quality.
15. In any case, the question as to whether the medical gases constitute a distinct market can be left open for the purposes of the present decision since the competitive assessment does not differ depending on the definition retained.

Specialty gases

16. A large number of different gases and gas mixtures are generally referred to as “specialty” gases. Even though there is no clear definition of specialty gases, this group comprises all gases which are not considered to be “industrial gases”. Specialty gases and specialty gas mixtures can be distinguished from standard industrial gases on the basis of price, quantities sold, application or method of supply. Moreover, specialty gases are generally produced through specific chemical processes as opposed, for example, to atmospheric gases, which are obtained from the air. They are usually sold in much smaller quantities (and mainly supplied in cylinders) and at significantly higher prices than standard industrial gases.
17. Specialty gases comprise a large number of gases and gas mixtures. Gases companies may be active in different ways in the supply chain for specialty gases, *i.e.* in generating the gas, in purification of purchased low-grade gas, in transfilling of purchased high-grade gas or in mere trading.
18. The parties identified five main groups of specialty gases which capture the different specialty gases available on the market: (i) refrigeration gases, (ii) electronic specialty gases, (iii) noble gases and noble gas mixtures, (iv) gaseous chemicals (“chemicals”) and (v) calibration and other gas mixtures. All five groups of specialty gases comprise

various individual gases and gas mixtures and the proposed segmentation was introduced in order to facilitate the competition analysis in this case and does not correspond to the respective relevant product markets

19. The following table summarizes the main uses of the five groups of specialty gases

Gas group	Examples of gases contained in the respective group	Main applications
Noble gases and noble gas mixtures	Krypton, neon, radon, xenon and mixtures	Production of light bulbs (lighting industry), production of excimer lasers (electronics industry)
ESGs	AsH ₃ , BF ₃ , C ₂ F ₆ , HCl, HBr, SF ₆ , Halocarbon 23, Chlorine, Nitrous Oxide, Silicone Tetrafluoride	used in the semiconductor industry for various specific applications
Refrigerants	R 404 A, R 134a, R22, R 407 C, R 410, Hydrocarbon Refrigerants	Cooling agents
Chemicals	Ethylene (C ₂ H ₄), Ammonia (NH ₃), Ethylene Oxide ² (C ₂ H ₄ O), Sulfur Hexafluoride (SF ₆), Carbon monoxide (CO), Sulphur Dioxide	Various applications in the chemical, biochemical and manufacturing industry
Calibration gas mixtures	Environmental mixtures, special application mixtures, other calibration mixtures	Calibration of instruments and other special applications

2. Distinct relevant markets per gas

20. In its previous decisions in the cases *M.1641 - Linde/AGA*, *M.1630 - Air Liquide/BOC* and *M.3314 Air Liquide/Messer*, the Commission took the view that the different individual industrial, medical and specialty gases are generally not interchangeable because of their different chemical and physical properties and therefore each gas constitutes a separate relevant product market.

² Please note that the Ethylene Oxide assessed in the present case is highly purified EO that is sold in small quantities in cylinders mainly to customers in the health care industry and used as disinfectant. In contrary, ethylene oxide supplied to large volume customers in bulk and used as a chemical intermediate for the production of EO-derivatives, is not assessed in this case.

21. The parties agree with this market definition³ and this view has been largely confirmed by the market investigation in this case⁴. Already in the Air Liquide/Messer case it was found that customers generally do not consider substitution to be a realistic option. In practice, price differences and the degree of integration of a particular gas with the customers' specific application processes largely exclude substitution between gases.
22. From the supply-side point of view, and with respect to atmospheric gases, the production capacity of a plant⁵ is normally given in tons per day of oxygen and nitrogen that the plant can produce. Although there may be some flexibility, the proportions of the different atmospheric gases produced are determined (the separation of oxygen implies necessarily the separation of nitrogen) and therefore the possibility of supply-side substitution is limited. The same holds true with respect to the other industrial non-atmospheric gases such as hydrogen, carbon monoxide, carbon dioxide or acetylene, which are produced with different processes and from different sources.
23. In line with its previous decisions⁶ and on the basis of its investigations in the present case⁷, the Commission takes the view that there is no general interchangeability between the various industrial and specialty gases either from the demand or from the supply side and therefore, for the purposes of this decision, the individual gases constitute separate product markets.

3. Distinct relevant markets according to the forms of supply

24. Industrial, medical and specialty gases are supplied in different forms (gaseous or liquid) and via different distribution channels (tonnage, bulk and cylinders). The distribution in tonnage and cylinders is generally made in gaseous form while bulk distribution generally means supply in liquid form⁸.
25. *Tonnage* distribution most commonly concerns oxygen, nitrogen and hydrogen, but also carbon monoxide, *i.e.*, gases that are required in high volumes. The two industrial gases that are most commonly supplied in *bulk* are liquid nitrogen and liquid oxygen. Argon, carbon dioxide and hydrogen can also be delivered in liquid form as well as some specialty gases. Bulk quantities of hydrogen are delivered both in liquid form and in gaseous form (in trailers). All industrial, medical and specialty gases can be delivered in *cylinders* (the most common volume for a cylinder is 50 litres). Acetylene and nitrous oxide are only delivered in cylinders.

3.1 Tonnage

26. Tonnage sales relate to the delivery of large quantities exceeding 100 tpd. The gases are supplied to customers in gaseous form through pipelines or from dedicated plants that are located on-site or nearby the customer's production facility. Customers are

³ Form CO, section 6.1.1.1, page 27

⁴ Questionnaire to competitors 1 – Industrial gases sent on 7 April 2006, question 6, in which 83% of the respondents agree to this market definition.

⁵ Cryogenic air separation units, pressure swing adsorption or membrane separation.

⁶ Cases M.1641 - Linde/AGA, M.1630 - Air Liquide/BOC and M.3314 Air Liquide/Messer.

⁷ See footnote 4.

⁸ One exception is, for example, hydrogen which is sometimes distributed in bulk in gaseous form.

mainly industrial users (for instance in the petrochemical/chemical, steel, refining and glass industries). For such customers, the gases are an essential element of their production process and they value foremost the reliability of supply.

27. While the atmospheric gases oxygen, nitrogen and argon are produced in so-called Air Separation Units (ASUs), fundamentally different technology is used for hydrogen and carbon monoxide, which are not produced from air but from raw materials, such as natural gas, propane and naphtha in so-called HCS plants.
28. The industrial gas supplier normally owns the on-site plants, operates them on the basis of a long-term contract (up to 15 years) and provides on-going 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. Each gas is delivered through a specific pipe. In such a case, gases delivered by an incumbent pipeline benefit from a cost and reliability advantage as compared to on-site plants since they profit from synergies in terms of back-up supply provided by different plants connected to the pipeline and from larger sizes of the plants which supply several customers.
29. According to the Commission's findings in its decisions in the cases *M.1641 - Linde/AGA*, *M.1630 - Air Liquide/BOC* and *M.3314 Air Liquide/Messer*, these two methods of supply – on-site plants and pipeline supply - compete with each other and are without alternative for volumes greater than 100 tons per day (tpd). Even though confirming the advantages of pipeline supply, the market investigation in this case has not shown indications which would justify a different view⁹.

3.2 Bulk

30. Bulk mainly covers the supply of gases in liquid form to customers, whose demand is between 20 to 100 tpd. Gases delivered in gaseous form from either stand-alone ASUs (which are exclusively dedicated to the production of gases to be distributed in bulk) or tonnage plants (so-called “piggy-back plants”) are liquefied in liquefaction plants. The liquefied gases are transported by road or rail tanker from the supplier's plant to the site of the customer. On the customer's premises, the gases are stored, before being used in liquid form or transformed again into gaseous form. Each gas is transported and stored separately in specific dedicated equipment.
31. In its previous decisions, the Commission has found that small on-site air separation plants, which are used to satisfy the customer's demand for gas in a range that could also be supplied in bulk, should be regarded as being part of the bulk market. These findings have been confirmed by the market investigation in the present case¹⁰.

⁹ Questionnaire to competitors 1 – Industrial gases sent on 7th April 2006, question 7. Four out of five competitors confirmed this conclusion.

¹⁰ Questionnaire to competitors 1 – Industrial gases sent on 7th April 2006, question 8. All competitors confirmed this view.

3.3 Cylinders

32. Cylinders are used when the quantities requested by the customers are small, ranging from 1 m³/month to 1 000 m³/month. Cylinders may be filled at, and distributed from, the suppliers' production plant or, alternatively, liquid gases may be transported in tankers (bulk supplies) to cylinder filling centres in order to be transformed into compressed gas. From there, they are transported either directly to the customer or to depots (also called "hubs"), from which the supply to retail customers is carried out.

3.4 Conclusion of the forms of supply

33. In line with the Commission's findings in its decisions in the cases *M.1641 - Linde/AGA*, *M.1630 - Air Liquide/BOC* and *M.3314 Air Liquide/Messer*, the three methods of supply - tonnage, bulk and cylinders – constitute separate relevant product markets. This market definition has been confirmed by the present market investigation. Therefore, for the purposes of this decision, each of the three ways in which a gas can be distributed constitutes a separate relevant product market.

4. Distinct market levels for helium

34. Helium takes a particular position in the range of the different gases. It is supplied on a wholesale and on a retail level. It is sourced and produced in various places all over the world and is transported by wholesalers from the respective production site either to own transfill centres or to the transfill centres of other retailers in the areas of consumption. Wholesale helium is transported in liquid form in special low temperature containers ("cryogenic containers").
35. The supply of end-customers is made from the transfill centres either by helium wholesalers who are vertically integrated into the retail level or by independent retailers who buy helium on the wholesale market. At a transfill centre the liquid helium is removed from the cryogenic container and either transferred into small containers specifically used for helium, so-called cryogenic "dewars" for liquid deliveries to end-users or into high-pressure cylinders or tube trailers for supplies in compressed gaseous form. Retail sales in liquid and gaseous form are made in various quantities. Dewars for liquid supplies may have capacities of 30, 50, 60, 100, 250, 450 or 1000 litres. High-pressure cylinders may have a helium content of 0.9, 1.8, 3.6, 5.6, 9.1, 10.9 (bundle) m³, while tube trailers can have a capacity of as high as 3,700 m³.
36. In previous decisions, the Commission has distinguished between a helium wholesale market and a helium retail market. This view is confirmed by the fact that on these two levels a different circle of customers exists, as well as different contractual conditions and prices to which much higher quantities are sold.
37. So far, no distinction has been made by the Commission between the different supply forms on retail level, i.e. dewars (liquid helium), cylinders and tube trailers (both gaseous helium). Customers' needs clearly differ with respect to the different supply forms. Customers of liquid helium almost exclusively use helium because of its unique low temperature (-269°C), which is required for high-field magnets needed for Magnetic Resonance Image ("MRI") applications. Customers of gaseous helium mainly use helium due to its inertness (e.g., welding shield gas, carrier gas), its light molecular weight (party balloons, dirigibles), its high thermal productivity (optical

fiber manufacturing) its low boiling point (purging rocket engines) or the small size of a helium molecule (leak detection). Moreover, due to the highly different quantities supplied with cylinders and tube trailers, exchangeability of these two forms of gaseous supply is very limited.

38. However, supply-side substitutability is comparably large. Unlike industrial gases, helium supplies to the end-customers are regularly made from a transfill centre. In the case of industrial gases, bulk is supplied directly from the production site to the end-customer or is transported to the filling centres in order to be transferred into cylinders. A company active in industrial gases bulk supplies is therefore not automatically able to also supply industrial gases in cylinders if it does not own the necessary filling centres.
39. In the case of helium, all retail supplies in dewars, cylinders and tube trailers are made via the transfill centre where the large cryogenic containers arrive from the helium sources worldwide. While there are no helium retailers that only supply liquid product, there are some niche players that only supply gaseous helium from their filling centres. However, the helium transfill centers of all major helium retailers are used for both vaporizing, compressing and filling helium into tube trailers and cylinders for gaseous supplies and the “re-packaging” of liquid helium into dewars for liquid supplies. Consequently, most companies active on the helium retail level have transfill centres which allow filling helium into any vessel required by the customer.
40. While the customers are not able to switch to a large extent between the different supply forms and clearly represent different market segments, there appears to be a sufficient degree of supply-side substitutability which does not support a further subdivision of the retail market. It can, however, be left open whether cylinder, dewar and tube trailer supplies constitute separate markets since the market analysis does not change under either market definition.

5. Sale of plants

41. The Commission has indicated in its decision *M.1630 Air Liquide/BOC* that the tonnage supply of industrial gases on the basis of long-term contracts needs to be distinguished from the sale of plants to other gas companies or to industrial customers that operate the plant on their own¹¹. This view is also reflected in the decision *M.3314 Air Liquide/Messer*. Due to the differences in technology and the differing circle of suppliers, it appears appropriate to distinguish between the market for the sale of ASUs and the one for sales of HCS plants. However, the exact market definition can be left open, since the competition analysis does not change under either alternative market definition.

6. Conclusion

42. The Commission therefore considers that the following relevant product markets per individual gas have to be distinguished for the purpose of this decision:
 - tonnage supplies of oxygen, nitrogen, hydrogen and carbon monoxide

¹¹ M.1630 – Air Liquide/BOC, para. 37.

- bulk supplies of industrial and (if applicable) medical oxygen, nitrogen, argon, carbon dioxide, hydrogen
 - cylinder supplies of industrial and (if applicable) medical oxygen, nitrogen, argon, carbon dioxide, hydrogen, acetylene, nitrous oxide as well as all affected individual specialty gases (from the group of noble gases and mixtures: krypton, inert noble gas mixtures, and brominated compound gas mixtures; ESGs including AsH₃, BF₃, C₂F₆, HCl, HBr, SF₆, Halocarbon 23, Chlorine, Nitrous Oxide, Silicone Tetrafluoride; refrigerants; R 404 A, R 134a, R22, R 407 C, R 410, Hydrocarbon Refrigerants; for chemicals: SF₆, C₂H₄, NH₃, CO, Sulphur Dioxide and Ethylene Oxide and calibration gas mixtures including environmental gas mixtures, other calibration gases and special application mixtures)
 - helium wholesale supply
 - helium retail supply
43. It can be left open whether the sale of ASUs and the sale of HCS plants for the production of industrial and medical gases constitute two separate markets.
44. It should be noted that some markets may be inter-related since a large part of bulk industrial gases are produced from tonnage plants (via so-called piggy-back plants) and the industrial gases filled in the cylinders are derived from bulk.

B. RELEVANT GEOGRAPHIC MARKETS

1. Tonnage

45. In its previous decisions¹², the Commission reached the conclusion that the markets for tonnage were EEA-wide in scope. In the most recent case dealing with this industry *M.3314 Air Liquide / Messer*, the Commission rejected a market definition wider than the EEA and even found elements that pointed towards the existence of national markets. Moreover, in that case the question was raised whether the Eastern European countries which were at that time in the accession process, exhibited already sufficiently similar competitive conditions as the Member States in order to be included into the EEA-wide market. The parties agree in principle with the Commission's previous findings but stress the national aspects of the tonnage markets. In the present case, the Commission follows the results of the *Air Liquide/Messer* investigation and assumes an EEA-wide market which however shows important regional aspects.¹³

12 M.3314 – Air Liquide/Messer Targets, M.1630-Air Liquide/BOC and M.1641-Linde/AGA.

13 A number of competitors confirmed in the market investigation, that they in principle can participate in bids EEA-wide, but that local presence confers competitive advantages. See questionnaire to competitors 1 – Industrial gases sent on 7 April 2006, question 20: four out of five competitors confirmed the EEA-wide reach of requests for proposals, two of them also highlighted the importance of local presence.

2. Bulk and cylinder gases (Industrial gases / Medical gases)

46. The Commission has defined in previous decisions¹⁴ the markets for bulk and cylinder supply of industrial gases as national, and the parties consider that this definition is still appropriate.
47. With respect to the bulk markets, transport costs (estimated by the parties in [10-20]% of the selling price) depend on the distance between the production plant and the customer as well as on other factors such as the number of customers served per transport. Thus, bulk gases can be transported economically only within a limited area. Bulk oxygen, nitrogen and carbon dioxide can be distributed economically over distances of approximately 200 km from the production plant. Bulk hydrogen and argon are more expensive products and can profitably be distributed over longer distances up to 300 km – 400 km for hydrogen and up to 800 km for argon. Despite the fact that in many instances the above mentioned shipping distances do not cover an entire Member State, the overlapping catchment areas of the various production plants and the existence of swap agreements between suppliers to reduce transportation costs makes competition in the bulk and cylinder markets for standard industrial gases to take place at the national level.
48. This conclusion is also confirmed by the data submitted by the notifying party on average sales prices for typical bulk customers in various EEA countries, which indicate that price levels in Europe differ across countries.
49. Regarding the cylinders markets, the parties state that the maximum shipping distances of cylinders are mainly determined by the ratio between production costs and end-customer prices. Given the significant transportation costs compared to the relatively small quantities supplied in cylinders, it does not normally make economic sense to ship cylinder standard industrial gases over long distances. In addition, cylinder customers often attach significance to a supplier being located in their relative proximity.
50. However, as with bulk supplies, the Commission found in previous decisions¹⁵ that due to the overlapping catchment areas of the cylinder filling centres and the existence of swap agreements between suppliers to reduce transportation costs, competition in the cylinder markets takes place also at national level.
51. The notifying party has also in this case submitted average sales prices for typical cylinder customers in various EEA countries which confirm that price levels in Europe may differ across countries.
52. The market investigation has confirmed the above statements, and therefore, for the purposes of this decision, the bulk and cylinders markets are considered as national markets.¹⁶

3. Helium

¹⁴ M.1641 - Linde/AGA, M.1630 - Air Liquide/BOC and M.3314 Air Liquide/Messer.

¹⁵ Cases M.1641 - Linde/AGA, M.1630 - Air Liquide/BOC and M.3314 Air Liquide/Messer.

¹⁶ Questionnaire to competitors 1 – Industrial gases sent on 7th April 2006, questions 25 to 35 and Questionnaire to customers – Industrial gases sent on 10th April 2006, questions 22 to 30.

3.1 Overview

53. Helium is extracted, refined and liquefied at a limited number of sites worldwide which are located in the United States, Algeria, Qatar, Poland and Russia. It is a by-product of the production of natural gas and the production of liquid natural gas (“LNG”). While the “historic” sources in the US, Poland and Russia are connected to natural gas production facilities, the newer helium sources in Algeria and Qatar typically extract helium in the process of producing LNG.¹⁷
54. So far, there are only 14 sources in the world where the right conditions exist to justify helium recovery. Helium extraction facilities are located close to the sources of natural gas that are suitable for the extraction of helium. In the natural gas / LNG production process, helium producers receive crude helium which is then refined and purified to generate pure helium (in the following “refined helium”).
55. Deliveries from the helium refineries are usually made in large quantities. The refined helium is normally delivered in liquid form from the helium production facility to a transfilling plant in the area of consumption which may belong to a vertically integrated wholesaler also active on the retail level or to another gas company, such as an independent retailer. Special low temperature logistics, in particular vacuum-insulated tank containers (“cryogenic containers”), are required for the shipment from the source to the filling facility in order to prevent evaporation losses resulting from warming of the gas during transportation. This transport of helium to the transfill centres is therefore done by gas companies that have access to these cryogenic containers.¹⁸
56. Helium producers are consequently natural gas/LNG producers, such as Krio (Poland), Cryor (Russia), Sonatrach (Algeria) and Exxon (US). They themselves, however, are normally not active in the wholesale business. They either enter into long-term supply contracts (up to 20 years) with the industrial gas companies or create joint-ventures with the industrial gas companies in order to jointly produce helium.
57. Moreover, some of the wholesalers are vertically integrated into the production of helium: BOC has a large production facility in Otis, Kansas; Air Products and Praxair also have own production sites in the US. Air Liquide has entered into a joint venture with Air Products and the Algerian state-owned gas company Sonatrach to exploit the Algerian source in Arzew. Linde has only recently entered into a joint-venture with Sonatrach to produce helium at Skikda, Algeria, which, however, has not yet started its production. All the mentioned wholesalers moreover have long-term agreements with independent helium producers.

3.2 Helium wholesale

¹⁷ The main difference between the sources of natural gas in Poland, US and Russia and the sources of natural gas transformed into LNG (Algeria, Qatar) is the helium content of the natural gas from which the helium is extracted. The LNG production process typically has a huge gas throughput and the ability to concentrate helium in the waste gas. This can make helium recovery economically viable for natural gas with a helium content as low as 0.05% as opposed to 0.2% as it is required in the case of non-liquefied natural gas production.

¹⁸ Through their Gardner Cryogenics subsidiary, Air Products has been and remains the primary producer of these large cryogenic helium containers worldwide.

58. In the case *M.1630 Air Liquide/BOC*, the Commission considered the possibility of an EEA-wide market for helium wholesale supply. The market definition was, however, left open. The parties submit that the market is EEA-wide and refer to the above mentioned decision.
59. As will be explained in the following, the market investigation in the current case has shown indications that the market for wholesale helium should be regarded as global even though it exhibits some important regional aspects, mainly with respect to the US, the EEA and Asia.
60. The EEA is to a large extent supplied with helium from the sources located within Europe (Poland, Russia) or close to Europe, i.e. Algeria and to some extent Qatar which is, however, a source commonly also used for the supply of the Asian markets. Sources located close to the area of consumption have an advantage in terms of costs, reliability of supply and transport time as compared to sources which are located in far distance. In the case *M.1630 Air Liquide/BOC*, these proximity advantages have led the Commission to consider that the helium wholesale market might be EEA-wide in scope, covering all sources in and around the EEA. At the time of the *Air Liquide/BOC* case in the year 2000, imports from the US into the EEA were estimated at 25% of the total helium demand in the EEA. The assumption of a potential EEA-wide market was made against the background that these imports were expected to decrease in the near future.
61. Imports from the US into the EEA have, however, meanwhile grown to a considerable size which militates against the assumption of a distinct EEA-wide market. According to the parties' estimates, the rate of imports from the US into the EEA has reached a level of 32% in the year 2005. A quantity of round-about 11.2 million m³ of helium was shipped from the US into the EEA. The total demand in the EEA amounts according to estimates by the parties to approximately 35 million m³.¹⁹ In 2004 the imports from the US into the EEA had even covered a larger quantity (approximately 12.6 million m³).
62. The market investigation has shown that a number of market participants expect US-imports to decrease to some extent in the near future with the (complete) start-up of the new sources in Qatar and Algeria.²⁰ However, it was also indicated that US-imports will in the long-run continue to play an important role in the EEA. The US has the by far largest production of helium in the world. In the EEA, however, demand significantly exceeds the supply which can be generated from the sources in and close to Europe. This explains why there are helium shipments from the US to Europe but not the other way around.
63. The fact that no helium is exported from the sources in and around the EEA to the US does, however, not exclude the assumption of a worldwide market. From the perspective of independent helium retailers in the EEA, US imports are a feasible alternative of supply and therefore constitute a real competitive constraint which cannot be ignored. Negotiations between helium retailers and helium wholesale suppliers are usually conducted at headquarter level, although some small contracts

¹⁹ Total global demand is estimated at approximately 160 million m³.

²⁰ Questionnaire to competitors 1 – Industrial gases sent on 7 April 2006, question 38. Four respondents indicated that imports might decrease in the future.

may be negotiated by local sales businesses. Equally, contracts of helium wholesalers with helium producers are typically negotiated at headquarters level at the place of the helium source. Given the location of the players in the helium business, cross-border and transatlantic negotiations are a common pattern for both contracts with helium producers and helium wholesalers.

64. The market investigation has, moreover, shown indications that the wholesalers use swap agreements on the basis of which they may shift quantities across world-regions without the need for physical transport.²¹ Quantities being produced in one region can therefore to some extent be “moved” by individual players while at the same time avoiding lengthy and costly transports. This means that the location of a source not necessarily indicates the location of where this supply has an impact on competition.
65. In the case *M.1630 Air Liquide/BOC*, the Commission has found that market prices for refined helium are not set at worldwide level. Price setting mechanisms as they exist for commodities traded on world markets, such as certain metals and minerals, were not found to be in place for refined helium. However, the market investigation in the present case has shown indications that helium prices in all world regions are influenced by demand and supply in the US due to the large quantities which are produced there. A change in supply in the US inevitably has price effects on the rest of the world.
66. Moreover, prices for crude helium are significantly influenced by the prices which are set by the US Bureau for Land Management (BLM). The BLM is an agency of the U.S. Department of the Interior and manages public land in the US in 12 Western states, including Alaska. The BLM owns and operates a helium pipeline and storage system²² which is the only storage facility for crude helium in the world.²³
67. The BLM manages a large quantity of crude helium (approximately five times the current world demand) in its storage system which was accumulated mainly in the 1960s and 1970s when the US-government purchased and stored crude helium for strategically important space, defense, and energy programs. The BLM now sells crude helium in defined quantities and at prices which are set in advance for the next few years. 94.5% of the total quantity offered by the BLM are reserved for the refiners connected to the BLM pipeline (among them BOC, Air Products and Praxair). The rest is offered to non-refiners.
68. The prices for crude helium on the market are sometimes linked to the BLM-prices which in turn are indexed to the consumer price index. According to BOC internal documents, the “[...]”. Due to the high importance of the US-quantities which can be shipped anywhere in the world, wholesalers will generally take into account the prices

²¹ See internal document of BOC: [...]

²² Helium production in the United States is concentrated in Texas, Oklahoma, Kansas, and Wyoming because natural gas from these areas is richer in helium (generally greater than 0.3 percent helium) than from other areas of the United States. The helium storage and transportation system consists of the storage reservoir in the Bush Dome, Cliffside Field, and a 425-mile pipeline system originating at Cliffside, Texas and ending near Bushton, Kansas. The pipeline connects ten privately owned crude helium plants and six privately owned helium purification plants to the Bush Dome at Cliffside Gas Field as well as four BLM facilities.

²³ The parties have indicated that another storage facility exists in Russia which is, however, only accessible by the Russian producer Cryor.

for crude helium in the US for the calculation of prices for refined helium to be offered in the EEA or in other regions. It can therefore be assumed that the BLM prices in the US have an effect on the price levels for crude and refined helium on other continents and therefore create a global price level which mainly differs in specific regions due to transport costs. A number of market participants have referred in their responses to a worldwide helium wholesale market or to a global price level.²⁴

69. The companies currently acting as wholesalers are Praxair, Air Products, BOC, Air Liquide and to a small extent Linde. The four main suppliers have mostly access to sources located in the US as well as sources in or around Europe in order to pursue a balanced sourcing strategy for reliable supply. They mostly sell helium in all parts of the world and compete on a global level against each other. Independent retailers in the EEA have indicated during the market investigation that they also receive helium from the US. In some cases, the transport costs have to be paid extra. In some cases, however, helium is delivered to a fixed negotiated price and the buyer cannot distinguish from which source this helium is provided.
70. It cannot be excluded, that the importance of US-sources will shrink in the future for some time with the increased capacities available around the EEA and that the market will then tend towards an EEA-wide scope. However, against the background of the past and current significance of the US-imports and the existing strong influence of the US market, the geographic market for wholesale helium will for the purposes of this case be considered as worldwide.²⁵

3.3 Helium retail

71. Refined helium is transported by the wholesalers from the sources to transfill centres in the area of consumption. These are owned either by wholesalers who are vertically integrated into the retail level or by independent retailers who buy helium from the wholesalers. Apart from this, wholesalers also trade helium among each other and may transport helium from the sources to transfill centres of other wholesalers who are also active in the retail business.
72. At a transfill centre the liquid helium is removed from the cryogenic container and transferred into dewars, cylinders or tube trailers for supplies to end customers. Deliveries of helium are either made from the transfill centre directly to the end-customer or through local distribution networks via industrial or local hubs.
73. The parties submit that while the conditions of competition for helium retail are homogenous at a national level, they significantly differ between the EEA Member States. They therefore suggest a national market definition for helium supplies on retail level. In the decision *M.3314 Air Liquide / Messer*, the Commission has defined a national market for retail helium in Germany.
74. The market investigation has broadly confirmed that the market for helium retail supply in cylinders, dewars and tube-trailers is national in scope. Helium is more

²⁴ Questionnaire competitors – Remedies, questions 1, 6 and 7. Five respondents make this reference.

²⁵ The definition of a global wholesale market goes in line with Linde's submission in its notification of the acquisition of joint control over Helison together with Sonatrach (case M.2868 Linde/Sonatrach) in the year 2002.

valuable than many standard industrial gases which would militate for a larger radius of supply than for the cylinder and bulk supply of industrial gases. Nevertheless, a transportation of helium across the whole of the EEA is generally not feasible.

75. Liquid helium can only be transported and stored for a limited period of time in special very low temperature equipment. But also for gaseous helium, no long transportation times are possible since customers require a quick supply. In the market investigation, several customers pointed out that not the exact distance but the fast availability of the product is of relevance. Some customers specified that the delivery time should not exceed 24 to 48 hours. Consequently, helium end customers have indicated that they source from suppliers located in a distance between 50 and 500 km.
76. This corresponds to the radius within which 80% of the customers of the parties' transfill centres are located, which is a range up to 200 and 400 km. The market investigation has confirmed similar radiuses for competing helium retailers, who indicated distances of up to between 200 and 500 km. Since large quantities of helium can be transported more cost-efficiently than small quantities in cylinders, the distances that were indicated for cylinders were as a tendency slightly lower than the ones for tube-trailers.
77. Most helium retailers (including most large integrated gases companies) are active only in one or a selected number of EEA countries. The parties have, moreover, provided price information for retail helium per Member State which shows that the price levels may differ considerably. A large number of respondents confirmed that sourcing is possible on a national basis.²⁶
78. Therefore, the helium retail markets are assumed to be national in scope, which goes in line with the Commission's findings in previous cases.

4. Specialty gases

79. The parties take the view that the respective relevant geographic markets for all *noble gases and noble gas mixtures* are at least EEA-wide. In particular, it is submitted that noble gases and noble gas mixtures have a high value compared to industrial gases. Moreover, transportation costs are relatively low compare to total costs and account for less than 5% of the total sales price. There are furthermore no regulatory or other barriers to purchase noble gases and noble gas mixtures abroad. This view has been largely confirmed by the market investigation.²⁷ Therefore, the relevant geographic markets for noble gases and noble gas mixtures seem to be at least EEA wide.
80. The parties submit that the respective relevant geographic markets for all *ESGs* are at least EEA-wide. In particular, it is submitted that *ESGs* have a high value compared to industrial gases. Moreover, transportation costs are relatively low and account for less than 5% of the total sales price. There are furthermore no regulatory or other barriers to

²⁶ Questionnaire to customers 1 – Industrial gases, sent 10 April 2006, questions 33 and 37. In 8 of 15 responses on these questions a possible national supply was explicitly indicated.

²⁷ The majority of customers source their supplies on an EEA-wide basis; see replies to Questionnaire to customers – Speciality gases sent on 10th April 2006, question 15.

purchase ESGs abroad. This is in line with previous Commission's decisions²⁸. Therefore, the relevant geographic markets for ESGs seem to be at least EEA wide.

81. Ultimately, the definition of the relevant geographic markets for noble gases and noble gas mixtures as well as for ESGs can be left open, since, regardless of the precise market definition, the transaction will not give rise to competition concerns.
82. The parties take the view that the respective relevant geographic markets for all *refrigerants* are at least national, irrespective of the form of supply. Supply of refrigerants had traditionally been organized at a national or regional level. This is particularly the case with respect to BOC, which only sells refrigerants in the UK, Ireland and Poland. This view has been largely confirmed by the market investigation, where a majority of the customers indicated to source refrigerants on the national basis and stressed the importance of the distribution network²⁹. On the other hand, some suppliers are active on a regional basis (for example Linde has transfilling sites for refrigerants in [...]) and price levels tend to converge in the EEA according to the parties' data. Therefore, the relevant geographic markets for refrigerants still seem to be national with a growing tendency towards wider, either regional or EEA-wide markets
83. The parties take the view that the respective relevant geographic markets for all *chemicals* are at least national, irrespective of the form of supply. Supply of chemicals had traditionally been organized at a national or regional level. This is particularly the case with respect to BOC, which only sells chemicals in the UK, Ireland and Poland. Moreover, transport costs play a significant role for certain low value chemicals (for example ammonia, sulphur dioxide). However, some suppliers are active on a wider than national basis, for example Linde has [...] filling sites for chemicals within the EEA. The parties submit that for certain high value products such as sulfur hexafluoride and ethylene oxide sold in cylinders for mainly medical applications³⁰, transportation costs are of minor importance. Ethylene oxide is transfilled centrally by each gas company and distributed in cylinders from one or two filling sites throughout the EEA. Therefore, the relevant geographic markets for chemicals seem to be national with a clear development towards broader markets, in particular for certain high value chemicals like ethylene oxide sold in cylinders for mainly medical applications.
84. The parties take the view that the respective relevant geographic markets for all *calibration mixtures* are at least national. Supply of calibration gas mixtures had traditionally been organized at a national or regional level. This is particularly the case with respect to BOC, which only sells calibration mixtures in the UK, Ireland and Poland. Filling stations are primarily used to supply customers in the country in which they are located. This view has been largely confirmed by the market investigation. Therefore, the relevant geographic markets for calibration gas mixtures seem to be national.

²⁸ COMP/M.1630 – Air Liquide/BOC, COMP/M.3314 – Air Liquide/Messer Targets

²⁹ Majority of customers source their supplies on national basis; see replies to Questionnaire to customers – Speciality gases sent on 10th April 2006, question 22.

³⁰ Please note that the Ethylene Oxide assessed in the present case is highly purified EO that is sold in small quantities in cylinders mainly to customers in the health care industry and used as disinfectant. In contrary, ethylene oxide supplied to large volume customers in bulk and used as a chemical intermediate for the production of EO-derivatives, is not assessed in this case.

5. Sale of plants

85. The parties submit that the relevant geographic markets for the sale of plants (both ASU and HCS) are global in scope. These gas production plants are expensive capital goods that are manufactured by a number of major suppliers worldwide. These suppliers all have the ability to set up gas production plants all over the world.
86. It can, however, be left open, whether the relevant geographic market is worldwide or EEA-wide since the analysis does not change under either market definition.

C. COMPETITION ANALYSIS

1. Industrial gases / Medical gases

87. Within the wide group of industrial/medical gases, the only markets in which the transaction gives rise to affected markets are the bulk and the cylinders markets in Poland and the UK. The assessment is therefore focussed on these markets. The transaction moreover affects the EEA-wide tonnage market as well as the cylinder and bulk business on a European scale.

1.1 Bulk markets

a. Poland

Market structure

88. The table below shows, for 2005, a summary of the market shares of the parties and of the main competitors in Poland for following relevant markets: oxygen, nitrogen, argon (including argon mixtures), hydrogen and carbon dioxide:

Bulk industrial gases: market shares for 2005 in Poland

Products	Oxygen	Nitrogen	Argon	Hydrogen	CO ₂
Market size (M €)	[...]	[...]	[...]	[...]	[...]
Linde	[30-40]%	[40-50]%	[30-40]%	[10-20]%	[20-30]%
BOC	[30-40]%	[40-50]%	[10-20]%	[20-30]%	[10-20]%
Linde + BOC	[60-70]%	[80-90]%	[40-50]%	[40-50]%	[40-50]%
Air Liquide	[10-20]%	[0-10]%	[20-30]%	[10-20]%	[0-10]%
Air Prod.	[<5]%	[<5]%	[0-10]%	[0-10]%	[0-10]%
Messer	[10-20]%	[0-10]%	[20-30]%	[10-20]%	[20-30]%
Praxair	0%	0%	0%	0%	0%
ZAP	0%	0%	0%	[20-30]%	[10-20]%
ACP	0%	0%	0%	0%	[10-20]%
Others	[<5]%	[<5]%	[<5]%	0%	[<5]%

89. As the data above shows, BOC has a strong position in Poland, achieved following the acquisition of parts of the privatized PolGaz. As it will be indicated further below,

BOC has also a very strong position in the UK. This situation is a consequence of the strategy followed by BOC in the EEA by which it has concentrated, with the exception of Poland, on its home countries.

90. After the merger, Linde's current leading position in oxygen, nitrogen, argon and CO₂ and the strong position in hydrogen will be significantly enhanced by the addition of the BOC activities. Linde would achieve the highest market shares in all the markets. In particular with respect to oxygen and nitrogen, the high market shares would indicate that after the merger Linde may enjoy a single dominant position for these markets.
91. If medical gases are assessed separately, the transaction would also give rise to significant overlaps with respect to bulk oxygen. After the merger, Linde would have a market share of [80-90]% ([50-60]% from Linde and [30-40]% from BOC). The only two alternatives would be Air Liquide ([0-10]%) and Messer ([10-20]%). The transaction therefore eliminates the most important alternative competitor to Linde in Poland.

Production capacities

92. Linde has bulk production for oxygen, nitrogen and argon while BOC also produces CO₂.
93. Linde has [...] bulk production plants in Poland: one plant supplying both the tonnage and the bulk markets (a piggy-back plant) and [...] small ASUs which supply [...].
94. BOC's presence is, however, more significant in terms of production plants. It has two piggy-back plants at Kedzierzyn and Czestochowa, one stand-alone plant dedicated to the bulk market at Oswiecim, and [...] small ASUs located in [...], which supply [...]. BOC's facilities for the production of CO₂ are located in Janikowo.
95. The table below shows the market size (in tons per day) and an estimate of the bulk production capacities for each producer. This capacity data excludes the small ASUs as they are dedicated to single customers and therefore do not exert the same competitive constrain on the market as the piggy-back or the stand-alone plants.

Capacities in Poland (tpd) - 2005

Gas Producer	Oxygen		Nitrogen		Argon	
	tpd	%	tpd	%	tpd	%
Linde	[...]	[10-20]%	[...]	[10-20]%	[...]	[0-10]%
BOC	[...]	[50-60]%	[...]	[60-70]%	[...]	[50-60]%
Linde + BOC	[...]	[60-70]%	[...]	[70-80]%	[...]	[60-70]%
Air Liquide	[...]	[30-40]%	[...]	[20-30]%	[...]	30-40]%
Air Products	0	0%	0	0%	0	0%
Messer	0	0%	0	0%	0	0%
Total (tpd)	[...]		[...]		[...]	

96. As it is clear from the data above, post-transaction the oxygen, nitrogen and argon markets will not only be highly concentrated in terms of sales, but also in terms of production capacity, for which the combined entity will hold more than 60% in each relevant market.
97. Moreover, it appears that, with the exception of BOC, the rest of the players in the Polish market are either highly capacity constrained or dependent on competitors' production (via swap agreements or other supply agreements) to serve their customers. The parties themselves recognise³¹ [...].
98. The dependence of other competitor's on BOC can be observed by analysing the purchases made from BOC's plants. The table below shows, for each of the three gases the percentage of each competitor's sales dependent on supplies from BOC.

Estimate of the % of purchases from BOC made by each market participant with respect to their total sales in Poland in 2005			
Gas Producer	Oxygen	Nitrogen	Argon
Messer	[...]%	[...]%	[...]%
Air Products	[...]%	[...]%	[...]%
Linde	[...]%	[...]%	[...]%

99. In essence, the Polish oxygen, nitrogen and argon bulk markets are characterised by few producers with considerable capacity limitations (except for BOC). Thus, some competitors have to rely on imports from neighbouring countries [...] or on purchases from other competitors, in particular from BOC.
100. In these circumstances, the acquisition of BOC would confer Linde the ability to foreclose those current competitors in the oxygen, nitrogen and argon markets who are currently highly dependent on BOC to source their gas needs and thereby it would likely achieve a single dominant position in these markets.

Hydrogen and CO2

101. With respect to CO₂ and hydrogen, the market positions after the transaction will also be fairly high. Although in these markets there is no overlap in terms of production capacities as only BOC has facilities for the production of CO₂ (Janikowo, with a capacity of [...]), this has not prevented the parties from achieving strong positions on the Polish market. Linde covers its hydrogen and CO₂ needs either through imports from its own facilities in the surrounding countries or from third parties within Poland³². [...].

Results of the market investigation

102. The market investigation has given indications that post transaction, the competitive situation in the Polish market is likely to be significantly worsened. In particular, some customers have indicated that the limited number of suppliers that will remain after the

³¹ Form CO, page 163.

³² Form CO page 73 and Annexes 6.1.1.3.2.2-A and 6.1.2.2-A4.

operation is likely to affect the negotiation of prices to the detriment of customers, and that price increases are likely to happen³³.

103. The above mentioned concerns have also been expressed by the competitors³⁴. The strong positions that Linde will have in the industrial gases will significantly affect competition and will make the expansion of the current competitors more difficult. Furthermore, given that Linde would become more independent in terms of availability of industrial gases, it will no longer swap or supply agreements with other players. Consequently smaller competitors will have more difficulties to get access to industrial gases and to expand their geographical coverage, becoming therefore less strong competitors.

Conclusion

104. In the light of the above, the Commission considers that, given the high market shares that Linde would get after the acquisition of BOC in Poland and the especially strong position that Linde will enjoy in terms of production capacities, the transaction is likely to create competition concerns with respect to the oxygen, nitrogen and argon markets and raises serious doubts as to its compatibility with the common market in Poland.

b. The UK

Market structure

105. The following table below summarizes, for 2005, the market shares of the parties and of the main competitors in the UK for the relevant markets oxygen, nitrogen, argon (including argon mixtures), hydrogen and CO₂.

Bulk industrial gases: market shares for 2005 in the UK

Products	Oxygen	Nitrogen	Argon	Hydrogen	CO₂
Market size (M €)	[...]	[...]	[...]	[...]	[...]
Linde	[<5]%	[<5]%	[<5]%	[20-30]%	[<5]%
BOC	[60-70]%	[60-70]%	[70-80]%	[30-40]%	[20-30]%
Linde + BOC	[60-70]%	[60-70]%	[70-80]%	[60-70]%	[20-30]%
Air Liquide	[0-10]%	[0-10]%	[<5]%	[0-10]%	[30-40]%
Air Products	[30-40]%	[30-40]%	[20-30]%	[30-40]%	[<5]%
Messer	0%	0%	0%	0%	0%
Praxair	0%	0%	0%	0%	0%
Yara	0%	0%	0%	0%	[40-50]%
Others	0%	0%	0%	0%	[<5]%

³³ Questionnaire to customers – Industrial gases sent on 10th April 2006, questions 80 and 81. Five out of twelve customers raised competition concerns.

³⁴ Questionnaire to competitors – Industrial gases sent on 7th April 2006, questions 72, 104 and 105. Four competitors raised concerns. For other three, the questions were not applicable.

106. With respect to oxygen, nitrogen and argon, the situation in the UK is quite different compared to Poland. In the UK, BOC has already significant high market positions for these three markets, well above 50%. After the merger, the initial modest position of Linde for nitrogen and argon will therefore be strongly reinforced. Regarding hydrogen, both Linde and BOC have strong market positions and the combined share will be above 60% after the merger.
107. If medical gases are assessed separately, the transaction does not give rise to combination of market shares as Linde is not currently active in these markets. However, the position of BOC is very strong, with a market share of [80-90]%, the only alternative competitor being Air Products with the remaining [20-30]%

Production facilities

108. BOC's strong position in the UK mirrors its position at the level of production facilities. BOC has five piggy-back plants (located at Scunthorpe, Middlesbrough, Margam, Brinsworth and Fawley), two stand-alone merchant plants for the bulk markets (located at Thame and Motherwell) and a large number of small ASUs.
109. BOC sources CO₂ from [...]. It sources hydrogen from its three production plants (Dalry, St Helens and Margam) and from [...].
110. Linde has neither piggy-back nor stand-alone merchant plants, and its presence in the UK is therefore rather based on [...] small ASUs, sourcing the rest of its needs of the various gases from third parties and from companies within the Linde group. Thus, Linde sources liquid oxygen and liquid nitrogen from [...] in the UK.
111. With regard to the liquid argon activities, Linde sources liquid argon from a Linde Group's company in [Business Secret: source of argon outside the UK and description of the distribution process in the UK]. However, this situation has not prevented Linde from entering the UK market becoming a real alternative to many customers.
112. With regard to bulk hydrogen, Linde has facilities in the UK at [Business Secret: source of hydrogen and description of the production process].

Results of the market investigation

113. The market investigation has shown concerns because of the reduction in the number of players and the elimination of an important source of competition, in particular with respect to hydrogen, leading to a drastic reduction of competition in prices³⁵.
114. Moreover, it has also been pointed out that, given the reduction in the number of potential gas suppliers and the significant strong position of Linde/BOC, the combined entity may drive other competitors out of the UK market³⁶.

³⁵ Questionnaire to competitors – Industrial gases sent on 7th April 2006, questions 72, 104 and 105. Out of seven competitors, four raised concerns and for the rest the questions were not applicable. Questionnaire to customers – Industrial gases sent on 10th April 2006, questions 46 to 48, 53 to 55, 80 and 81.

³⁶ Questionnaire to customers – Industrial gases sent on 10th April 2006, questions 80 and 81. Competitive concern raised by [...].

115. Also the main competitors have raised concerns with respect to the transaction³⁷. These concerns relate not only to the existing high market shares in oxygen, nitrogen and argon currently held by BOC, but in particular to the new strong position gained in the hydrogen market.

Conclusion

116. With respect to oxygen, nitrogen and argon, Linde’s position is modest. However, the removal of this small market constraint, which is potentially a future stronger competitor (as it has happened with respect to argon, where Linde has been able to gain [0-10]% market share without having a local presence in terms of production), would reinforce the present very strong market position enjoyed by BOC in these markets..

117. With respect to the hydrogen market only two players will remain, giving Linde the leading position with a market share above 60%, followed by Air Product with about [30-40]%. The very high market share gained by Linde through the elimination of one of the main sources of competition in the market (market share of [30-40]%) is likely to give rise to anticompetitive effects derived from the unilateral behaviour of Linde resulting in price increases.

118. In the light of the above, the Commission considers that the transaction is likely to create competition concerns with respect to the bulk markets for oxygen, nitrogen, argon and hydrogen and raises serious doubts as to its compatibility with the common market in the UK.

1.2 Cylinder markets

a. Poland

Market structure

119. As in the case of the bulk industrial gases markets, the transaction leads to important overlaps (except for nitrous oxide) in the cylinders gases markets in Poland. The market position of the parties and of the main competitors are shown below:

Cylinder industrial gases: market shares for 2005 in Poland

Products	Oxygen	Nitrogen	Argon	Hydrogen	CO ₂	Acetylene
Market size (M€)	[...]	[...]	[...]	[...]	[...]	[...]
Linde	[40-50]%	[50-60]%	[30-40]%	[20-30]%	[50-60]%	[40-50]%
BOC	[20-30]%	[10-20]%	[20-30]%	[40-50]%	[20-30]%	[30-40]%
Linde + BOC	[60-70]%	[60-70]%	[60-70]%	[60-70]%	[70-80]%	[70-80]%
Air Liquide	[<5]%	[<5]%	[<5]%	[0-10]%	[<5]%	[<5]%
Air Prod.	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[<5]%	[<5]%
Messer	[10-20]%	[10-20]%	[10-20]%	[20-30]%	[10-20]%	[10-20]%
ZA Chorz.	0%	0%	0%	0%	0%	0%

³⁷ Questionnaire to competitors – Industrial gases sent on 7th April 2006, questions 72, 104 and 105. Out of seven competitors, four raised concerns and for the rest the questions were not applicable.

Others	[0-10]%	[10-20]%	[10-20]%	[0-10]%	[0-10]%	[0-10]%
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120. The combined entity will have a leading position with market shares above 70% for CO₂ and acetylene, and above 60% for oxygen, nitrogen, argon and hydrogen. With respect to nitrous oxide the transaction does not give rise to a significant change in the market structure.
121. The main competitor in these markets is Messer with market shares ranging between [10-20]% and [20-30]% in the different gases.
122. The high combined market shares that Linde would achieve remain also high if gases for medical applications are assessed separately. The table below indicates the market shares of the various competitors in these markets:

Medical gases in cylinders - Poland 2005

Products	Medical Oxygen	Medical Nitrous Oxide
Market size (M€)	[...]	[...]
Linde	[40-50]%	[40-50]%
BOC	[30-40]%	[0-10]%
Linde + BOC	[70-80]%	[40-50]%
Air Liquide	[0-10]%	[0-10]%
Messer	[10-20]%	[10-20]%
ZA Chorz.	[<5]%	[40-50]%

Filling facilities

123. Linde has [...] filling plants spread all around Poland. Nitrous oxide and hydrogen are filled in [...].
124. BOC has [...] filling plants located in [...]. It has in addition [...] acetylene production plants. As in Linde's case, hydrogen is filled in [...].
125. In terms of cylinder filling capacities, neither Linde nor BOC appear to be capacity constrained. [...] In the case of BOC, it is running at a capacity utilization rate of around [...] % in [...] of the [...] plants [...] and at around [...] in [...]. On average, its capacity utilization rate is around [...] %. With respect to Linde, and although the situation can be different depending on the type of gas and location, [...] with utilization rates ranging from [...] % to [...] % with only higher values for [...] in [...] and for [...] in [...]. Given the vertical relationships between the bulk and the cylinder markets (see below), this situation [...] would therefore facilitate Linde's ability to serve additional demand in the cylinder markets in case of foreclosure of its competitors in the bulk market.

Results of the market investigation

126. The market investigation has revealed concerns regarding the transaction³⁸. The reduced number of players and the significantly high market shares that the merged entity will achieve will lead, according to some respondents, to an increased likelihood of price increases.
127. Also competitors have raised concerns with respect to the transaction and the high market shares that Linde will gain³⁹. In particular, some concerns indicate that, given the large geographic coverage that Linde will get in Poland as a result of the combination of the two cylinder distribution networks, it will be more difficult for the rest of the players to compete efficiently.

Vertical relationships between the bulk and the cylinders markets

128. The situation in the cylinders' market would in addition be aggravated by the strength that Linde would have post-transaction in the upstream markets. As indicated above in the bulk section, there is a risk of creation of single dominance in the bulk oxygen and nitrogen markets, together with very high market positions for argon and hydrogen. Given the production capacity limitations that the Polish bulk markets appear to have and hence the other competitors' dependence on Linde, the latter would have the ability to leverage its dominant positions in the bulk markets to become even stronger in the cylinders' markets.

Conclusion

129. In the light of the above, the Commission considers that the proposed transaction raises serious doubts as to its compatibility with the common market in Poland with respect to oxygen, nitrogen, argon, hydrogen, CO₂ and acetylene cylinder markets.

b. The UK

Market structure

130. The main impact of the transaction regarding cylinder gases distribution in the UK would be with respect to oxygen, hydrogen and nitrous oxide, and to a limited extent also for argon. The table below shows a summary of the market shares of the main players in the UK market:

Cylinder industrial gases: market shares for 2005 in the UK

Products	Oxygen	Nitrogen	Argon	Hydrogen	CO₂	Acetylene
Market size (M€)	[...]	[...]	[...]	[...]	[...]	[...]
Linde	[10-20]%	0%	[<5]%	[0-10]%	[0-10]%	[<5]%
BOC	[70-80]%	[50-60]%	[50-60]%	[50-60]%	[40-50]%	[60-70]%
Linde + BOC	[80-90]%	[50-60]%	[60-70]%	[60-70]%	[40-50]%	[70-80]%
Air Liquide	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[10-20]%	[<5]%

³⁸ Questionnaire to customers – Industrial gases sent on 10th April 2006, questions 61 to 65, 80 and 81. Four out of ten respondents, for which the questions were applicable, raised concerns.

³⁹ Questionnaire to competitors – Industrial gases sent on 7th April 2006, questions 87, 104 and 105. Out of three respondents for which the questions were applicable, all raised concerns.

Air Products	[10-20]%	[20-30]%	[20-30]%	[20-30]%	[10-20]%	[20-30]%
Energas	0%	[0-10]%	0%	0%	[0-10]%	0%
Cryo-services	0%	0%	0%	0%	[10-20]%	0%
Others	[<5]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[<5]%

131. While the impact of the transaction on nitrogen and CO₂ will be negligible, Linde's small positions in argon and acetylene and to a larger extent in oxygen will add to the already significantly high market shares of BOC in these markets, with combined market shares of [60-70]% (argon), [70-80]% (acetylene) and [80-90]% (oxygen). The main change of the transaction in terms of addition of market shares would be on the hydrogen market ([0-10%]+[50-60%]).
132. With the exception of the CO₂ market, in the rest of the markets practically only one significant competitor would remain: Air Products. The third player would be Air Liquide with modest market shares of around [0-10%].
133. The high combined market shares that Linde would achieve for gases for industrial applications remain also high if gases for medical applications are assessed separately. The table below indicates the market shares of the various competitors in these markets:

Medical gases in cylinders UK - 2005

Products	Medical Oxygen	Medical Nitrous Oxide	Entonox (50% O ₂ + 50% N ₂ O)	Heliox (Helium + O ₂ mixtures)
Market size (M€)	[...]	[...]	[...]	[...]
Linde	[<5]%	[10-20]%	[10-20]%	[0-10]%
BOC	[70-80]%	[60-70]%	[60-70]%	[90-100]%
Linde + BOC	[80-90]%	[70-80]%	[80-90]%	[90-100]%
Air Products	[10-20]%	[20-30]%	[10-20]%	0%
Others	[0-10]%	[<5]%	[<5]%	0%

Filling facilities

134. In the UK, Linde has [...] filling stations for cylinder standard industrial gases located at [...]. It has also [...] filling station for specialty gases at [...]. Linde covers the whole of the UK from these filling stations (which also serve as depots) and from additional depots [...] and facilities [...].
135. As it is the case in Poland, Linde's filling capacities in the UK are [Business Secrets: description of the lack of filling capacity constraints in the UK].
136. BOC's presence is far much stronger and it owns [...] filling plants with a very large geographic coverage. In terms of capacity utilisation, BOC appears to have higher utilisation rates of [...] for all its filling plants. However, as in the case of Poland, and in particular with respect to the new Linde's strong market position in the bulk hydrogen market, the situation of [Business Secrets: description of Linde's lack of capacity constraints] may facilitate the leverage of its position upstream ([60-70%]),

acting as a deterrent for the expansion of smaller players in the cylinder market and therefore reinforcing its already strong position in this market ([60-70]%).

Results of the market investigation

137. The market investigation has shown concerns expressed by customers because of the reduction in the number of players which would render the UK into a very concentrated market for most of the industrial gases with adverse effects on competition. Competition between Linde and BOC would disappear and therefore, given the new market structure, prices would be likely to rise.
138. Competitors have also claimed that, as in the case of Poland, the enlarged cylinder's distribution network together with the high market positions that Linde will have in many markets would prevent the rest of the players to compete efficiently.

Conclusion

139. In the light of the high market shares that Linde would have post-transaction and the significant structural change that it would bring about, Linde would be post-transaction in a position to behave independently of its competitors and customers and to increase prices in the markets for oxygen, argon, hydrogen, acetylene and nitrous oxide distributed in cylinders above the competitive level absent the merger. Therefore the Commission considers that the transaction raises serious doubts as to its compatibility with the common market in the UK.

1.3 Industrial gases on EEA-level (tonnage, bulk, cylinders)

140. In addition to the concerns set out above, the Commission is of the view that the merger would be likely to lead to coordinated effects on the overall industrial gas market in the EEA through a geographic division of the industrial gas markets between Air Liquide and Linde and through the creation of structural links between the two companies.
141. On the bulk and cylinder markets, the transaction will to a large extent complete the division of the EEA between Linde and Air Liquide, with one of them having a dominant or leading position in virtually every EEA country. With the acquisition of BOC's strong position in Poland, Linde will cover the whole of Eastern Europe and will lead this whole area without any strong competitor within this region, thereby mirroring the strong position and coverage of Air Liquide in the West. The same holds true for the tonnage market in which the two leading players have symmetric market positions both in terms of market shares⁴⁰ and geographic positioning.
142. Several market participants indeed raised the concern, that the European market would be divided between the two leading players. Post-merger Linde would become an unequivocal leader in all North-Eastern European countries, whereas Air Liquide would be far the strongest in Western Europe⁴¹. Moreover the two companies would

⁴⁰ Both Air Liquide and the combined entity would each reach market shares close to 40% on the tonnage markets in the EEA.

⁴¹ Linde/BOC dominant in Poland ([40-50]%-[80-90]%), Czech Republic ([60-70]%-[70-80]%), Slovakia ([30-40]%-[50-60]%), Hungary ([30-40]%-[60-70]%), Baltic States ([40-50]%-[90-100]%), Norway ([80-90]%-[90-100]0%), Sweden ([60-70]%-[80-90]%). Air Liquide dominant in Belgium ([30-40]%-[40-

keep small market shares in each other's respective territories which makes an effective retaliation more credible. As a result of these symmetric positions both companies would thus be likely to have a common incentive not to compete effectively, by allocating geographic markets through the adoption of a *chacun chez soi* approach in Europe.⁴² As already underlined in the Air Liquide/Messer case, evidence of past collusion between these firms on the bulk and cylinder markets constitutes an important indication in this respect.⁴³

143. The markets show a high degree of transparency which allows for a coordinated behaviour and in particular for the monitoring of any deviations. As already shown in the Air Liquide/Messer case, the bulk and cylinder markets are transparent insofar as it is fairly easy for suppliers to know the identity of each others' main customers. It would therefore be easy for either Air Liquide or Linde to monitor whether one of them enters or expands into each others' respective territories. The same holds true for the tonnage market, where the bidders usually know well each others' identity and can easily find out about the winners in a request for quotation⁴⁴.
144. Against that background, the Commission is of the view that coordinated effects would become likely through the merger as a result of the creation of significant structural links between Linde and Air Liquide. BOC currently operates a number of joint ventures in Asia together with Air Liquide. After the merger, Linde would replace BOC in these joint ventures, which represent an important part of their parent companies' worldwide sales (up to [0-20]%).
145. First, the structural links between Air Liquide and the new Linde/BOC entity in Asia resulting from the transaction will increase considerably the transparency between the two European industrial gas suppliers as partners in the joint ventures, in particular in view of the implications of the head offices in the decision process, the frequency of the contacts between executives and the types of information that is exchanged. As the joint venture agreements show, group executives and senior managers have to meet at several occasions, in particular in the board meetings of [...] joint venture. They moreover have joint [...]. In addition, senior commercial and marketing people, finance managers and technical experts from the two groups have to meet with joint venture team members to [...]. Strategic initiatives are often common.⁴⁵
146. Second, apart from helping to align incentives⁴⁶, the creation of structural links between the duopolists supports credible retaliation mechanisms that could be activated, in particular in view of the implication of Air Liquide and the new Linde/BOC entity head offices in the management of the joint ventures. In the case at hand, one of the credible retaliation mechanisms would be the threat of future

50]%), France ([40-50]%-[80-90]%), Italy ([40-50]%-[60-70]%), Spain ([0-10]%-[40-50]%), Portugal ([30-40]%-[30-40]%). The pattern of these bulk market shares is closely followed in cylinder markets.

42 See Horizontal Merger Guidelines, para. 46.

43 See Commission Decision of 24 July 2002 relating to a proceeding pursuant to Article 81 of the EC Treaty, Case COMP/E-3/36.700 – Industrial and medical gases, OJ L4.2003, L84, p. 1.

44 Questionnaire to competitors, question 55, all competitors confirmed.

45 Major investments are reviewed by the two partners before they are submitted to the board with regard [...].

46 See Horizontal merger guidelines, para. 48.

retaliations on the functioning on the Asian joint ventures, which as already emphasized, are of high strategic importance for industrial gas suppliers. In particular, each party could refuse to reach any agreement on strategic decisions for the business in Asia should one of them depart from the terms of coordination. Indeed, the Commission has also found previously that the effective retaliation need not necessarily take place in the same market as the deviation⁴⁷.

147. Finally, competitors already active in the EEA such as Air Products and Praxair would not have the ability to disrupt significantly the stability of the coordinated duopoly. None of them has a similar geographic coverage and they would remain to an appreciable extent from both members of the duopoly since when contracting with new customers where they are not present, they would also need to conclude swap and supply agreements either with Air Liquide or with Linde in order to extend their geographic reach and secure back-up for these new supplies.
148. It is not expected either that industrial gas customers would be in a position to jeopardize the competitive outcome of coordination. Customers are highly reluctant to switch supplier at the end of the contract, although they will often seek competitive offers before renewal. Incumbency most frequently confers an advantage through the relationship with the customer and an understanding of his process and related gas equipment. Moreover, demand is dispersed which excludes any significant countervailing power from the customers' side.
149. As a result, in the absence of remedies aimed at removing both the overlaps in the UK and in Poland as well as preventing substantial structural links between Air Liquide and Linde the operation would raise serious doubts as to its compatibility with the common market.

2. Helium

150. The notified transaction leads to horizontally affected markets on wholesale and on retail level, as well as to vertically affected markets on these two levels. The merger raises serious doubts with respect to the global helium wholesale market as well as with respect to the helium retail markets in Poland and in the UK.

2.1 Helium wholesale

Market shares

151. Traditionally, Air Products, Praxair and BOC have had relatively symmetric leading positions on the helium wholesale markets worldwide, based on their historic access to US sources (which at one time were the only sources available in the Western world). All three companies have worldwide activities in the helium wholesale business and supply retailers in Europe, North America and Asia/Pacific.
152. This market structure of three companies remained largely unchanged until the mid-1980s, when Air Liquide entered into the wholesale business by gaining access to helium sources. Air Liquide is now active in the helium business on a worldwide basis, with access to sources in the Algeria, Qatar, Russia and the US, and with wholesale

⁴⁷ See Horizontal merger guidelines, para. 55; see also Case COMP/M.1673 – VEBA/VIAG point 226 and COMP/M.2567 Nordbanken/Postgirot

activities in the US, the EEA and Asia. Linde has only recently entered into the production of helium with the acquisition of its share in the joint venture with Sonatrach in Algeria. Currently, it has an only minor position in this market.

153. The positions of the helium wholesale companies are reflected in the following market shares which were calculated on the basis of sales figures provided by the market participants. Depending on whether the volumes traded between the wholesalers are included or not, the market participants have slightly different positions:

Worldwide helium wholesale market shares - 2005

	Linde	BOC	combined	Air Products	Praxair	Air Liquide
Sales to helium retailers	[<5]%	[30-40]%	[30-40]%	[25-35]%	[25-35]%	[0-10]%
Sales to helium retailers and to other wholesalers	[<5]%	[40-50]%	[40-50]%	[25-35]%	[20-30]%	[0-10]%

154. The parties submitted market shares for the helium wholesale market which were based on the approach to qualify all those sales as wholesale sales that are made before the final sale to the end-customer. This would, according to the parties, also include independent producers, such as Cryor and Krio, into the circle of wholesalers since they sell to vertically integrated industrial gas companies who are also active as retailers.
155. This view does not reflect the real market situation. The market shows complex supply relationships between the different companies active in the helium business who are vertically integrated to differing extents. This makes it difficult to draw the lines between the market levels. The market investigation has, however, shown that only those companies who have access to the helium sources (by long-term agreement with the independent producers or by ownership of sources) and who transport helium in large quantities and over long distances to the transfill centres of the retailers can be regarded as wholesalers.⁴⁸ Only BOC, Air Products, Air Liquide, Praxair and to a lesser extent Linde are currently able to qualify as wholesalers. They are the only companies who are perceived as wholesalers by the market.
156. There are some independent retailers who own a number of helium containers necessary to transport wholesale helium. These retailers, however, generally do not have direct access to helium sources and mostly give these containers to their supplying wholesaler for their own supplies. They consequently do not act as wholesalers themselves. It can moreover not be excluded that in a few instances direct sales between independent producers and independent retailers occur. The parties have reported one such case. However, this seems to be exceptional and only relates to very small quantities in total.

Capacity shares

⁴⁸ Questionnaire to competitors 1 – Industrial gases sent on 7 April 2006, question 91. Being asked for the main competitors in helium wholesale, all respondents indicate some or all of the five following companies: Praxair, Air Products, BOC, Air Liquide, Linde. Only in one instance, Krio is mentioned which has marginal sales to end-customers. One respondent mentions SOL and SIAD who, however, do not have any sales other than to end-customers.

157. In order to become active on the helium wholesale market access to helium sources is crucial, either by long-term contracts with the producers, by having shares in joint ventures with the helium producers or by having own helium production sites.

158. In the market investigation, some market participants referred to “access to helium sources” in order to estimate the parties’ and their competitors’ market position.⁴⁹ The parties have provided data concerning the wholesalers’ access to helium sources which broadly comply with the results of the market investigation. The following capacity shares (shares of the wholesalers in access to sources) can be derived:

Worldwide helium capacity shares - 2005

	Linde	BOC	combined	Air Products	Praxair	Air Liquide
Access to helium	[<5]%	[20-30]%	[20-30]%	[30-40]%	[20-30]%	[10-20]%

159. These capacity shares take into account the currently available capacity.⁵⁰ The capacity that will in the future be provided by the joint venture between Linde and Sonatrach in Skikda, Algeria is not considered. If Skikda’s full capacity was taken into account, Linde’s capacity share would increase from [<5]% to [0-10]%. The worldwide capacity shares (calculated on the basis of the currently existing long-term agreements) would be the following:

Worldwide helium capacity shares (forecast)

	Linde	BOC	combined	Air Products	Praxair	Air Liquide
Access to helium	[0-10]%	[20-30]%	[30-40]%	[20-30]%	[20-30]%	[10-20]%

Non-coordinated effects of the transaction

160. Linde has recently acquired an own access to helium sources both by long-term agreements and more importantly by its own significant production in the joint venture with Sonatrach. It has thereby entered the market for helium wholesale supply and would have exerted considerable competitive pressure in the next years with the new quantities from the Skikda source. It can be expected, that Linde’s incentives to compete on this market will decrease after the merger. This raises serious doubts as to the compatibility of the merger with the common market.

Linde has aggressively competed before the merger

161. Linde has only recently entered into the production of helium with its participation in the joint venture with Sonatrach for the production and marketing of helium produced at the source in Skikda, Algeria. The joint venture agreements with Sonatrach were entered into in 2002. However, due to an explosion which destroyed [...] of the

⁴⁹ Questionnaire to competitors 1 – Industrial gases sent on 7 April 2006, question 103, in which 4 out of 13 respondents referred to sourcing.

⁵⁰ The new Qatar source currently only operates at [...]% of its capacity since it is in a start-up phase. [...]The Qatar source was fully taken into account by the parties, which reflects that the capacity is already existent and will become fully operational soon.

production facility, the start of the plant was delayed. The production facility at Skikda is currently expected to start production with approximately [...] % of its capacity [...]. According to the parties, the restoration of the full capacity might take another [...]. The planned total capacity of the production facility at Skikda in the long run is [10-20] million m³.

162. During the market investigation several market participants indicated that Linde has recently competed aggressively in the market in order to sell the quantities from its long-term contracts as well as those which would be generated from the Skikda source. It was also indicated that this had caused significant price pressure. Linde's contracts with Sonatrach foresee that [...]. In both cases, new capacities would become available on the wholesale market.
163. The impact of Skikda would be significant against the background that total demand in the EEA is estimated at approximately 35 million m³ and worldwide at approximately 160 million m³ whereas Skikda has a total capacity of [10-20] million m³. Internal documents provided by Linde show that Linde had planned to achieve [...].⁵¹ Market participants have indicated that they had expected prices to fall due to Linde's activities and its entry into the wholesale market. Also according to internal documents of BOC, BOC expected [...].⁵²

Linde's incentives to compete will change due to the transaction

164. It is likely that after the transaction, Linde will not compete to the same extent as it would have done absent the merger.
165. After the transaction, Linde will not anymore have the role of a newcomer who has to gain market shares from the large established wholesalers in order to achieve an own significant position. Linde acquires BOC's access to sources and wholesale business in the market. It will therefore have a strong and independent position on the wholesale level as well as with respect to access to sources. Its previous need for independence and its strategy to develop an own position on the wholesale market will not anymore give rise to the incentive to aggressively compete.
166. The market structure after the merger is therefore likely to result in less intensive competition, higher prices and a smaller total quantity if compared to a market structure with a newcomer who is ready to accept a lower price in order to enter the market. Generally, a price decrease resulting from an increase in total supply often does not affect the newcomer in the same way as the large incumbents. Any company bringing new quantities into the market has to take into account the losses that occur due to the resulting decrease in price affecting not only the new sales made on the basis of the additional quantities but also (maybe after some delay) the already existing supply relationships. With a higher existing market share, this trade-off is likely to occur at a smaller additional quantity than with a lower market share. This is all the more true against the background that the newcomer might be ready to "invest" into lower margins in order to establish a stronger market position.

⁵¹ See Linde: [...]

⁵² See for example BOC: [...]

167. With the acquisition of BOC, Linde will have a much higher market share on the wholesale level ([30-40]% instead of [<5]%) and will also gain new retail businesses. The total global sales in the helium market will increase from previously roundabout [...] million Euro to [...] million Euro (and from [...] million m³ to approximately [...] million m³). Linde will therefore after the merger be much more affected by a price decrease than in its newcomer role on the wholesale market where the price decrease would have been an investment in order to enter the market and gain market shares. This will likely lead to an incentive to limit the expansionary effect which will result from the Skikda-source as well as from any other future expansion in access to helium.

Linde will gain the possibility to reduce supply

168. After the merger, Linde will not only have an incentive but also a direct possibility to control its supply and influence it in the way described above. The parties have argued that it is generally impossible to “turn off the tap” in helium production. Since helium is a by-product of the production of natural gas / LNG, it is always “automatically” produced when natural gas is generated.

169. This technical connection between the helium and the natural gas production does, however, not mean that the economic supply would be equally inelastic. It is true that the producers of helium are often bound by long-term take-or-pay agreements or investments which will limit their possibility to reduce the purchased/produced output. However, at least the helium wholesalers with an own production facility may control their output. This is in particular possible if the production facility is connected to the BLM pipeline and storage system, where helium producers are in essence refineries producing pure helium from crude helium stored in the BLM system. Moreover, crude helium may be stored and its marketing can thereby at least to some extent be shifted over time.

170. Storage of helium is very difficult due to its high volatility. As mentioned above, there is only one significant storage facility in the world which provides for a possibility to store crude helium: the BLM Pipeline and Storage System (Cliffside-System). Linde indicated to in principle be able to access the storage facilities at the Cliffside Field. However, the parties explained that since Linde does not have any own helium production facilities at the BLM pipeline, it does not have any incentive to store large amounts of crude helium. After the merger, Linde will own the BOC plant connected to this pipeline and will therefore have a direct possibility and incentive to use this storage facility.

171. The parties have moreover explained that helium is supplied to the helium wholesalers mostly in long-term take-or-pay agreements which do not allow for a reduction of supply in an economic way. Also in the joint ventures, supplies are often linked to take-or-pay obligations. Moreover, the helium wholesalers are “bound” by their investments into own production facilities which need to be amortized – an aim which would be impeded by running the facilities at lower capacities.

172. However, this does not mean that no reduction of supply is possible. BOC is able to reduce or increase the production of its own plant at Otis, Kansas which is connected to the BLM gas field. The parties have explained that [...]

173. It can therefore be assumed, that in a situation of perceived oversupply, the production of the Otis plant can be stored in the BLM pipeline system or be reduced to some extent without incurring large losses. This is probably due to the fact that the plant is

already operating since 40 years and will be largely depreciated even though some investments into the plant were made in the recent years.

New entry is difficult

174. It can therefore be expected that after the merger, Linde will not as aggressively put new quantities on the market as absent the merger and that the resulting pressure on prices will be removed. This expectation is supported by the fact that barriers to entry into the wholesale market are high and new entry is very difficult.
175. Developing an own source is difficult for a small non-integrated retailer due to the large investments (up to approx. US-\$ 100 million for a helium liquefier) and a lead time of several years. New sources are developed only rarely. There are not many natural gas fields in the world which are eligible for the production of helium. The decision to produce helium from these fields depends on the often state-owned natural gas producers who are not always interested in this business since helium is only a marginal portion of their total production and correspondingly of their total turnover.
176. Producers of helium usually enter with their customers into long-term contracts which have durations of up to 20 years. This strongly limits any newcomer's chance to achieve direct access to the existing sources. These contracts moreover often cover quantities which are too large for smaller players. Even large industrial gas companies have indicated in the market investigation that it might become difficult to enter into new contracts after the merger because Linde/BOC will purchase large quantities and might thereby have better access to the producers.
177. A fleet of cryogenic containers for helium (at a price of approximately [up to US-\$ 800,000] per container) can only be established in the medium- to long-term. The only well-established commercial supplier of large cryogenic helium containers worldwide is Gardner Cryogenics which is a wholly-owned Air Products subsidiary. There are therefore limited production capacities which may sometimes result in significant lead times of up to one year.
178. The past has shown that the market structure has remained stable throughout many years. Historically, only three players were active in the market for a long time. Only in the mid-1980s Air Liquide entered. (Messer was a very small player for some time.) Linde would therefore have been the first significant new entrant after Air Liquide in many years.

Conclusion on non-coordinated effects

179. The removal of Linde as a newcomer would, therefore, with high probability lead to non-coordinated effects and would have a dampening effect on the price decrease which was expected absent the merger. The transaction therefore raises serious doubts in the helium wholesale market.

Coordinated effects of the transaction

180. Furthermore, the Commission has serious doubts that the proposed merger may even lead to a weakening of competitive pressure as a result of coordinated effects. These coordinated effects would result in a smaller total quantity and prices on the market higher than if they were dictated only by the individual, non-coordinated, profit-maximising behaviour of each individual competitor. The helium wholesale market is prone to coordination. The removal of Linde as an aggressive “maverick” increases the risk of tacit collusion in this market and thereby raises serious doubts as to the compatibility of the merger with the common market.

The conditions on the helium wholesale market make coordination likely

181. The helium wholesale market shows characteristics which make coordination likely. Helium is a homogeneous good. The market structure on the wholesale market is very tight with four established players, three of them having combined more than 80% of the available access to sources. This market structure has shown a high stability in the past with the major change being Air Liquide’s entry in the mid 1980’s and has largely remained stable since then.

182. It can be assumed, that at least the three large global players would have an interest in reducing supply below the level of their independent profit maximizing quantities in order to jointly profit from the resulting price increase. The three leading helium wholesalers are likely to have very comparable incentives due to their equal vertical integration, extent of access to sources and market positions. Due to their similar market shares, they would profit from such a strategy to a similar extent. Their market positions are not only similar on the capacity and wholesale level, but also in their worldwide sales to end customers (without independent retailers: BOC: [20-30]%, Air Products: [20–30]%, Praxair: [20–30]%).

183. These similar incentives are supported by remarks found in internal documents: Internal documents from BOC indicate, for example, considerations that “[...]”⁵³. Further, it is considered: “[...]”⁵⁴.

184. Tacit coordination and the resulting higher price would, however, create an incentive for the individual oligopolists to deviate by increasing the quantity individually in order to profit from the increased price more than the others. This means, that the individual players would have an incentive to store less of the new capacity brought on the market than the others or to turn down their production to a lower extent than the others. This deviation could be prevented within the oligopoly if such behaviour could be detected and retaliated by the others oligopolists.

185. It is likely that the market shows a sufficient degree of transparency to allow for such a mechanism. Already in the decision *M.1630 Air Liquide/BOC*, the Commission had come to the conclusion, that the helium market is highly transparent.⁵⁵ The market participants generally know both about the aggregate supplies of helium as well as the capacities available to the different market participants. The BLM publishes on its website monthly statistics which provide aggregate inventory data and its periodic sales of crude helium showing the quantity purchased by each company. Moreover, the

⁵³ [...]

⁵⁴ See BOC: [...]

⁵⁵ See M.1630 Air Liquide/BOC, para. 278 ff.

market players are interrelated by joint ventures, such as the Air Liquide/Air Products/Sonatrach helium joint venture in Arzew, Algeria, as well as via various agreements, such as wholesale contracts provided to each other, tolling agreements (for the refining of crude helium), back-to-back-supply agreements, and swap agreements, which increase the transparency about the quantities available to the market players.

186. A back-to-back contract is a secondary supply contract generally entered into at the same time as (or shortly after) the primary supply contract. From a commercial point of view, the secondary supply contract shifts the commitments of the primary supply contract to the secondary purchaser. An example for a back-to-back arrangement is the source in Qatar which is in its start-up phase and therefore currently operates [...] % of its capacity. This source is operated by a joint venture of Qatargas and Rasgas. Its output is committed to BOC and Air Liquide [...]. After having gained this access to the Qatar source, BOC and Air Liquide entered into back-to-back agreements with [...]. BOC sells [...] of its quantity in a long-term back-to-back agreement to [...]; Air Liquide entered into a similar agreement to sell [...] of the own quantity in a back-to-back agreement to [...].
187. Swap agreements are used for logistic optimisation in order to “shift” individual supply between different regions as well as for allocating storage capacity to players who need (additional) storage in the BLM system. By swaps, helium can be “shifted” by individual players from their original source to other regions or to the plants in the BLM system.
188. All these contracts together do not only provide for an increased transparency concerning quantities and cost positions in the market but also enhance the mutual dependency of the market players which could allow for a retaliation mechanism on the basis of rejected short- and long-term supplies (for example in case of technical problems and production outages) as well as swaps.

The merger removes a maverick

189. The transaction raises serious doubts as to the elimination of Linde as an aggressive newcomer which increases the risk of coordination among the established players. This is supported by an internal BOC document which states that “[...]” and “[...]”.⁵⁶
190. Linde has therefore emerged as an aggressive player potentially disturbing coordinated behaviour of the incumbents. Also Air Liquide is apparently perceived as an aggressive player. However, Air Liquide’s possibilities to expand and aggressively compete also appear to be limited due to the general difficulty of getting access to sources. The quoted “aggressive” impact is limited to the increase in quantities from the Qatar source which – as explained above – is, however, largely shared among the four established players and therefore only to a small extent in Air Liquide’s hands. It is worth noting that the three largest wholesalers apparently were not perceived as competing aggressively even though they had equal or even higher new supplies from Qatar than Air Liquide.
191. It appears that Linde has been a significant risk. First, it had the larger future quantities as compared to Air Liquide. Second, Linde had the aim of increasing its market share

⁵⁶ See BOC document: [...]

in order to achieve an own position in the wholesale business and was therefore particularly ready to make aggressive moves in the market.

Conclusion on coordinated effects

192. The removal of Linde as a maverick and the combination of Linde’s and BOC’s sources after to the merger would therefore be likely to result in coordinated effects by eliminating Linde as a maverick being ready to enter aggressively and to increase total supply by its newly available quantities.

2.2 Helium retail (horizontal effects)

193. The parties’ activities in the national retail helium markets overlap in the UK and in Poland and will have very high market shares after the merger. The transaction raises serious doubts as to the creation of a dominant position in the Polish helium retail market. In the UK, the merger raises serious doubts as to the strengthening of a dominant position.

a. Poland

Market shares

194. On an overall helium retail market (not divided according to cylinder, dewar and tube trailer supply), the parties reach a combined market share of [60-70]% with an overlap of [10-20]% as the following table indicates:

Helium retail market shares – Poland 2005

	Linde	BOC	combined	Air Liquide	Air Products	Messer	Praxair
Poland	[10-20]%	[50-60]%	[60-70]%	[0-10]%	[0-10]%	[10-20]%	0%

195. Only one competitor follows with a medium-sized position of [10-20]% market share which is Messer. The other competitors are very small.

196. The Polish helium retail market predominantly comprises gaseous sales in cylinders. According to the parties, only approximately 10-15% of the helium retail sales to Polish customers (115,000 m³ in total) are accounted for by liquid helium sales in dewars and sales in tube trailers are according to the parties not existent. The market shares of the parties and their competitors in the separate helium cylinder and dewar markets are estimated as not being significantly different from those in the overall market.

Non-coordinated effects and creation/strengthening of a dominant position in Poland

197. BOC has in the past withdrawn from all activities in the EEA except for its “historical” markets in the UK and Ireland and in Poland where BOC has a strong position. Together with Linde’s activities in Poland, the merged entity will become the by far leading player with the only remaining stronger competitor being Messer.

198. Linde’s position in the retail helium market is not as strong as it is in the other cylinder and bulk industrial gas markets in Poland. In fact, Linde has achieved an overall position in the industrial gases business very similar to the one of BOC. Linde’s market

share in helium retail appears rather exceptional. In the industrial gases businesses the two companies have combined market shares between [40-50]% and [80-90]% in Poland mostly having very similar positions (see above).

199. Therefore, Linde and BOC can be regarded as closest competitors. Many gas customers prefer to buy all gases needed from the same supplier. This mainly relates to cylinders and to some extent also to bulk. With Linde's comparably stronger position in the other Polish industrial gas markets, it was presumably the strongest threat to BOC due to its large potential of increasing its share in the helium retail business on the basis of the other industrial gas activities. With the high combined market share (in helium as well as in industrial gases) and with the elimination of this closest competitor, it is likely that the merged entity will achieve a dominant position in Poland.
200. New entry into helium retail is not easy and will not provide a major threat to the merged entity. It was confirmed in the market investigation that helium is basically not a "stand-alone" business on retail level. Market participants explained in the market investigation that helium is a significant part of the product range⁵⁷. An entrant into the helium retail market would therefore have to enter into the supply of many gases at the same time in order to reach these customers.
201. At the same time, the combined production of tonnage, bulk and cylinder gases provides for synergies since the different markets are intertwined. The merged entity would therefore have a significant advantage which raises entry barriers for new entrants which are not yet active in the other industrial gas supply forms in this geographic region. A similar barrier applies to the existing smaller competitors who have to gain customers for many gases and supply forms in order to expand their business.
202. The market investigation confirmed that due to these factors the very strong position of one player in a national market covering all industrial gases and forms of supply often does not allow new entrants or small players to reach a critical size in order to be successful in the long-term. This effect is moreover enhanced by the fact that a smaller player who has not yet reached the critical size is more strongly affected by retaliation measures than an incumbent having already a strong cost structure. With an even increased market share on the part of the merged entity, this barrier would be raised further.
203. Consequently, Linde was the most serious competitor to BOC. The transaction therefore raises serious doubts as to the creation of a dominant position in the helium retail market and as to the significant impediment of competition.

b. The UK

Market shares

⁵⁷ Questionnaire to competitors 1 – Industrial gases sent on 7 April 2006, question 95, in which 9 out of 13 respondents confirmed the importance of helium in the product range.

204. On an overall helium retail market (not divided according to cylinder, dewar and tube trailer supply), the parties reach a combined market share of [70-80]% in the UK. The merger results in an overlap of [20-30]%. The market shares of the different competitors are set out in the following table:

Helium retail market shares – UK 2005

	Linde	BOC	combined	Air Liquide	Air Products	Messer	Praxair
UK	[20-30]%	[50-60]%	[70-80]%	[<5]%	[20-30]%	0%	0%

205. Only Air Products follows with a medium-sized position of [20-30]% market share. Air Liquide has an estimated market share of only [<5]%.
 206. A further distinction of separate markets for helium retail would not significantly change the picture which can be seen in the following table:

Helium retail market shares – UK 2005 (per supply form)

	Linde	BOC	combined	Air Products	Others
Dewars	[30-40]%	[60-70]%	[90-100]%	[10-20]%	0%
Tube trailers	[<5]%	[70-80]%	[80-90]%	[20-30]%	0%
Cylinders	[10-20]%	[50-60]%	[70-80]%	[20-30]%	[0-10]%

Non-coordinated effects and strengthening of a dominant position in the UK

207. BOC has been the historically by far leading market player in the UK in all industrial gases supplied in tonnage, bulk⁵⁸ and cylinders as well as in the helium retail business. Its market position as the by far leading player has in the past remained largely uncontested. Being asked for the EEA-wide retail margins, BOC indicated an average value (covering UK, Ireland and Poland) of [...] % for the retail helium business. Linde submitted an EEA-average of [...] %. It seems likely that the high BOC margin mainly results from a dominant market position in the UK and in Ireland (market share: [70-80]%).

208. With the merger, the strong BOC business will be combined with Linde’s activities. BOC’s likely dominant position in the UK would thereby be enhanced. The merged entity would have a by far leading position on the helium retail market with a market share of almost [80-90]% and competitors who only follow with a large distance. As described above, new entry into helium retail is not easy. It therefore does not represent a major threat to BOC. The transaction would further raise the already existing barriers to entry due to the merged entity’s increased possibilities to prevent a newcomer from reaching a minimum critical size.

⁵⁸ The only exception is bulk carbon dioxide, for which Air Liquide has a stronger market position in the UK.

209. The merger will eliminate one of the two only significant competitive restraints on BOC. It can be assumed that Linde with its strong background in many other EEA-countries (among them the “neighbouring” countries Netherlands, Germany and the Nordic countries) was able to exert a particularly strong competitive pressure on BOC. Due to its large geographic coverage in the EEA (which is also significantly larger than the one of Air Products), Linde was in a particularly favourable position to gain for example customers with activities in more than one country, among them in countries where Linde is already a supplier.
210. The merger which, constitutes a move from three to two players in the market, therefore removes an important competitive constraint, will likely lead to price increases, less choice and a strengthening of a dominant position.

2.3 Helium retail (vertical effects)

Market shares

211. The helium retail markets are vertically related to the helium wholesale markets. Linde has so far not been active to a significant extent on the wholesale market, but has been strong in some national retail helium markets in the EEA. With the merger, Linde acquires BOC’s strong position in this field.
212. The parties reach more than 25% on the worldwide helium wholesale market. Therefore, all national retail helium markets in the EEA are vertically affected.
213. While BOC is only active in Poland, the UK and in Ireland, Linde reaches high market shares in several national retail markets in the EEA. These market positions mainly correspond to Linde’s overall strength in the industrial gas markets for bulk and cylinder supply. These countries cover the Baltics, some Eastern European countries, the Northern European countries as well as Germany and Austria where Linde reaches market shares between [30-40]% and [70-80]%, with the highest market share being reached in Iceland ([90-100]%). On an EEA-wide level, however, this corresponds to a “market share” of only [20-30]% which results from the fact that Linde has strong market positions in many countries with very small market volumes.
214. In the retail helium business, competitors include both integrated gases companies such as Air Liquide, Air Products and Praxair, and various independent retailers such as Messer, Taiyo Nippon Sanso, Pure Helium, Sapio, SIAD and SOL who have different regional focuses. The independent retailers buy helium on the wholesale market from the large wholesalers.

Foreclosure of inputs

215. The transaction will not lead to the risk of foreclosure of inputs on the helium retail markets. The largest competitors on the helium retail markets are vertically integrated into the wholesale level themselves.
216. A concern mentioned during the market investigation related to the elimination of BOC as an “independent” supplier. BOC’s helium retail activities are limited to Poland, the UK and Ireland. For all retailers active in other countries of the EEA, BOC qualified as an independent supplier since they did not compete against BOC on retail level. The concern was raised that after the merger, Linde would not be ready to supply independent retailers to the same conditions as BOC did before since Linde has a much

broader geographic coverage and competes against the independent retailers in some countries.

217. It has to be noted, however, that after the transaction, all independent retailers will still have the possibility to source helium from four helium wholesalers. During the market investigation, concerns were raised that these four are as vertically integrated players all active as competitors on the retail level and might have an incentive to raise their independent rivals' costs.
218. However, the independent retailers will still have the choice between four wholesalers for their supplies. If Linde tried to foreclose a specific independent retailer by offering uncompetitive supply conditions in order to weaken the competitive pressure exerted by this retailer in one or several Member States, Linde would mainly risk losing sales to the other wholesalers.

Foreclosure of demand

219. The merger does not lead to a customer foreclosure for the large wholesalers. Even though Linde has a strong position in some Member States it covers only a comparably smaller share of the customers on EEA-level and an even smaller one worldwide (estimated [0-10]%). The merger does not lead to a risk for any of the wholesalers who sell helium on a worldwide market.

3. Specialty gases

3.1 Noble gases and noble gas mixtures

220. On the EEA markets for *noble gases and noble gas mixtures*, the parties' combined market share in 2005 exceeded 25% for krypton (Linde [30-40]%, BOC [<5]%), inert noble gas mixtures (Linde [40-50]%, BOC [<5]%). However, the overlap was small in these two markets. On the EEA market for brominated compound gas mixtures Linde had a market share of [40-50]% in 2005. However, BOC is not active on this market.
221. Post-merger, the parties would continue to face effective competition from other strong market players. Air Liquide is a major supplier in the EEA, with shares of above 15% for all noble gases and noble gas mixtures (krypton [20-30]%, inert noble gas mixtures [20-30]%, brominated compound gas mixtures [20-30]%)
222. Hence, the notified transaction does not significantly impede competition in EEA markets for noble gases and noble gas mixtures.

3.2 ESGs

223. On the EEA markets for *ESGs*, the parties' combined market share in 2005 exceeded 25% for AsH₃ (Linde [20-30]%, BOC [<5]%), BF₃ (Linde [<5]%, BOC [20-30]%), C₂F₆ (Linde [10-20]%, BOC [10-20]%), HCl (Linde [20-30]%, BOC [10-20]%), HBr (Linde [10-20]%, BOC [10-20]%), SF₆ (Linde [10-20]%, BOC [20-30]%), Halocarbon 23 (Linde [10-20]%, BOC [10-20]%), Chlorine (Linde [10-20]%, BOC [0-10]%), Nitrous Oxide (Linde [30-40]%, BOC [0-10]%) and Silicone Tetrafluoride (Linde [20-30]%, BOC [0-10]%). On the EEA market for SDS, Linde had a market share of [70-80]% in 2005. However, BOC is not active on this market.

224. Post-merger, the parties would continue to face effective competition from other strong market players, particularly from Air Liquide, Air Products and Praxair as the following table illustrates:

ESG	Parties' combined market share	Air Liquide	Air Products	Praxair
AsH3	[20-30]%	[20-30]%	[20-30]%	0%
BF3	[20-30]%	[20-30]%	[30-40]%	[20-30]%
C2F6	[20-30]%	[20-30]%	[20-30]%	[10-20]%
HCl	[30-40]%	[10-20]%	[20-30]%	[30-40]%
HBr	[30-40]%	[10-20]%	[20-30]%	[30-40]%
SF6	[30-40]%	[20-30]%	[20-30]%	[20-30]%
Halocarbon 23	[20-30]%	[20-30]%	[30-40]%	[10-20]%
Chlorine	[20-30]%	[20-30]%	[20-30]%	[10-20]%
Nitrous Oxide	[30-40]%	[30-40]%	[10-20]%	[20-30]%
Silicone Tetrafluoride	[30-40]%	[10-20]%	[30-40]%	[30-40]%
SDS	[70-80]%	0%	0%	[<5]%

Source: Form CO

225. Furthermore, the parties submit that producers of ESGs face buyer power from the concentrated semiconductor demand side. This has been broadly confirmed by the market investigation.⁵⁹

226. Hence, the notified transaction does not significantly impede competition in EEA markets for ESGs.

3.3 Refrigerants

a. UK

227. On the *UK markets for refrigerants*, the parties' combined market share in 2005 exceeded 25% for R 404 A, R 410 and hydrocarbon refrigerants where BOC had a market share of [20-30]%, [30-40]% and [80-90]% respectively. However, Linde is not active in any of these markets. In consequence no overlap would arise due to the merger.

228. Hence, the notified transaction does not significantly impede competition in the UK markets for refrigerants.

b. Poland

229. On the *Polish markets for refrigerants*, the merger would lead to a substantial overlap of the parties' market shares on the markets for R 404 A (Linde [30-40]%, BOC [10-20]%), R 134a (Linde [50-60]%, BOC [20-30]%), and R 22 (Linde [40-50]%, BOC

⁵⁹ Majority of customers confirmed this view (4 out of 6). See: replies to Questionnaire to customers – Speciality gases sent on 10th April 2006, questions 20 and 21.

[20-30]%). Some respondents to the market investigation expressed their concerns that two close competitors and major suppliers in the Polish market for refrigerants would merge and expected a lessening of competition on these markets.⁶⁰ It was also stressed that a company would need to offer all refrigerants in order to be competitive which would make market entry more difficult.

230. Linde also has a market share exceeding 25% on the markets for R 407C ([20-30]%), R 410 ([60-70]%) and hydrocarbon refrigerants ([50-60]%). However, BOC is not active on these markets so that the merger does not lead to a horizontal overlap.

231. Hence, the notified transaction creates serious doubts as to its compatibility with the common market on the Polish markets for the refrigerants R 404 A, R 134a and R 22.

3.4 Chemicals

a. UK and Ireland

232. On the UK markets for chemicals, the parties' combined market share in 2005 exceeded 25% for SF₆ (Linde 0%, BOC [20-30]%), C₂H₄ (Linde 0%, BOC [40-50]%), NH₃ (Linde [<5]%, BOC [30-40]%), CO (Linde [<5]%, BOC [40-50]%) and Sulphur Dioxide (Linde [<5]%, BOC [30-40]%). However, the overlap was small in these markets.

233. On the other hand, on the UK market for ethylene oxide sold in cylinders for mainly medical applications, the merger would lead to a substantial overlap leading to a combined market share of [50-60]% (Linde [0-10]%, BOC [40-50]%). This is also true for Ireland where the merger would create a monopoly with market shares of [80-90]% and [10-20]% for Linde and BOC respectively.

234. Hence, the notified transaction creates serious doubts as to its compatibility with the common market on the UK and Irish markets for the ethylene oxide

b. Poland

As the combined market shares of the parties do not exceed 25% in any market for chemicals, there are no affected markets in Poland for these products.

3.5 Calibration gas mixtures

a. UK

235. On the *UK markets for calibration gas mixtures*, the parties' combined market share in 2005 exceeded 25% for other calibration gases and special application mixtures where BOC had a market share of [40-50]%, [50-60]% respectively. However, Linde is not active in any of these markets. In consequence, no overlap would arise due to the merger.

236. Hence, the notified transaction does not significantly impede competition in the UK markets for calibration gas mixtures.

⁶⁰ Replies to Questionnaire to customers – Speciality gases sent on 10th April 2006, question: 2. 2 out of 4 customers raised concerns.

b. Poland

237. On the *Polish markets for calibration gas mixtures*, the merger would lead to a substantial overlap of the parties' market shares on the markets for environmental gas mixtures (Linde [60-70]%, BOC [0-10]%), other calibration gases (Linde [10-20]%, BOC [30-40]%), and special application mixtures (Linde [<5]%, BOC [30-40]%). A number of respondents to our market investigation expressed their concerns that two close competitors and major suppliers in the Polish market for calibration gas mixtures would merge and expected a lessening of competition on these markets. The only major competitor appears to be Messer with market shares of [20-30]% for environmental gases, [30-40]% for other calibration gases and [30-40]% for special application mixtures.
238. Hence, the notified transaction creates serious doubts as to its compatibility with the common market on the Polish markets for the environmental gas mixtures, other calibration gases and special application mixtures.

4. Sale of plants

239. The transaction does not lead to a horizontal overlap in the sale of plants. Only Linde is active in the sale of ASU and HCS plants. BOC has left the plant construction business after having transferred its plant construction activities to LindeBOC Process Plants LLC ("LindeBOC"), a company solely controlled by Linde. Following the transfer, BOC has sourced its demand for ASU and HCS plants exclusively from LindeBOC and from other Linde Group companies.
240. All major gas companies as well as a number of engineering companies have the know-how to produce plants. Linde's annual market shares in the sale of ASU's fluctuate depending on the intake of orders in the years 2003 to 2005 between [30-40]% and [50-60]% on a worldwide level and between 0% and [60-70]% in the EEA. The same applies for other suppliers such as Air Products (between [0-10]% and [20-30]% worldwide; between 0% and [90-100]% in the EEA) and Air Liquide (between [20-30]% and [30-40]% worldwide; between 0% and [40-50]% in the EEA).
241. On the market for HCS plants, the market shares are steadier with Linde reaching between [10-20]% and [10-20]% in the years 2004 – 2005 on a worldwide market and even less on an EEA-wide market. The main competitors are TN ([30-40]%-[30-40]%), Lurgi and Uhde (both [10-20]%-[10-20]%) on EEA and worldwide level.
242. Linde is a company which is strong in the engineering of plants. The market investigation has, however, not shown any concerns with respect to the sale of plants. The vertical integration which is increased by the merger does not bring about any significant changes, since BOC already purchased its plants only from Linde.

V. PROPOSED REMEDIES

A. DESCRIPTION

243. In order to remove the Commission's concerns, the parties have submitted a number of remedies:
244. Linde commits to divest

- a. its four helium supply contracts, two with Cryor, Orenburg (Russia) and two with ExxonMobil, Shute Creek (USA) and Linde's shareholdings in two jointly controlled joint ventures with Sonatrach (Helison Joint Ventures), including all contractual rights and obligations of Linde associated with these shareholdings, and the supply contract with one of the Helison Joint Ventures with a combined volume [exceeding 12] million m³ as of beginning of 2007 (Alternative A)⁶¹;

or, alternatively,

- b. Linde's two helium supply contracts with Cryor and three of BOC's helium supply contracts, one with Cryor, one with the Polish Oil and Gas company (previously: Krio), Odolanov (Poland) and one with ExxonMobil with a combined volume of [exceeding 12] million m³ (Alternative B).
245. According to Linde's proposal, Alternative B would become effective in case that Alternative A fails to be divested within a certain period of time. The reasons for offering this alternative are possible difficulties in receiving Sonatrach's consent to the sale of Linde's shares in the joint-venture.
246. In addition, Linde later modified this remedy by adding a commitment to divest a sufficient number of cryogenic containers as well as wholesale contracts if required by the purchaser.
247. Linde commits to divest BOC Gazy Sp z o.o. including its subsidiary Roboprojekt BOC Sp. z o.o. and, thus, essentially all of BOC's gases business in Poland ("Polish Divested Business"). The Polish Divested Business includes BOC's entire bulk and cylinder supply of standard industrial gases including retail helium. It moreover covers its supply of calibration mixtures and refrigerants in Poland.
248. In addition, Linde commits to divest Linde Gas UK Limited including its subsidiaries and, thus, essentially all of Linde's gases business in the United Kingdom ("UK Divested Business"). The UK Divested Business includes Linde's entire bulk and cylinder supply of standard industrial gases including retail helium.
249. Apart from that, Linde commits to divest its customer contracts in the ethylene oxide business of its wholly-owned subsidiary Chemogas N.V. (Belgium) in the UK and in Ireland.
250. Linde commits to remove structural links between Linde and Air Liquide following from the existing joint ventures between BOC and Air Liquide by severing such joint ventures to the extent that the combined turnover of the severed joint ventures accounts for at least [...] % of the combined total turnover of all joint ventures between BOC and Air Liquide. To carry out the commitment, Linde commits to either sell BOC's shareholding or to acquire Air Liquide's shareholding in the respective joint ventures or to dissolve the joint ventures.

B. EVALUATION OF THE REMEDIES

⁶¹ Alternative A was later taken out of the Commitments on the basis of the results from the market test. See para. 255 and 256.

251. The remedies remove the serious doubts raised by the transaction. This was largely confirmed by the market test.

1. Industrial gases

252. The proposed remedies with respect to the affected national markets in Poland and in the UK eliminate the complete overlap created by the transaction. The serious doubts regarding the various cylinder and bulk markets in these two national markets which were raised by the merger will therefore be clearly removed.

253. The commitments, moreover, remove the serious doubts resulting from the likelihood of coordinated effects through the division of the industrial gases markets by removing the horizontal overlaps in Poland and in the UK as well as by severing structural links between Linde and Air Liquide. In particular, the divestiture of BOC's complete Polish business will already avoid the creation of a region uniformly dominated by Linde in Eastern Europe and will prevent the increase in geographic symmetry between the leading players Air Liquide and Linde in the EEA.

254. In addition, the severance of structural links between Air Liquide and Linde removes the additional element, facilitating coordinated effects that would have been brought about by the merger. The market test clearly confirmed that such a remedy would be necessary and effective.

2. Helium

255. In the market test, the proposed divestiture of helium supply contracts and shares in the Helison Joint Ventures respectively as described under Alternative A and Alternative B were tested. The market test has shown that the proposed remedies are in principle eligible to remove the serious doubts which are raised by the transaction.⁶² However, two modifications resulted from the market test:

- a. Alternative A was overall regarded as too risky. The market was sceptical whether the implementation of this alternative would be feasible against the background of the necessary consent of Sonatrach which was perceived as being difficult to achieve. Moreover, there were some doubts about the investments still necessary to remove the technical problems resulting from the earlier explosion.

Consequently, Alternative B was unanimously considered as being less risky and more effective than Alternative A. In the light of this and in coordination with the US-FTC who had come to the same result in its assessment, the Commission decided that Alternative A should be dropped and the remedy should only contain a commitment as to Alternative B.

- b. The market test, moreover, indicated that assets and customer contracts would have to be added to the supply contracts in order to ensure the viability of the remedy. As a consequence, the parties modified the proposed remedy by adding to the divestment a sufficient number of cryogenic containers and wholesale contracts if the purchaser requires.

⁶² Questionnaire competitors – Remedies sent on 12 May 2006, question 6, in which 7 out of 8 competitors who responded to this question, in principle confirmed the effectiveness of the remedy referring also to additional assets or to the importance of the identity of the buyer.

256. Consequently, due to the risks connected with Alternative A, only Alternative B is regarded as a suitable remedy and will in the following be assessed. The remedy removes the serious doubts which were raised by the transaction with regard to the helium wholesale market. Linde had entered the helium production level and the helium wholesale market as a newcomer and had thereby exerted specific competitive pressure in the market, in particular on the three historical wholesalers. Its entry had taken place by long-term contracts and its participation in the Helison Joint Ventures which operate the Skikda source.
257. With the remedy, another company will take over a position which is equivalent to the one that Linde had so far on the global helium wholesale market and will continue to exert competitive pressure. The quantities provided by Alternative B are slightly higher than those of Alternative A and do not show the risk involved in Alternative A. They moreover show a similar degree of diversity in access to different sources and are therefore sufficient to allow for an effective new entry into the wholesale market.
258. On the Commission's request, the parties have modified their initial proposal by adding assets and customer contracts if the purchaser requires which are part of the wholesale business in order to ensure the viability of the divestiture. Some market participants had required transfill centres and customer contracts on the retail level in addition. However, the Commission takes the view that assets and contracts originally belonging to the wholesale business completely address the serious doubts raised.
259. The change brought about by the transaction has its main effect on the wholesale market. Linde's individual competitive potential which is removed by the transaction results mainly from the future Skikda quantities. These are to a large extent assigned to be sold on the wholesale market.⁶³ As a consequence, additional assets and contracts need to relate to the wholesale market.
260. Consequently, the addition of cryogenic tanks and the existing wholesale customer contracts sufficiently ensures the viability of the business. In Europe, all major independent retailers have own transfill centres. An addition of additional assets, such as transfill centres (and the corresponding contracts with end-customers) to the remedy would therefore go beyond the viability of the remedy in the wholesale market.
261. As described in the competitive assessment, the incentives of a smaller company on the wholesale market largely differ from those of the incumbents. The divestiture to a company which is not one of the large historical players will therefore ensure that the new capacities will remain in the market, that competitive pressure will be exerted with these new quantities and that any additional risk of tacit coordination that was created by the elimination of Linde as a maverick will be removed.

3. Specialty gases

262. The proposed remedies eliminate the complete overlap created by the transaction on the affected markets for refrigerants and calibration gas mixtures in Poland. The serious doubts regarding these six markets which were raised by the merger will therefore be clearly removed.

⁶³ [...]

263. Concerning the UK and Irish markets for ethylene oxide, the parties will divest Linde's customer contracts and will thereby allow a new player to enter into these markets. In view of the response to the market test and in view of a growing trend towards competitive pressure from geographically neighboring markets, the serious doubts raised by the merger will be removed by the divestiture of Linde's customer contracts.

C. CONCLUSION ON THE REMEDIES

264. The Commission considers that the proposed remedies are sufficient to eliminate the serious doubts as to the compatibility of the transaction with the Common Market.

VI. CONCLUSION

265. The Commission has concluded that the remedies submitted by the Parties are sufficient to remove the serious doubts raised by the concentration. Accordingly, subject to the full compliance with the commitments submitted by the notifying party, the Commission has decided not to oppose the notified operation and to declare it compatible with the common market and with the EEA Agreement. This decision is adopted in application of Article 6(1)b and Article 6(2) of Council Regulation (EC) No 139/2004.

266. The Commission underlines that the divestment of the UK Divested Business, the Polish Divested Business, the Helium Divested Business, the Ethylene Oxide Divested Business as well as the severance of future structural links between Linde and Air Liquide in Asia as defined in the commitments including the schedules are conditions to the clearance of the proposed transaction. The other undertakings constitute obligations as they concern the implementing steps, which are necessary to achieve the sought changes.

267. The detailed text of the commitments is annexed to this decision. The full texts of the annexed commitments form an integral part to this decision.

For the Commission

(signed)

Neelie KROES

Member of the Commission

CASE COMP/M.4141 – LINDE/BOC

COMMITMENTS TO THE EUROPEAN COMMISSION

Pursuant to Article 6(2), of Council Regulation (EC) No. 139/2004 as amended (the “**Merger Regulation**”), Linde AG (the “**Notifying Party**”) hereby provides the following Commitments (the “**Commitments**”) in order to enable the European Commission (the “**Commission**”) to declare the acquisition of The BOC Group PLC by the Notifying Party (the “**Notified Concentration**”) compatible with the common market and the EEA Agreement by its decision pursuant to Article 6(1)(b) of the Merger Regulation (the “**Decision**”).

Each of these Commitments is submitted on the understanding that it will be returned prior to the Commission issuing the Decision if on further investigation the Commission concludes that the proposed concentration does not give rise to serious doubts as to its compatibility with the common market in the area concerned or if otherwise no longer considered necessary.

The Commitments shall take effect upon the date of adoption by the Commission of the Decision, provided that if completion of the Notified Concentration does not subsequently take place for any reason and is hereby abandoned, the Notifying Party shall not be bound by these Commitments.

This text shall be interpreted in the light of the Decision to the extent that the Commitments are attached as conditions and obligations, in the general framework of Community law, in particular in the light of the Merger Regulation, and by reference to the Commission Notice on remedies acceptable under Council Regulation (EEC) No. 4064/89 and under Commission Regulation (EC) No. 447/98.

Section A – Definitions

For the purpose of the Commitments, the following terms shall have the following meaning:

Affiliated Undertakings: undertakings controlled by the Parties and/or by the ultimate parents of the Parties, whereby the notion of control shall be interpreted pursuant to Article 3 Merger Regulation and in the light of the Commission Notice on the concept of concentration under Council Regulation (EEC) No. 4064/89.

Air Liquide: the company L’Air Liquide S.A., incorporated in France including its affiliated undertakings.

BOC: the company The BOC Group PLC, incorporated in United Kingdom, with its registered office at Chertsey Road, Windlesham, Surrey GU20 6HJ, United Kingdom.

Chemogas: the company Chemogas N.V., incorporated in Belgium, a wholly-owned subsidiary of the Notifying Party.

Closing: the transfer of the legal title of the Divestment Businesses to the Purchaser.

Divestment Businesses: the divested businesses as defined in Section B and the attached Schedules I to IV.

Divestiture Trustee: one or more natural or legal person(s), independent from the Notifying Party, who is(are) approved by the Commission and appointed by the Notifying Party and who has(have) received from the Notifying Party the exclusive Trustee Mandate to sell the Divestment Businesses to one or several purchaser(s) at no minimum price.

Effective Date: the date of the adoption of the Decision by the European Commission, unless the acquisition of control of BOC by the Notifying Party is completed more than 30 days after the said Decision, in which case the effective date will be the date of completion of the notified concentration.

Ethylene Oxide Divested Business: the business as defined in Section B and the attached Schedule IV.

First Divestiture Period:

- a) for the UK and Polish Divested Businesses: a period of **[Business Secret]** months from the Effective Date.
- b) for the Helium Divested Business: a period of **[Business Secret]** months from the Effective Date.
- c) for the Ethylene Oxide Divested Business: a period of **[Business Secret]** months from the Effective Date.
- d) for the Severed Asian Joint Venture Business:
 - (i) to sever joint ventures to the extent that the combined turnover of the severed joint ventures accounts for at least **[Business Secret]**% of the combined total turnover of all joint ventures between BOC and Air Liquide as described in Schedule V: a period of **[Business Secret]** months from the Effective Date.
 - (ii) to sever additional joint ventures to the extent that the combined turnover of all severed joint ventures accounts for at least **[Business Secret]**% of the combined total turnover of all joint ventures between BOC and Air Liquide as described in Schedule V: a period of **[Business Secret]** months from the Effective Date.

Helium Divested Business: the business as defined in Section B and the attached Schedule III.

Hold Separate Manager: the person(s) appointed by the Notifying Party for the Divestment Businesses to manage the day-to-day business under the supervision of the Monitoring Trustee.

Key Personnel: all personnel necessary to maintain the viability and competitiveness of the UK and Polish Divested Businesses, as listed in the Schedules I and II.

Monitoring Trustee: one or more natural or legal person(s), independent from the Notifying Party, who is(are) approved by the Commission and appointed by the Notifying Party, and who has(have) the duty to monitor the Notifying Party's compliance with the conditions and obligations attached to the Decision.

Notifying Party: the company Linde AG, incorporated under the laws of Germany, with its registered office at Abraham-Lincoln-Straße 21, 65189 Wiesbaden, Germany.

Personnel: all personnel currently employed by the UK Divested Business and the Polish Divested Business, including Key Personnel, staff seconded to the UK Divested Business and the Polish Divested Businesses, shared personnel and the additional personnel.

Parties: the Notifying Party and BOC.

Polish Divested Business: BOC Gazy Sp. z o.o. including its subsidiaries as defined in Section B and the attached Schedule II.

Purchaser: each entity approved by the Commission as acquirer of each of the Divestment Businesses in accordance with the criteria set out in Section D.

Severed Asian Joint Venture Business: BOC's Asian joint ventures with Air Liquide that are to be severed as defined in Section E and the attached Schedule V.

Trustee(s): the Monitoring Trustee and the Divestiture Trustee.

Trustee Divestiture Period:

- a) for the UK and Polish Divested Businesses: a period of **[Business Secret]** months from the end of the First Divestiture Period.
- b) for the Helium Divested Business: a period of **[Business Secret]** months from the end of the First Divestiture Period.
- c) for the Ethylene Oxide Divested Business: a period of **[Business Secret]** months from the end of the First Divestiture Period.
- d) for the Severed Asian Joint Venture Business: a period of **[Business Secret]** months from the end of the First Divestiture Period.

UK Divested Business: Linde Gas UK Limited including its subsidiaries as defined in Section B and the attached Schedule I.

Section B – The Divestment Businesses

Section B.1 The UK Divested Business and the Polish Divested Business

Commitment to divest

1. In order to restore effective competition, the Notifying Party commits to divest
 - (a) the UK Divested Business as a going concern to one purchaser and on terms of sale approved by the Commission in accordance with the procedure described in paragraph 26. To carry out the divestiture, the Notifying Party commits to find a purchaser and to enter into a final binding sale and purchase agreement for the sale of the UK Divested Business within the First Divestiture Period. If the Notifying Party has not entered into such agreement at the end of the First Divestiture Period, the Notifying Party shall grant the Divestiture Trustee an

exclusive mandate to sell the UK Divested Business in accordance with the procedure described in paragraph 26 in the Trustee Divestiture Period; and

- (b) the Polish Divested Business as a going concern to one purchaser and on terms of sale approved by the Commission in accordance with the procedure described in paragraph 26. To carry out the divestiture, the Notifying Party commits to find a purchaser and to enter into a final binding sale and purchase agreement for the sale of the Polish Divested Business within the First Divestiture Period. If the Notifying Party has not entered into such agreement at the end of the First Divestiture Period, the Notifying Party shall grant the Divestiture Trustee an exclusive mandate to sell the Polish Divested Business in accordance with the procedure described in paragraph 26 in the Trustee Divestiture Period.

On request of the Notifying Party, the requirement to divest the Polish Divested Business as a whole to a single purchaser may be waived if the Notifying Party clearly demonstrates that a divestiture to more than one purchaser does not affect the viability and competitiveness of the parts of the Polish Divested Business, taking account of the proposed purchasers, and restores effective competition.

2. The Notifying Party shall be deemed to have complied with this commitment if, by the end of the Trustee Divestiture Period, the Notifying Party has entered into the final binding sale and purchase agreements needed for the UK and Polish Divested Businesses, if the Commission approves the purchaser of the UK and Polish Divested Business respectively and the terms in accordance with the procedure described in paragraph 26 and if the closing of the sale of the UK and Polish Divested Businesses takes place within a period not exceeding **[Business Secret]** months after the approval of the respective purchaser and the terms of sale by the Commission.
3. In order to maintain the structural effect of the Commitments, the Notifying Party shall, for a period of **[Business Secret]** years after the Effective Date, not acquire direct or indirect influence over the whole or part of the UK or Polish Divested Businesses, unless the Commission has previously found that the structure of the market has changed to such an extent that the absence of influence over the UK or Polish Divested Businesses is no longer necessary to render the proposed concentration compatible with the Common Market.

Structure and definition of the UK and Polish Divested Businesses

4. The UK Divested Business consists of a viable and competitive company active in the United Kingdom (as further described in Schedule I) and the Polish Divested Business consists of a viable and competitive company active in Poland (as further described in Schedule II).
5. The UK and Polish Divested Businesses, as described in more detail in Schedules I and II, include:
 - a) All existing tangible and intangible assets (including intellectual property rights), which contribute to the current operation or are necessary to ensure the viability and competitiveness of the UK and Polish Divested Businesses;

- b) All licences, permits and authorisations issued by any governmental organisation for the benefit of the UK and Polish Divested Businesses;
- c) All contracts, leases, commitments and customer orders of the UK and Polish Divested Businesses, all customer, credit and other records of the UK and Polish Divested Businesses (items referred to under (a)-(c) hereinafter collectively referred to as “Assets”);
- d) The Personnel; and
- e) The benefit, for a transitional period of up to 2 years after Closing and on terms and conditions equivalent to those at present afforded to the UK and Polish Divested Businesses, of all current arrangements under which the Parties or Affiliated Undertakings supply products or services to the UK and Polish Divested Businesses, to the extent described in the attached Schedules, unless otherwise agreed with the respective Purchaser of the UK and Polish Divested Businesses.

Section B.2 The Helium Divested Business

Commitment to divest

6. In order to restore effective competition, the Notifying Party commits to divest the Helium Divested Business to one or more purchaser(s) on terms of sale approved by the Commission in accordance with the procedure described in paragraph 26. To carry out the divestiture, the Notifying Party commits to find one or more purchaser(s) and to enter into one or more final binding sale and purchase agreements for the sale of the Helium Divested Business within the First Divestiture Period. If the Notifying Party has not entered into such agreements at the end of the First Divestiture Period, the Notifying Party shall grant the Divestiture Trustee an exclusive mandate to sell the Helium Divested Business in accordance with the procedure described in paragraph 26 in the Trustee Divestiture Period.
7. The Notifying Party shall be deemed to have complied with this commitment if, by the end of the Trustee Divestiture Period, the Notifying Party has entered into the final binding sale and purchase agreements needed for the Helium Divested Business, if the Commission approves the purchaser(s) and the terms in accordance with the procedure described in paragraph 26 and if the closing of the sale of the Helium Divested Business takes place within a period not exceeding **[Business Secret]** months after the approval of each purchaser and the terms of sale by the Commission.
8. The Notifying Party shall not reacquire any of the divested contracts.
9. [Intentionally left blank]

Structure and definition of the Helium Divested Business

10. The Helium Divested Business, as described in more detail in Schedule III, consists of
 - a) the Notifying Party’s two helium supply contracts with Cryor, Orenburg (Russia);

- (b) three of BOC's helium supply contracts, one with Cryor, one with Krio, Odolanov (Poland) and one with ExxonMobil, Shute Creeek (USA); and
- (c) if and to the extent required by the Purchaser, cryogenic 40" ISO-containers and contracts with helium wholesale customers.

Section B.3 The Ethylene Oxide Divested Business

Commitment to divest

11. In order to restore effective competition, the Notifying Party commits to divest the Ethylene Oxide Divested Business to one purchaser on terms of sale approved by the Commission in accordance with the procedure described in paragraph 26. To carry out the divestiture, the Notifying Party commits to find a purchaser and to enter into a final binding sale and purchase agreement for the sale of the Ethylene Oxide Divested Business within the First Divestiture Period. If the Notifying Party has not entered into such agreement at the end of the First Divestiture Period, the Notifying Party shall grant the Divestiture Trustee an exclusive mandate to sell the Ethylene Oxide Divested Business in accordance with the procedure described in paragraph 26 in the Trustee Divestiture Period.
12. The Notifying Party shall be deemed to have complied with this commitment if, by the end of the Trustee Divestiture Period, the Notifying Party has entered into the final binding sale and purchase agreement needed for the Ethylene Oxide Divested Business, if the Commission approves the purchaser and the terms in accordance with the procedure described in paragraph 26 and if the closing of the sale of the Ethylene Oxide Divested Business takes place within a period not exceeding **[Business Secret]** months after the approval of the purchaser and the terms of sale by the Commission.
13. The Notifying Party shall not reacquire any of the divested contracts.

Structure and definition of the Ethylene Oxide Divested Business

14. The Ethylene Oxide Divested Business as further defined in Schedule IV consists of the contracts between Chemogas and all of its **[Business Secret]** customers in the United Kingdom and Ireland.

Section C – Related commitments

Preservation of Viability, Marketability and Competitiveness

15. With regard to the UK and Polish Divested Businesses as described in section B.1 and in the Schedules I and II, from the date of adoption of the Decision until Closing, the Notifying Party shall preserve the economic viability, marketability and competitiveness of the UK and Polish Divested Businesses, in accordance with good business practice, and shall minimise as far as possible any risk of loss of competitive potential of the UK and Polish Divested Businesses. In particular, the Notifying Party undertakes:
 - a) Not to carry out any act upon its own authority that might have a significant adverse impact on the value, management or competitiveness of the UK and Polish Divested Businesses or that might alter the nature and scope of activity,

or the industrial or commercial strategy or the investment policy of the UK and Polish Divested Businesses;

- b) To make available sufficient resources for the development of the UK and Polish Divested Businesses, on the basis and continuation of the existing business plans;
 - c) To take all reasonable steps, including appropriate incentive schemes (based on industry practice), to encourage all Key Personnel to remain with the UK and Polish Divested Businesses.
16. With regard to the Helium Divested Business as described in Schedule III, from the date of adoption of the Decision until Closing, the Notifying Party shall preserve the economic viability, marketability and competitiveness of the Helium Divested Business, in accordance with good business practice, and shall minimise as far as possible any risk of loss of competitive potential of the Helium Divested Business. To the extent applicable, the undertakings at paragraph 15 (a) through (c) shall apply *mutatis mutandis*.
17. With regard to the Ethylene Oxide Divested Business as described in Schedule IV, from the date of adoption of the Decision until Closing, the Notifying Party shall preserve the economic viability, marketability and competitiveness of the Ethylene Oxide Divested Business, in accordance with good business practice, and shall minimise as far as possible any risk of loss of competitive potential of the Ethylene Oxide Divested Business. To the extent applicable, the undertakings at paragraph 15 (a) through (c) shall apply *mutatis mutandis*.

Hold-separate obligations of Parties

18. With regard to the UK and Polish Divested Businesses as described in section B.1 and Schedules I and II
- a) The Notifying Party commits, for the UK Divested Business from the date of the adoption of the Decision until Closing and for the Polish Divested Business from the date of completion of the notified concentration until Closing, to keep the UK and Polish Divested Businesses separate from the businesses the Notifying Party is retaining and to ensure that Key Personnel of the UK and Polish Divested Businesses – including the Hold Separate Manager – have no involvement in any business retained and vice versa. The Notifying Party shall also ensure that the Personnel do not report to any individual outside the UK and Polish Divested Businesses.
 - b) Until Closing, the Notifying Party shall assist the Monitoring Trustee in ensuring that the UK and Polish Divested Businesses are managed as distinct and saleable entities separate from the businesses retained by the Parties. The Notifying Party shall appoint a Hold Separate Manager who shall be responsible for the management of the UK and Polish Divested Businesses, under the supervision of the Monitoring Trustee. The Hold Separate Manager shall manage the UK and Polish Divested Businesses independently and in the best interest of the business with a view to ensuring its continued economic viability, marketability and competitiveness and its independence from the businesses retained by the Parties.

19. [Intentionally left blank]

Ring-fencing

20. With regard to the UK Divested Business as described in section B.1 after the date of the adoption of the Decision, and with regard to the Polish Divested Business as described in section B.1 after the Effective Date, the Notifying Party shall implement all necessary measures to ensure that the Parties do not obtain any business secrets, know-how, commercial information, or any other information of a confidential or proprietary nature relating to the UK and Polish Divested Businesses. In particular, the participation of the UK and Polish Divested Businesses in a central information technology network shall be severed to the extent possible, without compromising the viability of the UK and Polish Divested Businesses. The Parties may obtain information relating to the UK and Polish Divested Businesses which is reasonably necessary for the divestiture of the UK and Polish Divested Businesses or whose disclosure to the Parties is required by law.

Non-solicitation clause

21. With regard to the UK and Polish Divested Businesses as described in section B.1, the Notifying Party undertakes, subject to customary limitations, not to solicit, and to procure that Affiliated Undertakings do not solicit, the Key Personnel transferred with the UK and Polish Divested Businesses for a period of 24 months after Closing.

Due Diligence

22. In order to enable potential purchasers to carry out a reasonable due diligence of the Divestment Businesses, the Notifying Party shall, subject to customary confidentiality assurances and dependent on the stage of the divestiture process:

- a) Provide to potential purchasers sufficient information as regards the Divestment Businesses;
- b) Provide to potential purchasers sufficient information relating to the Personnel and allow them reasonable access to the Personnel.

Reporting

23. The Notifying Party shall submit written reports in English on potential purchasers of the Divestment Businesses and developments in the negotiations with such potential purchasers to the Commission and the Monitoring Trustee no later than 10 days after the end of every month following the date of the adoption of the Decision (or otherwise at the Commission's request).

24. The Notifying Party shall inform the Commission and the Monitoring Trustee on the preparation of the data room documentation and the due diligence procedure and shall submit a copy of any information memorandum to the Commission and the Monitoring Trustee before sending the memorandum out to potential purchasers.

Section D – The Purchaser

25. In order to ensure the immediate restoration of effective competition, for each of the Divestment Businesses, the purchaser(s), in order to be approved by the Commission, must:
- a) Be independent of and unconnected to the Parties;
 - b) Have the financial resources, proven expertise and incentive to maintain and develop the Divestment Businesses as viable and active competitive forces in competition with the Parties and other competitors;
 - c) Neither be likely to create, in the light of the information available to the Commission, prima facie competition concerns nor give rise to a risk that the implementation of the Commitments will be delayed, and must, in particular, reasonably be expected to obtain all necessary approvals from the relevant regulatory authorities for the acquisition of the Divestment Businesses (the before-mentioned criteria for the purchaser hereafter the “Purchaser Requirements”).
26. The final binding sale and purchase agreement or agreements and all ancillary agreements shall be conditional on the Commission’s approval. When the Notifying Party has reached an agreement with a purchaser, it shall submit a fully documented and reasoned proposal, including a copy of the final agreement(s), to the Commission and the Monitoring Trustee. The Notifying Party must be able to demonstrate to the Commission that each purchaser meets the Purchaser Requirements and that each of the Divestment Businesses is being sold in a manner consistent with the Commitments. For the approval, the Commission shall verify that each purchaser fulfils the Purchaser Requirements and that each of the Divestment Businesses is being sold in a manner consistent with the Commitments. The Commission may approve the sale of the Divestment Businesses without one or more Assets or parts of the Personnel, if this does not affect the viability and competitiveness of the Divestment Businesses after the sale, taking account of the proposed purchaser.

Section E – Severance of structural links

Commitment to sever structural links

27. The Notifying Party commits to remove structural links between the Notifying Party and Air Liquide following from the existing joint ventures between BOC and Air Liquide as listed in Schedule V by severing such joint ventures to the extent that the combined turnover of the severed joint ventures accounts for at least **[Business Secret]**% of the combined total turnover of all joint ventures between BOC and Air Liquide as described in Schedule V. To carry out the commitment, the Notifying Party commits to either sell the whole of BOC’s shareholding or to acquire the whole of Air Liquide’s shareholding in the respective joint ventures or to dissolve the joint ventures within the respective First Divestiture Period. If the Notifying Party has not entered into the agreements necessary to fulfil the commitment at the end of the respective First Divestiture Period, the Notifying Party shall grant the Divestiture Trustee an exclusive mandate to sever the joint ventures between BOC and Air Liquide according to the commitment of the Notifying Party.
28. The terms of the agreements to fulfil this commitment need to be approved by the Commission. In case of a sale of BOC’s shareholding, also the purchaser(s) require the

Commission's approval; paragraph 25 (a) and (c) shall apply accordingly. The final binding agreement or agreements and all ancillary agreements shall be conditional on the Commission's approval. When the Notifying Party has reached an agreement, it shall submit a fully documented and reasoned proposal, including a copy of the final agreement(s), to the Commission and the Monitoring Trustee. The Notifying Party must be able to demonstrate to the Commission that each agreement is consistent with the Commitments. For the approval, the Commission shall verify that each agreement is consistent with the Commitments.

29. The Notifying Party shall be deemed to have complied with the commitment described in paragraph 27 if, by the end of the Trustee Divestiture Period, the Notifying Party has entered into final agreements necessary to fulfil this commitment, and if the Commission approves the agreements, and if applicable, the purchaser(s) and if the agreements are implemented within a period not exceeding **[Business Secret]** months after the approval by the Commission.
30. In order to maintain the structural effect of the Commitments, the Notifying Party shall, for a period of **[Business Secret]** years after the Effective Date, not enter into any new joint ventures with Air Liquide without the Commission's prior approval.

Related commitments

31. The Notifying Party shall submit written reports in English on all main commercial developments within the Severed Asia Joint Venture Business, the decisions taken by the respective boards of the Severed Asia Joint Venture Business and all developments regarding the fulfilment of the commitment described in paragraph 27, in particular on all negotiations with Air Liquide, to the Commission and the Monitoring Trustee no later than 10 days after the end of every month following the date of the adoption of the Decision (or otherwise at the Commission's request).

Section F – Trustee

I Appointment Procedure

32. The Notifying Party shall appoint a Monitoring Trustee to carry out the functions specified in the Commitments for a Monitoring Trustee. If the Notifying Party has not entered into a binding sale and purchase agreement for each of the Divestment Businesses one month before the end of the First Divestiture Period or if the Commission has rejected a purchaser proposed by the Notifying Party at that time or thereafter, the Notifying Party shall appoint a Divestiture Trustee to carry out the functions specified in the Commitments for a Divestiture Trustee for the Divestment Businesses not yet covered by a binding sale and purchase agreement. If the Notifying Party has not entered into agreement(s) necessary to fulfil the commitment described in paragraph 27 one month before the end of the First Divestiture Period, or if the Commission has not approved such agreement(s) or, if applicable, rejected a purchaser at that time or thereafter, the Notifying Party shall appoint a Divestiture Trustee to carry out the commitment described in paragraph 27. The appointment of the Divestiture Trustee shall take effect upon the commencement of the Trustee Divestiture Period.
33. The Trustee shall be independent of the Parties, possess the necessary qualifications to carry out its mandate, for example as an investment bank or consultant or auditor, and shall neither have nor become exposed to a conflict of interest. The Trustee shall be

remunerated by the Parties in a way that does not impede the independent and effective fulfilment of its mandate. In particular, where the remuneration package of a Divestiture Trustee includes a success premium linked to the final sale value of the Divestment Businesses, the fee shall also be linked to a divestiture within the Trustee Divestiture Period.

Proposal by the Notifying Party

34. No later than one week after the date of adoption of the Decision, the Notifying Party shall submit a list of one or more persons whom the Notifying Party proposes to appoint as the Monitoring Trustee to the Commission for approval. No later than one month before the end of the First Divestiture Period, the Notifying Party shall submit a list of one or more persons whom the Notifying Party proposes to appoint as Divestiture Trustee to the Commission for approval. The proposal shall contain sufficient information for the Commission to verify that the proposed Trustee fulfils the requirements set out in paragraph 25 and shall include:
- a) the full terms of the proposed mandate, which shall include all provisions necessary to enable the Trustee to fulfil its duties under these Commitments
 - b) the outline of a work plan which describes how the Trustee intends to carry out its assigned tasks;
 - c) an indication whether the proposed Trustee is to act as both Monitoring Trustee and Divestiture Trustee or whether different trustees are proposed for the two functions.

Approval or rejection by the Commission

35. The Commission shall have the discretion to approve or reject the proposed Trustee(s) and to approve the proposed mandate subject to any modifications it deems necessary for the Trustee to fulfil its obligations. If only one name is approved, the Notifying Party shall appoint or cause to be appointed, the individual or institution concerned as Trustee, in accordance with the mandate approved by the Commission. If more than one name is approved, the Notifying Party shall be free to choose the Trustee to be appointed from among the names approved. The Trustee shall be appointed within one week of the Commission's approval, in accordance with the mandate approved by the Commission.

New proposal by the Notifying Party

36. If all the proposed Trustees are rejected, the Notifying Party shall submit the names of at least two more individuals or institutions within one week of being informed of the rejection, in accordance with the requirements and the procedure set out in paragraphs 32 and 35.

Trustee nominated by the Commission

37. If all further proposed Trustees are rejected by the Commission, the Commission shall nominate a Trustee, whom the Notifying Party shall appoint, or cause to be appointed, in accordance with a trustee mandate approved by the Commission.

II Functions of the Trustee

38. The Trustee shall assume its specified duties in order to ensure compliance with the Commitments. The Commission may, on its own initiative or at the request of the Trustee or the Notifying Party, give any orders or instructions to the Trustee in order to ensure compliance with the conditions and obligations attached to the Decision.

Duties and obligations of the Monitoring Trustee

39. The Monitoring Trustee shall:

- (i) Propose in its first report to the Commission a detailed work plan describing how it intends to monitor compliance with the obligations and conditions attached to the Decision;
- (ii) Oversee the on-going management of the Divestment Businesses with a view to ensuring its continued economic viability, marketability and competitiveness and monitor compliance by the Notifying Party with the conditions and obligations attached to the Decision. To that end the Monitoring Trustee shall:
 - a) monitor the preservation of the economic viability, marketability and competitiveness of the Divestment Businesses, and the keeping separate of the Divestment Businesses from the businesses retained by the Parties, in accordance with paragraphs 15, 16, 17, and 18 of the Commitments;
 - b) supervise the management of the Divestment Businesses as a distinct and saleable entity, in accordance with paragraph 18 of the Commitments;
 - c) (i) in consultation with the Notifying Party, determine all necessary measures to ensure that the Notifying Party does not, with regard to the UK Divested Business after the date of the adoption of the Decision and with regard to the Polish Divested Business after the Effective Date, obtain any business secrets, know-how, commercial information, or any other information of a confidential or proprietary nature relating to the UK and Polish Divested Businesses, in particular strive for the severing of the UK and Polish Divested Businesses' participation in a central information technology network to the extent possible, without compromising the viability of the UK and Polish Divested Businesses; and (ii) decide whether such information may be disclosed to the Parties as the disclosure is reasonably necessary to allow the Notifying Party to carry out the divestiture or as the disclosure is required by law;
 - d) as applicable, monitor the splitting of assets and the allocation of Personnel between the Divestment Businesses and the Parties or Affiliated Undertakings;
- (iii) Assume the other functions assigned to the Monitoring Trustee under the conditions and obligations attached to the Decision;
- (iv) Propose to the Parties such measures as the Monitoring Trustee considers necessary to ensure the Notifying Party's compliance with the conditions and obligations attached to the Decision, in particular the maintenance of the full economic viability, marketability or competitiveness of the Divestment Businesses and, as applicable, the holding separate of the Divestment Businesses and the non-disclosure of competitively sensitive information;

(v) Review and assess potential purchasers as well as the progress of the divestiture process and verify that, dependent on the stage of the divestiture process, (a) potential purchasers receive sufficient information relating to the Divestment Businesses and the Personnel in particular by reviewing, if available, the data room documentation, the information memorandum and the due diligence process, and (b) potential purchasers are granted reasonable access to the Personnel;

(vi) Provide to the Commission, sending the Notifying Party a non-confidential copy at the same time, a written report within 15 days after the end of every month following the appointment of the Monitoring Trustee. The report shall cover the operation and management of the Divestment Businesses so that the Commission can assess whether the Divestment Businesses are held in a manner consistent with the Commitments and the progress of the divestiture process as well as potential purchasers. In addition to these reports, the Monitoring Trustee shall promptly report in writing to the Commission, sending the Notifying Party a non-confidential copy at the same time, if it concludes on reasonable grounds that the Notifying Party is failing to comply with these Commitments;

(vii) Within one week after receipt of the documented proposal referred to in paragraph 25, submit to the Commission a reasoned opinion as to the suitability and independence of the proposed purchaser and the viability of the Divestment Businesses after the sale and as to whether the Divestment Businesses are sold in a manner consistent with the conditions and obligations attached to the Decision, in particular, if relevant, whether the sale of the Divestment Businesses without one or more Assets or not all of the Personnel affects the viability of the Divestment Businesses after the sale, taking account of the proposed purchaser. Within one week after receipt of the documented proposal referred to in paragraph 28, the Monitoring trustee shall submit to the Commission a reasoned opinion as to the consistency of the proposal with the commitment described in Section E.

Duties and obligations of the Divestiture Trustee

40. Within the Trustee Divestiture Period, the Divestiture Trustee shall sell at no minimum price the Divestment Businesses to the purchaser(s), provided that the Commission has approved both the purchaser(s) and the final binding sale and purchase agreement(s) in accordance with the procedure laid down in paragraph 26. The Divestiture Trustee shall include in the sale and purchase agreement(s) such terms and conditions as it considers appropriate for an expedient sale in the Trustee Divestiture Period. In particular, the Divestiture Trustee may include in the sale and purchase agreement(s) such customary representations and warranties and indemnities as are reasonably required to effect the sale. The Divestiture Trustee shall protect the legitimate financial interests of the Notifying Party, subject to the Parties' unconditional obligation to divest at no minimum price in the Trustee Divestiture Period.

41. Within the Trustee Divestiture Period, the Divestiture Trustee shall sever the existing joint ventures between BOC and Air Liquide as listed in Schedule V to the extent that the combined turnover of the severed joint ventures accounts for at least **[Business Secret]**% of the combined total turnover of all joint ventures between BOC and Air Liquide as described in Schedule V. To carry out this task, the Divestiture Trustee shall either sell the whole of BOC's shareholding or acquire the whole of Air Liquide's shareholding in the respective joint ventures or dissolve the joint ventures. Any agreement entered into by the Divestiture Trustee shall be subject to and conditional

upon the Commission's approval in accordance with paragraph 28. The Divestiture Trustee shall include in the agreement(s) such terms and conditions as it considers appropriate for an expedient implementation of the commitment described in paragraph 27 in the Trustee Divestiture Period. The Divestiture Trustee shall protect the legitimate financial interests of the Notifying Party, subject to the Notifying Party's unconditional obligation to sever the structural links as described in paragraph 27 at no minimum financial or commercial result in the Trustee Divestiture Period.

42. In the Trustee Divestiture Period (or otherwise at the Commission's request), the Divestiture Trustee shall provide the Commission with a comprehensive monthly report written in English on the progress of the divestiture and the severing process. Such reports shall be submitted within 15 days after the end of every month with a simultaneous copy to the Monitoring Trustee and a non-confidential copy to the Parties.

III Duties and obligations of the Parties

43. The Notifying Party shall provide and shall cause its advisors to provide the Trustee with all such co-operation, assistance and information as the Trustee may reasonably require to perform its tasks. The Trustee shall have full and complete access to any of the Parties' or the Divestment Businesses' books, records, documents, management or other personnel, facilities, sites and technical information necessary for fulfilling its duties under the Commitments and the Parties and the Divestment Businesses shall provide the Trustee upon request with copies of any document. The Parties and the Divestment Businesses shall make available to the Trustee one or more offices on their premises and shall be available for meetings in order to provide the Trustee with all information necessary for the performance of its tasks.
44. The Notifying Party shall provide the Monitoring Trustee with all managerial and administrative support that it may reasonably request on behalf of the management of the Divestment Business. This shall include all administrative support functions relating to the Divestment Businesses which are currently carried out at headquarters level. The Notifying Party shall provide and shall cause its advisors to provide the Monitoring Trustee, on request, with the information submitted to potential purchasers, in particular give the Monitoring Trustee access to the data room documentation and all other information granted to potential purchasers in the due diligence procedure. The Notifying Party shall inform the Monitoring Trustee on possible purchasers, submit a list of potential purchasers, and keep the Monitoring Trustee informed of all developments in the divestiture and the severing process.
45. The Notifying Party shall grant or procure Affiliated Undertakings to grant comprehensive powers of attorney, duly executed, to the Divestiture Trustee to effect the sale, the Closing and all actions and declarations which the Divestiture Trustee considers necessary or appropriate to achieve the sale and the Closing, including the appointment of advisors to assist with the sale process. Upon request of the Divestiture Trustee, the Notifying Party shall cause the documents required for effecting the sale and the Closing to be duly executed. The Notifying Party shall also grant or procure Affiliated Undertakings to grant comprehensive powers of attorney, duly executed, to the Divestiture Trustee to effect all agreements, actions and declarations which the Divestiture Trustee considers necessary or appropriate to carry out and implement the commitment described in paragraph 27, including the appointment of advisors. Upon request of the Divestiture Trustee, the Notifying Party shall cause the necessary documents to be duly executed.

46. The Notifying Party shall indemnify the Trustee and its employees and agents (each an “**Indemnified Party**”) and hold each Indemnified Party harmless against, and hereby agrees that an Indemnified Party shall have no liability to the Notifying Party for any liabilities arising out of the performance of the Trustee’s duties under the Commitments, except to the extent that such liabilities result from the wilful default, recklessness, gross negligence or bad faith of the faith of the Trustee, its employees, agents or advisors.
47. At the expense of the Notifying Party, the Trustee may appoint advisors (in particular for corporate finance or legal advice), subject to the Notifying Party’s approval (this approval not to be unreasonably withheld or delayed) if the Trustee considers the appointment of such advisors necessary or appropriate for the performance of its duties and obligations under the Mandate, provided that any fees and other expenses incurred by the Trustee are reasonable. Should the Notifying Party refuse to approve the advisors proposed by the Trustee the Commission may approve the appointment of such advisors instead, after having heard the Notifying Party. Only the Trustee shall be entitled to issue instructions to the advisors. Paragraph 46 shall apply mutatis mutandis. In the Trustee Divestiture Period, the Divestiture Trustee may use advisors who served the Notifying Party during the Divestiture Period if the Divestiture Trustee considers this in the best interest of an expedient sale.

IV Replacement, discharge and reappointment of the Trustee

48. If the Trustee ceases to perform its functions under the Commitments or for any other good cause, including the exposure of the Trustee to a conflict of interest:
- a) The Commission may, after hearing the Trustee, require the Notifying Party to replace the Trustee; or
 - b) The Notifying Party, with the prior approval of the Commission, may replace the Trustee.
49. If the Trustee is removed according to paragraph 48, the Trustee may be required to continue in its function until a new Trustee is in place to whom the Trustee has effected a full hand over of all relevant information. The new Trustee shall be appointed in accordance with the procedure referred to in paragraphs 32-37.
50. Beside the removal according to paragraph 48, the Trustee shall cease to act as Trustee only after the Commission has discharged it from its duties after all the Commitments with which the Trustee has been entrusted have been implemented. However, the Commission may at any time require the reappointment of the Monitoring Trustee if it subsequently appears that the relevant remedies might not have been fully and properly implemented.

Section G - The Review Clause

51. The Commission may, where appropriate, in response to a request from the Notifying Party showing good cause and accompanied by a report from the Monitoring Trustee:
- (i) Grant an extension of the time periods foreseen in the Commitments; or
 - (ii) Waive, modify or substitute, in exceptional circumstances, one or more of the undertakings in these Commitments.

Where the Notifying Party seeks an extension of a time period, it shall submit a request to the Commission no later than one month before the expiry of that period, showing good cause. Only in exceptional circumstances shall the Notifying Party be entitled to request an extension within the last month of any period.

Berlin, June 2, 2006

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Ulrich Quack

Duly authorised for and on behalf of the Notifying Party

Schedule I: UK Divested Business

Background

The Notifying Party divests Linde Gas UK Limited (“Linde Gas UK”) including all of its subsidiaries by selling its shareholding in Linde Gas UK to the Purchaser.

Essentially all of the Notifying Party’s gases business in the United Kingdom, in particular its entire bulk and cylinder supply of standard industrial gases including retail helium, rests with Linde Gas UK. Linde Gas UK supplies bulk and cylinder standard industrial and medical gases as well as helium to customers throughout Great Britain, but does not have any sales in the UK tonnage business. Linde Gas UK also supplies certain specialty gases.

Linde Gas UK has some **[Business Secret]** customers in Great Britain, including some companies within the Linde AG Group. Linde Gas UK currently employs **[Business Secret]** people.

1. The Divestment Business as operated to date has the following legal and functional structure:

Linde Gas UK Limited is a company incorporated in England and Wales. Corporate details are set out below:

- (a) **Registered office** – Johnsons Bridge Road, West Bromwich, West Midlands, B71 1LG.
- (b) **Company officers** – **[Business Secret]**
- (c) **Issued share capital** – **[Business Secret]**
- (d) **Shareholders** – Linde Gas UK is a wholly-owned subsidiary of Linde AG.

Linde Gas UK has four subsidiaries, each of which is wholly-owned. These are:

- (a) **Gas and Equipment Limited** – **[Business Secret]**;
- (b) **Kingston Medical Gases Limited** – **[Business Secret]**;
- (c) **Offshore Diving Gases Inc.** – **[Business Secret]**; and
- (d) **Gas and Equipment Willemstad NV** – **[Business Secret]**.

[Business Secret]

Linde Gas UK is managed by a dedicated local management. A copy of Linde Gas UK's organisational/management chart is contained at **Appendix 1**.

2. Following paragraph 4 of these Commitments, the Divestment Business includes, but is not limited to:

(a) the following main tangible assets:

- all nine sites operated by Linde Gas UK in the UK:
 - IRLAM (Sorby Road, North Bank Industrial Park, Irlam, Manchester, M44 5BA), **[Business Secret]**.
 - STRATFORD (160 Leyton Road, Stratford, London, E15 1ND), **[Business Secret]**.
 - ABERDEEN (Greenbank Road, East Tullos Industrial Estate, Aberdeen, AB12 3BQ), **[Business Secret]**.
 - EYNHAM (Stanton Harcourt Road, Eynham, Witney, Oxfordshire, OX29 1JG), **[Business Secret]**.
 - WEST BROMWICH (Johnson's Bridge Road, Church Lane, West Bromwich, West Midlands, B71 1LG), **[Business Secret]**.
 - BELLSHILL (Katrine Avenue, Righead Industrial Estate, Bellshill, Motherwell, ML14 3LS), **[Business Secret]**.
 - TYNESIDE (Unit 2, Port of Tyne, South Shields, Tyneside NE33 5SP), **[Business Secret]**.
 - STOKE (Newfield Industrial Estate, Tunstall, Stoke-on-Trent, Staffordshire, ST6 5PD), **[Business Secret]**.
 - STOCKTON (39 Portrack Lane, Stockton-on-Tees, Cleveland), **[Business Secret]**.
- all tangible assets owned by Linde Gas UK and located at the nine sites, in particular cylinder filling stations, test equipment, helium liquefiers, a methane production plant as well as administrative, storage and distribution facilities;

- **[Business Secret]** small on-site nitrogen plants;
- facilities for the processing of hydrogen at **[Business Secret]** in **[Business Secret]**
- all essential transportation and distribution equipment operated by Linde Gas UK to serve its customers in the United Kingdom, in particular lorries, articulated units, trailers, tankers and cylinders.

(b) the following main intangible assets:

all intangible assets owned by Linde Gas UK, **[Business Secret]**.

(c) the following main licences, permits and authorisations:

all licences, permits and authorisations owned by Linde Gas UK, *inter alia* a number of manufacturing and marketing authorisations for medical gases. This includes all the necessary licences, permits and authorizations to operate the sites mentioned above and to carry out the business in the United Kingdom.

(d) the following main contracts, agreements, leases, commitments and understandings:

all contracts, agreements, leases, commitments and understandings entered into by Linde Gas UK (to the extent this is not hindered by change of control clauses and the subsequent termination of any such agreements). This includes in particular all customer contracts of Linde Gas UK and all supply contracts of Linde Gas UK with third-party suppliers. The main third-party suppliers to Linde Gas UK are the following:

[Business Secret]

(e) the following customer, credit and other records:

all records relating to Linde Gas UK's customers, credits and other business activities.

(f) the following Personnel:

all Personnel that is employed by Linde Gas UK.

(g) the following Key Personnel:

all Key Personnel of Linde Gas UK.

The key management of Linde Gas UK comprises the following Personnel:

[Business Secret]

- (h) **the arrangements for the supply with the following products or services by Affiliated Undertakings for a transitional period of up to 2 years after Closing:**

To the extent that the Purchaser of the UK Divested Business wishes, the Notifying Party would be prepared to put in place a contract with the Purchaser to replicate the following supply arrangements for gases between Linde Gas UK and Affiliated Undertakings:

[Business Secret]

3. The Divestment Business shall not include:

The UK Divested Business extends to Linde Gas UK and its subsidiaries as a whole.

As Linde Gas UK accounts for about **[Business Secret]**% of all gases related sales of the Notifying Party to end customers⁶⁴ in the United Kingdom, the divestment includes essentially all of the Notifying Party's gases business in the United Kingdom, in particular its entire bulk and cylinder supply of standard industrial gases including retail helium.

The UK Divested Business also includes the Notifying Party's specialty gases business in the United Kingdom with two exceptions:

- **[Business Secret] [Note: The UK Divested Business does not include the Notifying Party's activities in the United Kingdom in the area of electronic specialty gases carried out through Linde Nippon Sanso and its subsidiaries.]**
- **[Business Secret] [Note: The UK Divested Business does not include the Ethylene Oxide Divested Business.]**

⁶⁴ **Business Secret] [Note: The UK Divested Business does not include sales of specialty gases made by Affiliated Undertakings other than Linde Gas UK to other gas companies.]**

APPENDIX 1

LINDE GAS UK – ORGANISATIONAL AND MANAGEMENT STRUCTURE

[Business Secret]

Schedule II: Polish Divested Business

Background

The Notifying Party divests BOC Gazy Sp z o.o. (“BOC Gazy”) including its subsidiary Roboprojekt BOC Sp. z o.o. by selling the shareholding in BOC Gazy that is currently held by the BOC Group to the Purchaser.

All of BOC’s gases business in Poland rests with BOC Gazy. BOC Gazy supplies tonnage, bulk and cylinder standard industrial gases as well as helium and specialty gases to customers throughout Poland.

BOC Gazy has about [Business Secret] customers throughout Poland. BOC Gazy currently employs approximately [Business Secret] people.

1. The Divestment Business as operated to date has the following legal and functional structure:

BOC Gazy is a company incorporated in Poland. Corporate details are set out below:

- (a) Registered office** – ul. Pory 59, Warszawa, PL 02-757
- (b) Company officers** – [Business Secret]
- (c) Issued share capital** – [Business Secret]
- (d) Shareholders** – [Business Secret].

BOC Gazy has one wholly-owned subsidiary, Roboprojekt BOC Sp. z o.o.

BOC Gazy is managed by a local management team. A copy of BOC Gazy’s organisational/management chart is contained at **Appendix 1**.

The Polish Divested Business is currently operated as part of two of BOC’s global “lines of business”.

- Industrial & Special Products (ISP) focuses on cylinder markets and bulk product supplied to fabrication and medical customers. The ISP business operates a national Customer Service Centre in Siewierz, where all customer orders are taken. ISP’s national scheduling centre is also at Siewierz (as is the supply chain / supply management function for gases and equipment).

- Process Gas Solutions (PGS) encompasses tonnage and bulk (including small onsites), with the exception of supplies to fabrication and medical customers. PGS's national operations centre is based in Częstochowa from where it also operates the plant at Oświęcim.

PGS's bulk distribution for the Polish Divested Business is currently scheduled from the centre at Kędzierzyn.

PGS manages an in-house Customer Engineering Services (CES) activity responsible for installation of storage tanks, applications equipment for all BOC Gazy's Polish customers.

These market-orientated organizations are supported by four key enabling functions:

- Finance;
- Human Resources;
- Information Management [**Business Secret**];
- Safety, Health, Environment & Quality.

2. Following paragraph 4 of these Commitments, the Divestment Business includes, but is not limited to:

(a) the following main tangible assets:

- the following tonnage plants:
 - Kędzierzyn (Waryńskiego, Kędzierzyn-Kozle, PL 47-220)
 - Głogów (ul. Zukowicka, Zukowice, PL 67 – 231)
 - Częstochowa (ul. Rejtana 8, Częstochowa, PL 42-200)
 - Oświęcim (ul. Stara Droga 1, Oświęcim, PL 61-022)
 - Ostrowiec (ul. Samsonowicza 2, Ostrowiec Sw., PL 27-400)
- the CO₂ production facility in Janikowo (ul. Przemysłowa 30, Janikowo, PL 88-160)

- the following small on-site plants:

[Business Secret]

- the following cylinder filling plants:
 - Siewierz (ul. Kielecka 30, Siewierz, PL 42-470)
 - Oświęcim (ul. Stara Droga 1, Oświęcim, PL 61-022)
 - Warsaw (ul. Bukowiecka 71, Warszawa, PL 03-893)
 - Brzeg Dolny (ul. Sienkiewicza 29, Brzeg Dolny, PL 56-120)
 - Poznań (ul. Krańcowa 14, Poznań, PL 61-022)
 - Zdzeszowice (ul Filarskiego, Zdzeszowice, PL 47-330)
- all tangible assets owned by BOC Gazy and located at the sites listed above, in particular administrative, storage and distribution facilities;
- 22 “Gas & Gear” centres and 12 “Roboprojekt” shops;
- all essential transportation and distribution equipment operated by BOC Gazy to serve its customers in Poland, in particular delivery and hauler vehicles, trailers, tankers and cylinders.

(b) the following main intangible assets:

all intangible assets owned by BOC Gazy.

(c) the following main licenses, permits and authorisations:

all licenses, permits and authorisations owned by BOC Gazy, including all the necessary licenses, permits and authorizations to operate the sites mentioned above and to carry out the business in Poland.

(d) the following main contracts, agreements, leases, commitments and understandings:

all contracts, agreements, leases, commitments and understandings entered into by BOC Gazy (to the extent this is not hindered by change of control clauses and the subsequent

termination of any such agreements). This includes in particular all customer contracts of BOC Gazy and all supply contracts of BOC Gazy with third-party suppliers. The main third-party suppliers to BOC Gazy are the following:

[Business Secret]

(e) the following customer, credit and other records:

all records relating to BOC Gazy's customers, credits and other business activities.

(f) the following Personnel:

all Personnel that is employed by BOC Gazy.

(g) the following Key Personnel:

all Key Personnel of BOC Gazy.

The key management of BOC Gazy comprises the following Personnel:

PGS

[Business Secret]

ISP

[Business Secret]

(h) the arrangements for the supply with the following products or services by BOC or Affiliated Undertakings for a transitional period of up to 2 years after Closing:

To the extent that the Purchaser of the Polish Divested Business wishes, the Notifying Party would be prepared to put in place a contract with the Purchaser to replicate the current supply arrangement according to which BOC UK supplies BOC Gazy with **[Business Secret]**.

3. The Divestment Business shall not include:

The Polish Divestment Business extends to BOC Gazy as a whole.

For the avoidance of doubt, it should be noted that BOC's contract for the supply of helium by Krio from the source in Odolanów is managed separately from and does not form part of BOC Gazy. BOC Gazy has a separate contract with **[Business Secret]** for the supply of

helium to meet BOC Gazy's requirements for the retail market in Poland; only that contract remains with the Polish Divested Business.

APPENDIX 1

BOC GAZY – ORGANISATIONAL AND MANAGEMENT STRUCTURE

[Business Secret]

Schedule III: Helium Divested Business

1. The Helium Divested Business as operated to date has the following legal and functional structure:

The Helium Divested Business consists of

- (i) the Notifying Party’s two helium supply contracts with Cryor; and of
- (ii) three of BOC’s helium supply contracts, one with Cryor, one with Krio, Odolanov (Poland) and one with ExxonMobil;

with a combined volume of up to **[Business Secret]** million m³.

2. Following paragraph 10 of these Commitments, the Helium Divested Business includes:

- (a) Linde helium supply contracts

The following helium supply contracts will be assigned to the Purchaser(s) of the Helium Divested Business:⁶⁵

Helium producer (company, source, country)	Beginning date of agreement	Ending date of agreement	Contractual volume (maximum mio m ³ p.a.)	Contractual volume (maximum mmcf p.a.)
Cryor – Orenburg, Russia	[Business Secret]			
Cryor – Orenburg, Russia	[Business Secret]			

- (b) BOC helium supply contracts

The following helium supply contracts will be assigned to the Purchaser(s) of the Helium Divested Business:⁶⁶

Helium producer (company, source, country)	Beginning date of agreement	Ending date of agreement	Contractual volume (maximum mio m ³ p.a.)	Contractual volume (maximum mmcf p.a.)

⁶⁵ Due to conversion and rounding, actual contract volumes may be slightly different.

⁶⁶ Due to conversion and rounding, actual contract volumes may be slightly different.

ExxonMobil – Shute Creek, WY, USA	[Business Secret]			
Cryor – Orenburg, Russia	[Business Secret]			
Polish Oil and Gas Company Odolanow, Poland (Krio)	[Business Secret]			

[Note: The aggregate contractual volume (maximum p.a.) of all helium supply contracts listed in (a) and (b) above exceeds 12 mio m³/430 mmcf. More than two thirds of these contractual volumes are subject to supply contracts with a remaining duration of more than three years.]

(c) Cryogenic containers

If and to the extent required by the Purchaser(s), the Notifying Party will provide the Purchaser(s) with up to [Business Secret] cryogenic 40" ISO-containers (11,000 gallon), either by selling such containers to the Purchaser(s) or, if the Purchaser(s) agree, by entering into lease arrangements for a period of up to two years.

(d) Helium wholesale customer contracts

If and to the extent required by the Purchaser(s), the Notifying Party will assign the following contracts with helium wholesale customers to the Purchaser(s):

Linde

Wholesale Customer	Location	Contract duration	Expected volumes scf/year (m3/year)
[Business Secret]			

BOC

Wholesale Customer	Location	Contract duration*	Quantity supplied in 2005 scf/year (m3/year)
[Business Secret]			
[Business Secret]			
[Business Secret]			

* Duration stated includes past contract extensions.

Schedule IV: Ethylene Oxide Divested Business

1. The Divestment Business as operated to date has the following legal and functional structure:

The Ethylene Oxide Divested Business as operated today does not constitute a separate legal entity. It consists of the ethylene oxide business of the Notifying Party's wholly-owned subsidiary Chemogas N.V. (Belgium) with end-customers in the United Kingdom and in Ireland.

2. Following paragraph 14 of these Commitments, the Divestment Business includes:

(a) Customer contracts

The following customer contracts will be assigned to the Purchaser of the Ethylene Oxide Divested Business:

Name of customer	[Business Secret]
Address of customer	
Contracted volume (2005)	
Price	
Duration of contract	
Delivery mode (place of delivery and frequency of delivery)	
Number of cylinders designated to the customer	

(b) Cylinders

To the extent that the Purchaser of the Ethylene Oxide Divested Business wishes, the Notifying Party would be prepared to provide the Purchaser with the number of cylinders indicated in the table above that is needed to supply the customers of the assigned contracts listed in Section 2(a) above. These cylinders are in every case designated specifically to just one customer.

(c) Transitional agreements

To the extent that the Purchaser of the Ethylene Oxide Divested Business wishes, the Notifying Party would be prepared to enter into one or both of the following transitional agreements for a period of up to 2 years:

- (1) an agreement under which the Notifying Party supplies the Purchaser of the Ethylene Oxide Divested Business with the bulk volumes of ethylene oxide

that are needed to supply the customers of the assigned contracts listed in Section 2(a) above;

- (2) an agreement under which the Notifying Party for the Purchaser of the Ethylene Oxide Divested Business fills the cylinders with ethylene oxide for the supply of the customers of the assigned contracts listed in Section 2(a) above.

3. The Divestment Business shall not include:

For the avoidance of doubt it should be noted that the Ethylene Oxide Divested Business does not include any sales of ethylene oxide to end-customers in the United Kingdom that are made by Linde Gas UK. Any such sales, which in 2005 amounted to EUR **[Business Secret]** (equaling **[Business Secret]**% of all ethylene oxide sales of the Notifying Party to end-customers in the United Kingdom), are divested as part of the UK Divested Business as defined in Schedule I.

Schedule V: Severed Joint Venture Business

BOC is partner to [Business Secret] joint ventures with Air Liquide in the Asia/Pacific region. These joint ventures with Air Liquide are active only in Asia; none is active in Europe. As far as some of these joint ventures are incorporated as holding companies in Europe (Jersey), their only purpose is to own shares in the respective Asian gases companies.

[Business Secret]

Joint Ventures AL/BOC		BOC's share in JV	Turnover Mio. € in 2005	in% of total turnover of JVs in Asia
Name	Activity in Asia			
