Linde/BOC: Concentration in the industries of industrial gases, 
specialty gases and helium (1)

Sandra KIJEWSKI, Directorate-General for Competition, unit C-4; 
Enrique SEPULVEDA GARCIA, Kamila KLOC-EVISON, Mariusz HUBSKI and 
Uli WIENRICH, Directorate-General for Competition, unit B-3

On 6 June 2006, the European Commission 
approved, subject to conditions, the acquisition by 
Linde AG (“Linde”) of The BOC group (“BOC”). 
Both companies are active in industrial and spe 
cialty gases including helium.

The initial market investigation found that the 
proposed acquisition could have created significant 
competition problems by removing an important 
competitor of Linde on a number of gas markets.

These competition concerns were removed by the 
remedy package offered by the parties which includes 
the divestiture of Linde’s industrial gases business 
in the UK including some customer contracts for 
specialty gases and BOC’s industrial and specialty 
gases business in Poland. The approval is further 
conditional on divesting several helium wholesale 
supply contracts of both Linde and BOC. Linde will 
also break to a defined extent its structural links with 
Air Liquide with regard to Asian Joint Ventures.

I. Introduction

a. The concentration

Both Linde and BOC offer a broad range of gases 
worldwide to customers in a wide variety of differ 
ent industries. The gases cover standard industrial 
gases, such as oxygen, nitrogen and argon in their 
industrial as well as — if applicable — their medi 
cal use; specialty gases, such as various refrigerants 
and calibration mixtures; and helium.

These gases are used in various industries includ 
ing the steel, chemicals, glass, electronics, paper, 
food processing, health care and aerospace indus 
tries.

Linde and BOC entered into an agreement pursu 
ant to which Linde acquires 100% of BOC’s shares 
and thereby sole control over BOC.

b. The product market

Distinct markets per gas

The Commission has already in previous cases 
examined these markets (2). In its previous deci 
sions, the Commission took the view that the dif 
f erent individual industrial, medical and specialty 
gases are generally not interchangeable because of 
their different chemical and physical properties 
and that therefore each gas constitutes a separate 
relevant product market. The investigation in this 
case confirmed this product market definition.

Distinct markets per form of supply

Industrial, medical and specialty gases are sup 
plied in different forms (gaseous or liquid) and via 
different distribution channels (tonnage, bulk and 
cylinders). As already found in earlier decisions, 
these different distribution forms are generally not 
substitutes for the customers and therefore consti 
tute separate markets for each gas.

Tonnage sales relate to the delivery of large quanti 
ties exceeding 100 tons per day (“tpd”) under long 
term agreements (usually 15 years). The gases are 
supplied to customers in gaseous form through 
pipelines or from dedicated plants located on the 
customer’s production facility.

Bulk mainly covers the supply of gases in liquid 
form to customers, whose demand is between 20 
to 100 tpd. The liquefied gases are transported by 
road or rail tanker from the supplier’s plant to the 
site of the customer.

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 the suppliers’ production plant or specific filling 
centres where liquid bulk gases are transformed 
into compressed gas. From there, they are distrib 
uted either directly to the customer or via depots.

(1) The content of this article does not necessarily reflect the 
official position of the European Communities. Respon 
sibility for the information and views expressed lies enti 
rely with the authors.

(2) Decisions in the cases COMP/M.1630 Air Liquide / BOC; 
COMP/M.1641 Linde / AGA; COMP/M.3314 Air Liquide 
/ Messer Targets
Distinct market levels for helium

Helium has 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 at various places all over the world and is transported by wholesalers as liquid gas in special “cryogenic containers” from the respective production site to transfill centres in the areas of consumption.

From there it is supplied in smaller quantities to end-customers on the retail level. The suppliers can be helium wholesalers who are vertically integrated into the retail level or independent retailers who buy helium on the wholesale market.

In line with the previous decision Air Liquide / BOC, the Commission distinguished also in this case a retail and a wholesale market for helium.

c. The geographic market

Industrial/ medical gases

In the most recent case dealing with this industry Air Liquide / Messer Targets, the Commission rejected a market definition wider than the EEA for the tonnage supply and even found elements that pointed towards the existence of national markets.

In the present case, the market investigation confirmed that the industrial gas companies in principle can participate in bids on an EEA-wide basis, but that local presence confers important competitive advantages. In line with the previous decision in this sector, the Commission therefore assumed an EEA-wide market for tonnage which however shows important regional aspects.

The market investigation, moreover, confirmed that the geographic scope of the bulk and the cylinder markets can be considered as national despite of the local aspects which are of particular relevance in the cylinder business. Due to the overlapping catchment areas of the cylinder filling centres and the existence of swap agreements between suppliers to reduce transportation costs, competition takes place at national level.

Helium

Helium is extracted, refined and liquefied at 14 sources worldwide. It is a by-product of the production of natural gas and liquid natural gas (“LNG”). The wholesalers active in the EEA source helium in Poland, Russia, Algeria, Qatar, and the US. Imports into the EEA are significant. Approximately one third of the total EEA-supply of helium is imported from the US alone. Against this background the Commission considered the present geographic market for wholesale helium as worldwide whereas the retail helium markets have proved to be national in scope.

Specialty gases

Specialty gases are predominantly supplied in cylinders. Their prices are, however, generally higher than those of industrial gases. This, at least for some specialty gases, justifies a geographic market definition wider than national. For the purpose of the decision it was not necessary to clearly define the geographic scope of all of the specialty gases markets. The market investigation has, however, shown strong indications that the markets for specialty gases belonging to the group of noble gases and noble gas mixtures as well as electronic specialty gases are at least EEA-wide. The specialty gases belonging to the group of refrigerants and chemicals show national elements with a tendency towards a wider scope. The markets for calibration mixtures are considered to be at least national.

d. The procedure

The proposed operation raised serious doubts as to its compatibility with the Common Market in the bulk and cylinder supply of several industrial and medical gases in Poland and in the UK as well as on an EEA-wide basis; on the worldwide helium wholesale market and on the helium retail markets in Poland and the UK as well as on the markets for refrigerants in those two countries and for ethylene oxide (belonging to the chemicals group) in the UK and Ireland.

In order to address the competition concerns identified by the Commission, the notifying party submitted a set of commitments mainly consisting of divestitures of subsidiaries as well as important Linde and BOC contracts. After having tested these commitments on the market, the Commission concluded that the proposed remedies would effectively remove the serious doubts and cleared the transaction subject to these commitments.

The Polish competition authority agreed with this assessment and withdrew a previously submitted request for a partial referral based on concerns about the affected Polish markets.

The competitive conditions as well as the remedies for the worldwide helium wholesale market were moreover assessed in close cooperation with the US-FTC which examined the case at the same time. This cooperation allowed the parties to address the concerns of both competition authorities in parallel in a coherent and effective way.
II. Industrial gases

a. Single dominant positions in bulk and cylinders in Poland and the UK

While Linde has wide-spread activities all over the EEA, BOC has focussed its European activities exclusively on Poland and the UK, in the latter they have historically enjoyed a leading position. The only overlap on the national bulk and cylinder markets for several industrial gases therefore occurred in these two countries.

**Bulk and cylinder supply in Poland**

In Poland, Linde and BOC have been active to comparable extents and have in most markets been the strongest suppliers.

Linde's pre-merger leading position in the bulk supply of oxygen, nitrogen, argon, carbon dioxide and hydrogen would be significantly enhanced by the addition of the BOC activities. Linde would have become by far the strongest market player in all these markets with market shares always exceeding 40% and going up to 80%. For most bulk gases the market would not only be highly concentrated in terms of sales, but also in terms of production capacity. The market investigation gave indications that the competitors in Poland would be dependent on the parties due to capacity constraints, swap and supply agreements.

Therefore the Commission concluded that the merged entity would, with high probability, be able to raise prices since neither customers nor competitors would have sufficient means to counteract such a strategy.

A similar situation would result from the merger in the Polish cylinder markets for several industrial gases. The combined entity would be by far the largest supplier with market shares between 60 and 70% for most gases. Bulk gases are used to fill cylinders and are therefore vertically related to the cylinder supply. Given the merged entity's leading position on the bulk markets, the Commission concluded that the high market shares and the competitors' comparatively lower flexibility in capacity would likely lead to price increases post-merger on the cylinder markets in Poland.

**Bulk and cylinder supply in the UK**

In the UK, BOC has enjoyed a historically strong position while Linde has been active in the individual gases to varying extent, however, always on a significantly smaller level than BOC.

In bulk oxygen, nitrogen and argon, BOC has had pre-merger strong market positions with shares well above 50%. Regarding hydrogen, both Linde and BOC have strong market positions and the combined share would exceed 60% after the merger.

In almost all cylinder gases, BOC has held very high market shares in the UK while Linde was a smaller competitor.

The removal of Linde as a serious threat to the historical market leader BOC and a potentially stronger competitor in the future, would reinforce the current very strong market position enjoyed by BOC in most of the various bulk and cylinder markets which could result in price increases post-merger.

b. Coordinated effects in industrial gases on EEA-level

In addition to the concerns set out above, the Commission came to 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.

On the bulk and cylinder markets, the transaction would to a large extent complete the division of the EEA between Linde and Air Liquide, with one or the other of them having a dominant or leading position in virtually every EEA country. With the acquisition of BOC’s strong position in Poland, Linde would become an incontestable leader in the whole of Eastern Europe, thereby mirroring the strong position and coverage of Air Liquide in the West. The same would be true for the tonnage market.

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 (3). As already highlighted 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. The markets, moreover, show a high degree of transparency which allows for a coordinated behaviour and in particular for the monitoring of any deviations.

The transaction would also grant Linde joint control together with Air Liquide over important Asian joint ventures. Structural links of this kind would further facilitate the exchange of information and bring about new means of retaliation.

(3) See Horizontal Merger Guidelines, para. 46.
III. Helium

a. Non-coordinated effects in helium wholesale

There are only 14 sources in the world where conditions exist to justify helium recovery. Helium producers are 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 industrial gas companies who act as wholesalers or create joint-ventures with them in order to jointly produce helium. Some of the wholesalers are vertically integrated into the production of helium.

Traditionally, Air Products, Praxair and BOC have had relatively symmetric leading positions on the helium wholesale markets worldwide (market shares of 25 — 40% each). Air Liquide is a smaller player with an estimated helium wholesale market share of below 10% on a global scale. Capacity shares based on the access to helium sources lead to a similar market structure which has shown significant stability in the past due to the difficulties of getting access to the helium sources.

Linde has very recently acquired an own access to helium sources both by long-term agreements and by a joint venture \(^4\) with the Algerian company Sonatrach (Skikda source) and thereby entered the helium wholesale market. The market investigation confirmed that Linde had already started and was expected to continue to exert considerable competitive pressure in the helium wholesale market with the new quantities acquired.

The Commission considered, that Linde’s incentives to compete on this market would decrease post-merger since Linde would then be part of the group of the three established leading companies and no longer an aggressive entrant competing to ensure its position on the market and gain market share. The Commission therefore concluded that the elimination of Linde as an aggressive new entrant would lead to non-coordinated effects and a subsequent increase in prices on the helium wholesale market.

b. Coordinated effects in helium wholesale

Furthermore, the Commission had concerns that the merger could even lead to a weakening of competitive pressure as a result of coordinated effects.

The market structure has been historically stable. Moreover, the investigation confirmed that there is a high degree of transparency on the market. Furthermore, the three largest players are moreover connected by various swap and supply agreements.

The removal of Linde as an aggressive “maverick” would increase the risk of tacit collusion in this market and thereby raise serious doubts as to the compatibility of the merger with the common market.

c. Single dominance in helium retail in the UK and in Poland

On the helium retail markets in Poland and in the UK, BOC had pre-merger the by far leading position with market shares of more than 50% whereas Linde had market shares below 30% in the UK and below 20% in Poland. Linde can be regarded as an important competitive constraint to BOC due to its strong background in industrial gases. The market investigation confirmed that many customers prefer to buy helium from their industrial gas suppliers. Therefore, in both countries, the merger would lead to the removal of the most important remaining competitive constraint on BOC. The Commission therefore concluded that the merger would lead to serious doubts on the helium retail markets in these two countries.

IV. Specialty gases

On the Polish markets for calibration gas mixtures and for refrigerants, the merger would lead to a substantial overlap of the parties’ market shares on the markets for environmental gas mixtures. The market investigation had identified concerns about the effects of the combination of two close competitors and major suppliers in the Polish market for these specialty gases.

On the market for ethylene oxide sold in cylinders for mainly medical applications, the merger would lead to a substantial overlap leading to strong market positions for the parties in the UK and Ireland. The Commission therefore concluded that the notified transaction would raise concerns with respect to the UK and Irish markets for the ethylene oxide.

V. Remedies

a. Description of the proposed remedies

In order to remove the Commission’s concerns the parties to the merger committed themselves to the following remedies:

\(^4\) Formally the mentioned joint venture consists of two joint ventures which are closely connected.
Merger control

(i) Divestment of the BOC subsidiary active in Poland (“BOC Gazy”) and, thus, essentially all of BOC’s gases business in Poland.

(ii) Divestment of the Linde subsidiary active in the UK (“Linde Gas UK”) and, thus, essentially all of Linde’s gases business in the United Kingdom.

(iii) Severance to a defined extent of structural links between Linde and Air Liquide following from the existing joint ventures of BOC and Air Liquide in Asia.

(iv) Divestment of either — Linde’s shareholdings in the joint ventures with Sonatrach and four specified Linde helium supply contracts (Alternative A) (5); or, alternatively,
  — two specified Linde and three specified BOC helium supply contracts with a larger combined volume than Alternative A (Alternative B).

Alternative B was offered due to possible difficulties in obtaining Sonatrach’s consent to the sale of Linde’s shares in the joint-ventures and would become effective should Alternative A fail to be divested within a certain period of time (6).

(v) Divestment of Linde’s customer contracts in the ethylene oxide business of its wholly-owned subsidiary Chemogas N.V. (Belgium) in the UK and in Ireland.

b. Assessment of the remedies

Industrial gases

The proposed remedies with respect to the affected national markets in Poland and in the UK eliminate the complete overlap created by the transaction. Therefore the serious competition concerns regarding the national markets for cylinder and bulk supply in these two countries would be clearly removed.

The commitments, moreover, eliminate the serious doubts resulting from the likelihood of coordinated effects through the division of the industrial gases markets. In particular, the divestiture of BOC’s complete Polish business will ensure that Eastern Europe is not dominated by Linde and will prevent the increase in geographic symmetry between the leading players Air Liquide and Linde in the EEA. In addition, the severance to a defined extent of certain structural links between Air Liquide and Linde removes the additional element, facilitating coordination that would have been brought about by the merger.

Helium wholesale and retail

The market test of Alternatives A and B confirmed that the proposed remedies are in principle capable of removing the concerns which were raised by the transaction. The market participants overall regarded Alternative A as too risky due to the uncertainty as to whether Sonatrach would consent to the change in the joint venture shareholdings and the investments necessary to remove some technical problems of these joint ventures. In the light of this and in coordination with the US-FTC whose assessment had reached the same result, the Commission decided that Alternative A should be dropped and the final remedy should only contain a commitment as to Alternative B. The market test, moreover, indicated that assets and customer contracts would have to be added to the supply contracts to ensure the viability of the remedy. As a consequence, the parties modified the proposed remedy accordingly.

The remedy removes the concerns 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 on the market, in particular on the three established wholesalers. With the remedy, another company will take over this role.

On the helium retail market, all overlaps in the UK and Poland are removed by the divestiture of BOC’s Polish business and Linde’s UK business.

Specialty gases

The proposed remedies eliminate the complete overlap created by the transaction on the affected markets for refrigerants and calibration gas mixtures in Poland. The concerns regarding the specialty gases markets belonging to these two groups of gases will therefore be clearly removed. 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.

IV. Conclusion

This case has shown that even problematic cases involving highly complex markets which require extensive investigation may be cleared in the first
phase if sufficiently clear-cut remedies are offered by the parties. Moreover, the coordination of both competition authorities — the US-FTC and the Commission — allowed for a joint analysis of the worldwide helium wholesale market as well as a consistent assessment and solution for both sides of the Atlantic while at the same time avoiding for the parties a doubled burden caused by different remedies addressing the same competition concern.